



Deliverable D1.12

Final report on quality control and data homogenization measures applied per country, including QC protocols and measures to determine the achieved increase in data quality

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INTRODUCTION

The homogenization, the data quality control and the data completion were implemented by common software on national level. According to the service contract and the accepted deliverables D1.7, D1.8, D1.11 the common method was MASH (Multiple Analysis of Series for Homogenization; Szentimrey, 1999, 2008, 2011). Between the neighbouring countries there was an exchange of the near border station data series in order to cross-border harmonization.

1. THE SOFTWARE MASHV3.03

The MASH software, which was developed for homogenization of monthly and daily data series, includes also quality control and missing data completion units for the daily as well as the monthly data. Depending on the climate elements, additive or multiplicative model can be used.

The new version of the software is MASHv3.03 that includes new developments for automation. These automatic 'user friendly' procedures make the homogenization easier for the users.

The participants of the project have received this software with the manual (Szentimrey, 2011).

1.1 The procedure for homogenization of daily series by MASHv3.03

The most important properties of the method MASH were described in the deliverables D1.7, D1.8 submitted to the JRC.

The main steps of homogenization of daily series with quality control and missing data completion are as follows.

1. Monthly series from daily series.
2. MASH homogenization procedure for monthly series,
estimation of monthly inhomogeneities. Meta data can be used automatically.
3. On the basis of estimated monthly inhomogeneities,
smooth estimation for daily inhomogeneities.
4. Automatic correction of daily series.
5. Automatic quality control (QC) for homogenized daily data.
6. Automatic missing daily data completion.
7. Monthly series from homogenized, controlled, completed daily data.
8. Test of homogeneity for the new monthly series by MASH.

During the procedure the results as detected break points and errors, estimated corrections and certain verification test results are documented in automatically generated tables.

1.2 The result files of the MASH procedure

Two types of the results can be differentiated.

A, The first type is, output files of the homogenized, controlled and completed series, inhomogeneity series, detected breaks, detected errors. These output files are possessed by the implementing countries.

B, The second type is, output files of test results, verification tables in order to evaluate the homogenization procedure:

- In the verification tables: test statistics before and after homogenization, statistics to characterize the modification of series, the spatial representativity of the station network etc.
- Tables of quality control results for daily data.

Information of quality control and homogenization procedure performed can be tracked on these tables. The summary of them can be added to the homogenized series as the newly created metadata

2. WORKING PLAN IN MODULE 1.3 FOR HOMOGENIZATION BY MASH

The main steps for creation of station data series of meteorological variables listed in Table 1. (Annex I – Technical Specifications, Contract Notice 2010/S 110-166082 dated 9 June 2010)

The homogenization, the data quality control and the data completion was made on national level, implemented by the common software MASH. Between the neighbouring countries the near border station data series was exchanged in order to cross-border harmonization.

I. Compilation of the raw station data series.

1. Selection of the stations (with the spherical coordinates: ϕ , λ), determination of the time period (1961-2010).
2. Collecting the daily station data series (missing data are allowed) and the metadata per countries. **Exchange of the near border station data series** and the metadata between the neighbouring countries.

II. Homogenization, quality control, data completion for the station data series by MASH on national level, with using the near border data.

1. Derivation of monthly station data series from the daily station data series collected in I.2. Homogenization, quality control, data completion of the monthly station data series.
2. Daily station data series (I.2): homogenization, quality control, data completion. This procedure is based on the results of II.1.
3. **Exchange of the near border homogenized data for cross-border harmonization** and for gridding (Module 2: modelling, interpolation).
4. Evaluation of the results of the homogenization and quality control. **Controlling of the cross-border harmonization of the data series.** The cross-border harmonization will be continued after modelling procedure of gridding in Module 2.

3. THE METEOROLOGICAL VARIABLES AND THE RESULT FILES

According to Annex I – Technical Specifications, Contract Notice 2010/S 110-166082 dated 9 June 2010 – the minimum set of meteorological variables in daily temporal resolution to be provided is as follows:

T_a : 2 m mean daily air temperature

T_{min}: Minimum air temperature

T_{max}: Maximum air temperature

p: Accumulated total precipitation

DD: 10 m wind direction, Degrees (0-360)

VV: 10 m horizontal wind speed, m/s

Sunshine: Sunshine duration, hours

cc: Cloud cover, tenths

R_{global}: Global radiation MJ/m²/day

RH: Relative humidity, %

p_{vapour}: Surface vapour pressure, hPa

p_{air}: Surface air pressure, hPa

Snow depth: Snow depth, mm

The homogenization, the data quality control and the data completion procedures were applied for almost all the above variables.

3.1 Some remarks on the variables

3.1.1 Daily mean temperature

The homogenized T_a is calculated as the arithmetic mean of homogenized T_{min} and T_{max} .

3.1.2 Daily mean wind speed and direction (VV, DD)

The following algorithm was developed for homogenization of daily mean wind speed and wind vector direction:

i, Calculation of the daily mean wind speed series,

$$z_j(t) \quad (t = 1, \dots, n; j = 1, \dots, N) \quad (t: \text{day}, j: \text{station})$$

ii, Calculation of the daily mean wind vector series,

$$\mathbf{v}_j(t) = [u_j(t), v_j(t)]^T \quad (t = 1, \dots, n; j = 1, \dots, N)$$

The series $z_j(t), u_j(t), v_j(t)$ are homogenized together!

iii, Homogenization of the wind speed series $z_j(t)$ ($t = 1, \dots, n; j = 1, \dots, N$) (MASH, multiplicative model). Let the homogenized series be: $z_{H,j}(t)$ ($t = 1, \dots, n; j = 1, \dots, N$)

iv, Correction of the component series $u_j(t), v_j(t)$ based on the homogenized wind speed series $z_{H,j}(t)$:

$$u_{z_{H,j}}(t) = \frac{z_{H,j}(t)}{z_j(t)} \cdot u_j(t), \quad v_{z_{H,j}}(t) = \frac{z_{H,j}(t)}{z_j(t)} \cdot v_j(t) \quad (\text{if } z(t) \neq 0)$$

v, Homogenization of corrected component series systems

- $u_{z_{H,j}}(t)$ ($t = 1, \dots, n; j = 1, \dots, N$) (MASH, additive model),
- $v_{z_{H,j}}(t)$ ($t = 1, \dots, n; j = 1, \dots, N$) (MASH, additive model).

vi, Calculation of the homogenized daily “vectorial mean” meteorological wind direction series $\phi_{MET,H,j}(t)$ from the homogenized component series $u_{H,j}(t), v_{H,j}(t)$.

3.1.3 Daily global radiation

Homogenized R_{global} is calculated from homogenized sunshine duration mostly. However the verification statistics were produced for R_{global} before and after the homogenization alike.

3.1.4 Daily snow depth

The related item from the “Minutes of the 5th meeting of CARPATCLIM project, Gödöllő, Hungary, 2-3 April”:

“The discussion with the representative of ZAMG gave the conclusion, that as far as the harmonised and gridded temperature and precipitation data will be ready, based on these fields and snow depth data how they are (should not be homogenised for any case), the snow map calculation and verification (according to the existing snow depth data) can be started.”

3.2 The homogenized variables and the result files

As a consequence of the former remarks we had altogether 12 variables to be homogenized. Results for the different variables are in Annex 1-12: maximum air temperature (1), minimum air temperature (2), precipitation sum (3), relative humidity (4), cloud cover (5), surface vapour pressure (6), surface air pressure (7), sunshine duration (8), global radiation (9), wind speed (10), wind direction, component U (11), wind direction, component V (12).

The homogenization by MASH was performed per countries using near border data series. The homogenized, corrected, completed output daily data files are possessed by the implementing countries, but some important result tables are enclosed in Annex 1-12. There are three type of the tables:

- Station parameters of the series systems.

- Test statistics before (TSB) and after homogenization (TSA) together with certain statistics, which characterize the modification of the series. The statistics were calculated for the monthly, seasonal and annual series automatically during the procedures (II.1 in section 2). The statistics calculated for the annual series are presented in Annex 1-12.
- Summary of the quality control results (II.2 in section 2).

The test statistics after homogenization (TSA) can be compared to the test statistics calculated before homogenization (TSB). The test statistics (TSA) have to be near to the critical value or much less than the test statistics (TSB) if the homogenization is acceptable. Moreover the measures of modification are expected to be in accordance with the difference of TSB and TSA. The applied statistics for measure of relative modification are essentially the ratio of RMSE and standard deviation. The details of verification statistics can be found in MASH manual (Szentimrey, 2011).

The tables of countries in Annex 1-12 are listed in anti-clockwise direction starting with Hungary and Croatia ending with Czech Republic: Hungary and Croatia (1), Serbia (2), Romania (3), Ukraine (4), Slovakia (5), Poland (6), Czech Republic (7).

References

- D1.7 Proposal for quality control tests to be performed for all observational time series, Submitted to JRC.
- D1.8 Proposal for homogenization methods to be applied to all observational time series, Submitted to JRC.
- D1.11 Report on preliminary results of the quality control and data homogenization measures applied per country, including QC protocols and measures to determine the achieved increase in data quality
- D2.3 Proposal for the methodology to harmonize observational time series across country borders
- D2.4 Report with preliminary results of the data harmonization procedures applied, including all protocols, per country
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Annex 1. Maximum air temperature

Table 1.1a. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda	fi	station	country
1	16.08083333	47.03083333	16601	AT
2	16.60222222	47.67833333	13703	HU
3	16.72916666	47.48138888	14706	HU
4	16.64777777	47.19833333	15307	HU
5	16.30944444	46.91027777	16203	HU
6	16.81280000	46.92580000	16414	HU
7	16.61305555	46.60555555	17308	HU
8	16.97060000	46.45610000	17809	HU
9	17.26720000	47.88970000	23201	HU
10	17.67470000	47.71000000	23703	HU
11	17.37220000	47.29220000	25212	HU
12	17.23860000	46.73560000	26505	HU
13	17.87380000	46.36270000	27815	HU
14	17.52690000	46.10330000	28700	HU
15	18.31080000	47.65170000	34211	HU
16	18.04080000	46.91080000	36100	HU
17	18.95220000	46.95060000	36407	HU
18	18.18360000	46.68560000	36500	HU
19	18.25220000	46.13470000	38605	HU
20	18.23500000	45.99500000	39113	HU
21	19.28360000	47.79000000	43613	HU
22	19.02810000	47.51110000	44121	HU
23	19.47640000	47.65560000	44214	HU
24	19.18220000	47.42920000	44527	HU
25	19.74830000	46.91310000	46303	HU
26	19.09890000	46.51030000	47106	HU
27	19.01670000	46.18330000	48101	HU
28	20.53610000	48.49530000	51705	HU
29	20.77140000	48.09690000	52819	HU
30	20.01670000	47.86670000	53101	HU
31	20.23580000	47.73970000	53521	HU
32	20.64780000	47.64470000	54306	HU
33	20.20000000	47.12860000	55502	HU
34	20.74000000	47.10640000	55706	HU
35	20.52780000	46.86940000	56300	HU
36	20.68750000	46.54420000	57311	HU
37	20.09030000	46.25610000	58113	HU
38	20.73670000	46.31720000	58300	HU
39	21.65890000	48.38080000	61709	HU
40	21.88690000	47.96220000	63411	HU
41	21.61080000	47.49030000	64704	HU
42	21.16060000	46.67940000	66519	HU
43	22.62560000	47.86220000	73302	HU
44	16.85000000	45.91700000	bjelo	HR
45	17.23300000	45.60000000	daruv	HR
46	17.06700000	46.05000000	djurd	HR
47	18.16700000	45.76700000	donji	HR
48	18.63300000	45.53300000	osije	HR
49	18.00000000	45.16600000	slavo	HR
50	18.35000000	45.66700000	valpo	HR
51	19.67050000	45.33660000	backi	RS
52	19.76410000	46.09720000	palic	RS
53	19.14310000	45.76700000	sombo	RS
54	20.46460000	45.84260000	kikin	RS
55	21.35362152	46.13351640	arad	RO
56	21.89592406	47.03570901	orade	RO
57	22.09450716	47.34415862	sacui	RO
58	20.60156003	46.07128625	sanni	RO
59	22.88714903	47.72148469	satu	RO
60	22.60000000	48.20000000	bereg	UA
61	23.30000000	48.20000000	khust	UA
62	22.30000000	48.60000000	uzhgo	UA
63	17.11060000	48.16860000	brati	SK
64	18.19420000	47.87310000	hurba	SK
65	19.73600000	48.33900000	lucen	SK
66	20.79750000	48.71810000	stos	SK
67	21.22250000	48.67220000	kosic	SK
68	21.72400000	48.66300000	milho	SK

Table 1.1b. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY (Ordered Statistics)
Null hypothesis: the examined series are homogeneous.
Critical value (significance level 0.05): 20.86
Test statistics (TS) can be compared to the critical value.

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
34211	15	58.65	58113	37	48.89	donji	47	45.28
36500	18	43.72	valpo	50	43.54	sombo	53	43.25
osije	48	41.03	66519	42	40.42	38605	19	38.63
milho	68	35.19	63411	40	34.10	sacui	57	32.83
48101	27	32.13	23201	9	31.59	slavo	49	31.31
64704	41	31.19	58300	38	31.14	55706	34	30.07
khust	61	27.32	bereg	60	26.00	25212	11	25.85
satu	59	25.60	27815	13	25.46	hurba	64	25.25
43613	21	25.22	djurd	46	24.26	28700	14	23.79
brati	63	23.06	46303	25	23.01	56300	35	22.32
kosic	67	22.14	palic	52	22.08	44121	22	21.49
23703	10	21.48	arad	55	20.81	15307	4	20.05
36100	16	19.81	16601	1	19.72	36407	17	19.47
39113	20	19.22	14706	3	19.18	53101	30	19.01
73302	43	18.39	47106	26	18.23	54306	32	18.10
orade	56	17.79	55502	33	17.78	bjelo	44	17.21
17308	7	17.09	backi	51	16.20	26505	12	15.24
sanni	58	15.04	13703	2	14.94	57311	36	14.80
44527	24	14.17	61709	39	13.61	kikin	54	12.99
52819	29	12.75	16414	6	12.15	stos	66	12.12
uzhgo	62	11.91	16203	5	11.78	lucen	65	11.73
51705	28	11.66	17809	8	11.11	53521	31	10.79
44214	23	10.14	daruv	45	9.83			
AVERAGE:		23.56						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
43613	21	1403.15	osije	48	767.14	54306	32	610.04
14706	3	583.92	donji	47	523.50	16203	5	515.17
36407	17	511.07	16414	6	494.79	52819	29	472.79
61709	39	467.03	55502	33	327.38	milho	68	298.59
58113	37	266.22	58300	38	265.75	38605	19	262.81
17809	8	260.60	sombo	53	235.76	27815	13	218.51
valpo	50	217.38	brati	63	194.88	44214	23	192.40
hurba	64	172.58	66519	42	171.96	lucen	65	151.06
48101	27	136.03	26505	12	135.32	64704	41	130.54
53521	31	127.01	28700	14	124.27	46303	25	122.12
17308	7	112.35	55706	34	104.74	34211	15	103.28
slavo	49	100.32	44121	22	98.21	73302	43	97.54
daruv	45	94.82	uzhgo	62	89.58	bereg	60	87.98
57311	36	86.02	kosic	67	85.83	36500	18	80.50
sanni	58	80.44	bjelo	44	80.19	backi	51	79.69
39113	20	79.61	25212	11	79.17	sacui	57	78.94
djurd	46	75.04	56300	35	74.73	63411	40	71.35
satu	59	71.09	53101	30	66.25	47106	26	65.35
23201	9	64.19	16601	1	59.99	36100	16	52.68
23703	10	49.35	51705	28	48.31	13703	2	46.72
khust	61	38.30	44527	24	37.36	kikin	54	32.55
palic	52	30.89	15307	4	27.20	stos	66	27.10
arad	55	27.02	orade	56	20.63			
AVERAGE:		190.66						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
43613	21	1.57	73302	43	0.65	52819	29	0.63
16414	6	0.61	53101	30	0.60	61709	39	0.47
64704	41	0.43	63411	40	0.38	milho	68	0.34
osije	48	0.31	36500	18	0.29	44121	22	0.25
28700	14	0.25	16203	5	0.24	39113	20	0.23
36407	17	0.23	55502	33	0.23	brati	63	0.21
hurba	64	0.21	26505	12	0.21	57311	36	0.21
donji	47	0.21	bjelo	44	0.21	sacui	57	0.20
54306	32	0.19	48101	27	0.18	uzhgo	62	0.18
53521	31	0.17	lucen	65	0.17	66519	42	0.17
46303	25	0.17	14706	3	0.17	palic	52	0.17
38605	19	0.17	valpo	50	0.16	stos	66	0.16
44214	23	0.15	daruv	45	0.15	51705	28	0.15
58113	37	0.15	27815	13	0.14	kosic	67	0.14
satu	59	0.13	khust	61	0.13	17809	8	0.13
58300	38	0.13	arad	55	0.13	16601	1	0.12
36100	16	0.12	sombo	53	0.12	47106	26	0.11
55706	34	0.10	23201	9	0.10	25212	11	0.10
13703	2	0.10	sanni	58	0.09	slavo	49	0.09
34211	15	0.08	23703	10	0.08	17308	7	0.08
bereg	60	0.08	backi	51	0.08	orade	56	0.07
djurd	46	0.06	56300	35	0.05	kikin	54	0.05
44527	24	0.04	15307	4	0.04			
AVERAGE:		0.21						

Table 1.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 4154
 Total number of errors: 6307
 Maximal positive error: 10.92
 Minimal negative error: -22.26

Table 1.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY (Ordered Statistics)

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
BJ	3	124.93	KV	35	113.47	PO	34	104.15
KG	24	95.17	OS	1	85.78	ZA	38	82.39
KS	36	81.53	VL	2	77.97	SZ	4	77.20
VA	21	76.45	VG	26	72.54	LJ	30	71.57
BP	28	68.86	ZL	33	66.11	ZR	16	62.84
CU	37	57.95	BB	39	57.55	PA	13	57.53
BC	31	55.59	SM	20	54.76	ZG	32	48.43
SO	14	47.33	TS	10	46.78	LO	19	46.30
TI	6	45.47	KI	17	41.11	NE	27	40.60
SE	29	39.83	NS	15	35.53	VS	18	34.58
BL	11	32.43	SU	22	30.12	OR	8	29.16
SP	25	26.37	CA	12	23.90	BN	7	21.62
SN	5	17.01	BG	23	13.15	SC	9	8.92
AVERAGE:		55.72						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
SE	29	905.78	BB	39	834.40	OS	1	645.83
VL	2	414.52	PO	34	326.39	ZR	16	317.61
ZL	33	298.75	BC	31	270.06	BP	28	267.29
NS	15	217.04	BJ	3	194.09	KV	35	191.53
SO	14	182.44	ZA	38	177.58	SZ	4	172.49
LJ	30	171.95	ZG	32	163.35	VA	21	151.02
SM	20	147.84	KG	24	132.42	KS	36	114.90
TS	10	98.02	CU	37	97.76	NE	27	92.89
SN	5	77.64	VG	26	71.66	BL	11	68.21
SP	25	59.01	CA	12	57.19	TI	6	57.10
LO	19	52.38	KI	17	50.36	OR	8	40.44
VS	18	36.51	PA	13	28.61	SU	22	26.28
BG	23	19.38	BN	7	15.43	SC	9	15.28
AVERAGE:		186.19						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
SE	29	0.96	BC	31	0.45	ZG	32	0.36
OS	1	0.30	BB	39	0.28	ZL	33	0.26
LJ	30	0.24	KV	35	0.22	BL	11	0.20
PO	34	0.17	ZA	38	0.15	VL	2	0.15
ZR	16	0.13	SZ	4	0.13	SP	25	0.13
SC	9	0.13	SM	20	0.12	BP	28	0.12
NS	15	0.11	SO	14	0.10	LO	19	0.09
BJ	3	0.09	SN	5	0.09	CA	12	0.07
NE	27	0.07	KS	36	0.05	OR	8	0.05
VG	26	0.04	VA	21	0.04	BG	23	0.04
TI	6	0.04	CU	37	0.04	TS	10	0.03
BN	7	0.03	SU	22	0.03	KI	17	0.03
PA	13	0.02	KG	24	0.02	VS	18	0.02
AVERAGE:		0.14						

Table 1.2b. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

1	18.63300000	45.53300000	Osijek
2	18.35000000	45.66700000	Valpovo
3	19.01666667	46.18333334	Baja
4	20.09027778	46.25611112	Szeged
5	20.60156002	46.07128625	Sannicolau Mare
6	21.25807108	45.77105643	Timisoara
7	21.13639857	45.38270108	Banloc
8	21.71048271	45.03871153	Oravita
9	22.05580461	45.18139466	Semenic
10	22.62607371	44.62645870	Drobeta Turnu Severin
11	23.11307189	44.47618111	Bacles
12	22.94605240	43.98489980	Calafat
13	19.76402300	46.09721800	Palic
14	19.14313500	45.76700000	Sombor
15	19.83000300	45.32221500	Novi Sad
16	20.37600800	45.39872400	Zrenjanin
17	20.46464000	45.84263400	Kikinda
18	21.30552400	45.14413700	Vršac
19	19.22693300	44.54109900	Loznica
20	19.55503600	45.00937300	Sremska Mitrovica
21	19.91247300	44.27546400	Valjevo
22	20.29106300	44.82423700	Surcin
23	20.46482200	44.79845700	Beograd
24	20.92777100	44.02722200	Kragujevac
25	20.94214600	44.36960000	Smederevska Palanka
26	21.49843000	44.75261400	Veliko Gradište
27	22.53634000	44.23915700	Negotin
28	19.67048700	45.33659900	Backi Petrovac
29	20.09604500	45.92344200	Senta
30	19.29780900	44.27528100	Ljubovija
31	21.32216800	44.83614700	Bela Crkva
32	21.77957700	44.19973700	Žagubica
33	19.71302300	43.73780700	Zlatibor
34	20.02952100	43.84307000	Pozega
35	20.69983600	43.70888400	Kraljevo
36	21.33995400	43.56405400	Krusevac
37	21.38063600	43.94061600	Cuprija
38	22.28856500	43.88312800	Zajecar
39	19.56145951	43.96678698	Bajina Basta

Table 1.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 2849
 Total number of errors: 3811
 Maximal positive error: 13.50
 Minimal negative error: -7.47

Table 1.3a. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda(x)	fi(y)	h	Station_ID	Station_name	Country
1	24.87977	43.76042	25	346452	TURNU MAGURELE	RO
2	23.94569	43.79006	39	347357	BECHET	RO
3	28.58898	43.81647	1	349835	MANGALIA	RO
4	25.93422	43.87547	24	352557	GIURGIU	RO
5	22.94757	43.98525	61	359257	CALAFAT	RO
6	25.35437	43.97829	85	359521	ALEXANDRIA	RO
7	23.33262	44.02951	59	401321	BAILABLETI	RO
8	24.35881	44.10044	105	406421	CARACAL	RO
9	24.98003	44.10774	111	407500	ROSIORII DE VEDE	RO
10	27.96713	44.08862	156	408800	ADAMCLISI	RO
11	27.33986	44.20643	22	412721	CALARASI	RO
12	28.64638	44.21409	13	413838	CONSTANTA	RO
13	23.86846	44.31060	192	414352	CRAIOVA	RO
14	28.25288	44.24356	67	415816	MEDGIDIA	RO
15	25.53854	44.28326	118	417530	VIDELE	RO
16	27.84048	44.39178	58	422751	FETESTI	RO
17	26.09532	44.41236	82	425606	BUCURESTI FILARET	RO
18	23.11458	44.47672	313	428307	BICLES	RO
19	26.52505	44.45323	67	428632	FUNDULEA	RO
20	26.07976	44.51082	90	430608	BUCURESTI BANEASA	RO
21	24.79153	44.56288	225	436447	STOLNICI	RO
22	22.62765	44.62673	77	438238	DR.TR.SEVERIN	RO
23	25.58074	44.65320	174	439534	TITU	RO
24	27.96508	44.69200	41	441757	HIRSOVA	RO
25	26.65856	44.72195	65	443639	URZICENI	RO
26	21.63461	44.72285	82	444127	MOLDOVA VECHE	RO
27	24.23871	44.66576	275	444417	DRAGASANI	RO
28	28.34358	44.73470	221	444820	CORUGEA	RO
29	27.29599	44.74096	51	445718	GRIVITA	RO
30	28.87793	44.76641	36	446853	JURILOVCA	RO
31	24.86746	44.84929	332	452452	PITESTI	RO
32	23.71024	44.87842	271	453344	TG.LOGRESTI	RO
33	29.60052	44.89687	1	454936	SF. GH. DELTA	RO
34	22.00774	44.91865	256	455200	BOZOVICI	RO
35	25.42726	44.92991	285	456526	TIRGOVISTE	RO
36	25.98899	44.95609	172	457600	PLOIESTI	RO
37	24.57179	45.01629	550	500432	DEDULESTI	RO
38	22.86105	44.99714	260	501252	PADES(APA NEAGRA)	RO
39	21.71184	45.03896	309	502141	ORAVITA	RO
40	23.26088	45.04096	204	502317	TG. JIU	RO
41	24.38098	45.08919	242	506422	RM. VILCEA	RO
42	22.05712	45.18173	1432	507158	SEMENIC	RO
43	24.67128	45.17917	449	509441	CURTEA DE ARGES	RO
44	26.85300	45.13291	89	509649	BUZAU	RO
45	29.76045	45.14869	3	509940	SULINA	RO
46	23.81015	45.16587	525	511349	POLOVRAGI	RO
47	28.82569	45.19084	5	511849	TULCEA	RO
48	29.15827	45.17711	3	511912	GORGOVA	RO
49	22.53434	45.28117	2180	515231	TARCU	RO
50	25.03814	45.27515	690	517507	CIMPULUNG	RO
51	25.75395	45.14448	461	517545	CIMPINA	RO
52	22.50305	45.30081	1456	518231	CUNTU	RO
53	26.37080	45.32496	293	519622	PATIRLAGELE	RO
54	21.13797	45.38305	83	523108	BANLOC	RO
55	23.46462	45.38769	1559	523328	PARING	RO
56	25.51571	45.35526	1510	523530	SINAIA(1500)	RO
57	27.04016	45.39075	155	523703	RM. SARAT	RO
58	22.22684	45.41756	241	525215	CARANSEBES	RO
59	23.37825	45.40661	607	525323	PETROSANI	RO
60	23.96855	45.41150	573	525358	VOINEASA	RO
61	25.45826	45.44614	2506	527527	VF. OMU	RO
62	25.27327	45.43191	1376	528518	FUNDATA	RO
63	25.58510	45.50646	1096	530535	PREDEAL	RO
64	28.03393	45.47330	71	530801	GALATI	RO
65	24.27318	45.65318	523	538416	BOITA	RO
66	23.93400	45.65751	1462	539357	PALTINIS	RO
67	21.93463	45.68673	168	541154	LUGOJ	RO
68	26.05830	45.66855	707	541601	INT.BUZAULUI	RO
69	25.52772	45.69613	535	542532	BRASOV	RO
70	21.25936	45.77146	86	546115	TIMISOARA	RO
71	24.09294	45.78970	453	548409	SIBIU	RO
72	24.93672	45.83636	435	551459	FAGARAS	RO
73	26.37708	45.82401	1778	551621	LACAUTI	RO
74	27.41036	45.84195	57	551716	TECUCI	RO
75	22.90046	45.86504	230	553254	DEVA	RO
76	23.54309	45.96453	267	557334	SEBES-ALBA	RO
77	26.11687	45.99324	571	600608	TG.SECUIESC	RO

78	22.15242	46.01949	156	602213	VARADIA DE MURES	RO
79	20.60316	46.07163	85	604037	SANNICOLAU MARE	RO
80	25.59740	46.08104	508	605537	BARAOLT	RO
81	27.17181	46.10502	101	606705	ADJUD	RO
82	21.35522	46.13385	117	608121	ARAD	RO
83	22.72770	46.16976	273	610244	TEBEA	RO
84	23.93677	46.17882	342	611355	BLAJ	RO
85	24.59318	46.22825	323	614436	DUMBRAVENI	RO
86	27.64558	46.23136	168	614740	BIRLAD	RO
87	22.33490	46.27951	177	617220	GURAHONT	RO
88	26.64259	46.27296	245	617637	TG. OCNA	RO
89	25.29334	46.29709	532	618518	ODORHEIUL SECUIESC	RO
90	23.04195	46.36410	621	622303	CIMPENI (BISTRA)	RO
91	25.77417	46.37158	667	622544	MIERCUREA CIUC	RO
92	21.54300	46.51894	96	632130	CHISINEU CRIS	RO
93	22.46809	46.52832	278	632229	STEI	RO
94	24.53533	46.53368	317	632432	TG.MURES	RO
95	23.31182	46.53577	1357	634322	BAISOARA	RO
96	23.79284	46.58339	431	635347	TURDA	RO
97	26.91407	46.53215	183	635658	BACAU	RO
98	27.71583	46.64624	121	639744	VASLUI	RO
99	25.51417	46.70608	747	642540	JOSENI	RO
100	22.79579	46.75956	1840	646247	VLADEASA 1800	RO
101	23.57299	46.77799	417	647334	CLUJ-NAPOCA	RO
102	27.44370	46.83833	134	650727	NEGRESTI(VASLUI)	RO
103	23.03412	46.85765	566	651305	HUEDIN	RO
104	25.36153	46.92664	690	655522	TOPLITA	RO
105	26.91339	46.96946	218	655650	ROMAN	RO
106	25.95151	46.97776	1897	656555	CEAHLAU TOACA	RO
107	26.39090	46.93402	360	656621	PIATRA NEAMT	RO
108	21.89755	47.03602	136	703156	ORADEA	RO
109	24.51545	47.14942	374	708430	BISTRITA	RO
110	23.90050	47.12826	240	709352	DEJ	RO
111	27.63008	47.17106	103	710736	IASI	RO
112	23.04836	47.19528	303	711305	ZALAU	RO
113	26.38059	47.21243	385	714623	TG. NEAMT	RO
114	25.13604	47.32492	931	719507	POIANA STAMPEI	RO
115	22.09580	47.34447	124	722205	SACUIENI	RO
116	26.92741	47.35867	289	722657	COTNARI	RO
117	24.65073	47.60283	1792	737439	IEZER	RO
118	26.24196	47.63328	366	739615	SUCEAVA	RO
119	23.49324	47.66121	224	740330	BATA-MARE	RO
120	26.64704	47.73605	160	741640	BOTOSANI	RO
121	23.94214	47.77737	508	747356	OC.SUGATAG	RO
122	22.88878	47.72177	128	748253	SATU MARE	RO
123	25.89185	47.83801	387	751555	RADAUTI	RO
124	23.90588	47.93957	283	758355	SIGHETUL MARMATIEI	RO
125	21.16056	46.67944		66519	Békéscsaba Békés	HU
126	21.61083	47.49028		64704	Debrecen Repül?tér	HU
127	20.68750	46.54417		57311	Orosháza	HU
128	22.62556	47.86222		73302	Pátyod magántelek	HU
129	20.73667	46.31722		58300	Pitvaros	HU
130	21.32217	44.83615		2802	BELACRKVA	SR
131	20.46464	45.84263		13174	KIKINDA	SR
132	22.53634	44.23916		13295	NEGOTIN	SR
133	21.49843	44.75261		13285	VELIKO GRADISTE	SR
134	21.30552	45.14414		13183	VRSAC-kontrolisanoJasna	SR
135	20.37601	45.39872		13173	ZRENJANIN	SR
136	22.65000	48.20000		33634	Beregove	UA
137	25.97250	48.26639		33658	Chernivtsi	UA
138	23.30000	48.18333		33638	Khust	UA
139	24.19806	48.04750		33647	Rakhiv	UA
140	25.21667	47.88333		33657	Seliatyn	UA

Table 1.3b. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
541154	67	110.31	634322	95	92.00	13295	132	86.49
58300	129	79.97	428307	18	79.30	605537	80	76.07
639744	98	76.00	719507	114	72.87	33634	136	71.71
13285	133	71.13	519622	53	69.07	401321	7	68.94
528518	62	68.70	551459	72	67.74	517507	50	64.42
722205	115	63.08	406421	8	61.87	530801	64	60.93
525323	59	59.95	2802	130	59.17	527527	61	58.69
444127	26	57.80	33647	139	57.48	13173	135	57.31
614740	86	56.99	422751	16	56.18	538416	65	55.10
614436	85	54.67	622544	91	53.58	523530	56	52.86
446853	30	52.41	618518	89	51.96	349835	3	51.74
737439	117	51.23	413838	12	51.07	359257	5	50.85
438238	22	50.61	602213	78	50.50	73302	128	49.51
600608	77	48.97	502317	40	48.47	57311	127	48.36
523328	55	48.22	530535	63	46.22	647334	101	45.90
617637	88	45.41	509649	44	45.25	722657	116	44.83
407500	9	44.75	441757	24	44.45	13174	131	43.96
455200	34	43.84	408800	10	43.16	517545	51	42.85
452452	31	41.42	656555	106	39.64	414352	13	39.57
500432	37	39.30	346452	1	39.01	417530	15	38.30
748253	122	38.29	457600	36	38.08	444820	28	37.20
13183	134	37.12	444417	27	37.12	632130	92	37.03
502141	39	36.06	655522	104	36.02	454936	33	35.81
412721	11	35.20	606705	81	34.81	501252	38	34.13
359521	6	33.86	741640	120	32.78	66519	125	32.10
64704	126	32.01	347357	2	31.73	650727	102	31.58
711305	112	31.53	747356	121	31.46	33638	138	31.00
352557	4	30.86	445718	29	30.46	617220	87	29.90
758355	124	28.92	509940	45	28.80	739615	118	28.19
425606	17	28.07	539357	66	27.95	542532	69	27.80
635658	97	27.26	439534	23	27.22	525215	58	26.97
443639	25	26.92	541601	68	26.78	428632	19	26.65
415816	14	26.59	430608	20	26.35	655650	105	25.92
708430	109	25.66	632432	94	25.64	651305	103	25.54
557334	76	25.31	453344	32	25.08	546115	70	25.03
656621	107	24.86	646247	100	24.32	548409	71	24.31
714623	113	24.14	523703	57	24.12	751555	123	24.11
604037	79	23.12	553254	75	22.11	703156	108	22.02
551716	74	21.66	507158	42	20.96	642540	99	20.76
525358	60	20.58	509441	43	20.50	456526	35	20.43
622303	90	20.11	710736	111	19.77	436447	21	19.77
551621	73	19.66	610244	83	19.57	611355	84	19.48
511349	46	18.84	511912	48	18.42	33657	140	18.23
511849	47	18.04	506422	41	17.31	740330	119	16.66
518231	52	16.10	608121	82	16.01	632229	93	15.70
709352	110	15.00	515231	49	14.65	33658	137	13.91
635347	96	13.21	523108	54	12.25			
AVERAGE:		39.01						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
617220	87	243.19	13285	133	232.05	605537	80	228.88
517545	51	199.94	541154	67	191.29	444127	26	185.83
2802	130	177.17	13173	135	177.10	722205	115	167.80
73302	128	163.44	517507	50	162.48	428307	18	156.55
604037	79	155.95	406421	8	148.71	618518	89	147.93
13295	132	147.67	528518	62	147.63	57311	127	145.39
454936	33	144.73	33634	136	139.12	647334	101	135.82
428632	19	132.77	58300	129	132.59	639744	98	128.91
359257	5	112.99	539357	66	111.58	527527	61	111.32
656621	107	109.70	617637	88	109.10	525323	59	108.04
530801	64	104.56	719507	114	104.27	64704	126	98.21
452452	31	96.50	602213	78	95.40	349835	3	94.37
509649	44	93.69	523328	55	91.81	523530	56	89.19
401321	7	87.70	614740	86	86.26	509441	43	83.83
425606	17	83.68	413838	12	83.51	446853	30	82.52
443639	25	81.63	551459	72	81.09	632130	92	75.88
519622	53	70.77	546115	70	69.98	407500	9	69.65
614436	85	69.19	635658	97	68.80	634322	95	67.70
622544	91	66.54	600608	77	65.91	441757	24	65.32
422751	16	64.67	445718	29	63.69	722657	116	62.07
748253	122	61.24	655650	105	60.02	414352	13	59.68
656555	106	58.30	502141	39	58.19	502317	40	56.73
737439	117	56.72	352557	4	56.58	714623	113	56.17
500432	37	56.08	430608	20	55.60	13174	131	55.44
417530	15	54.41	538416	65	54.14	359521	6	54.01
530535	63	53.97	444417	27	52.83	632229	93	51.40
655522	104	50.46	346452	1	50.23	444820	28	49.89
453344	32	49.38	758355	124	49.19	511349	46	48.99
408800	10	48.49	751555	123	48.48	457600	36	47.84
33647	139	47.78	646247	100	47.43	438238	22	46.11
33638	138	46.07	651305	103	45.06	610244	83	44.03
509940	45	43.74	455200	34	42.09	708430	109	41.93
525358	60	41.81	412721	11	40.91	650727	102	39.50
553254	75	38.81	741640	120	38.63	66519	125	38.55
456526	35	37.84	711305	112	37.23	439534	23	36.50
501252	38	35.77	511912	48	35.23	606705	81	34.15
518231	52	33.09	557334	76	33.01	632432	94	32.25
611355	84	31.96	739615	118	31.83	541601	68	30.88
347357	2	30.86	13183	134	30.74	622303	90	30.64
703156	108	30.48	542532	69	30.27	710736	111	29.06
507158	42	28.21	747356	121	27.81	548409	71	27.48
525215	58	26.65	436447	21	26.18	33658	137	25.75
523703	57	25.24	415816	14	24.06	506422	41	24.06
740330	119	23.27	642540	99	23.13	551621	73	22.18
709352	110	21.28	608121	82	21.18	511849	47	19.05
551716	74	17.37	33657	140	16.63	523108	54	15.23
515231	49	14.56	635347	96	11.30			
AVERAGE:		72.88						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
2802	130	0.60	73302	128	0.54	539357	66	0.37
617220	87	0.36	527527	61	0.33	64704	126	0.32
57311	127	0.29	528518	62	0.27	523530	56	0.25
33647	139	0.21	656555	106	0.21	605537	80	0.20
428307	18	0.19	519622	53	0.19	656621	107	0.19
523328	55	0.18	647334	101	0.17	506422	41	0.16
525358	60	0.16	454936	33	0.16	737439	117	0.15
446853	30	0.15	618518	89	0.15	428632	19	0.14
452452	31	0.14	518231	52	0.14	748253	122	0.13

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>	Version <i>final</i>		Page <i>19</i>			
722205	115	0.13	610244	83	0.13	511349	46	0.13
406421	8	0.13	401321	7	0.12	517545	51	0.12
708430	109	0.12	538416	65	0.12	443639	25	0.11
517507	50	0.11	13285	133	0.11	33634	136	0.10
646247	100	0.10	509441	43	0.10	651305	103	0.10
655522	104	0.10	604037	79	0.10	349835	3	0.09
551621	73	0.09	457600	36	0.09	740330	119	0.09
430608	20	0.09	13173	135	0.09	530801	64	0.09
33638	138	0.09	445718	29	0.09	58300	129	0.08
530535	63	0.08	635658	97	0.08	611355	84	0.08
439534	23	0.07	444820	28	0.07	436447	21	0.07
444417	27	0.07	509649	44	0.07	438238	22	0.07
541154	67	0.07	642540	99	0.07	719507	114	0.07
359257	5	0.07	500432	37	0.06	13295	132	0.06
523703	57	0.06	414352	13	0.06	453344	32	0.06
413838	12	0.06	602213	78	0.06	622544	91	0.06
600608	77	0.06	441757	24	0.06	425606	17	0.06
525215	58	0.05	417530	15	0.05	632229	93	0.05
617637	88	0.05	614436	85	0.05	622303	90	0.05
632130	92	0.05	352557	4	0.05	655650	105	0.05
635347	96	0.04	346452	1	0.04	502141	39	0.04
711305	112	0.04	709352	110	0.04	509940	45	0.04
741640	120	0.04	13183	134	0.04	33657	140	0.04
632432	94	0.04	722657	116	0.04	614740	86	0.04
546115	70	0.04	751555	123	0.04	422751	16	0.04
523108	54	0.04	444127	26	0.04	456526	35	0.04
553254	75	0.04	634322	95	0.03	551459	72	0.03
710736	111	0.03	557334	76	0.03	407500	9	0.03
747356	121	0.03	412721	11	0.03	542532	69	0.03
639744	98	0.03	606705	81	0.03	502317	40	0.03
507158	42	0.03	515231	49	0.03	33658	137	0.02
13174	131	0.02	608121	82	0.02	758355	124	0.02
66519	125	0.02	541601	68	0.02	408800	10	0.02
551716	74	0.02	359521	6	0.02	714623	113	0.02
455200	34	0.02	703156	108	0.02	511849	47	0.02
347357	2	0.02	650727	102	0.01	548409	71	0.01
525323	59	0.01	739615	118	0.01	415816	14	0.01
501252	38	0.01	511912	48	0.00			
AVERAGE:		0.09						

Table 1.3c. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 6263
Total number of errors: 10241
Maximal positive error: 996.58
Minimal negative error: -20.95

Table 1.4a. Station parameters of the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

index	lambda(x)	fi(y)	h
1	24.75000004	50.90000005	198.0
2	23.63333337	50.25000001	252.0
3	27.04027778	50.16194445	277.0
4	25.73333337	50.13333334	259.0
5	24.35000002	50.11666667	212.0
6	25.15000001	50.08333334	227.0
7	23.38333335	49.95000005	245.0
8	26.20500001	49.94805560	274.0
9	23.96527783	49.80750004	319.0
10	23.16666668	49.80000004	232.0
11	27.93333338	49.56666670	284.0
12	25.68333337	49.53333336	327.0
13	24.95000005	49.43333336	303.0
14	23.56694447	49.36222224	275.0
15	26.93750005	49.35361113	350.0
16	23.81666671	49.25000001	302.0
17	23.03333334	49.15000001	594.0
18	25.76666671	49.01666667	320.0
19	28.13333334	49.01666667	313.0
20	24.00000000	48.96666672	470.0
21	22.46666669	48.90000005	205.0
22	24.68888892	48.88944449	275.0
23	23.45000002	48.85000004	592.0
24	27.26666668	48.85000004	292.0
25	23.10000001	48.76666671	496.0
26	23.36666669	48.70000004	615.0
27	26.60861114	48.69333337	217.0
28	23.20694446	48.65888892	1330.0
29	22.26666668	48.63333337	113.0
30	25.03333334	48.53333336	295.0
31	23.50444447	48.52666669	456.0
32	24.55000003	48.45000002	531.0
33	27.78333337	48.45000002	77.0
34	25.97250005	48.26638890	242.0
35	22.65000003	48.20000001	113.0
36	23.30000002	48.18333334	164.0
37	24.53333336	48.15000001	1451.0
38	24.19805557	48.04750000	430.0
39	25.21666668	47.88333338	762.0
40	22.05000000	50.10000001	212.0
41	22.33333335	49.46666669	420.0
42	21.91388894	49.25305557	305.0
43	22.00583333	48.93888894	176.0
44	21.73472226	48.66805559	104.0
45	21.65888892	48.38055558	100.0
46	21.88694449	47.96222227	142.0
47	22.62555559	47.86222227	118.0
48	23.90416671	47.93916672	276.0
49	25.89027782	47.83777782	100.0
50	22.88722227	47.72138893	124.0
51	23.94055560	47.77694448	100.0
52	23.49138891	47.66083337	100.0
53	24.64888892	47.60277781	100.0

Table 1.4b. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
14	14	73.46	48	48	52.55	27	27	49.26
44	44	42.32	25	25	37.76	18	18	35.83
32	32	34.80	36	36	32.96	5	5	32.00
38	38	31.52	28	28	31.23	13	13	30.60
30	30	29.85	45	45	29.66	42	42	28.84
16	16	27.62	12	12	26.25	33	33	22.90
49	49	22.24	51	51	21.88	43	43	21.60
2	2	21.43	17	17	21.05	7	7	20.58
39	39	20.44	47	47	20.18	46	46	19.93
24	24	19.93	40	40	19.82	4	4	19.63
50	50	19.57	8	8	19.40	35	35	19.29
20	20	18.92	53	53	18.79	31	31	18.59
37	37	18.20	1	1	18.03	19	19	17.37
23	23	17.04	3	3	16.86	21	21	15.77
41	41	14.68	29	29	14.64	6	6	13.54
34	34	13.34	11	11	12.97	15	15	12.89
52	52	12.54	10	10	12.15	22	22	11.98
9	9	11.10	26	26	7.93			
AVERAGE:		23.65						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
15	15	873.23	14	14	792.55	41	41	594.96
17	17	459.52	42	42	417.08	27	27	321.74
44	44	311.96	18	18	283.29	47	47	260.96
45	45	255.39	23	23	232.34	4	4	176.92
26	26	164.07	29	29	140.62	8	8	140.54
12	12	136.98	37	37	134.84	21	21	132.54
28	28	130.07	5	5	129.24	20	20	126.22
1	1	113.59	50	50	107.13	33	33	106.06
38	38	105.05	36	36	104.64	24	24	104.12
31	31	101.80	43	43	85.90	3	3	80.90
7	7	76.91	40	40	72.57	35	35	70.85
6	6	70.82	25	25	66.40	46	46	65.33
48	48	58.78	49	49	55.19	13	13	54.44
2	2	52.17	22	22	47.96	30	30	46.63
19	19	36.83	10	10	34.91	52	52	34.24
39	39	33.60	16	16	31.37	32	32	28.05
53	53	26.88	51	51	26.63	9	9	21.83
11	11	14.54	34	34	11.45			
AVERAGE:		154.01						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
47	47	0.58	15	15	0.53	14	14	0.37
41	41	0.32	46	46	0.29	38	38	0.28
25	25	0.27	26	26	0.26	5	5	0.21
44	44	0.20	45	45	0.20	20	20	0.20
21	21	0.18	42	42	0.16	29	29	0.16
37	37	0.16	18	18	0.16	8	8	0.15

CARPATCLIM			Date		Version		Page		
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>		<i>22</i>		
50	50	0.14	4	4	0.14	30	30	0.13	
12	12	0.13	16	16	0.13	53	53	0.12	
17	17	0.12	24	24	0.11	43	43	0.10	
19	19	0.10	10	10	0.10	33	33	0.09	
36	36	0.09	52	52	0.08	13	13	0.08	
35	35	0.07	31	31	0.07	28	28	0.07	
27	27	0.06	48	48	0.06	1	1	0.05	
51	51	0.05	9	9	0.05	6	6	0.04	
40	40	0.03	49	49	0.03	11	11	0.03	
23	23	0.03	34	34	0.03	22	22	0.02	
2	2	0.02	7	7	0.02	3	3	0.01	
32	32	0.00	39	39	0.00				
AVERAGE:		0.13							

Table 1.4c. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 4101
 Total number of errors: 5444
 Maximal positive error: 107.65
 Minimal negative error: -22.03

Table 1.5a. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

1	18.02916667	48.89694449	209.0	11803
2	17.57805559	48.75055559	409.0	11806
3	17.11055556	48.16861112	287.0	11813
4	17.68055559	48.49194447	178.0	11819
5	18.19416668	47.87305560	115.0	11858
6	18.77527782	49.43916669	423.0	11866
7	18.59388892	48.76972226	260.0	11867
8	19.18305556	49.36833335	780.0	11868
9	19.72527782	49.03916667	640.0	11874
10	19.91055560	49.14000001	972.0	11876
11	19.09388889	48.31916668	355.0	11902
12	19.14194445	48.64250003	313.0	11903
13	19.64666670	48.64444448	1015.0	11910
14	19.66666670	48.32916668	187.0	11927
15	20.23583335	49.18944445	1778.0	11931
16	20.18916668	48.84861115	901.0	11938
17	20.80138893	48.71666670	575.0	11946
18	20.84583338	49.25972224	485.0	11961
19	21.22250001	48.67222226	230.0	11968
20	21.91388894	49.25333335	305.0	11977
21	21.73472226	48.66805559	104.0	11978
22	22.00611111	48.93888894	176.0	11993
23	22.60000003	48.20000001	113.0	33634
24	23.00000000	49.20000001	594.0	33511
25	22.30000002	48.60000003	115.0	33631
26	22.50000003	48.90000005	205.0	33514
27	19.02805556	47.06111111	153.0	44120
28	17.67472226	47.71000004	117.0	23702
29	20.53611114	48.49527780	309.0	51700
30	20.01666667	47.86666671	1011.0	53100
31	17.26722224	47.88972227	121.0	23212
32	21.65888892	48.38083335	100.0	62305
33	18.19166668	50.06166667	206.0	540
34	19.80194449	50.07194445	237.0	566
35	20.98444450	50.01888889	209.0	575
36	22.02916667	50.11527778	212.0	580
37	19.00111111	49.80805560	398.0	600
38	19.96027783	49.29388890	855.0	625
39	19.98194450	49.23250001	1991.0	650
40	20.68916670	49.62722225	292.0	660
41	22.34166668	49.46638891	420.0	690
42	18.92027783	49.99638894	270.0	5409
43	19.09527778	50.08500000	255.0	5508
44	19.95861116	50.06416667	206.0	5511
45	19.68805559	49.72583337	360.0	6507
46	19.51888892	49.61166670	697.0	6513
47	19.69583337	49.47194447	615.0	6518
48	20.41833336	49.69361115	515.0	6605
49	20.43166669	49.44555558	445.0	6618
50	20.88638894	49.34972224	445.0	6628
51	21.29583335	49.73527782	285.0	6702
52	21.17250001	49.43805558	519.0	6707
53	22.06333334	49.33916668	470.0	6809
54	17.56972225	49.32055557	222.0	11774
55	17.70777781	48.90277782	383.0	11779
56	17.54194447	49.77722226	749.0	11766
57	18.24055557	49.54111114	436.0	11785
58	18.44777780	49.54611114	1322.0	11787
59	18.12166667	49.69833337	250.0	11782

Table 1.5b. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
5508	43	58.79	11977	20	55.30	11858	5	44.79
62305	32	42.12	580	36	41.90	11803	1	41.40
566	34	41.28	23212	31	40.85	33514	26	37.65
11813	3	35.60	6507	45	33.82	33511	24	33.46
11946	17	33.27	6707	52	33.02	6605	48	32.15
23702	28	31.75	11938	16	30.72	11782	59	30.03
11876	10	29.46	600	37	29.39	51700	29	29.24
11978	21	29.03	625	38	29.01	11806	2	28.99
540	33	28.68	11787	58	28.50	11910	13	28.39
11868	8	26.87	6702	51	26.56	575	35	26.24
33634	23	24.62	11902	11	24.04	5409	42	23.78
11766	56	23.77	11931	15	23.70	44120	27	23.50
11785	57	22.83	5511	44	22.64	690	41	22.45
11819	4	22.34	11866	6	21.55	11993	22	21.02
11874	9	20.10	660	40	19.78	33631	25	19.10
11927	14	18.39	6628	50	16.29	650	39	15.79
11779	55	15.34	11968	19	15.14	11867	7	15.11
11961	18	13.64	6518	47	13.61	53100	30	12.60
6513	46	11.70	11774	54	11.30	11903	12	9.73
6618	49	8.80	6809	53	8.53			
AVERAGE:		26.43						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
6605	48	912.26	690	41	682.45	11910	13	498.71
5508	43	441.58	11978	21	379.38	62305	32	358.17
11866	6	343.22	11876	10	342.03	11779	55	336.27
540	33	318.52	33511	24	282.20	11977	20	227.06
11867	7	212.96	11806	2	210.21	6702	51	204.87
11858	5	188.42	11868	8	183.57	11803	1	178.49
6518	47	175.89	5511	44	173.37	33514	26	163.77
33631	25	154.57	6507	45	151.71	11902	11	139.27
11993	22	135.93	575	35	135.32	11931	15	133.30
11961	18	129.60	51700	29	127.36	6707	52	123.83
660	40	116.27	44120	27	115.80	6809	53	113.74
566	34	107.24	11874	9	107.15	11774	54	105.44
625	38	103.17	6618	49	101.33	11813	3	95.63
11785	57	91.10	11968	19	89.61	11938	16	87.42
33634	23	84.22	11782	59	81.56	6628	50	80.37
23702	28	78.25	580	36	76.04	650	39	74.83
23212	31	74.50	11787	58	72.24	600	37	69.22
11903	12	64.18	11946	17	61.52	11766	56	53.06
53100	30	50.56	6513	46	44.68	11819	4	40.69
5409	42	39.50	11927	14	39.17			
AVERAGE:		175.64						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
53100	30	0.85	6605	48	0.72	11866	6	0.65
11803	1	0.56	11787	58	0.49	62305	32	0.47

CARPATCLIM			Date	Version			Page	
<i>Report</i>			<i>02/10/2012</i>	<i>final</i>			<i>25</i>	
690	41	0.45	11785	57	0.42	11910	13	0.41
6809	53	0.38	6507	45	0.36	11978	21	0.36
11931	15	0.34	44120	27	0.31	11806	2	0.30
540	33	0.30	11902	11	0.30	6702	51	0.26
11876	10	0.26	11766	56	0.24	660	40	0.24
11867	7	0.24	11779	55	0.22	33514	26	0.21
6618	49	0.19	11868	8	0.19	11782	59	0.19
5508	43	0.19	5511	44	0.19	11946	17	0.18
51700	29	0.17	11961	18	0.17	33631	25	0.16
11774	54	0.16	6513	46	0.16	11858	5	0.15
11977	20	0.15	625	38	0.15	33634	23	0.14
6628	50	0.13	6518	47	0.12	11874	9	0.12
11813	3	0.12	575	35	0.12	580	36	0.11
11819	4	0.10	23212	31	0.09	33511	24	0.09
5409	42	0.09	11903	12	0.08	11938	16	0.08
6707	52	0.07	11993	22	0.07	600	37	0.06
23702	28	0.05	650	39	0.04	11968	19	0.04
11927	14	0.02	566	34	0.02			
AVERAGE:		0.23						

Table 1.5c. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 3302
 Total number of errors: 4542
 Maximal positive error: 11.29
 Minimal negative error: -14.53

Table 1.6a. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
26	26	54.96	2	2	54.14	23	23	45.73
38	38	37.90	32	32	36.25	12	12	35.76
22	22	32.86	25	25	31.81	24	24	31.55
29	29	30.84	8	8	30.80	13	13	28.22
30	30	26.40	15	15	25.44	10	10	23.77
4	4	23.69	31	31	23.41	20	20	23.05
17	17	23.02	9	9	22.10	11	11	21.45
27	27	20.57	28	28	20.35	3	3	19.96
14	14	19.95	7	7	19.95	36	36	19.20
21	21	19.12	37	37	17.83	6	6	17.55
34	34	14.47	33	33	14.15	5	5	13.96
35	35	13.11	1	1	12.90	16	16	12.80
19	19	11.79	18	18	11.20			
AVERAGE:		24.79						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
16	16	912.26	9	9	667.60	11	11	481.24
1	1	318.14	36	36	301.93	37	37	226.40
19	19	202.88	12	12	173.81	15	15	162.41
22	22	146.39	3	3	135.32	25	25	128.37
13	13	126.10	28	28	111.39	21	21	110.49
8	8	107.89	2	2	107.24	17	17	101.33
38	38	87.41	20	20	86.47	26	26	83.79
14	14	82.03	30	30	81.56	24	24	81.53
18	18	80.37	31	31	73.23	23	23	72.92
5	5	68.13	7	7	64.65	32	32	60.80
27	27	53.06	6	6	42.61	4	4	40.81
29	29	34.59	10	10	32.94	35	35	26.96
34	34	26.11	33	33	22.71			
AVERAGE:		150.63						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
16	16	0.79	22	22	0.71	28	28	0.49
9	9	0.48	1	1	0.44	36	36	0.37
8	8	0.31	19	19	0.30	13	13	0.28
30	30	0.28	21	21	0.28	14	14	0.25
18	18	0.25	31	31	0.24	38	38	0.23
24	24	0.22	27	27	0.21	11	11	0.18
37	37	0.17	15	15	0.15	20	20	0.14
25	25	0.14	32	32	0.12	34	34	0.11
17	17	0.11	12	12	0.10	6	6	0.09
4	4	0.09	3	3	0.08	5	5	0.08
26	26	0.07	7	7	0.06	35	35	0.06
33	33	0.04	23	23	0.03	29	29	0.03
10	10	0.02	2	2	0.00			
AVERAGE:		0.21						

Table 1.6b. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda(x)	fi(y)	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	18.92027783	49.99638894	270.0
11	19.09527778	50.08500000	255.0
12	19.95861116	50.06416667	206.0
13	19.68805559	49.72583337	360.0
14	19.51888892	49.61166670	697.0
15	19.69583337	49.47194447	615.0
16	20.41833336	49.69361115	515.0
17	20.43166669	49.44555558	445.0
18	20.88638894	49.34972224	445.0
19	21.29583335	49.73527782	285.0
20	21.17250001	49.43805558	519.0
21	22.06333334	49.33916668	470.0
22	18.76583337	49.43611113	468.0
23	20.21500001	49.19527779	2635.0
24	20.23444446	49.18944445	1778.0
25	20.84277782	49.26027779	485.0
26	21.64638892	49.21472223	208.0
27	17.54194447	49.77722226	749.0
28	18.24055557	49.54111114	436.0
29	18.44777780	49.54611114	1322.0
30	18.12166667	49.69833337	250.0
31	17.70777781	48.90277782	383.0
32	17.56972225	49.32055557	222.0
33	23.63333337	50.25000001	252.0
34	23.16666668	49.80000004	232.0
35	23.38333335	49.95000005	245.0
36	23.56694447	49.36222224	275.0
37	23.03333334	49.15000001	594.0
38	22.46666669	48.90000005	205.0

Table 1.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 2630
 Total number of errors: 3288
 Maximal positive error: 22.68
 Minimal negative error: -26.33

Table 1.7a. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 1240
 Total number of errors: 1400
 Maximal positive error: 10.43
 Minimal negative error: -6.24

Table 1.7b. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
9	9	48.17	13	13	45.49	5	5	35.81
12	12	34.93	15	15	30.67	3	3	29.61
18	18	27.74	6	6	27.44	11	11	26.39
7	7	25.62	2	2	24.54	17	17	19.33
10	10	18.93	16	16	18.89	1	1	18.64
8	8	17.96	14	14	16.88	4	4	13.48
AVERAGE:		26.70						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
18	18	667.05	2	2	391.11	15	15	318.69
7	7	299.68	12	12	252.93	11	11	252.91
13	13	249.28	8	8	183.86	9	9	124.87
1	1	107.25	4	4	91.14	6	6	81.56
5	5	72.24	3	3	53.06	10	10	51.01
16	16	48.89	14	14	37.67	17	17	34.22
AVERAGE:		184.30						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
7	7	0.72	8	8	0.67	4	4	0.66
12	12	0.49	15	15	0.37	5	5	0.36
6	6	0.28	2	2	0.28	3	3	0.27
18	18	0.25	11	11	0.20	14	14	0.17
1	1	0.13	13	13	0.12	10	10	0.09
16	16	0.08	17	17	0.06	9	9	0.00
AVERAGE:		0.29						

Table 1.7c. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

index	lambda(x)	fi(y)	h
1	17.57000003	49.32000002	222.0
2	17.71000004	48.90000005	383.0
3	17.54000003	49.78000004	749.0
4	18.24000001	49.54000003	436.0
5	18.45000002	49.55000003	1322.0
6	18.12000001	49.70000004	250.0
7	18.02916667	48.89694449	209.0
8	17.57805559	48.75055559	409.0
9	17.11055556	48.16861112	287.0
10	17.68055559	48.49194447	178.0
11	18.19416668	47.87305560	115.0
12	18.77527782	49.43916669	423.0
13	18.59388892	48.76972226	260.0
14	19.18305556	49.36833335	780.0
15	50.06166667	18.19166668	206.0
16	49.80805560	19.00111111	398.0
17	49.99638894	18.92027783	270.0
18	50.08500000	19.09527778	255.0

Annex 2. Minimum air temperature
(The station systems are the same as in Annex 1)

Table 2.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
palic	52	61.74	stos	66	61.30	lucen	65	42.69
63411	40	42.07	13703	2	39.04	hurba	64	36.12
55706	34	36.05	51705	28	34.94	25212	11	34.77
sacui	57	34.04	48101	27	34.04	kikin	54	33.98
osije	48	31.33	46303	25	30.54	backi	51	30.49
uzhgo	62	30.17	52819	29	29.26	14706	3	28.58
brati	63	28.24	satu	59	27.69	39113	20	27.39
44121	22	27.27	61709	39	27.21	sanni	58	27.15
23703	10	27.02	arad	55	26.73	23201	9	26.23
kosic	67	26.02	17308	7	25.35	daruv	45	24.70
valpo	50	24.41	73302	43	24.21	57311	36	23.72
orade	56	23.64	64704	41	23.34	44214	23	23.33
khust	61	22.14	44527	24	21.64	28700	14	21.52
36100	16	20.89	36407	17	19.37	26505	12	18.88
43613	21	18.76	47106	26	18.73	sombo	53	18.37
16414	6	17.96	bereg	60	17.92	34211	15	17.85
bjelo	44	17.68	54306	32	16.75	27815	13	15.96
38605	19	15.94	53521	31	15.89	slavo	49	15.68
55502	33	15.52	milho	68	15.14	36500	18	14.84
donji	47	14.64	58300	38	14.59	15307	4	14.58
17809	8	14.03	56300	35	13.43	djurd	46	13.33
58113	37	12.81	16203	5	12.76	16601	1	12.00
66519	42	10.33	53101	30	9.79			
AVERAGE:		24.33						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
48101	27	2231.88	bjelo	44	1025.61	52819	29	812.66
44214	23	619.14	palic	52	595.51	kikin	54	507.55
58300	38	488.70	46303	25	435.46	26505	12	430.94
43613	21	392.95	daruv	45	387.39	16414	6	353.48
36407	17	343.44	55502	33	339.91	17308	7	329.02
17809	8	325.25	uzhgo	62	276.25	donji	47	242.82
milho	68	232.13	backi	51	231.71	arad	55	209.49
13703	2	207.24	sombo	53	205.10	stos	66	199.46
57311	36	198.07	23201	9	197.26	hurba	64	192.45
34211	15	192.12	bereg	60	188.26	73302	43	175.40
valpo	50	154.68	61709	39	147.56	16203	5	146.93
khust	61	142.30	sacui	57	138.07	slavo	49	123.54
56300	35	121.37	25212	11	111.37	orade	56	108.48
51705	28	105.41	54306	32	103.96	23703	10	100.31
66519	42	97.41	27815	13	94.31	28700	14	83.46
15307	4	78.19	36100	16	77.92	53521	31	77.83
16601	1	75.79	osije	48	75.57	36500	18	67.15
djurd	46	62.49	63411	40	54.92	kosic	67	51.52
14706	3	51.06	64704	41	50.05	44121	22	46.42
brati	63	45.91	lucen	65	44.48	39113	20	43.74
sanni	58	43.71	satu	59	42.41	55706	34	29.13
44527	24	27.51	58113	37	26.19	38605	19	25.51
47106	26	14.44	53101	30	9.84			
AVERAGE:		227.46						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
44214	23	1.59	48101	27	1.53	43613	21	1.31
26505	12	1.19	backi	51	1.11	bjelo	44	1.03
36407	17	0.91	58300	38	0.89	27815	13	0.85
55502	33	0.82	57311	36	0.80	52819	29	0.80
46303	25	0.67	16414	6	0.62	17809	8	0.60
66519	42	0.56	17308	7	0.56	daruv	45	0.52
bereg	60	0.51	61709	39	0.48	sombo	53	0.44
25212	11	0.43	73302	43	0.42	donji	47	0.41
hurba	64	0.40	palic	52	0.40	slavo	49	0.37
34211	15	0.37	stos	66	0.37	uzhgo	62	0.37
36500	18	0.37	kikin	54	0.36	khust	61	0.34
kosic	67	0.33	milho	68	0.33	16203	5	0.33
djurd	46	0.33	orade	56	0.30	arad	55	0.29
28700	14	0.28	23201	9	0.26	13703	2	0.26
56300	35	0.24	16601	1	0.24	valpo	50	0.23
14706	3	0.22	64704	41	0.21	58113	37	0.21
sacui	57	0.20	44121	22	0.20	lucen	65	0.20
osije	48	0.19	36100	16	0.19	51705	28	0.19
54306	32	0.17	23703	10	0.16	63411	40	0.14
sanni	58	0.12	55706	34	0.11	38605	19	0.07
47106	26	0.06	satu	59	0.06	53521	31	0.05
brati	63	0.05	53101	30	0.04	44527	24	0.04
15307	4	0.03	39113	20	0.00			
AVERAGE:		0.42						

Table 2.1b. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 3089
 Total number of errors: 4110
 Maximal positive error: 23.74
 Minimal negative error: -9.74

Table 2.2a. Quality Control results for the series system of of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 1845
 Total number of errors: 2161
 Maximal positive error: 11.77
 Minimal negative error: -8.02

Table 2.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
BB	39	167.04	PA	13	112.00	BJ	3	107.63
SO	14	100.47	NE	27	95.16	SE	29	91.31
KI	17	88.98	CA	12	74.54	ZR	16	70.15
VA	21	67.85	SP	25	66.66	VG	26	60.96
BP	28	58.94	CU	37	58.81	LJ	30	57.68
SN	5	57.63	OR	8	56.92	TI	6	56.04
BC	31	47.55	NS	15	47.42	VS	18	46.57
VL	2	42.50	SC	9	42.14	ZG	32	40.96
BN	7	36.44	LO	19	34.36	KV	35	32.96
KG	24	32.33	OS	1	25.61	SM	20	23.55
TS	10	20.41	ZA	38	20.24	SZ	4	19.46
ZL	33	18.66	SU	22	18.54	PO	34	16.52
KS	36	14.40	BG	23	10.47	BL	11	6.78
AVERAGE:		52.48						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
BN	7	9412.46	BJ	3	2188.17	OR	8	1976.80
PA	13	637.46	BP	28	487.59	BB	39	407.29
CU	37	317.82	NE	27	306.08	SO	14	289.00
VL	2	273.21	CA	12	200.10	BC	31	192.20
VG	26	173.64	KI	17	167.46	LJ	30	159.37
SP	25	150.58	SM	20	147.35	SE	29	138.51
TI	6	124.11	ZG	32	114.93	NS	15	110.39
SN	5	109.33	SC	9	102.64	VA	21	100.10
BL	11	95.12	VS	18	88.89	ZR	16	72.48
KG	24	54.60	LO	19	47.16	OS	1	42.51
KV	35	38.99	ZL	33	32.38	SZ	4	26.81
PO	34	24.69	TS	10	23.62	SU	22	20.09
ZA	38	18.42	KS	36	17.30	BG	23	11.94
AVERAGE:		484.66						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
BJ	3	1.30	BN	7	1.27	BP	28	1.01
OR	8	0.78	BL	11	0.59	VL	2	0.47
VG	26	0.46	ZG	32	0.40	SM	20	0.40
CU	37	0.36	CA	12	0.32	PA	13	0.31
SO	14	0.26	BB	39	0.26	SZ	4	0.22
TS	10	0.21	SE	29	0.19	NE	27	0.19
ZR	16	0.15	BC	31	0.15	KI	17	0.13
LO	19	0.12	SN	5	0.11	NS	15	0.11
ZL	33	0.11	VA	21	0.10	OS	1	0.10
SU	22	0.10	KG	24	0.08	TI	6	0.08
PO	34	0.08	SP	25	0.07	BG	23	0.06
LJ	30	0.06	KV	35	0.05	KS	36	0.03
ZA	38	0.03	VS	18	0.03	SC	9	0.00
AVERAGE:		0.28						

Table 2.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
523328	55	248.60	538416	65	206.78	539357	66	199.85
646247	100	177.58	530801	64	138.74	528518	62	126.42
634322	95	122.76	33638	138	117.73	13285	133	116.79
523530	56	113.65	428632	19	106.66	642540	99	106.27
2802	130	101.11	33658	137	98.57	430608	20	92.67
523108	54	92.39	709352	110	88.41	511349	46	87.14
622544	91	82.39	412721	11	82.11	346452	1	80.34
509649	44	79.58	33647	139	78.60	64704	126	75.74
13295	132	75.62	515231	49	73.99	436447	21	73.93
506422	41	73.59	518231	52	73.56	428307	18	72.93
359521	6	71.72	502317	40	68.61	551716	74	68.55
741640	120	68.36	525215	58	68.00	33634	136	64.09
647334	101	63.74	413838	12	61.93	444127	26	59.50
542532	69	57.60	347357	2	57.34	635347	96	56.63
415816	14	56.18	57311	127	56.12	453344	32	55.17
748253	122	54.92	719507	114	54.92	711305	112	54.11
758355	124	53.64	600608	77	52.98	13173	135	52.89
443639	25	52.49	751555	123	50.57	651305	103	50.08
655650	105	49.90	441757	24	49.86	352557	4	48.61
517545	51	47.69	456526	35	46.29	501252	38	44.40
604037	79	44.14	13183	134	43.81	500432	37	43.54
617220	87	43.30	610244	83	43.14	606705	81	43.12
509441	43	43.10	523703	57	43.04	546115	70	42.93
58300	129	42.92	414352	13	42.04	66519	125	42.02
511912	48	41.93	444820	28	41.35	511849	47	41.30
425606	17	40.45	608121	82	40.35	622303	90	39.79
349835	3	39.60	722205	115	39.53	656621	107	39.18
519622	53	39.07	722657	116	38.89	605537	80	38.67
655522	104	36.80	553254	75	36.47	632229	93	36.26
359257	5	36.09	446853	30	36.00	525323	59	35.10
618518	89	35.09	639744	98	35.04	708430	109	34.84
714623	113	32.91	602213	78	31.34	530535	63	31.29
439534	23	31.03	445718	29	30.95	401321	7	29.84
407500	9	29.72	13174	131	28.82	455200	34	28.74
557334	76	28.72	650727	102	28.35	551459	72	27.98
541601	68	27.73	417530	15	27.59	614740	86	26.85
452452	31	26.75	632432	94	26.63	438238	22	26.43
635658	97	25.28	740330	119	24.92	406421	8	24.46
422751	16	24.36	739615	118	23.84	73302	128	23.66
507158	42	23.44	551621	73	23.33	703156	108	22.74
541154	67	22.44	747356	121	21.61	517507	50	21.31
548409	71	21.23	611355	84	20.81	454936	33	19.36
632130	92	19.01	527527	61	17.85	444417	27	17.59
737439	117	17.42	408800	10	17.27	509940	45	16.91
614436	85	16.24	457600	36	15.06	525358	60	12.83
502141	39	12.77	656555	106	12.19	710736	111	11.49
617637	88	11.12	33657	140	9.47			
AVERAGE:		52.51						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
430608	20	1302.34	530801	64	623.72	58300	129	555.48
417530	15	490.07	523108	54	477.27	538416	65	459.63
33658	137	444.29	622544	91	404.00	13174	131	365.77
452452	31	355.00	2802	130	354.72	33638	138	351.93
642540	99	313.15	506422	41	311.39	523328	55	291.21
13173	135	281.71	539357	66	276.39	13285	133	263.10
511349	46	245.40	553254	75	236.69	646247	100	230.80
456526	35	225.71	13295	132	220.95	608121	82	219.31
428632	19	216.59	73302	128	189.61	632432	94	178.60
518231	52	176.02	33647	139	172.57	57311	127	159.53
634322	95	153.38	509649	44	151.65	414352	13	151.40
415816	14	149.03	502317	40	148.13	604037	79	146.38
617220	87	142.50	528518	62	139.77	647334	101	139.65
523530	56	130.30	66519	125	128.01	509441	43	126.81
606705	81	125.20	515231	49	125.18	359521	6	122.26
33634	136	119.25	709352	110	117.05	708430	109	116.96
546115	70	116.50	656621	107	110.60	610244	83	105.82
622303	90	105.78	64704	126	104.36	453344	32	103.18
525215	58	102.53	758355	124	101.10	412721	11	101.01
741640	120	100.70	436447	21	98.13	439534	23	95.79
711305	112	94.53	618518	89	93.96	444127	26	89.58
635347	96	89.21	548409	71	85.36	600608	77	84.10
457600	36	83.67	542532	69	82.60	359257	5	81.89
655650	105	79.51	425606	17	76.17	500432	37	75.68
352557	4	75.18	446853	30	74.13	632229	93	72.31
443639	25	72.25	413838	12	71.78	428307	18	69.49
605537	80	68.71	347357	2	65.46	740330	119	63.98
557334	76	63.87	722205	115	62.57	703156	108	60.77
639744	98	57.72	541154	67	57.33	346452	1	56.26
519622	53	56.24	722657	116	56.12	444820	28	55.79
445718	29	55.13	13183	134	54.40	719507	114	51.15
441757	24	50.91	349835	3	50.34	651305	103	49.99
509940	45	49.42	455200	34	48.49	635658	97	45.79
517545	51	44.59	517507	50	43.89	602213	78	43.88
614436	85	43.42	551459	72	43.38	551716	74	41.03
714623	113	40.97	523703	57	40.31	650727	102	39.96
438238	22	39.79	408800	10	39.79	655522	104	39.16
530535	63	38.87	501252	38	38.62	401321	7	38.40
511849	47	38.40	748253	122	37.74	541601	68	37.66
511912	48	37.13	407500	9	36.91	632130	92	36.66
751555	123	33.50	739615	118	29.21	525323	59	28.19
614740	86	26.85	737439	117	24.93	507158	42	23.96
444417	27	23.68	747356	121	23.07	33657	140	22.90
611355	84	22.65	527527	61	22.59	422751	16	21.26
551621	73	19.67	454936	33	17.86	406421	8	16.63
525358	60	15.91	617637	88	14.66	710736	111	14.51
502141	39	11.40	656555	106	9.80			
AVERAGE:		128.34						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
430608	20	1.18	456526	35	0.88	58300	129	0.85
57311	127	0.68	452452	31	0.46	622544	91	0.45
553254	75	0.37	632432	94	0.35	519622	53	0.34
511349	46	0.33	530801	64	0.33	13295	132	0.32
2802	130	0.30	548409	71	0.29	73302	128	0.29
417530	15	0.29	414352	13	0.29	13173	135	0.29
614436	85	0.27	33658	137	0.27	538416	65	0.27
610244	83	0.26	642540	99	0.25	656621	107	0.23
502317	40	0.23	352557	4	0.23	539357	66	0.23

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>	Version <i>final</i>	Page <i>35</i>
13174	131	0.23	66519 125	0.23 523108 54 0.23
517545	51	0.22	511849 47	0.21 443639 25 0.21
605537	80	0.21	608121 82	0.20 740330 119 0.20
617220	87	0.19	446853 30	0.18 33638 138 0.18
741640	120	0.17	506422 41	0.17 546115 70 0.17
747356	121	0.17	349835 3	0.16 708430 109 0.15
13285	133	0.15	444820 28	0.15 647334 101 0.14
33634	136	0.13	359257 5	0.13 455200 34 0.12
515231	49	0.12	604037 79	0.12 518231 52 0.12
453344	32	0.12	606705 81	0.11 346452 1 0.11
445718	29	0.11	525323 59	0.11 703156 108 0.10
359521	6	0.10	511912 48	0.10 632229 93 0.10
751555	123	0.09	64704 126	0.09 509649 44 0.09
413838	12	0.09	13183 134	0.08 415816 14 0.08
525215	58	0.08	632130 92	0.08 530535 63 0.08
33647	139	0.07	33657 140	0.07 639744 98 0.07
425606	17	0.07	527527 61	0.07 436447 21 0.06
600608	77	0.06	722205 115	0.06 509441 43 0.06
651305	103	0.06	646247 100	0.06 634322 95 0.06
541601	68	0.06	557334 76	0.05 542532 69 0.05
507158	42	0.05	457600 36	0.05 501252 38 0.05
622303	90	0.05	444127 26	0.05 635347 96 0.05
407500	9	0.05	719507 114	0.05 758355 124 0.05
551716	74	0.05	500432 37	0.05 439534 23 0.05
722657	116	0.05	611355 84	0.04 714623 113 0.04
748253	122	0.04	523703 57	0.04 711305 112 0.04
525358	60	0.04	739615 118	0.04 709352 110 0.04
444417	27	0.04	656555 106	0.04 523328 55 0.04
551459	72	0.04	401321 7	0.04 650727 102 0.04
617637	88	0.04	406421 8	0.03 441757 24 0.03
655650	105	0.03	412721 11	0.03 541154 67 0.03
528518	62	0.03	422751 16	0.03 618518 89 0.03
602213	78	0.03	428307 18	0.03 655522 104 0.03
438238	22	0.03	408800 10	0.02 509940 45 0.02
635658	97	0.02	710736 111	0.02 428632 19 0.02
614740	86	0.02	737439 117	0.02 454936 33 0.02
347357	2	0.02	502141 39	0.00 517507 50 0.00
523530	56	0.00	551621 73	0.00
AVERAGE:		0.14		

Table 2.3b. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 4561
Total number of errors: 6689
Maximal positive error: 95.11
Minimal negative error: -416.64

Table 2.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
29	29	153.78	6	6	152.89	12	12	143.42
7	7	140.74	38	38	130.51	30	30	127.75
16	16	121.50	49	49	89.08	22	22	88.85
9	9	82.81	48	48	65.13	37	37	58.64
14	14	53.89	36	36	52.96	35	35	52.44
17	17	51.97	53	53	51.92	44	44	51.37
13	13	49.89	18	18	47.82	42	42	47.38
26	26	45.51	33	33	45.44	34	34	44.14
4	4	44.00	45	45	43.15	1	1	40.49
25	25	39.86	19	19	39.64	10	10	36.69
15	15	35.54	31	31	34.22	11	11	34.05
3	3	33.04	8	8	30.43	47	47	29.64
23	23	27.76	50	50	27.33	21	21	26.86
39	39	26.06	5	5	25.26	40	40	24.95
41	41	23.03	32	32	22.75	51	51	22.47
28	28	19.66	43	43	19.26	52	52	19.22
46	46	17.15	20	20	17.08	2	2	15.07
24	24	14.64	27	27	13.96			
AVERAGE:		51.94						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
30	30	434.25	6	6	365.92	9	9	351.89
29	29	335.62	49	49	263.68	26	26	227.77
38	38	217.24	44	44	193.48	47	47	191.20
13	13	181.09	8	8	179.82	12	12	170.20
24	24	165.09	35	35	162.20	34	34	161.04
36	36	156.44	33	33	145.78	7	7	139.81
45	45	137.79	25	25	128.07	16	16	126.64
21	21	126.60	3	3	122.96	22	22	116.59
20	20	112.88	27	27	91.83	19	19	82.51
48	48	78.60	46	46	76.80	11	11	75.38
18	18	72.27	42	42	70.00	15	15	69.30
4	4	65.57	37	37	61.27	14	14	59.05
1	1	55.52	53	53	53.33	40	40	49.25
31	31	48.35	52	52	43.81	2	2	42.37
39	39	41.80	32	32	40.07	5	5	39.67
17	17	37.31	51	51	35.59	50	50	32.21
43	43	31.53	41	41	30.83	10	10	30.63
23	23	29.86	28	28	15.85			
AVERAGE:		120.28						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
26	26	0.41	30	30	0.39	33	33	0.35
22	22	0.33	29	29	0.32	47	47	0.32
45	45	0.30	20	20	0.25	25	25	0.25
9	9	0.24	21	21	0.21	34	34	0.20
27	27	0.20	24	24	0.19	44	44	0.16
36	36	0.16	40	40	0.15	4	4	0.15

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>37</i>		
12	12	0.15	51	51	0.14	8	8	0.14
28	28	0.13	5	5	0.13	52	52	0.12
37	37	0.12	42	42	0.12	35	35	0.11
46	46	0.10	6	6	0.10	16	16	0.09
3	3	0.09	13	13	0.09	49	49	0.09
38	38	0.08	15	15	0.08	43	43	0.05
23	23	0.05	48	48	0.05	41	41	0.05
53	53	0.05	50	50	0.04	32	32	0.04
19	19	0.04	7	7	0.03	11	11	0.03
18	18	0.03	31	31	0.03	1	1	0.03
14	14	0.02	10	10	0.02	2	2	0.02
39	39	0.02	17	17	0.00			
AVERAGE:		0.13						

Table 2.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 2978
 Total number of errors: 4111
 Maximal positive error: 79.31
 Minimal negative error: -417.62

Table 2.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
650	39	116.27	6618	49	89.56	11961	18	78.26
11931	15	73.06	11946	17	61.32	11910	13	45.23
5409	42	45.01	11874	9	44.55	33631	25	39.36
6702	51	38.34	11866	6	37.43	600	37	36.71
11978	21	34.85	23702	28	33.35	625	38	33.03
660	40	31.70	566	34	30.92	44120	27	29.44
11938	16	29.26	11779	55	29.01	5511	44	28.11
33511	24	27.28	11782	59	24.66	6707	52	24.21
11927	14	24.01	5508	43	23.81	11819	4	23.26
6513	46	22.94	580	36	22.81	11902	11	22.73
11867	7	22.38	23212	31	21.51	6628	50	21.11
11785	57	20.92	6605	48	20.91	540	33	20.52
11903	12	20.43	11813	3	20.29	6809	53	20.05
11876	10	18.28	11968	19	17.93	6507	45	17.41
62305	32	17.34	11803	1	16.87	11774	54	16.53
575	35	16.34	690	41	16.04	6518	47	15.84
33514	26	15.01	11977	20	14.52	11806	2	14.51
53100	30	14.06	51700	29	13.72	11868	8	13.15
11993	22	13.01	33634	23	12.81	11858	5	10.99
11787	58	10.27	11766	56	8.34			
AVERAGE:		28.50						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11910	13	1403.81	6702	51	972.84	6618	49	682.88
33631	25	626.25	11946	17	471.65	11779	55	434.19
11874	9	385.99	6605	48	355.97	6507	45	340.45
6707	52	260.86	625	38	224.02	33634	23	214.51
566	34	208.05	44120	27	173.59	600	37	166.97
11803	1	161.30	11961	18	160.10	660	40	157.45
11785	57	154.13	11977	20	144.63	11868	8	134.24
5409	42	131.99	11876	10	125.00	33514	26	124.00
23702	28	122.76	650	39	121.20	11978	21	112.12
690	41	108.29	6513	46	107.69	62305	32	107.18
11927	14	103.46	11867	7	103.17	11938	16	102.64
575	35	101.54	11819	4	99.48	5511	44	94.17
580	36	91.55	6628	50	90.46	23212	31	81.94
11866	6	80.26	11931	15	76.75	6518	47	69.89
6809	53	63.49	5508	43	61.94	11782	59	53.80
11902	11	47.66	540	33	45.87	11766	56	40.00
11806	2	39.00	11968	19	36.13	11903	12	32.60
53100	30	32.41	11993	22	32.30	11774	54	28.09
11813	3	26.20	33511	24	25.74	51700	29	24.99
11858	5	15.45	11787	58	9.79			
AVERAGE:		179.74						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
6702	51	1.44	6605	48	0.76	11803	1	0.73
11910	13	0.72	6507	45	0.58	11806	2	0.56

CARPATCLIM			Date		Version		Page	
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>		<i>39</i>	
11876	10	0.50	11868	8	0.46	566	34	0.46
6707	52	0.43	11867	7	0.43	11779	55	0.37
6618	49	0.37	11874	9	0.37	11946	17	0.36
33631	25	0.33	5409	42	0.27	33514	26	0.21
51700	29	0.20	600	37	0.19	44120	27	0.19
62305	32	0.18	11902	11	0.17	11978	21	0.17
6513	46	0.16	625	38	0.16	6518	47	0.16
11938	16	0.15	11819	4	0.15	11961	18	0.14
11785	57	0.12	33634	23	0.12	11866	6	0.11
580	36	0.11	53100	30	0.11	11977	20	0.10
575	35	0.10	540	33	0.10	11782	59	0.10
5508	43	0.09	11813	3	0.09	11858	5	0.08
660	40	0.08	6809	53	0.07	650	39	0.07
11968	19	0.06	11931	15	0.05	5511	44	0.05
6628	50	0.05	690	41	0.05	23702	28	0.04
11903	12	0.03	11927	14	0.03	11774	54	0.03
11766	56	0.02	11993	22	0.02	33511	24	0.00
23212	31	0.00	11787	58	0.00			
AVERAGE:		0.22						

Table 2.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 2534
Total number of errors: 3197
Maximal positive error: 14.88
Minimal negative error: -9.89

Table 2.6a. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 2079
Total number of errors: 2592
Maximal positive error: 15.89
Minimal negative error: -9.98

Table 2.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
2	2	105.34	19	19	76.74	5	5	75.65
13	13	69.27	26	26	68.05	8	8	67.24
14	14	63.34	34	34	62.43	25	25	57.48
11	11	56.71	36	36	56.61	16	16	55.94
17	17	55.68	6	6	53.46	22	22	53.36
30	30	50.44	24	24	49.91	37	37	48.58
21	21	46.21	10	10	44.75	3	3	43.53
20	20	42.58	27	27	42.50	39	39	34.06
15	15	30.06	12	12	27.64	35	35	26.73
23	23	26.27	4	4	23.79	1	1	22.48
9	9	21.81	28	28	21.31	38	38	20.32
32	32	19.89	7	7	18.41	33	33	17.91
18	18	15.87	29	29	13.34	31	31	9.25
AVERAGE:		43.46						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
19	19	982.62	17	17	682.88	13	13	331.74
16	16	291.26	20	20	261.08	25	25	212.73
2	2	207.13	24	24	177.65	5	5	167.21
26	26	160.10	8	8	157.45	30	30	154.13
10	10	133.46	23	23	126.87	39	39	110.64
14	14	107.69	3	3	101.54	6	6	98.30
36	36	98.02	12	12	94.16	18	18	90.51
22	22	79.45	27	27	78.51	15	15	68.63
34	34	65.37	11	11	62.32	32	32	52.12
21	21	52.08	37	37	49.30	1	1	45.90
7	7	34.65	35	35	34.35	4	4	28.79
38	38	25.63	9	9	21.69	28	28	20.71
29	29	18.11	33	33	14.35	31	31	9.79
AVERAGE:		141.25						

2. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
19	19	1.98	16	16	0.75	13	13	0.61
2	2	0.57	25	25	0.46	17	17	0.41
23	23	0.40	20	20	0.39	10	10	0.32
24	24	0.29	39	39	0.23	15	15	0.23
14	14	0.22	26	26	0.18	5	5	0.18
30	30	0.16	12	12	0.13	27	27	0.13
22	22	0.12	3	3	0.12	33	33	0.11
6	6	0.11	1	1	0.10	7	7	0.10
4	4	0.07	32	32	0.07	11	11	0.07
8	8	0.07	18	18	0.07	21	21	0.05
29	29	0.04	36	36	0.04	38	38	0.02
28	28	0.02	9	9	0.02	35	35	0.01
31	31	0.00	34	34	0.00	37	37	0.00
AVERAGE:		0.23						

Table 2.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
2	2	118.79	13	13	59.97	12	12	58.13
4	4	49.51	10	10	44.71	14	14	42.55
17	17	41.88	7	7	39.98	16	16	39.17
15	15	25.38	18	18	25.30	8	8	25.04
1	1	23.30	6	6	22.21	3	3	21.02
9	9	18.80	11	11	14.49	5	5	9.79
AVERAGE:		37.78						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
2	2	310.86	17	17	173.13	4	4	153.54
7	7	148.75	16	16	126.50	12	12	117.43
14	14	116.68	13	13	113.89	10	10	96.74
6	6	59.54	8	8	51.13	18	18	49.88
15	15	45.96	3	3	40.03	9	9	32.73
1	1	30.45	11	11	13.54	5	5	9.79
AVERAGE:		93.92						

Table 7b. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 360
 Total number of errors: 375
 Maximal positive error: 0.68
 Minimal negative error: -1.14

Annex 3. Precipitation sum

Table 3.1a. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda(x)	fi(y)	h	stno	stna	
1	16.60000000	47.68000000	234.0	13704	Sopron Kuruc-domb	HU
2	16.88000000	47.58000000	135.0	14421	Fertőszentmiklós	HU
3	16.65000000	47.20000000	201.0	15310	Szombathely	HU
4	16.48000000	47.03000000	206.0	15604	Pinkaminszent	HU
5	16.19000000	46.88000000	282.0	16100	Felsőszőlőnk	HU
6	16.31000000	46.91000000	312.0	16204	Szentgotthárd Farkasfa	HU
7	16.50000000	46.87000000	271.0	16206	Kisrákos Viszák	HU
8	16.70000000	46.92000000	206.0	16302	Hagyárosbörönd	HU
9	16.99000000	46.68000000	160.0	16804	Felsőrajk	HU
10	16.53000000	46.62000000	166.0	17300	Lenti	HU
11	16.72000000	46.43000000	151.0	17705	Letenye	HU
12	17.20000000	48.00000000	131.0	22502	Rajka	HU
13	17.26720000	47.88970000	121.0	23201	Mosonmagyaróvár	HU
14	17.25000000	47.62000000	118.0	24111	Csorna	HU
15	17.77000000	47.52000000	162.0	24419	Ravaszd	HU
16	17.80000000	47.61670000	133.0	24421	Pér	HU
17	17.11670000	47.46670000	134.0	24506	Beled	HU
18	17.87860000	47.36420000	281.0	24803	Bakonyszentkirály	HU
19	17.16420000	47.29310000	133.0	25108	Kemenesszentmárton	HU
20	17.26670000	47.16670000	141.0	25200	Kerta	HU
21	17.45000000	47.25000000	213.0	25208	Kup	HU
22	17.73000000	47.25250000	268.0	25304	Bakonybél	HU
23	17.62000000	47.22000000	401.0	25314	Farkasgyepű	HU
24	17.16670000	47.03330000	156.0	25502	Ötvös	HU
25	17.74670000	47.13310000	342.0	25711	Herend	HU
26	17.63330000	47.08330000	401.0	25714	Úrkút	HU
27	17.65000000	47.15000000	295.0	25716	Városlőd	HU
28	17.10000000	46.85000000	126.0	26100	Kehidakustány	HU
29	17.10000000	46.98330000	153.0	26104	Türje	HU
30	17.28330000	46.98330000	178.0	26202	Sümeg	HU
31	17.45000000	46.88330000	126.0	26207	Tapolca	HU
32	17.70250000	46.98860000	269.0	26326	Nagyvázsony	HU
33	17.89000000	46.92000000	107.0	26403	Tihany	HU
34	17.10000000	46.80000000	125.0	26501	Zalacsány	HU
35	17.16360000	46.67080000	123.0	26502	Zalavár	HU
36	17.23860000	46.73560000	111.7	26505	Keszthely Tanyakereszt	HU
37	17.37190000	46.69810000	121.0	26601	Balatonkeresztúr	HU
38	17.38330000	46.68330000	111.0	26602	Balatonújlak	HU
39	17.65000000	46.66670000	149.0	26704	Lengyeltóti	HU
40	17.78330000	46.70000000	152.0	26800	Somogytúr	HU
41	17.95000000	46.78330000	201.0	26826	Bálványos	HU
42	17.43330000	46.50000000	141.0	27209	Mesztegyő	HU
43	17.41670000	46.58330000	130.0	27225	Marcali	HU
44	17.81670000	46.50000000	169.0	27416	Mernye	HU
45	17.10000000	46.35000000	196.0	27500	Iharos	HU
46	17.50000000	46.40000000	165.0	27607	Nagybajom	HU
47	17.10000000	46.26670000	148.0	28103	Csurgó	HU
48	17.55000000	46.30000000	159.0	28308	Csököly	HU
49	17.23330000	46.08330000	126.0	28501	Vízvár	HU
50	17.45000000	45.95000000	108.0	29201	Barcs	HU
51	18.79000000	47.98000000	127.0	33403	Vámosmikola	HU
52	18.86670000	47.86670000	232.0	33412	Márianosztra	HU
53	18.16670000	47.73330000	113.0	33508	Komárom Szőny	HU
54	18.45000000	47.53330000	203.0	34210	Tatabánya Felsőgalla	HU
55	18.63330000	47.60000000	191.0	34302	Gyermely	HU
56	18.03330000	47.36670000	243.0	34501	Súr	HU
57	18.75000000	47.35000000	121.0	34710	Tordas	HU
58	18.13000000	47.20000000	162.0	35106	Várpalota	HU
59	18.68500000	47.24330000	115.0	35314	Kápolnásnyék	HU
60	18.02000000	47.03000000	111.0	35500	Balatonalmádi	HU
61	18.25000000	47.05000000	174.0	35504	Füle	HU
62	18.25000000	47.00000000	120.0	35505	Lepsény	HU
63	18.04080000	46.91080000	108.2	36100	Siófok	HU
64	18.18360000	46.68560000	165.0	36500	Iregszemcse	HU
65	18.01670000	46.73330000	178.0	36506	Tab	HU
66	18.29280000	46.83060000	123.0	36612	Lajoskomárom	HU
67	18.43330000	46.68330000	115.0	36613	Pincehely	HU
68	18.66670000	46.68330000	109.0	36708	Bikács	HU
69	18.11670000	46.55000000	193.0	37100	Szakcs	HU
70	18.38330000	46.53330000	117.0	37202	Szakály	HU
71	18.71080000	46.53030000	121.0	37302	Tengelic	HU
72	18.84560000	46.57360000	97.2	37402	Paks	HU
73	18.01720000	46.42860000	148.0	37522	Göllő	HU
74	18.31670000	46.45000000	124.0	37604	Kurd	HU
75	18.63330000	46.28330000	169.0	38307	Szálka	HU

76	18.11670000	46.14250000	220.0	38511	Abaliget	HU
77	18.08330000	46.08330000	237.0	38525	Bakonya	HU
78	18.23500000	45.99500000	200.2	39113	Pécs Pogány	HU
79	18.31670000	45.78330000	93.0	39600	Alsószentmárton	HU
80	19.53330000	48.18330000	204.0	42303	Nógrádszakál	HU
81	19.70000000	48.16670000	199.0	42304	Karancskeszi	HU
82	19.05000000	48.05000000	155.0	42504	Drégelypalánk	HU
83	19.75000000	48.13330000	243.0	42707	Karancsalja	HU
84	19.86670000	48.13330000	451.0	42800	Salgótarján Rónafalu	HU
85	19.78000000	48.10000000	281.0	42808	Salgótarján	HU
86	19.11670000	47.93330000	197.0	43116	Tolmács	HU
87	19.05000000	47.90000000	237.0	43128	Nógrád	HU
88	19.28000000	47.83000000	231.0	43200	Nézsza Szentivány	HU
89	19.35000000	47.98330000	193.0	43207	Mohora	HU
90	19.38330000	47.90000000	231.0	43210	Becske	HU
91	19.35000000	47.85000000	181.0	43226	Galgaguta	HU
92	19.69330000	47.91440000	181.0	43304	Pásztó	HU
93	19.78330000	47.98330000	186.0	43406	Mátraverebély	HU
94	19.98330000	47.91670000	357.0	43427	Parádsasvár	HU
95	19.07000000	47.67000000	120.0	43507	Szentendre	HU
96	19.25000000	47.73000000	140.0	43518	Váchartyán	HU
97	19.38330000	47.75000000	176.0	43603	Galgagyörk	HU
98	19.78330000	47.73330000	158.0	43806	Ecséd	HU
99	19.78330000	47.81670000	203.0	43808	Gyöngyöspata	HU
100	19.02810000	47.51110000	230.0	44121	Budapest belterület	HU
101	19.48330000	47.56670000	170.0	44204	Valkó	HU
102	19.08000000	47.35000000	106.0	44503	Dunaharaszti	HU
103	19.28330000	47.40000000	121.0	44615	Vecsés	HU
104	19.87940000	47.34190000	106.0	44812	Tápiószele	HU
105	20.00000000	47.18330000	96.0	45405	Abony	HU
106	19.74830000	46.91310000	114.0	46303	Kecskemét külterület	HU
107	19.23000000	46.82000000	99.0	46508	Fülöpszállás	HU
108	19.36670000	46.80000000	107.0	46600	Izsák	HU
109	19.09890000	46.51030000	93.6	47106	Kalocsa Öregcsertő	HU
110	19.01670000	46.18330000	113.0	48101	Baja Csávoly	HU
111	19.18330000	46.20000000	133.0	48105	Felsőszentiván	HU
112	19.76670000	46.31670000	111.0	48403	Ruzsa	HU
113	19.78000000	46.20000000	116.0	48408	Ásotthalom	HU
114	19.15000000	46.11670000	119.0	48502	Bácsbokod	HU
115	20.66670000	48.50000000	156.0	51303	Szin	HU
116	20.73000000	48.54000000	183.0	51307	Bódvaszilas	HU
117	20.46670000	48.18330000	215.0	52205	Dédestapolcsány	HU
118	20.93330000	48.20000000	125.0	52401	Szikszó	HU
119	20.10000000	48.05000000	205.0	52506	Erdőkövesd	HU
120	20.16670000	48.06670000	196.0	52510	Bükkszenterzsébet	HU
121	20.61670000	48.15000000	211.0	52714	Varbó	HU
122	20.51670000	48.00000000	361.0	52742	Bükkszérc	HU
123	20.77140000	48.09690000	232.8	52819	Miskolc Avás	HU
124	20.11670000	47.93330000	173.0	53120	Recsk	HU
125	20.38890000	47.90390000	225.2	53215	Eger	HU
126	20.53330000	47.90000000	187.0	53300	Bogács	HU
127	20.61670000	47.96670000	201.0	53307	Kács	HU
128	20.16670000	47.81670000	140.0	53513	Vécs	HU
129	20.31500000	47.68580000	113.0	53602	Erdőtelek	HU
130	20.41670000	47.75000000	114.0	53604	Füzesabony	HU
131	20.55000000	47.80110000	117.0	53703	Mezőkövesd	HU
132	20.86670000	47.68330000	95.0	53801	Tiszadorogma	HU
133	20.64780000	47.64470000	90.2	54306	Poroszló	HU
134	20.16670000	47.36670000	91.0	54508	Jászládány	HU
135	20.44560000	47.39810000	86.8	54604	Tiszaroff	HU
136	20.63330000	47.36670000	93.0	54702	Kunhegyes	HU
137	20.53000000	47.27000000	91.0	55300	Fegyvernek	HU
138	20.20000000	47.13000000	90.0	55502	Szolnok Szandaszőlős	HU
139	20.74000000	47.10640000	85.9	55706	Túrkeve	HU
140	20.20000000	46.96670000	93.0	56114	Cibakháza	HU
141	20.29000000	46.84000000	89.0	56205	Kunszentmárton	HU
142	20.93330000	46.86670000	86.0	56407	Csárdaszállás	HU
143	20.58330000	46.66670000	91.0	56704	Gádosros	HU
144	20.77500000	46.76670000	89.0	56805	Kondoros	HU
145	20.18330000	46.51670000	87.0	57108	Mindszent	HU
146	20.01670000	46.30000000	90.0	58100	Szeged Kiskundorozsma	HU
147	20.71670000	46.25000000	96.0	58306	Csanádpalota	HU
148	20.28330000	46.15000000	83.0	58600	Kübekháza	HU
149	21.55000000	48.20000000	105.0	62303	Kenézlő	HU
150	21.80000000	48.31670000	107.0	62400	Karcsa	HU
151	21.13330000	48.08330000	99.0	62501	Taktaharkány	HU
152	21.16670000	48.01670000	108.0	62505	Tiszadob	HU
153	21.38330000	48.01670000	101.0	62613	Tiszalök	HU
154	21.80000000	48.06670000	105.0	62800	Kemecse	HU
155	21.95000000	48.15000000	100.0	62804	Gégény	HU
156	21.88000000	48.10000000	102.0	62809	Kék	HU

157	21.83000000	47.87000000	131.0	63400	Nagykálló	HU
158	21.88690000	47.96220000	142.1	63411	Nyíregyháza Napkor	HU
159	21.23000000	47.82000000	92.0	63508	Görbbeháza	HU
160	21.50000000	47.80000000	112.0	63605	Hajdúdorog	HU
161	21.50000000	47.68000000	125.0	63608	Hajdúböszörmény	HU
162	21.67830000	47.71280000	145.0	63700	Téglás	HU
163	21.38330000	47.45000000	97.0	64610	Hajdúszoboszló	HU
164	21.61080000	47.49030000	107.6	64704	Debrecen	HU
165	21.88330000	47.38330000	118.0	64810	Létavértes	HU
166	21.23330000	47.20000000	94.0	65107	Biharnagybajom	HU
167	21.18000000	47.02000000	92.0	65503	Szeghalom	HU
168	21.43330000	47.13330000	98.0	65602	Zsáka	HU
169	21.50000000	47.01670000	93.0	65604	Komádi	HU
170	21.60000000	47.03330000	99.0	65704	Kőrösszakál	HU
171	21.26670000	46.93330000	91.0	66209	Vésztő	HU
172	21.45330000	46.77420000	94.0	66611	Méhkerék	HU
173	21.01670000	46.28330000	105.0	68101	Battonya	HU
174	22.18330000	48.31670000	114.0	72119	Mándok	HU
175	22.46670000	48.16670000	113.0	72203	Csaroda	HU
176	22.19330000	48.06500000	131.0	72509	Nyírmada	HU
177	22.32000000	48.13000000	115.0	72616	Vásárosnamény	HU
178	17.67472222	47.71000000	116.7	23703	Győr Likócs	HU
179	20.53611111	48.49527777	308.9	51705	Jósvafő	HU
180	20.01666666	47.86666666	1011.3	53101	Kékestető	HU
181	20.68750000	46.54416666	88.8	57311	Orosháza	HU
182	20.09027777	46.25611111	81.8	58113	Szeged külterület	HU
183	21.65888888	48.38083333	100.4	61709	Sátoraljaújhely	HU
184	21.16055555	46.67944444	87.8	66519	Békéscsaba	HU
185	22.62555555	47.86222222	118.3	73302	Pátyod magántelek	HU
186	18.98300000	45.53300000	150.0	aljma	Aljmas Planina	CR
187	19.03000000	45.13300000	90.0	nijem	Nijemci	CR
188	18.63300000	45.53300000	89.0	osije	Osijek	CR
189	18.35000000	45.66700000	92.0	valpo	Valpovo	CR
190	16.85000000	45.91700000	141.0	bjelo	Bjelovar	CR
191	17.23300000	45.60000000	161.0	daruv	Daruvar	CR
192	17.06700000	46.05000000	121.0	djurd	Djurdjevac	CR
193	18.16700000	45.76700000	97.0	donji	Donji Miholjac	CR
194	18.00000000	45.16600000	88.0	slavo	Slavonski Brod	CR
195	17.86700000	45.60000000	120.0	cacin	Čačinci	CR
196	17.20000000	46.06700000	113.0	ferdi	Ferdinandovac	CR
197	17.05000000	46.20000000	121.0	gola	Gola	CR
198	18.30000000	45.66700000	97.0	marij	Marijanci	CR
199	17.03300000	45.90000000	144.0	sandr	Šandrovac	CR
200	17.20000000	45.90000000	187.0	sedla	Sedlarica	CR
201	19.67050000	45.33660000	85.0	backi	Backi Petrovac	RS
202	20.46460000	45.84260000	80.0	kikin	Kikinda	RS
203	19.76410000	46.09720000	102.0	palic	Palic	RS
204	19.14310000	45.76700000	87.0	sombo	Sombor	RS
205	19.43000000	45.97000000	115.0	bajmo	Bajmok	RS
206	18.92800000	45.84990000	90.0	bezda	Bezdan	RS
207	19.97780000	46.16660000	95.0	horgo	Horgoš	RS
208	20.41120000	45.89990000	85.0	mokri	Mokrin	RS
209	19.11140000	45.43320000	85.0	vajsk	Vajska	RS
210	21.35362152	46.13351640	112.0	arad	Arad	RO
211	21.89592406	47.03570901	132.0	orade	Oradea	RO
212	22.09450716	47.34415862	104.0	sacui	Sacuieni	RO
213	20.60156003	46.07128625	80.0	sanni	Sannicolau	RO
214	22.88714903	47.72148469	119.0	satu	Satu Mare	RO
215	22.60000000	48.20000000	113.0	bereg	Bereg	UA
216	23.30000000	48.20000000	164.0	khust	Khust	UA
217	22.30000000	48.60000000	115.0	uzhgo	Uzhgorod	UA
218	17.11060000	48.16860000	287.0	11813	Bratislava-Koliba	SK
219	18.19420000	47.87310000	115.0	11858	Hurbanovo	SK
220	19.73600000	48.33900000	214.0	11927	Lučenec-boľkovce	SK
221	20.79750000	48.71810000	580.0	11946	štós	SK
222	21.22250000	48.67220000	230.0	11968	Košice-letisko	SK
223	21.72400000	48.66300000	105.0	11978	Milhostov	SK
224	17.61300000	47.98800000	115.0	17540	Veľké blahovo	SK
225	18.63500000	48.12600000	148.0	37040	Jur nad hronom	SK
226	18.51300000	48.00700000	150.0	37260	Farná	SK
227	18.39700000	47.93100000	132.0	37320	Rúbaň	SK
228	21.81100000	48.39600000	100.0	51060	Somotor	SK
229	20.53000000	48.64900000	289.0	52140	Rožňava	SK
230	20.01100000	48.37400000	215.0	54200	Rimavská sobota	SK
231	20.28400000	48.30900000	164.0	54380	Číž	SK
232	21.00600000	48.61800000	218.0	55080	Moldava nad bodvou	SK
233	20.52700000	48.55500000	514.0	55180	Silica	SK

Table 3.1b. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
54306	133	74.10	54604	135	61.93	16804	9	61.09
43226	91	55.72	53215	125	52.47	25714	26	51.60
37522	73	51.57	44503	102	49.14	26704	39	48.88
marij	198	47.80	vajsk	209	47.64	25711	25	47.05
58306	147	47.01	62613	153	46.01	42808	85	45.76
52510	120	45.62	54200	230	44.98	24419	15	44.65
56114	140	44.40	65602	168	42.84	37040	225	42.83
15604	4	42.07	58100	146	41.68	42303	80	40.74
26826	41	39.70	24421	16	38.01	53513	128	37.86
26501	34	37.30	26602	38	36.95	63700	162	36.58
sandr	199	36.55	25716	27	36.53	36100	63	36.26
62303	149	36.18	33508	53	36.16	65604	169	36.16
26800	40	33.98	64704	164	33.98	57108	145	33.58
53300	126	33.05	36506	65	32.77	16204	6	31.88
horgo	207	31.55	37202	70	31.23	33403	51	31.12
51303	115	30.94	43200	88	30.75	53602	129	30.07
48502	114	29.39	73302	185	28.90	56205	141	27.96
palic	203	27.88	gola	197	27.82	25200	20	27.62
64810	165	27.32	63605	160	27.02	53703	131	26.81
65704	170	26.68	58113	182	26.60	72616	177	26.51
24506	17	26.38	35500	60	25.98	62800	154	25.95
57311	181	25.78	26207	31	25.53	63608	161	25.52
44204	101	25.44	25108	19	25.39	26505	36	25.27
52819	123	25.18	27416	44	24.98	43304	92	24.36
44812	104	23.35	42304	81	23.30	72203	175	23.21
13704	1	23.20	43116	86	23.17	56407	142	22.99
11858	219	22.88	sedla	200	22.55	osije	188	22.54
26502	35	22.53	11927	220	22.51	62400	150	22.41
53101	180	22.34	35106	58	22.26	22502	12	22.13
35504	61	22.02	52140	229	22.01	37402	72	21.75
satu	214	21.65	ajmas	186	21.50	46600	108	21.42
17540	224	21.34	62501	151	21.28	43808	99	20.77
mokri	208	20.69	55300	137	20.54	37100	69	20.18
26104	29	20.14	56805	144	20.01	25314	23	19.89
43518	96	19.71	37604	74	19.58	48403	112	19.36
14421	2	19.29	52742	122	19.28	orade	211	18.87
53801	132	18.78	11978	223	18.62	35505	62	18.59
34302	55	18.24	56704	143	18.08	51705	179	17.90
backi	201	17.88	36500	64	17.68	25304	22	17.48
53120	124	17.48	26601	37	17.44	cacin	195	17.38
43427	94	17.23	djurd	192	17.15	72509	176	17.10
29201	50	17.01	16206	7	16.97	48105	111	16.96
58600	148	16.82	34710	57	16.66	53307	127	16.60
52401	118	16.58	donji	193	16.52	55180	233	16.33
46303	106	16.28	66209	171	16.27	34501	56	16.15
64610	163	15.96	23201	13	15.83	54380	231	15.76
27225	43	15.70	26403	33	15.67	27500	45	15.65
kikin	202	15.61	36613	67	15.55	bjelo	190	15.50
uzhgo	217	15.21	27607	46	15.07	44121	100	15.06
63411	158	15.06	62809	156	15.03	52714	121	14.86
37260	226	14.83	55080	232	14.79	43210	90	14.66

38525	77	14.59	54508	134	14.59	65503	167	14.57
52506	119	14.36	39600	79	14.35	25208	21	14.34
valpo	189	14.28	khust	216	14.27	47106	109	14.19
26202	30	14.13	63508	159	14.13	51307	116	14.09
ferdi	196	14.02	26100	28	14.00	72119	174	13.70
62505	152	13.64	16302	8	13.60	37302	71	13.34
nijem	187	13.31	33412	52	13.29	27209	42	13.22
36708	68	12.87	34210	54	12.85	42800	84	12.69
11813	218	12.65	23703	178	12.63	24111	14	12.34
42707	83	12.19	sombo	204	11.96	28103	47	11.95
sacui	212	11.81	43406	93	11.66	43507	95	11.64
44615	103	11.56	bezda	206	11.55	11946	221	11.42
arad	210	11.41	43603	97	11.32	48408	113	11.27
17300	10	11.10	45405	105	11.10	42504	82	11.10
66611	172	10.85	43128	87	10.82	48101	110	10.67
53604	130	10.61	28308	48	10.34	39113	78	10.25
37320	227	10.12	62804	155	10.03	bereg	215	10.02
43806	98	9.75	63400	157	9.72	66519	184	9.68
46508	107	9.66	26326	32	9.63	51060	228	9.63
36612	66	9.56	61709	183	9.52	24803	18	9.50
slavo	194	9.25	bajmo	205	9.01	54702	136	8.97
52205	117	8.80	55502	138	8.70	11968	222	8.67
68101	173	8.05	15310	3	8.04	38511	76	7.86
sanni	213	7.70	16100	5	7.58	65107	166	7.22
38307	75	7.21	25502	24	7.15	28501	49	6.91
43207	89	6.77	17705	11	6.38	daruv	191	6.07
35314	59	6.00	55706	139	5.95			
AVERAGE:		21.60						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
26826	41	200.79	54306	133	181.47	25716	27	117.51
26502	35	116.00	sandr	199	106.50	25314	23	102.39
16804	9	100.10	52742	122	80.60	36506	65	80.00
43116	86	72.32	vajsk	209	71.72	17540	224	66.68
53215	125	66.05	26704	39	63.12	44503	102	62.28
33508	53	60.58	26602	38	59.31	37522	73	58.94
26800	40	57.85	54200	230	57.19	16206	7	54.78
43226	91	52.92	25714	26	51.60	25711	25	50.94
mokri	208	50.83	marij	198	49.88	64704	164	49.69
24419	15	49.55	51303	115	49.13	58100	146	48.45
62613	153	48.14	42808	85	47.95	43200	88	47.39
16204	6	47.37	65602	168	47.25	26501	34	47.06
37402	72	46.08	63700	162	46.02	52510	120	45.41
56114	140	44.99	62303	149	43.83	11858	219	43.08
37040	225	42.83	27225	43	42.38	36100	63	42.10
15604	4	42.07	42303	80	40.70	72203	175	39.56
57108	145	39.25	24421	16	38.67	53513	128	37.86
42304	81	37.11	27500	45	35.71	54604	135	35.43
25304	22	35.09	horgo	207	34.95	43304	92	33.80
52819	123	32.57	58113	182	32.53	sedla	200	32.50
26505	36	32.41	65604	169	32.38	53300	126	32.26
27416	44	31.81	44204	101	31.48	gola	197	31.28
37202	70	31.28	53307	127	30.62	43210	90	29.12
palic	203	28.79	ajmas	186	28.20	55180	233	28.04
62800	154	27.87	63605	160	27.55	27209	42	26.90
58306	147	26.86	73302	185	26.80	33403	51	26.58
53703	131	26.46	57311	181	26.38	24506	17	26.38
56805	144	26.32	25200	20	26.05	64810	165	25.95
43518	96	25.91	35500	60	25.82	26207	31	25.81
35106	58	25.80	osije	188	25.66	53602	129	25.63
25108	19	25.12	72616	177	25.10	22502	12	24.80
56205	141	24.73	26601	37	24.37	48403	112	24.11

56704	143	24.03	43808	99	24.01	63608	161	23.73
13704	1	23.20	48502	114	22.62	satu	214	22.48
53101	180	22.34	26100	28	22.22	52140	229	21.99
65704	170	21.81	48105	111	21.64	46600	108	21.42
62501	151	21.28	11927	220	21.26	62400	150	21.20
44812	104	21.12	62809	156	20.71	26104	29	20.51
53604	130	20.12	16302	8	19.92	37604	74	19.58
bjelo	190	19.20	14421	2	19.15	47106	109	19.04
43128	87	18.94	27607	46	18.86	29201	50	18.74
51705	179	18.73	34302	55	18.69	valpo	189	18.69
11978	223	18.55	37320	227	18.24	backi	201	17.88
nijem	187	17.76	cacin	195	17.66	53120	124	17.56
ferdi	196	17.51	43427	94	17.23	33412	52	17.22
35504	61	16.84	35505	62	16.74	uzhgo	217	16.66
26403	33	16.49	37302	71	16.49	54508	134	16.44
46303	106	16.36	63411	158	16.18	25208	21	16.05
56407	142	15.99	52401	118	15.88	23201	13	15.83
52714	121	15.72	64610	163	15.54	54380	231	15.51
donji	193	15.48	36613	67	15.46	34501	56	15.45
36500	64	15.39	65503	167	15.36	44121	100	15.06
34710	57	15.04	37100	69	14.86	11946	221	14.75
53801	132	14.65	51307	116	14.65	55080	232	14.64
38525	77	14.59	39600	79	14.42	52506	119	14.36
72119	174	14.32	khust	216	14.27	63508	159	14.08
48101	110	13.99	24803	18	13.81	62804	155	13.78
11813	218	13.67	43406	93	13.65	62505	152	13.60
26202	30	13.56	23703	178	13.49	orade	211	13.41
36612	66	13.40	44615	103	13.30	sacui	212	13.27
17300	10	13.00	26326	32	12.92	72509	176	12.90
58600	148	12.80	36708	68	12.68	66611	172	12.63
42800	84	12.61	55300	137	12.37	42707	83	12.28
37260	226	12.22	24111	14	12.10	66209	171	12.06
sombo	204	11.96	17705	11	11.67	bezda	206	11.50
43507	95	11.49	arad	210	11.41	kikin	202	11.37
34210	54	11.33	28103	47	11.32	42504	82	11.10
48408	113	11.05	45405	105	10.97	25502	24	10.73
bereg	215	10.59	sanni	213	10.57	djurd	192	10.38
28308	48	10.38	39113	78	10.25	61709	183	10.24
63400	157	10.07	43603	97	9.76	66519	184	9.68
51060	228	9.62	bajmo	205	9.52	46508	107	9.39
43806	98	9.03	55502	138	9.00	52205	117	8.97
11968	222	8.85	54702	136	8.76	68101	173	8.56
daruv	191	8.41	slavo	194	8.36	15310	3	8.04
38511	76	7.86	43207	89	7.54	65107	166	7.02
28501	49	6.96	38307	75	6.68	35314	59	6.00
55706	139	5.95	16100	5	5.71			
AVERAGE:		27.93						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
vajsk	209	0.75	mokri	208	0.45	54306	133	0.42
26502	35	0.40	16206	7	0.33	25314	23	0.32
17540	224	0.29	26826	41	0.28	sandr	199	0.28
27209	42	0.27	63700	162	0.24	36100	63	0.23
27225	43	0.22	27500	45	0.21	marij	198	0.21
52742	122	0.21	33508	53	0.19	43116	86	0.19
44503	102	0.19	43200	88	0.18	37402	72	0.18
25716	27	0.18	16100	5	0.18	72509	176	0.17
66209	171	0.16	55180	233	0.16	26602	38	0.15
52140	229	0.15	16804	9	0.14	58100	146	0.14
64810	165	0.12	54604	135	0.12	35106	58	0.11
sacui	212	0.11	64704	164	0.11	62809	156	0.10

valpo	189	0.10	48502	114	0.09	26704	39	0.09
44204	101	0.09	54200	230	0.09	72203	175	0.09
43304	92	0.08	52819	123	0.08	55502	138	0.08
56704	143	0.08	37320	227	0.08	65602	168	0.08
54702	136	0.08	26104	29	0.08	daruv	191	0.08
53307	127	0.07	53215	125	0.06	ajmas	186	0.06
58600	148	0.05	51303	115	0.05	26501	34	0.05
65604	169	0.05	62303	149	0.05	26403	33	0.05
36506	65	0.05	62804	155	0.05	34210	54	0.05
56205	141	0.05	48101	110	0.05	25108	19	0.04
27416	44	0.04	26601	37	0.03	cacin	195	0.03
35500	60	0.03	11946	221	0.02	24419	15	0.02
54380	231	0.01	51060	228	0.01	43406	93	0.01
63411	158	0.01	horgo	207	0.01	52714	121	0.01
55080	232	0.01	28103	47	0.01	37302	71	0.01
42304	81	0.01	65704	170	0.01	53801	132	0.01
13704	1	0.00	14421	2	0.00	15310	3	0.00
15604	4	0.00	16204	6	0.00	16302	8	0.00
17300	10	0.00	17705	11	0.00	22502	12	0.00
23201	13	0.00	24111	14	0.00	24421	16	0.00
24506	17	0.00	24803	18	0.00	25200	20	0.00
25208	21	0.00	25304	22	0.00	25502	24	0.00
25711	25	0.00	25714	26	0.00	26100	28	0.00
26202	30	0.00	26207	31	0.00	26326	32	0.00
26505	36	0.00	26800	40	0.00	27607	46	0.00
28308	48	0.00	28501	49	0.00	29201	50	0.00
33403	51	0.00	33412	52	0.00	34302	55	0.00
34501	56	0.00	34710	57	0.00	35314	59	0.00
35504	61	0.00	35505	62	0.00	36500	64	0.00
36612	66	0.00	36613	67	0.00	36708	68	0.00
37100	69	0.00	37202	70	0.00	37522	73	0.00
37604	74	0.00	38307	75	0.00	38511	76	0.00
38525	77	0.00	39113	78	0.00	39600	79	0.00
42303	80	0.00	42504	82	0.00	42707	83	0.00
42800	84	0.00	42808	85	0.00	43128	87	0.00
43207	89	0.00	43210	90	0.00	43226	91	0.00
43427	94	0.00	43507	95	0.00	43518	96	0.00
43603	97	0.00	43806	98	0.00	43808	99	0.00
44121	100	0.00	44615	103	0.00	44812	104	0.00
45405	105	0.00	46303	106	0.00	46508	107	0.00
46600	108	0.00	47106	109	0.00	48105	111	0.00
48403	112	0.00	48408	113	0.00	51307	116	0.00
52205	117	0.00	52401	118	0.00	52506	119	0.00
52510	120	0.00	53120	124	0.00	53300	126	0.00
53513	128	0.00	53602	129	0.00	53604	130	0.00
53703	131	0.00	54508	134	0.00	55300	137	0.00
55706	139	0.00	56114	140	0.00	56407	142	0.00
56805	144	0.00	57108	145	0.00	58306	147	0.00
62400	150	0.00	62501	151	0.00	62505	152	0.00
62613	153	0.00	62800	154	0.00	63400	157	0.00
63508	159	0.00	63605	160	0.00	63608	161	0.00
64610	163	0.00	65107	166	0.00	65503	167	0.00
66611	172	0.00	68101	173	0.00	72119	174	0.00
72616	177	0.00	23703	178	0.00	51705	179	0.00
53101	180	0.00	57311	181	0.00	58113	182	0.00
61709	183	0.00	66519	184	0.00	73302	185	0.00
nijem	187	0.00	osije	188	0.00	bjelo	190	0.00
djurd	192	0.00	donji	193	0.00	slavo	194	0.00
ferdi	196	0.00	gola	197	0.00	sedla	200	0.00
backi	201	0.00	kikin	202	0.00	palic	203	0.00
sombo	204	0.00	bajmo	205	0.00	bezda	206	0.00
arad	210	0.00	orade	211	0.00	sanni	213	0.00
satu	214	0.00	bereg	215	0.00	khust	216	0.00

CARPATCLIM			Date		Version			Page	
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>			<i>50</i>	
uzhgo	217	0.00	11813	218	0.00	11858	219	0.00	
11927	220	0.00	11968	222	0.00	11978	223	0.00	
37040	225	0.00	37260	226	0.00				
AVERAGE:		0.04							

Table 3.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 1120
Total number of errors: 1531
Maximal positive error: 71.94
Minimal negative error: -23.24

Table 3.2a. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

index	lambda(x)	fi(y)	
1	18.5614167	45.4998889	Osijek
2	18.3447778	45.6665278	Valpovo
3	18.9780278	45.5332500	Aljmas Planina
4	19.1500000	46.1166667	Bacsbokod
5	19.0166667	46.1833333	Baja
6	20.2833333	46.1500000	Kubekhaza
7	19.7666667	46.3166667	Ruzsa
8	20.0902778	46.2561111	Szeged
9	20.6015600	46.0712863	Sannicolau Mare
10	21.2580711	45.7710564	Timisoara
11	21.1363986	45.3827011	Banloc
12	21.7104827	45.0387115	Oravita
13	22.0558046	45.1813947	Semenic
14	22.6260737	44.6264587	Drobeta Turnu Severin
15	23.1130719	44.4761811	Bacles
16	22.9460524	43.9848998	Calafat
17	19.7112500	46.0998611	Subotica
18	19.7640230	46.0972180	Palic
19	19.9778056	46.1665833	Horgos
20	18.9279722	45.7998611	Backi Monostor
21	18.9279722	45.8498611	Bezdan
22	19.0613611	45.8998611	Gakovo
23	19.1431350	45.7670000	Sombor
24	19.4279444	45.9665556	Bajmok
25	19.6445833	45.8166111	Backa Topola
26	19.8278611	45.7666111	Gunaros
27	19.8278611	45.8831944	Tornjos
28	20.0278611	45.5332500	Backo Gradiste
29	20.0278611	45.6332500	Becej
30	20.0778333	45.7166389	Backo Petrovo Selo
31	20.0960450	45.9234420	Senta
32	20.1278333	45.7999167	Ada
33	20.1445556	45.5999444	Novi Becej
34	20.2778056	45.8499444	Sajan
35	20.3112222	45.5166667	Melenci
36	20.4111944	45.8999444	Mokrin
37	20.4111944	45.6332500	Basaid
38	20.4646400	45.8426340	Kikinda
39	20.4611944	45.7199444	Torda
40	20.5611944	45.6832500	Toba
41	20.5777778	45.7499444	Rusko Selo
42	20.6944722	45.7299722	Srpska Crnja
43	19.1113889	45.4332222	Vajska
44	19.2446667	45.3999444	Bac
45	19.3779722	45.2499444	Backa Palanka
46	19.6704870	45.3365990	Backi Petrovac
47	19.8300030	45.3222150	Novi Sad
48	19.8778889	45.3999722	Temerin
49	20.1778611	45.3000000	Mosorin
50	20.2945556	45.3832778	Aradac
51	20.3778611	45.2167222	Perlez
52	20.3760080	45.3987240	Zrenjanin
53	20.6278056	45.2667222	Tomasevac
54	20.6112222	45.2167222	Uzdin
55	20.7111944	45.3500000	Neuzina
56	20.7278611	45.1166944	Padina
57	21.0277778	45.0500556	Banatski Karlovac
58	21.3055240	45.1441370	Vrsac
59	19.2269330	44.5410990	Loznica
60	19.5550360	45.0093730	Sremska Mitrovica
61	20.2910630	44.8242370	Surcin
62	20.2779167	44.9000278	Batajnica
63	20.4648220	44.7984570	Beograd
64	20.5778611	44.7500833	Radmilovac
65	21.0111944	44.5834444	Mala Krsna
66	21.3111667	44.5334722	Batusa

67	21.3221680	44.8361470	Bela Crkva
68	21.4984300	44.7526140	Veliko Gradiste
69	21.9110833	44.6501389	Dobra
70	19.2978090	44.2752810	Ljubovija
71	19.3780833	44.3667222	Krupanj
72	19.5280556	44.4500556	Zavlaka
73	19.7280556	44.2167500	Pocuta
74	19.9124730	44.2754640	Valjevo
75	20.4612778	44.3334444	Darosava
76	20.5113333	44.1334444	Rudnik
77	20.7613056	44.1334444	Cumic
78	20.9277710	44.0272220	Kragujevac
79	20.9421460	44.3696000	Smederevska Palanka
80	21.7795770	44.1997370	Zagubica
81	21.9778056	44.0168889	Zlot
82	22.0944167	44.3335278	Rudna Glava
83	22.1444167	44.2835278	Crnajka
84	22.2610556	44.4835278	Miroc
85	22.3777222	44.3501944	Jabukovac
86	22.4943611	44.3668889	Mihajlovac
87	22.4944167	44.0335833	Sipikovo
88	22.5363400	44.2391570	Negotin
89	22.5776944	44.3002222	Prahovo
90	19.3948056	43.8667778	Zaovine
91	19.4115000	43.5168333	Pribojska Golesa
92	19.5614595	43.9667870	Bajina Basta
93	19.5781111	43.7501389	Semegnjevo
94	19.7130230	43.7378070	Zlatibor
95	19.7947778	43.5557222	Negbina
96	20.0114167	43.6001667	Bjelusa
97	20.0295210	43.8430700	Pozega
98	20.0780278	43.9668056	Gornja Dobrinja
99	20.4060833	43.7169722	Kaona
100	20.5780000	43.7168611	Vrdila
101	20.6998360	43.7088840	Kraljevo
102	20.8393056	43.5504167	Goc
103	20.8890278	43.6177222	Vrnjacka Banja
104	21.0112778	43.6335556	Trstenik
105	21.0779444	43.7168889	Riljac
106	21.0945833	43.8668611	Rekovac
107	21.2224722	43.9835833	Jagodina
108	21.3399540	43.5640540	Krusevac
109	21.3806360	43.9406160	Cuprija
110	21.5112222	43.5835833	Djunis
111	21.7112222	43.5336111	Aleksinac
112	21.8580278	43.6409722	Sokobanja
113	22.2611389	43.5336389	Knjazevac
114	22.2885650	43.8831280	Zajecar

Table 3.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
ZLA	94	135.76	MOS	49	100.71	VRD	100	94.80
GAK	22	88.88	BGR	28	87.26	GDO	98	85.05
TEM	48	77.01	BBA	92	72.54	SEM	13	70.91
NBC	33	65.02	TRS	104	64.38	NGB	95	61.87
MOK	36	59.19	SOK	112	56.54	MEL	35	55.06
SUB	17	54.21	SUR	61	53.40	MKR	65	52.91
PRH	89	52.42	GOC	102	52.02	MIR	84	48.94
BAT	62	48.77	REK	106	48.43	KAO	99	46.09
DAR	75	44.98	BPL	45	43.10	ALE	111	42.28
NEU	55	40.10	RUD	76	39.99	ARA	50	39.87
BAS	37	39.38	PER	51	39.07	RGL	82	37.24
BKA	57	34.46	JAB	85	34.07	SEN	31	32.94
SAJ	34	32.50	KRU	71	32.18	HOR	19	31.78
MIH	86	31.67	JAG	107	31.32	VAJ	43	30.93
SCR	42	30.17	VBA	103	29.85	SMG	93	29.48
ADA	32	28.87	BAJ	5	27.82	KRV	101	27.08
BEZ	21	26.22	BTS	66	26.18	KBH	6	25.33
POC	73	25.24	BPS	30	24.31	CUM	77	24.27
ZRE	52	23.97	PAL	18	23.42	ALP	3	23.32
RLJ	105	23.09	BEC	29	22.67	ZAO	90	21.86
UZD	54	21.83	CUP	109	21.47	BCS	4	21.16
BCL	15	20.86	VGR	68	20.43	ZAG	80	20.29
BTO	25	20.11	ORA	12	20.03	BAC	44	19.63
TOR	27	19.36	DTS	14	19.19	SRM	60	18.91
BJE	96	18.73	NEG	88	18.72	NSA	47	18.51
DJU	110	18.44	GUN	26	18.39	PDN	56	18.06
TMS	53	17.28	BCR	67	17.21	CAL	16	16.90
DOB	69	16.72	VRS	58	16.70	SOM	23	15.78
SPL	79	15.71	KRS	108	15.65	KIK	38	15.53
OSI	1	15.39	ZAV	72	15.23	BAN	11	15.05
TOB	40	14.60	BGD	63	14.36	ZLT	81	14.18
VAL	2	13.88	CRN	83	13.77	SIP	87	13.60
TRD	39	12.94	RAD	64	12.71	LJU	70	12.53
BPT	46	12.31	LOZ	59	11.89	BMO	20	11.30
SZE	8	11.15	RZS	7	10.69	VLJ	74	10.64
BMK	24	10.46	SNM	9	10.12	PBG	91	9.32
KRG	78	9.22	POZ	97	9.16	ZAJ	114	8.62
TIM	10	6.72	RUS	41	6.51	KNJ	113	4.12
AVERAGE:		31.27						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
ZLA	94	151.16	VRD	100	121.68	MOS	49	105.71
NBC	33	104.40	GDO	98	95.70	BGR	28	94.92
GAK	22	94.72	BBA	92	91.58	PRH	89	86.51
SEM	13	79.12	MOK	36	74.14	REK	106	73.85
BJE	96	68.86	KAO	99	67.68	SUR	61	67.59
SUB	17	65.97	NGB	95	64.89	MEL	35	62.60
ALE	111	57.40	GOC	102	56.30	SOK	112	55.57
TRS	104	54.78	DAR	75	52.77	RGL	82	49.53

ARA	50	49.10	MIR	84	48.85	TEM	48	48.11
SAJ	34	46.16	MIH	86	42.84	RUD	76	42.57
BPL	45	42.32	BAS	37	42.21	NEU	55	41.82
SCR	42	40.87	BAT	62	40.00	HOR	19	37.95
KRU	71	37.37	VBA	103	37.17	PER	51	36.88
MKR	65	35.69	BKA	57	35.33	SMG	93	34.52
JAG	107	32.14	ZAO	90	32.00	VAJ	43	31.35
BEC	29	31.08	JAB	85	31.06	BAJ	5	30.23
POC	73	27.83	RLJ	105	27.12	KBH	6	26.28
SEN	31	25.97	BPS	30	25.54	ADA	32	25.28
PAL	18	24.96	ZRE	52	24.79	BEZ	21	23.69
CUM	77	23.44	NEG	88	22.61	ZAG	80	22.14
CUP	109	21.67	BCL	15	21.47	BCS	4	21.19
ZAV	72	20.90	SRM	60	20.84	BTS	66	20.07
DJU	110	19.81	ALP	3	19.57	UZD	54	19.34
OSI	1	19.27	KRV	101	19.12	VGR	68	19.05
BTO	25	18.79	ORA	12	18.60	SPL	79	18.58
KIK	38	18.37	PDN	56	18.22	BAC	44	18.16
NSA	47	18.14	DOB	69	17.84	TMS	53	17.79
DTS	14	17.78	TOR	27	17.76	GUN	26	17.72
BCR	67	17.44	LJU	70	17.16	SOM	23	16.95
ZLT	81	16.74	VRS	58	16.67	CAL	16	16.66
KRS	108	16.57	TRD	39	16.18	BAN	11	14.99
BGD	63	14.55	LOZ	59	14.26	SIP	87	14.05
RAD	64	13.72	BPT	46	12.52	VLJ	74	12.49
TOB	40	11.71	CRN	83	11.63	VAL	2	11.31
BMK	24	11.27	SNM	9	10.68	RZS	7	10.35
SZE	8	9.96	BMO	20	9.74	PBG	91	9.39
POZ	97	9.14	ZAJ	114	8.67	RUS	41	8.39
KRG	78	8.33	TIM	10	7.27	KNJ	113	5.75
AVERAGE:		34.73						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
MOK	36	0.67	NBC	33	0.22	BTS	66	0.19
TRD	39	0.18	GOC	102	0.17	SEM	13	0.15
VRD	100	0.15	SCR	42	0.14	REK	106	0.13
SOK	112	0.12	ZAV	72	0.12	LOZ	59	0.12
VBA	103	0.12	KRU	71	0.11	PRH	89	0.11
RGL	82	0.10	BBA	92	0.10	BEC	29	0.10
SUR	61	0.10	POC	73	0.09	KAO	99	0.09
MIH	86	0.08	LJU	70	0.08	ALE	111	0.07
NGB	95	0.07	DAR	75	0.07	BMO	20	0.07
SUB	17	0.07	MIR	84	0.07	SMG	93	0.07
SAJ	34	0.07	KNJ	113	0.06	NEG	88	0.06
RUD	76	0.06	KRS	108	0.06	BCL	15	0.05
GAK	22	0.05	JAB	85	0.05	BAT	62	0.05
SOM	23	0.05	BEZ	21	0.04	NEU	55	0.04
KBH	6	0.04	JAG	107	0.04	NSA	47	0.04
BPT	46	0.03	ADA	32	0.03	MOS	49	0.03
VAJ	43	0.03	TOB	40	0.03	PAL	18	0.03
SPL	79	0.02	RLJ	105	0.02	ALP	3	0.02
BGR	28	0.02	RZS	7	0.02	BJE	96	0.02
RUS	41	0.02	TEM	48	0.02	GDO	98	0.02
MEL	35	0.02	CRN	83	0.02	DOB	69	0.01
BKA	57	0.01	HOR	19	0.01	PER	51	0.01
BGD	63	0.01	BPL	45	0.01	SIP	87	0.01
ARA	50	0.01	OSI	1	0.00	VAL	2	0.00
BCS	4	0.00	BAJ	5	0.00	SZE	8	0.00
SNM	9	0.00	TIM	10	0.00	BAN	11	0.00
ORA	12	0.00	DTS	14	0.00	CAL	16	0.00
BMK	24	0.00	BTO	25	0.00	GUN	26	0.00

CARPATCLIM			Date			Version			Page		
<i>Report</i>			<i>02/10/2012</i>			<i>final</i>			<i>55</i>		
TOR	27	0.00	BPS	30	0.00	SEN	31	0.00			
BAS	37	0.00	KIK	38	0.00	BAC	44	0.00			
ZRE	52	0.00	TMS	53	0.00	UZD	54	0.00			
PDN	56	0.00	VRS	58	0.00	SRM	60	0.00			
RAD	64	0.00	MKR	65	0.00	BCR	67	0.00			
VGR	68	0.00	VLJ	74	0.00	CUM	77	0.00			
KRG	78	0.00	ZAG	80	0.00	ZLT	81	0.00			
ZAO	90	0.00	PBG	91	0.00	ZLA	94	0.00			
POZ	97	0.00	KRV	101	0.00	TRS	104	0.00			
CUP	109	0.00	DJU	110	0.00	ZAJ	114	0.00			
AVERAGE:		0.05									

Table 3.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 569
Total number of errors: 672
Maximal positive error: 230.27
Minimal negative error: -36.87

Table 3.3a. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda	fi	ST_ID	h	ST_NAME
1	24.879770	43.760422	346452	31	TURNU
2	23.945690	43.790058	347357	37	BECHET
3	28.588980	43.816471	349835	6	MANGALIA
4	25.934219	43.875469	352557	23	GIURGIU
5	22.947571	43.985249	359257	62	CALAFAT
6	25.354370	43.978291	359521	74	ALEXANDRIA
7	23.332621	44.029510	401321	58	BAILESTI
8	24.358810	44.100441	406421	107	CARACAL
9	24.980030	44.107738	407500	105	ROSIORII
10	27.967131	44.088619	408800	159	ADAMCLISI
11	27.339861	44.206429	412721	19	CALARASI
12	28.646379	44.214088	413838	12	CONSTANTA
13	23.868460	44.310600	414352	194	CRAIOVA
14	28.252880	44.243561	415816	66	MEDGIDIA
15	25.538540	44.283260	417530	106	VIDELE
16	27.840481	44.391781	422751	57	FETESTI
17	26.095320	44.412361	425606	84	BUCURESTI
18	23.114580	44.476719	428307	316	BICLES
19	26.525049	44.453232	428632	65	FUNDULEA
20	26.079760	44.510818	430608	92	BUCURESTI
21	24.791531	44.562881	436447	210	STOLNICI
22	22.627649	44.626732	438238	73	DR.TR.SEVERIN
23	25.580740	44.653198	439534	155	TITU
24	27.965080	44.692001	441757	33	HIRSOVA
25	26.658560	44.721951	443639	57	URZICENI
26	21.634609	44.722851	444127	79	MOLDOVA
27	24.238710	44.665760	444417	274	DRAGASANI
28	28.343580	44.734699	444820	221	CORUGEA
29	27.295990	44.740959	445718	43	GRIVITA
30	28.877930	44.766411	446853	37	JURILOVCA
31	24.867460	44.849289	452452	322	PITESTI
32	23.710239	44.878422	453344	267	TG.LOGRESTI
33	29.600519	44.896870	454936	1	SF.
34	22.007740	44.918652	455200	251	BOZOVICI
35	25.427259	44.929909	456526	297	TIRGOVISTE
36	25.988991	44.956089	457600	181	PLOIESTI
37	24.571791	45.016289	500432	552	DEDULESTI
38	22.861050	44.997139	501252	261	PADES(APA
39	21.711840	45.038960	502141	303	ORAVITA
40	23.260880	45.040958	502317	203	TG.JIU
41	24.380980	45.089191	506422	229	RM.
42	22.057119	45.181728	507158	1432	SEMENIC
43	24.671280	45.179169	509441	455	CURTEA
44	26.853001	45.132912	509649	90	BUZAU
45	29.760450	45.148689	509940	0	SULINA
46	23.810150	45.165871	511349	531	POLOVRAGI
47	28.825689	45.190842	511849	2	TULCEA
48	29.158270	45.177109	511912	1	GORGOVA
49	22.534340	45.281170	515231	2184	TARCU
50	25.038139	45.275150	517507	684	CIMPULUNG
51	25.753950	45.144482	517545	486	CIMPINA
52	22.503050	45.300812	518231	1478	CUNTU
53	26.370800	45.324959	519622	285	PATIRLAGELE
54	21.137970	45.383049	523108	80	BANLOC
55	23.464621	45.387691	523328	1560	PARING
56	25.515711	45.355259	523530	1511	SINAIA(1500)
57	27.040159	45.390751	523703	145	RM.
58	22.226839	45.417561	525215	210	CARANSEBES
59	23.378250	45.406609	525323	610	PETROSANI
60	23.968550	45.411499	525358	579	VOINEASA
61	25.458260	45.446140	527527	2514	VF.
62	25.273270	45.431911	528518	1372	FUNDATA
63	25.585100	45.506458	530535	1101	PREDEAL
64	28.033930	45.473301	530801	68	GALATI
65	24.273180	45.653179	538416	506	BOITA
66	23.934000	45.657509	539357	1466	PALTINIS
67	21.934629	45.686729	541154	122	LUGOJ
68	26.058300	45.668549	541601	697	INT.BUZAULUI
69	25.527719	45.696129	542532	537	BRASOV
70	21.259359	45.771461	546115	87	TIMISOARA
71	24.092939	45.789700	548409	446	SIBIU
72	24.936720	45.836361	551459	428	FAGARAS
73	26.377081	45.824009	551621	1783	LACAUTI
74	27.410360	45.841949	551716	58	TECUCI
75	22.900459	45.865040	553254	236	DEVA
76	23.543091	45.964531	557334	254	SEBES-ALBA

77	26.116871	45.993240	600608	570	TG.SECUIESC
78	22.152420	46.019489	602213	152	VARADIA
79	20.603161	46.071629	604037	82	SINNICOLU
80	25.597401	46.081039	605537	508	BARAOLT
81	27.171810	46.105019	606705	103	ADJUD
82	21.355221	46.133850	608121	115	ARAD
83	22.727699	46.169762	610244	268	TEBEA
84	23.936769	46.178822	611355	327	BLAJ
85	24.593180	46.228249	614436	320	DUMBRAVENI
86	27.645580	46.231361	614740	167	BIRLAD
87	22.334900	46.279510	617220	175	GURAHONT
88	26.642590	46.272961	617637	245	TG.
89	25.293341	46.297089	618518	522	ODORHEIUL
90	23.041950	46.364101	622303	618	CIMPENI (BISTRA)
91	25.774170	46.371578	622544	665	MIERCUREA
92	21.542999	46.518940	632130	93	CHISINEU
93	22.468090	46.528320	632229	282	STEI
94	24.535330	46.533680	632432	306	TG.MURES
95	23.311819	46.535770	634322	1355	BAISOARA
96	23.792839	46.583389	635347	424	TURDA
97	26.914070	46.532150	635658	184	BACAU
98	27.715830	46.646240	639744	117	VASLUI
99	25.514170	46.706081	642540	752	JOSENI
100	22.795790	46.759560	646247	1843	VLADEASA
101	23.572990	46.777988	647334	407	CLUJ-NAPOCA
102	27.443701	46.838329	650727	132	NEGRESTI (VASLUI)
103	23.034121	46.857651	651305	560	HUEDIN
104	25.361530	46.926640	655522	675	TOPLITA
105	26.913389	46.969460	655650	220	ROMAN
106	25.951509	46.977760	656555	1873	CEAHLAU
107	26.390900	46.934021	656621	360	PIATRA
108	21.897551	47.036018	703156	134	ORADEA
109	24.515450	47.149422	708430	370	BISTRITA
110	23.900499	47.128262	709352	236	DEJ
111	27.630079	47.171059	710736	100	IASI
112	23.048361	47.195278	711305	294	ZALAU
113	26.380590	47.212429	714623	386	TG.
114	25.136040	47.324921	719507	922	POIANA
115	22.095800	47.344471	722205	119	SACUIENI
116	26.927410	47.358669	722657	286	COTNARI
117	24.650730	47.602829	737439	1789	IEZER
118	26.241961	47.633282	739615	360	SUCEAVA
119	23.493240	47.661209	740330	211	BAIA-MARE
120	26.647039	47.736050	741640	152	BOTOSANI
121	23.942141	47.777370	747356	503	OC.SUGATAG
122	22.888781	47.721771	748253	121	SATU
123	25.891850	47.838009	751555	385	RADAUTI
124	23.905880	47.939571	758355	272	SIGHETUL
125	23.366671	47.650002	739322	158	ARDUSAT
126	22.766670	46.466671	628246	839	ARIESENI
127	22.833330	46.366669	622250	876	AVRAM
128	23.166670	47.466671	728310	177	BASESTI
129	23.583330	47.400002	724335	437	BOIU
130	24.150000	47.666672	740409	490	BOTIZA
131	21.600000	45.650002	539136	122	BUZIAS
132	25.900000	47.633331	738554	465	CACICA
133	23.833330	46.750000	645350	332	COJOCNA
134	28.233330	44.533329	432814	94	CRUCEA-CT
135	23.650000	45.766670	546339	509	DOBRA-AB
136	24.466669	47.216671	713428	351	DUMITRA
137	26.333330	47.466671	728620	277	FALTICENI
138	21.583330	45.233330	514135	144	FOROTIC
139	21.799999	44.750000	445148	520	GARNIC
140	22.150000	45.716671	543209	296	HAUZESTI
141	23.516670	46.150002	609331	283	IGHIU
142	24.100000	46.233330	614406	264	JIDVEI
143	27.466669	45.500000	530728	18	MAICANESTI-POST
144	22.000000	46.583328	635200	191	MARAUS
145	21.833330	46.883331	653150	121	MIERSIG
146	26.483330	46.450001	627629	561	MOINESTI
147	25.433331	46.166672	610526	523	OCLAND
148	22.083330	45.466671	528205	221	OHABA
149	27.083330	45.916672	555705	267	PANCIU
150	27.116671	46.483330	629707	284	PARINCEA
151	25.583330	44.583328	435535	138	POTLOGI
152	24.616671	47.066669	704437	459	RAGLA-CETATE
153	23.583330	47.266670	716335	264	RUS
154	22.466669	45.566669	534228	422	RUSCA
155	26.549999	46.549999	633633	412	SOLONT
156	26.666670	46.000000	600640	526	SOVEJA
157	24.166670	47.299999	718410	323	SPERMEZEU

158	23.883329	47.533329	732353	508	STOICENI-TG
159	23.400000	46.700001	642324	601	STOLNA-SAVADISLA
160	23.400000	46.866669	652326	565	SUMURDUCU
161	26.516670	47.116669	707631	404	TIBUCANII
162	22.200001	47.066669	704212	172	TILEAGD
163	24.383329	45.433331	526423	649	TITESTI
164	25.650000	44.016670	401539	86	TOPORU
165	26.666670	45.916672	555640	594	TULNICI
166	24.900000	45.183331	511454	491	VLADESTI-AG
167	21.160561	46.679440	66519	83	BÚkÚscsaba
168	21.610830	47.490280	64704	106	Debrecen
169	20.687500	46.544170	57311	86	Orosháza
170	22.625561	47.862221	73302	115	Pátyod
171	21.016701	46.283298	68101	99	Battonya
172	21.322170	44.836151	2802	67	BELACRKVA
173	20.464640	45.842628	13174	78	KIKINDA
174	22.536341	44.239159	13295	45	NEGOTIN
175	21.498430	44.752609	13285	81	VELIKO
176	21.305519	45.144138	13183	83	VRŠAC-kontrolisanoJa
177	20.376011	45.398720	13173	78	ZRENJANIN
178	22.650000	48.200001	33634	113	Beregove
179	25.972500	48.266392	33658	241	Chernivtsi
180	23.299999	48.183331	33638	168	Khust
181	24.198059	48.047501	33647	434	Rakhiv
182	25.216669	47.883331	33657	822	Seliatyn

Table 3.3b. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 769
 Total number of errors: 975
 Maximal positive error: 10.27
 Minimal negative error: -1.52

Table 3.3c. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
439534	23	157.03	534228	154	136.74	610526	147	108.04
514135	138	96.66	646247	100	95.21	740409	130	83.46
622250	127	72.13	539136	131	68.51	515231	49	67.03
518231	52	62.26	527527	61	61.06	642324	159	59.94
446853	30	57.22	704437	152	55.92	551459	72	54.48
523530	56	52.68	528205	148	49.68	632229	93	49.59
751555	123	48.42	526423	163	46.19	445718	29	46.17
629707	150	45.07	628246	126	44.80	551621	73	44.14
509940	45	44.13	622303	90	43.44	500432	37	43.32
609331	141	43.18	728620	137	42.19	528518	62	41.62
655522	104	41.59	435535	151	41.36	441757	24	40.87
430608	20	40.57	511912	48	39.57	456526	35	38.77
408800	10	38.59	422751	16	38.02	739322	125	37.90
728310	128	37.72	655650	105	36.57	33658	179	36.56
541154	67	36.37	610244	83	35.98	718410	157	35.97
737439	117	35.77	455200	34	34.19	557334	76	34.06
635347	96	33.96	627629	146	32.95	546339	135	32.29
747356	121	32.25	719507	114	31.51	703156	108	31.19
66519	167	31.03	444820	28	30.92	412721	11	30.90
617220	87	30.86	502141	39	30.29	614406	142	29.85
414352	13	29.64	758355	124	29.53	656555	106	29.01
606705	81	28.92	501252	38	28.80	401321	7	28.76
555705	149	28.75	600608	77	27.72	428307	18	27.65
722657	116	27.26	653150	145	27.01	517507	50	26.94
432814	134	26.15	401539	164	25.63	708430	109	25.54
716335	153	25.42	530728	143	24.25	710736	111	24.19
740330	119	24.07	452452	31	23.99	444417	27	23.92
359521	6	23.87	443639	25	23.53	602213	78	23.22
732353	158	23.13	645350	133	22.76	511454	166	22.37
724335	129	22.08	738554	132	22.07	523328	55	22.01
525215	58	21.88	425606	17	21.85	525323	59	21.85
530535	63	21.83	33647	181	21.50	542532	69	21.22
713428	136	21.17	600640	156	20.63	707631	161	20.61
605537	80	20.52	507158	42	20.47	349835	3	20.41
555640	165	20.38	635200	144	20.36	614740	86	20.31
73302	170	20.19	347357	2	20.02	635658	97	19.95
647334	101	19.68	632432	94	19.19	509441	43	19.07
33638	180	18.73	2802	172	18.60	543209	140	18.46
57311	169	18.38	506422	41	18.17	13183	176	18.13
650727	102	18.03	651305	103	18.00	457600	36	18.00
741640	120	17.31	454936	33	17.30	722205	115	17.30
359257	5	17.16	453344	32	17.00	517545	51	16.67
525358	60	16.62	548409	71	16.61	704212	162	16.55
346452	1	16.45	523108	54	16.41	511849	47	16.26
445148	139	15.69	417530	15	15.63	33657	182	15.49
523703	57	15.26	739615	118	15.17	652326	160	15.15
748253	122	15.09	618518	89	15.09	58300	171	14.88
608121	82	14.57	617637	88	14.41	634322	95	14.24
415816	14	14.23	530801	64	13.64	407500	9	13.62
413838	12	13.54	553254	75	13.53	622544	91	13.42
551716	74	13.32	611355	84	13.24	406421	8	13.08

511349	46	12.24	714623	113	12.22	709352	110	12.10
614436	85	11.89	428632	19	11.59	639744	98	11.55
64704	168	11.34	438238	22	11.24	656621	107	10.54
509649	44	10.24	711305	112	10.22	519622	53	10.17
539357	66	9.83	546115	70	9.65	642540	99	9.55
632130	92	9.38	436447	21	9.16	633633	155	9.13
352557	4	8.65	13174	173	7.38	444127	26	7.11
502317	40	6.80	604037	79	6.80	13295	174	6.62
13285	175	6.59	33634	178	6.48	538416	65	5.32
13173	177	5.21	541601	68	4.54			
AVERAGE:		28.09						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
534228	154	335.07	514135	138	155.59	610526	147	152.07
527527	61	134.10	642324	159	104.04	539136	131	96.32
646247	100	95.97	439534	23	93.37	728310	128	84.90
740409	130	81.64	551621	73	78.65	528205	148	78.05
518231	52	77.38	704437	152	75.68	718410	157	73.57
515231	49	62.30	632229	93	58.70	622250	127	54.05
751555	123	52.67	628246	126	52.13	509940	45	51.44
523530	56	49.30	541154	67	46.59	629707	150	46.15
511912	48	45.79	430608	20	44.97	656555	106	44.27
728620	137	43.40	526423	163	43.40	422751	16	43.32
645350	133	43.00	622303	90	42.64	435535	151	42.52
635347	96	42.41	719507	114	41.72	528518	62	41.68
441757	24	40.36	445718	29	39.84	412721	11	39.50
739322	125	38.66	408800	10	38.59	737439	117	38.54
609331	141	38.23	456526	35	38.15	551459	72	37.97
655650	105	36.92	33658	179	35.55	732353	158	35.46
600608	77	35.22	455200	34	34.83	446853	30	34.68
557334	76	33.51	635200	144	33.47	627629	146	33.01
546339	135	32.49	758355	124	32.46	500432	37	32.36
747356	121	32.34	738554	132	31.65	414352	13	31.20
614406	142	31.13	444820	28	31.06	606705	81	30.00
703156	108	29.82	555705	149	29.59	525215	58	29.56
401539	164	29.32	501252	38	29.17	401321	7	28.88
655522	104	28.56	722657	116	28.40	724335	129	28.04
66519	167	28.02	523328	55	27.99	428307	18	27.10
502141	39	26.90	444417	27	26.67	432814	134	26.46
617220	87	26.07	710736	111	26.04	452452	31	25.66
618518	89	25.47	614740	86	25.35	530728	143	25.32
651305	103	24.92	511454	166	24.66	507158	42	24.29
740330	119	24.14	511849	47	23.99	525323	59	23.99
716335	153	23.98	543209	140	23.62	610244	83	23.46
413838	12	22.77	605537	80	22.64	33638	180	22.54
517507	50	22.48	443639	25	22.48	445148	139	22.39
33647	181	22.23	704212	162	22.19	530535	63	21.76
73302	170	21.59	713428	136	21.45	542532	69	21.35
653150	145	20.96	425606	17	20.76	722205	115	20.64
349835	3	20.35	359521	6	20.25	634322	95	20.25
632432	94	20.16	635658	97	19.96	707631	161	19.93
741640	120	19.77	530801	64	19.62	600640	156	19.25
647334	101	18.81	611355	84	18.38	2802	172	18.23
650727	102	18.21	57311	169	18.09	457600	36	18.00
346452	1	17.81	633633	155	17.76	622544	91	17.49
652326	160	17.46	13183	176	17.44	555640	165	17.02
709352	110	16.91	548409	71	16.72	517545	51	16.67
359257	5	16.66	525358	60	16.57	33657	182	16.34
523108	54	16.34	748253	122	16.07	454936	33	15.73
415816	14	15.56	602213	78	15.43	406421	8	15.32
347357	2	15.32	453344	32	15.27	617637	88	14.95
417530	15	14.91	739615	118	14.60	523703	57	14.27

551716	74	14.26	509441	43	13.81	58300	171	13.65
407500	9	13.43	708430	109	13.38	553254	75	12.81
506422	41	12.65	608121	82	12.46	614436	85	11.89
632130	92	11.68	64704	168	11.34	714623	113	11.30
639744	98	11.17	438238	22	11.16	546115	70	10.37
436447	21	10.20	519622	53	10.01	509649	44	10.00
539357	66	9.70	428632	19	9.51	642540	99	9.17
511349	46	9.10	352557	4	8.80	656621	107	8.76
711305	112	8.33	502317	40	8.02	604037	79	7.72
13174	173	7.55	13285	175	6.96	538416	65	6.70
33634	178	6.67	13295	174	6.61	444127	26	6.51
13173	177	5.31	541601	68	4.52			
AVERAGE:		31.88						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
718410	157	0.61	635200	144	0.45	528205	148	0.42
534228	154	0.38	610526	147	0.37	509940	45	0.37
704212	162	0.36	653150	145	0.35	737439	117	0.34
527527	61	0.33	58300	171	0.31	551621	73	0.30
511912	48	0.25	732353	158	0.25	728310	128	0.23
530801	64	0.22	500432	37	0.18	642324	159	0.17
428632	19	0.17	713428	136	0.17	514135	138	0.17
539136	131	0.15	656555	106	0.14	445148	139	0.13
611355	84	0.13	610244	83	0.13	740409	130	0.12
633633	155	0.12	412721	11	0.11	703156	108	0.11
646247	100	0.11	704437	152	0.11	445718	29	0.11
73302	170	0.10	525215	58	0.10	444127	26	0.10
724335	129	0.10	444417	27	0.09	452452	31	0.09
622250	127	0.09	518231	52	0.09	741640	120	0.09
634322	95	0.08	507158	42	0.08	628246	126	0.08
722205	115	0.08	406421	8	0.07	632130	92	0.07
655650	105	0.07	652326	160	0.07	614740	86	0.06
435535	151	0.06	645350	133	0.06	719507	114	0.06
740330	119	0.06	530728	143	0.06	454936	33	0.06
609331	141	0.05	716335	153	0.05	707631	161	0.05
600608	77	0.05	651305	103	0.05	738554	132	0.05
523328	55	0.05	515231	49	0.05	523703	57	0.04
506422	41	0.04	439534	23	0.04	739322	125	0.04
751555	123	0.04	614406	142	0.03	438238	22	0.03
629707	150	0.03	551716	74	0.02	417530	15	0.02
13183	176	0.02	444820	28	0.02	415816	14	0.02
523108	54	0.02	401539	164	0.02	714623	113	0.01
401321	7	0.01	551459	72	0.01	555705	149	0.01
441757	24	0.01	600640	156	0.01	546115	70	0.01
709352	110	0.01	627629	146	0.01	13173	177	0.01
359521	6	0.01	346452	1	0.01	347357	2	0.00
349835	3	0.00	352557	4	0.00	359257	5	0.00
407500	9	0.00	408800	10	0.00	413838	12	0.00
414352	13	0.00	422751	16	0.00	425606	17	0.00
428307	18	0.00	430608	20	0.00	436447	21	0.00
443639	25	0.00	446853	30	0.00	453344	32	0.00
455200	34	0.00	456526	35	0.00	457600	36	0.00
501252	38	0.00	502141	39	0.00	502317	40	0.00
509441	43	0.00	509649	44	0.00	511349	46	0.00
511849	47	0.00	517507	50	0.00	517545	51	0.00
519622	53	0.00	523530	56	0.00	525323	59	0.00
525358	60	0.00	528518	62	0.00	530535	63	0.00
538416	65	0.00	539357	66	0.00	541154	67	0.00
541601	68	0.00	542532	69	0.00	548409	71	0.00
553254	75	0.00	557334	76	0.00	602213	78	0.00
604037	79	0.00	605537	80	0.00	606705	81	0.00

CARPATCLIM			Date		Version		Page		
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>		<i>62</i>		
608121	82	0.00	614436	85	0.00	617220	87	0.00	
617637	88	0.00	618518	89	0.00	622303	90	0.00	
622544	91	0.00	632229	93	0.00	632432	94	0.00	
635347	96	0.00	635658	97	0.00	639744	98	0.00	
642540	99	0.00	647334	101	0.00	650727	102	0.00	
655522	104	0.00	656621	107	0.00	708430	109	0.00	
710736	111	0.00	711305	112	0.00	722657	116	0.00	
739615	118	0.00	747356	121	0.00	748253	122	0.00	
758355	124	0.00	432814	134	0.00	546339	135	0.00	
728620	137	0.00	543209	140	0.00	526423	163	0.00	
555640	165	0.00	511454	166	0.00	66519	167	0.00	
64704	168	0.00	57311	169	0.00	2802	172	0.00	
13174	173	0.00	13295	174	0.00	13285	175	0.00	
33634	178	0.00	33658	179	0.00	33638	180	0.00	
33647	181	0.00	33657	182	0.00				
AVERAGE:		0.06							

Table 3.4a. Station parameters of the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

index	lambda(x)	fi(y)	h
1	24.75000004	50.90000005	198.0
2	23.63333337	50.25000001	252.0
3	27.04027778	50.16194445	277.0
4	25.73333337	50.13333334	259.0
5	24.35000002	50.11666667	212.0
6	25.15000001	50.08333334	227.0
7	23.38333335	49.95000005	245.0
8	26.20500001	49.94805560	274.0
9	23.96527783	49.80750004	319.0
10	23.16666668	49.80000004	232.0
11	27.93333338	49.56666670	284.0
12	25.68333337	49.53333336	327.0
13	24.95000005	49.43333336	303.0
14	23.56694447	49.36222224	275.0
15	26.93750005	49.35361113	350.0
16	23.81666671	49.25000001	302.0
17	23.03333334	49.15000001	594.0
18	25.76666671	49.01666667	320.0
19	28.13333334	49.01666667	313.0
20	24.00000000	48.96666672	470.0
21	22.46666669	48.90000005	205.0
22	24.68888892	48.88944449	275.0
23	23.45000002	48.85000004	592.0
24	27.26666668	48.85000004	292.0
25	23.10000001	48.76666671	496.0
26	23.36666669	48.70000004	615.0
27	26.60861114	48.69333337	217.0
28	23.20694446	48.65888892	1330.0
29	22.26666668	48.63333337	113.0
30	25.03333334	48.53333336	295.0
31	23.50444447	48.52666669	456.0
32	24.55000003	48.45000002	531.0
33	27.78333337	48.45000002	77.0
34	25.97250005	48.26638890	242.0
35	22.65000003	48.20000001	113.0
36	23.30000002	48.18333334	164.0
37	24.53333336	48.15000001	1451.0
38	24.19805557	48.04750000	430.0
39	25.21666668	47.88333338	762.0
40	22.05000000	50.10000001	212.0
41	22.33333335	49.46666669	420.0
42	22.06333334	49.46638891	470.0
43	22.69305559	49.24777779	615.0
44	22.22083334	49.69111115	275.0
45	22.40722224	49.98527783	215.0
46	21.91388894	49.25305557	305.0
47	22.00583333	48.93888894	176.0
48	21.73472226	48.66805559	104.0
49	21.65888892	48.38055558	100.0
50	21.88694449	47.96222227	142.0
51	22.62555559	47.86222227	118.0
52	23.90416671	47.93916672	276.0
53	25.89027782	47.83777782	100.0
54	22.88722227	47.72138893	124.0
55	23.94055560	47.77694448	100.0
56	23.49138891	47.66083337	100.0
57	24.64888892	47.60277781	100.0

Table 3.4b. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
37	37	133.23	10	10	116.09	28	28	86.73
56	56	64.14	7	7	61.35	13	13	51.02
57	57	41.39	36	36	37.23	4	4	36.50
14	14	36.38	29	29	34.55	16	16	34.37
23	23	33.03	55	55	30.54	51	51	24.97
6	6	24.77	3	3	24.48	48	48	24.19
1	1	23.27	25	25	22.88	18	18	22.62
53	53	21.69	54	54	21.40	12	12	19.59
38	38	19.57	52	52	19.30	32	32	18.00
27	27	17.76	5	5	17.55	22	22	17.44
46	46	16.86	43	43	16.59	8	8	16.03
33	33	15.07	31	31	14.68	15	15	14.26
30	30	13.68	44	44	13.56	9	9	13.21
49	49	12.97	26	26	12.94	20	20	12.63
50	50	12.48	21	21	12.15	40	40	11.74
24	24	11.45	45	45	11.34	34	34	10.39
17	17	10.25	41	41	10.11	42	42	9.92
2	2	9.63	47	47	9.48	39	39	9.00
35	35	8.67	19	19	8.04	11	11	6.58
AVERAGE:		25.61						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
28	28	196.87	37	37	133.70	10	10	126.29
13	13	64.38	7	7	59.63	57	57	47.62
56	56	47.52	23	23	42.22	25	25	37.74
4	4	36.97	14	14	35.89	29	29	34.71
16	16	33.83	36	36	33.08	3	3	31.12
55	55	30.54	30	30	28.13	26	26	27.60
1	1	26.56	51	51	24.97	48	48	24.87
6	6	23.17	52	52	22.03	53	53	21.69
54	54	21.40	31	31	20.39	38	38	20.09
22	22	19.90	21	21	19.21	12	12	18.99
18	18	18.61	43	43	17.83	27	27	17.81
32	32	17.79	9	9	17.40	46	46	17.03
5	5	16.18	8	8	15.42	33	33	15.06
44	44	13.48	49	49	12.68	50	50	12.54
47	47	12.40	20	20	12.01	40	40	11.49
45	45	11.34	24	24	11.29	2	2	11.12
17	17	10.86	34	34	10.12	41	41	9.74
42	42	9.64	39	39	8.67	35	35	8.67
19	19	8.21	15	15	7.23	11	11	6.21
AVERAGE:		28.98						

2. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
30	30	0.24	37	37	0.17	28	28	0.15
15	15	0.14	22	22	0.11	10	10	0.10
57	57	0.08	23	23	0.08	1	1	0.08
56	56	0.07	48	48	0.07	21	21	0.07
13	13	0.06	3	3	0.06	11	11	0.06

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>65</i>		
14	14	0.05	42	42	0.04	43	43	0.04
20	20	0.03	2	2	0.03	24	24	0.01
49	49	0.01	33	33	0.01	25	25	0.01
4	4	0.00	5	5	0.00	6	6	0.00
7	7	0.00	8	8	0.00	9	9	0.00
12	12	0.00	16	16	0.00	17	17	0.00
18	18	0.00	19	19	0.00	26	26	0.00
27	27	0.00	29	29	0.00	31	31	0.00
32	32	0.00	34	34	0.00	35	35	0.00
36	36	0.00	38	38	0.00	39	39	0.00
40	40	0.00	41	41	0.00	44	44	0.00
45	45	0.00	46	46	0.00	47	47	0.00
50	50	0.00	51	51	0.00	52	52	0.00
53	53	0.00	54	54	0.00	55	55	0.00
AVERAGE:		0.03						

Table 3.4c. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 280
Total number of errors: 313
Maximal positive error: 179.46
Minimal negative error: -5.68

Table 3.5a. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

index	lambda(x)	fi(y)	h	Station
1	20.14361112	49.26305557	1007.0	11020
2	20.38500002	49.29833335	723.0	11080
3	20.42666669	49.39166669	465.0	11120
4	20.24555557	49.06888889	694.0	12040
5	20.21500001	49.19527779	2635.0	12100
6	20.43944447	49.12972223	626.0	12180
7	17.12833334	48.71500004	204.0	14060
8	17.40500002	48.68944448	232.0	15140
9	17.03277778	48.45194447	165.0	16160
10	17.60611114	47.99694450	116.0	17540
11	17.86916671	48.06638889	111.0	17680
12	17.27472224	48.20000001	124.0	18040
13	20.06333334	49.11944445	1322.0	20080
14	19.59222225	48.94388894	2005.0	21080
15	19.56500003	49.21888890	808.0	21180
16	19.40888891	49.10472223	517.0	21320
17	19.61138892	49.36083335	608.0	23100
18	18.91861116	49.10916667	502.0	24300
19	18.48611114	49.37250002	574.0	25060
20	18.89944449	49.49583336	540.0	25140
21	18.61777781	49.23194446	309.0	26040
22	18.31805557	49.06611111	254.0	27040
23	18.20027779	49.14333334	508.0	27080
24	17.83277782	48.61305559	163.0	28200
25	18.25805557	48.66916670	187.0	30500
26	18.31444446	48.46611113	329.0	32140
27	18.33916668	48.10750001	140.0	32280
28	20.02166667	48.86666671	764.0	33060
29	19.80222226	48.75500004	618.0	33160
30	19.63833337	48.86000004	634.0	34040
31	19.38583335	48.79111115	406.0	34080
32	19.23500001	48.71027781	459.0	34140
33	19.17861112	48.86194449	688.0	34180
34	19.59166670	48.56500003	825.0	35060
35	19.32194446	48.54416669	368.0	35140
36	18.78305560	48.65916670	422.0	36160
37	18.87222227	48.52916669	368.0	36200
38	18.63500003	48.12555556	148.0	37040
39	18.72722226	48.35472224	345.0	37060
40	18.74083337	48.26333335	213.0	37120
41	18.51333336	48.00416667	154.0	37260
42	18.39722224	47.93055560	132.0	37320
43	22.11666667	48.61888892	105.0	46020
44	21.94527783	48.74000004	110.0	46200
45	21.65000003	49.21555557	216.0	48120
46	21.27388890	49.28944446	305.0	49120
47	21.31277779	49.37055557	325.0	49160
48	21.42083336	49.11138889	205.0	49260
49	21.62444448	48.90833338	140.0	49380
50	21.81944449	48.42111113	100.0	51060
51	20.53750003	48.65305559	311.0	52140
52	20.09361112	48.59277781	311.0	53220
53	20.01055556	48.37388891	215.0	54200
54	20.28444446	48.30861113	164.0	54380
55	21.00166667	48.60444448	218.0	55080
56	20.52083336	48.55388892	520.0	55180
57	20.31277779	48.98861116	607.0	56060
58	20.55833336	48.94305560	456.0	56120
59	20.80416671	48.94388894	380.0	56200
60	20.67777781	48.79722226	533.0	57120
61	21.21944446	48.85861116	282.0	58160
62	20.86111116	49.14694445	443.0	59040
63	21.26833335	49.17388890	365.0	59180
64	17.46111113	48.94666672	211.0	10233
65	17.33916668	49.08750000	255.0	10234
66	17.80333338	49.15500001	348.0	10235

67	17.56972225	49.32055557	222.0	11774
68	17.70777781	48.90277782	383.0	11779
69	18.38055558	49.42222224	770.0	10236
70	17.54194447	49.77722226	749.0	11766
71	18.24055557	49.54111114	436.0	11785
72	18.25416668	49.94583338	220.0	10237
73	18.63750003	49.52638892	594.0	10238
74	18.44777780	49.54611114	1322.0	11787
75	18.12166667	49.69833337	250.0	11782
76	17.83527782	49.66944448	290.0	10239
77	17.91388894	49.81777782	485.0	10240
78	18.61666670	49.74250004	282.0	10241
79	18.64944448	49.62583337	500.0	10242
80	18.10694445	49.56166670	340.0	10243
81	17.07111111	49.70444448	234.0	10244
82	17.27916668	49.43194447	199.0	10245
83	18.08944445	49.19250001	480.0	10246
84	17.70583337	49.55194447	241.0	11768
85	17.81388893	49.41111113	405.0	10247
86	18.10638889	49.41638891	458.0	10248
87	18.19166668	50.06166667	206.0	540
88	19.80194449	50.07194445	237.0	566
89	20.98444450	50.01888889	209.0	575
90	22.02916667	50.11527778	212.0	580
91	19.00111111	49.80805560	398.0	600
92	19.96027783	49.29388890	855.0	625
93	19.98194450	49.23250001	1991.0	650
94	20.68916670	49.62722225	292.0	660
95	22.34166668	49.46638891	420.0	690
96	18.92027783	49.99638894	270.0	5409
97	19.09527778	50.08500000	255.0	5508
98	19.95861116	50.06416667	206.0	5511
99	20.25638890	50.09388889	202.0	5608
100	18.64916670	49.75500004	300.0	6403
101	19.68805559	49.72583337	360.0	6507
102	19.51888892	49.61166670	697.0	6513
103	19.69583337	49.47194447	615.0	6518
104	20.41833336	49.69361115	515.0	6605
105	20.43166669	49.44555558	445.0	6618
106	20.88638894	49.34972224	445.0	6628
107	20.00583333	49.24416668	1520.0	6632
108	20.07083334	49.87777782	306.0	6651
109	21.29583335	49.73527782	285.0	6702
110	21.17250001	49.43805558	519.0	6707
111	22.06333334	49.33916668	470.0	6809
112	18.42805558	50.06111111	290.0	95409
113	17.98166672	50.15333334	230.0	95418
114	19.38750002	50.14055556	295.0	95510
115	18.93833338	49.58527781	725.0	96404
116	18.87805560	49.62833337	480.0	96407
117	18.96833338	49.64527781	685.0	96408
118	18.85222227	49.71555559	650.0	96410
119	18.79500004	49.79888893	290.0	96416
120	18.98138894	49.94166672	250.0	96426
121	19.00888889	49.42583336	710.0	96511
122	19.70611115	49.42555558	680.0	96512
123	19.10555556	49.50611114	490.0	96515
124	19.81444449	49.54583336	795.0	96519
125	19.18666668	49.56194447	570.0	96520
126	19.34833335	49.56861114	650.0	96523
127	19.40527780	49.65583337	615.0	96537
128	18.99444450	49.70305559	575.0	96547
129	19.25555557	49.74027782	410.0	96552
130	19.51277780	49.87666671	260.0	96569
131	20.02638889	49.42472224	655.0	96612
132	20.21500001	49.65250003	660.0	96630
133	20.07444445	49.75027782	460.0	96641
134	20.41583335	49.78527782	545.0	96645
135	21.17111112	49.65527781	290.0	96723
136	21.24638890	49.81250004	280.0	96732
137	21.30833335	49.98694450	210.0	96743

138	22.69305559	49.24777779	615.0	96807
139	22.22083334	49.69111115	275.0	96829
140	22.40722224	49.98527783	220.0	96845
141	22.60000003	48.20000001	113.0	33634
142	23.00000000	49.20000001	594.0	33511
143	22.30000002	48.60000003	115.0	33631
144	22.50000003	48.90000005	205.0	33514
145	17.20000001	48.00000000	131.0	22502
146	17.26722224	47.88972227	121.0	23201
147	17.67472226	47.71000004	117.0	23703
148	17.80000004	47.61666670	133.0	24421
149	18.86666671	47.86666671	232.0	33412
150	18.16666668	47.73333337	113.0	33508
151	18.63333337	47.60000003	191.0	34302
152	19.53333336	48.18333334	204.0	42303
153	19.05000000	48.05000000	155.0	42504
154	19.86666671	48.13333334	451.0	42800
155	19.05000000	47.90000005	237.0	43128
156	19.35000002	47.98333338	193.0	43207
157	19.78333337	47.98333338	186.0	43406
158	19.02805556	47.51111114	153.0	44121
159	20.66666670	48.50000003	156.0	51303
160	20.53611114	48.49527780	309.0	51705
161	20.46666669	48.18333334	215.0	52205
162	20.16666668	48.06666667	196.0	52510
163	20.01666667	47.86666671	1011.0	53101
164	21.65888892	48.38083335	100.0	61709
165	21.80000004	48.31666668	107.0	62400

Table 3.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 648
 Total number of errors: 803
 Maximal positive error: 94.29
 Minimal negative error: -59.46

Table 3.5c. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
6403	100	67.54	6518	103	58.81	96410	118	57.45
96426	120	54.82	6702	109	51.40	10238	73	49.04
650	93	49.01	96523	126	48.07	95510	114	48.05
25140	20	46.39	34140	32	44.31	12100	5	44.07
26040	21	43.79	95409	112	42.83	37040	38	42.09
6651	108	40.06	54200	53	38.00	10242	79	37.80
33060	28	37.32	59180	63	36.99	96511	121	36.55
11779	68	36.50	11768	84	36.17	56120	58	35.87
96416	119	34.95	96630	132	33.66	10237	72	32.35
10235	66	32.29	17540	10	32.26	11080	2	32.11
96519	124	31.19	10241	78	30.56	96408	117	30.35
96404	115	29.67	6513	102	29.45	37060	39	28.09
96407	116	27.71	56200	59	27.62	96641	133	27.53
580	90	27.12	96569	130	26.73	11020	1	26.06
12180	6	26.02	10246	83	25.45	96552	129	25.30
44121	158	25.19	10247	85	25.06	42800	154	24.87
51705	160	24.63	51303	159	24.54	30500	25	24.05
10234	65	23.86	10236	69	23.76	36160	36	23.72
57120	60	23.43	96520	125	23.00	55180	56	22.99
96645	134	22.90	34040	30	22.63	49120	46	22.60
6605	104	22.38	10233	64	22.28	625	92	22.28
96723	135	22.27	53101	163	22.09	37120	40	21.46
6628	106	21.27	15140	8	21.26	11120	3	21.09
49160	47	20.96	10239	76	20.93	49380	49	20.60
22502	145	20.58	23703	147	20.18	540	87	20.14
33631	143	19.96	5409	96	19.79	36200	37	19.78
33160	29	19.52	5508	97	19.51	42303	152	19.47
54380	54	19.39	96732	136	19.25	10243	80	19.19
46200	44	19.12	46020	43	18.75	11787	74	18.71
52205	161	18.60	566	88	18.15	10248	86	17.69
96743	137	17.68	58160	61	17.64	14060	7	17.52
27080	23	17.47	55080	55	17.38	10244	81	17.25
96512	122	17.16	52510	162	17.06	33412	149	16.93
24421	148	16.90	43128	155	16.84	32140	26	16.72
23201	146	16.69	24300	18	16.60	48120	45	16.55
34180	33	16.50	11774	67	16.48	33511	142	16.33
5608	99	16.09	96547	128	16.07	600	91	15.91
23100	17	15.46	43406	157	15.22	37260	41	15.14
49260	48	15.03	6507	101	14.75	21180	15	14.56
59040	62	14.49	53220	52	14.28	96807	138	14.22
61709	164	14.11	56060	57	14.10	43207	156	13.89
6632	107	13.75	6618	105	12.64	51060	50	12.59
35140	35	12.45	34080	31	12.39	33508	150	12.36
34302	151	12.32	21080	14	12.24	5511	98	12.22
690	95	11.31	27040	22	11.29	33514	144	11.27
10245	82	11.19	37320	42	10.95	96515	123	10.83
96612	131	10.69	575	89	10.51	12040	4	10.40
16160	9	10.28	18040	12	10.28	33634	141	10.06
11782	75	9.94	96829	139	9.69	95418	113	9.53
11766	70	9.37	660	94	9.32	6809	111	9.23
21320	16	9.09	96537	127	8.95	28200	24	8.67
52140	51	8.55	42504	153	8.53	32280	27	8.53

35060	34	8.44	6707	110	8.34	62400	165	8.22
20080	13	8.17	10240	77	8.07	11785	71	7.80
25060	19	7.45	17680	11	6.74	96845	140	5.51
AVERAGE:		21.89						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
6702	109	229.41	96732	136	218.69	96408	117	207.28
10247	85	199.39	12100	5	133.20	57120	60	132.72
96523	126	127.47	10233	64	125.08	95510	114	113.47
10246	83	111.19	11768	84	102.49	650	93	96.16
10242	79	96.02	96743	137	86.59	11020	1	85.19
25140	20	80.90	96552	129	75.98	625	92	72.44
96520	125	71.04	6605	104	70.35	56120	58	69.46
6403	100	67.54	56200	59	66.96	49380	49	66.51
11080	2	65.29	96426	120	63.94	96404	115	63.46
10238	73	63.26	58160	61	62.43	96645	134	62.12
6651	108	62.11	11779	68	61.96	10236	69	61.90
540	87	60.99	95409	112	59.59	59180	63	59.09
6518	103	55.29	6513	102	54.11	96519	124	53.58
26040	21	53.20	96410	118	51.53	96641	133	50.65
37060	39	49.69	27080	23	47.93	33060	28	47.23
51303	159	46.69	54200	53	46.00	34140	32	44.17
600	91	43.75	96630	132	43.70	37040	38	42.83
5508	97	41.58	17540	10	41.28	10235	66	38.79
11120	3	37.80	11782	75	37.57	10241	78	35.05
10237	72	35.01	566	88	34.84	96416	119	31.52
10248	86	31.36	55180	56	31.12	96407	116	31.11
96511	121	29.40	10234	65	28.91	12180	6	28.05
96569	130	27.47	580	90	27.37	42800	154	27.28
54380	54	25.99	59040	62	25.91	15140	8	25.30
96723	135	25.24	44121	158	25.19	10239	76	25.00
53101	163	24.92	10243	80	24.21	36160	36	23.72
5608	99	23.09	11774	67	23.00	51705	160	22.98
24300	18	22.86	34040	30	22.55	37120	40	22.53
21180	15	21.76	33508	150	21.46	48120	45	20.85
6507	101	20.81	52205	161	20.71	49160	47	20.63
22502	145	20.58	33631	143	20.50	49260	48	19.76
42303	152	19.70	46200	44	19.60	6628	106	19.58
575	89	19.23	23703	147	19.23	49120	46	19.14
36200	37	18.67	14060	7	18.50	33160	29	18.45
5409	96	18.39	11787	74	18.27	30500	25	17.55
96547	128	17.42	23201	146	17.35	32140	26	17.33
52510	162	17.05	55080	55	17.01	33412	149	16.93
24421	148	16.90	43128	155	16.84	10244	81	16.72
96807	138	15.97	52140	51	15.52	43406	157	15.14
37260	41	15.14	34180	33	14.82	96512	122	14.75
33514	144	14.62	46020	43	14.62	20080	13	14.61
35140	35	14.61	53220	52	14.51	61709	164	14.41
43207	156	13.91	33511	142	13.80	27040	22	13.57
6632	107	13.46	96515	123	13.35	96612	131	13.00
56060	57	12.82	34080	31	12.39	34302	151	12.32
96829	139	12.18	51060	50	12.14	35060	34	11.85
95418	113	11.85	21080	14	11.71	6618	105	11.61
37320	42	10.89	10245	82	10.78	12040	4	10.77
17680	11	10.74	42504	153	10.67	690	95	10.66
6707	110	10.61	96537	127	10.29	33634	141	10.06
23100	17	10.04	16160	9	9.88	11766	70	9.56
18040	12	9.47	32280	27	9.41	660	94	9.20
21320	16	9.00	25060	19	8.79	28200	24	8.38
11785	71	8.34	62400	165	8.22	5511	98	7.17
10240	77	7.02	6809	111	6.77	96845	140	5.40
AVERAGE:		38.17						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
25140	20	0.70	10242	79	0.70	11782	75	0.61
12100	5	0.60	10246	83	0.56	57120	60	0.49
10247	85	0.49	96523	126	0.44	10233	64	0.44
27080	23	0.42	96732	136	0.42	10236	69	0.41
11768	84	0.36	96520	125	0.34	6507	101	0.33
10244	81	0.33	56200	59	0.32	20080	13	0.31
96408	117	0.31	58160	61	0.31	51303	159	0.30
96645	134	0.30	10243	80	0.30	11020	1	0.29
49380	49	0.28	59040	62	0.28	6651	108	0.26
96552	129	0.25	10237	72	0.24	37060	39	0.23
5508	97	0.22	600	91	0.21	10240	77	0.20
10238	73	0.20	540	87	0.19	96519	124	0.18
56120	58	0.18	11120	3	0.17	11080	2	0.16
650	93	0.16	96723	135	0.15	5608	99	0.14
24300	18	0.14	11779	68	0.14	23100	17	0.14
54200	53	0.13	17680	11	0.13	96537	127	0.12
33508	150	0.12	55180	56	0.12	52140	51	0.11
6605	104	0.11	17540	10	0.11	95510	114	0.10
96845	140	0.10	30500	25	0.10	10234	65	0.09
46200	44	0.09	35140	35	0.08	54380	54	0.08
12180	6	0.08	96426	120	0.08	96410	118	0.08
33060	28	0.08	14060	7	0.08	6702	109	0.08
59180	63	0.08	10245	82	0.07	49260	48	0.07
11785	71	0.07	96807	138	0.07	35060	34	0.07
10235	66	0.06	95418	113	0.06	10248	86	0.05
6707	110	0.05	33511	142	0.05	21080	14	0.05
625	92	0.05	27040	22	0.03	46020	43	0.03
33160	29	0.01	43406	157	0.01	12040	4	0.00
15140	8	0.00	16160	9	0.00	18040	12	0.00
21180	15	0.00	21320	16	0.00	25060	19	0.00
26040	21	0.00	28200	24	0.00	32140	26	0.00
32280	27	0.00	34040	30	0.00	34080	31	0.00
34140	32	0.00	34180	33	0.00	36160	36	0.00
36200	37	0.00	37040	38	0.00	37120	40	0.00
37260	41	0.00	37320	42	0.00	48120	45	0.00
49120	46	0.00	49160	47	0.00	51060	50	0.00
53220	52	0.00	55080	55	0.00	56060	57	0.00
11774	67	0.00	11766	70	0.00	11787	74	0.00
10239	76	0.00	10241	78	0.00	566	88	0.00
575	89	0.00	580	90	0.00	660	94	0.00
690	95	0.00	5409	96	0.00	5511	98	0.00
6403	100	0.00	6513	102	0.00	6518	103	0.00
6618	105	0.00	6628	106	0.00	6632	107	0.00
6809	111	0.00	95409	112	0.00	96404	115	0.00
96407	116	0.00	96416	119	0.00	96511	121	0.00
96512	122	0.00	96515	123	0.00	96547	128	0.00
96569	130	0.00	96612	131	0.00	96630	132	0.00
96641	133	0.00	96743	137	0.00	96829	139	0.00
33634	141	0.00	33631	143	0.00	33514	144	0.00
22502	145	0.00	23201	146	0.00	23703	147	0.00
24421	148	0.00	33412	149	0.00	34302	151	0.00
42303	152	0.00	42504	153	0.00	42800	154	0.00
43128	155	0.00	43207	156	0.00	44121	158	0.00
51705	160	0.00	52205	161	0.00	52510	162	0.00
53101	163	0.00	61709	164	0.00	62400	165	0.00
AVERAGE:		0.10						

Table 3.6a. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda(x)	fi(y)	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	18.92027783	49.99638894	270.0
11	19.09527778	50.08500000	255.0
12	19.95861116	50.06416667	206.0
13	20.25638890	50.09388889	202.0
14	18.64916670	49.75500004	300.0
15	19.68805559	49.72583337	360.0
16	19.51888892	49.61166670	697.0
17	19.69583337	49.47194447	615.0
18	20.41833336	49.69361115	515.0
19	20.43166669	49.44555558	445.0
20	20.88638894	49.34972224	445.0
21	20.00583333	49.24416668	1520.0
22	20.07083334	49.87777782	306.0
23	21.29583335	49.73527782	285.0
24	21.17250001	49.43805558	519.0
25	22.06333334	49.33916668	470.0
26	18.42805558	50.06111111	290.0
27	17.98166672	50.15333334	230.0
28	19.38750002	50.14055556	295.0
29	18.93833338	49.58527781	725.0
30	18.87805560	49.62833337	480.0
31	18.96833338	49.64527781	685.0
32	18.85222227	49.71555559	650.0
33	18.79500004	49.79888893	290.0
34	18.98138894	49.94166672	250.0
35	19.00888889	49.42583336	710.0
36	19.70611115	49.42555558	680.0
37	19.10555556	49.50611114	490.0
38	19.81444449	49.54583336	795.0
39	19.18666668	49.56194447	570.0
40	19.34833335	49.56861114	650.0
41	19.40527780	49.65583337	615.0
42	18.99444450	49.70305559	575.0
43	19.25555557	49.74027782	410.0
44	19.51277780	49.87666671	260.0
45	20.02638889	49.42472224	655.0
46	20.21500001	49.65250003	660.0
47	20.07444445	49.75027782	460.0
48	20.41583335	49.78527782	545.0
49	21.17111112	49.65527781	290.0
50	21.24638890	49.81250004	280.0
51	21.30833335	49.98694450	210.0
52	22.69305559	49.24777779	615.0
53	22.22083334	49.69111115	275.0
54	22.40722224	49.98527783	220.0
55	23.63333337	50.25000001	252.0
56	23.16666668	49.80000004	232.0
57	23.38333335	49.95000005	245.0
58	23.56694447	49.36222224	275.0
59	23.03333334	49.15000001	594.0
60	22.46666669	48.90000005	205.0
61	18.38000002	49.42000002	770.0
62	17.54000003	49.78000004	749.0
63	18.24000001	49.54000003	436.0
64	18.25000001	49.95000005	220.0
65	18.64000003	49.53000003	594.0
66	18.45000002	49.55000003	1322.0

67	18.12000001	49.70000004	250.0
68	17.84000004	49.67000003	290.0
69	17.91000005	49.82000004	485.0
70	18.62000003	49.74000004	282.0
71	18.65000003	49.63000003	500.0
72	18.11000001	49.56000003	340.0
73	20.14361112	49.26305557	1007.0
74	20.38500002	49.29833335	723.0
75	20.42666669	49.39166669	465.0
76	20.24555557	49.06888889	694.0
77	20.21500001	49.19527779	2635.0
78	20.43944447	49.12972223	626.0
79	20.06333334	49.11944445	1322.0
80	19.59222225	48.94388894	2005.0
81	19.56500003	49.21888890	808.0
82	19.40888891	49.10472223	517.0
83	19.61138892	49.36083335	608.0
84	18.91861116	49.10916667	502.0
85	18.48611114	49.37250002	574.0
86	18.89944449	49.49583336	540.0
87	18.61777781	49.23194446	309.0
88	20.02166667	48.86666671	764.0
89	19.80222226	48.75500004	618.0
90	19.63833337	48.86000004	634.0
91	22.11666667	48.61888892	105.0
92	21.94527783	48.74000004	110.0
93	21.65000003	49.21555557	216.0
94	21.27388890	49.28944446	305.0
95	21.31277779	49.37055557	325.0
96	21.42083336	49.11138889	205.0
97	21.62444448	48.90833338	140.0
98	20.31277779	48.98861116	607.0
99	20.55833336	48.94305560	456.0
100	20.80416671	48.94388894	380.0
101	20.86111116	49.14694445	443.0
102	21.26833335	49.17388890	365.0

Table 3.6b. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 348
 Total number of errors: 408
 Maximal positive error: 93.36
 Minimal negative error: -25.47

Table 3.6c. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
50	50	181.75	31	31	167.25	71	71	146.40
40	40	143.37	56	56	104.26	43	43	90.39
73	73	90.19	28	28	88.12	29	29	87.15
86	86	78.68	102	102	77.13	6	6	72.44
99	99	71.88	14	14	71.02	61	61	64.56
7	7	64.13	39	39	62.37	18	18	61.57
75	75	60.06	65	65	58.40	57	57	56.60
34	34	56.18	17	17	55.87	48	48	55.29
35	35	55.20	23	23	54.33	51	51	53.15
88	88	48.44	22	22	47.21	46	46	43.92
16	16	42.86	26	26	42.37	32	32	41.51
72	72	41.28	5	5	39.40	38	38	39.38
68	68	38.47	11	11	37.89	59	59	37.49
74	74	37.22	77	77	35.33	47	47	35.10
84	84	34.93	80	80	33.70	30	30	33.25
87	87	33.18	2	2	32.82	33	33	32.25
64	64	31.51	44	44	28.84	70	70	28.59
90	90	28.43	67	67	28.27	4	4	27.03
79	79	27.00	89	89	26.95	100	100	25.84
101	101	25.56	78	78	25.50	66	66	24.77
81	81	22.85	52	52	22.61	41	41	22.14
93	93	21.73	10	10	21.48	15	15	20.90
95	95	20.86	94	94	20.49	97	97	19.84
1	1	19.71	91	91	19.67	55	55	17.82
3	3	17.27	58	58	17.06	20	20	16.73
92	92	16.62	36	36	14.97	13	13	14.95
96	96	14.82	62	62	14.08	21	21	13.46
98	98	13.31	37	37	13.30	42	42	13.15
60	60	12.89	53	53	12.25	49	49	12.19
63	63	11.32	9	9	10.98	76	76	10.76
24	24	10.55	85	85	10.28	45	45	10.07
69	69	9.89	82	82	9.61	19	19	9.39
83	83	9.13	8	8	8.97	27	27	8.73
54	54	8.68	12	12	8.26	25	25	6.99
AVERAGE:		38.97						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
75	75	313.30	50	50	221.96	31	31	207.28
71	71	198.45	77	77	133.20	40	40	127.47
28	28	113.47	73	73	100.83	7	7	96.16
102	102	93.59	56	56	92.86	86	86	80.90
14	14	77.47	43	43	75.98	99	99	74.46
6	6	72.44	39	39	71.04	23	23	66.23
18	18	65.65	51	51	65.46	74	74	65.29
61	61	64.56	34	34	63.94	65	65	63.26
48	48	62.12	22	22	62.11	1	1	60.54
29	29	60.41	26	26	60.18	17	17	55.29
16	16	54.11	57	57	53.66	38	38	53.58
47	47	50.65	32	32	47.33	88	88	47.22
5	5	43.75	46	46	43.70	80	80	43.44

72	72	43.18	11	11	41.58	2	2	39.89
84	84	39.55	68	68	38.47	67	67	35.57
70	70	35.05	64	64	35.01	87	87	33.18
59	59	32.80	33	33	31.52	30	30	31.11
35	35	29.40	78	78	28.02	44	44	27.47
4	4	27.37	89	89	26.97	49	49	26.92
100	100	26.42	91	91	26.32	19	19	25.79
101	101	25.76	90	90	24.87	13	13	23.65
66	66	23.41	3	3	22.87	15	15	22.47
52	52	22.03	81	81	21.76	93	93	20.74
95	95	20.34	94	94	19.43	55	55	19.19
97	97	18.39	10	10	18.39	42	42	17.42
58	58	17.31	92	92	16.46	96	96	15.08
36	36	14.75	79	79	14.61	62	62	14.11
21	21	13.46	37	37	13.35	60	60	13.08
45	45	13.00	98	98	12.73	20	20	12.31
53	53	12.15	27	27	11.85	76	76	10.75
9	9	10.70	24	24	10.61	41	41	10.29
85	85	10.28	83	83	10.04	82	82	9.75
63	63	9.58	54	54	9.45	8	8	9.20
12	12	7.11	69	69	7.02	25	25	6.95
AVERAGE:		46.29						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
77	77	0.66	75	75	0.33	102	102	0.25
74	74	0.20	71	71	0.18	39	39	0.16
43	43	0.14	22	22	0.13	49	49	0.13
50	50	0.13	46	46	0.12	63	63	0.12
1	1	0.11	80	80	0.11	38	38	0.11
69	69	0.10	11	11	0.10	82	82	0.09
31	31	0.09	40	40	0.09	54	54	0.09
65	65	0.09	32	32	0.08	97	97	0.07
23	23	0.07	96	96	0.07	13	13	0.07
67	67	0.07	91	91	0.06	70	70	0.05
56	56	0.05	16	16	0.05	48	48	0.05
60	60	0.05	83	83	0.05	28	28	0.05
19	19	0.04	59	59	0.04	26	26	0.04
100	100	0.04	18	18	0.04	88	88	0.03
57	57	0.03	2	2	0.03	52	52	0.03
10	10	0.02	33	33	0.02	34	34	0.01
99	99	0.01	3	3	0.00	4	4	0.00
5	5	0.00	6	6	0.00	7	7	0.00
8	8	0.00	9	9	0.00	12	12	0.00
14	14	0.00	15	15	0.00	17	17	0.00
20	20	0.00	21	21	0.00	24	24	0.00
25	25	0.00	27	27	0.00	29	29	0.00
30	30	0.00	35	35	0.00	36	36	0.00
37	37	0.00	41	41	0.00	42	42	0.00
44	44	0.00	45	45	0.00	47	47	0.00
51	51	0.00	53	53	0.00	55	55	0.00
58	58	0.00	61	61	0.00	62	62	0.00
64	64	0.00	66	66	0.00	68	68	0.00
72	72	0.00	73	73	0.00	76	76	0.00
78	78	0.00	79	79	0.00	81	81	0.00
84	84	0.00	85	85	0.00	86	86	0.00
87	87	0.00	89	89	0.00	90	90	0.00
92	92	0.00	93	93	0.00	94	94	0.00
95	95	0.00	98	98	0.00	101	101	0.00
AVERAGE:		0.05						

Table 3.7a. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

index	lambda(x)	fi(y)	h
1	17.46000002	48.95000005	211.0
2	17.34000002	49.09000000	255.0
3	17.80000004	49.16000001	348.0
4	17.57000003	49.32000002	222.0
5	17.71000004	48.90000005	383.0
6	18.38000002	49.42000002	770.0
7	17.54000003	49.78000004	749.0
8	18.24000001	49.54000003	436.0
9	18.25000001	49.95000005	220.0
10	18.64000003	49.53000003	594.0
11	18.45000002	49.55000003	1322.0
12	18.12000001	49.70000004	250.0
13	17.84000004	49.67000003	290.0
14	17.91000005	49.82000004	485.0
15	18.62000003	49.74000004	282.0
16	18.65000003	49.63000003	500.0
17	18.11000001	49.56000003	340.0
18	17.07000000	49.70000004	234.0
19	17.28000001	49.43000002	199.0
20	18.09000000	49.19000001	480.0
21	17.71000004	49.55000003	241.0
22	17.81000004	49.41000002	405.0
23	18.11000001	49.42000002	458.0
24	20.14361112	49.26305557	1007.0
25	17.12833334	48.71500004	204.0
26	17.40500002	48.68944448	232.0
27	17.03277778	48.45194447	165.0
28	18.48611114	49.37250002	574.0
29	18.89944449	49.49583336	540.0
30	18.61777781	49.23194446	309.0
31	18.31805557	49.06611111	254.0
32	18.20027779	49.14333334	508.0
33	17.83277782	48.61305559	163.0
34	18.25805557	48.66916670	187.0
35	18.19166668	50.06166667	206.0
36	19.00111111	49.80805560	398.0
37	18.92027783	49.99638894	270.0
38	19.09527778	50.08500000	255.0
39	18.42805558	50.06111111	290.0
40	17.98166672	50.15333334	230.0
41	18.93833338	49.58527781	725.0
42	18.87805560	49.62833337	480.0
43	18.96833338	49.64527781	685.0
44	18.85222227	49.71555559	650.0
45	18.79500004	49.79888893	290.0
46	18.98138894	49.94166672	250.0
47	19.00888889	49.42583336	710.0
48	19.10555556	49.50611114	490.0
49	19.18666668	49.56194447	570.0
50	18.99444450	49.70305559	575.0
51	18.64916670	49.75500004	300.0

Table 3.7b. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.01): 31.00

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
16	16	146.65	43	43	115.98	22	22	114.43
41	41	79.54	29	29	78.64	51	51	70.98
6	6	68.14	46	46	63.16	10	10	61.49
5	5	48.04	36	36	47.31	39	39	46.74
38	38	46.02	44	44	41.51	32	32	40.86
47	47	39.48	49	49	36.76	20	20	34.41
42	42	33.25	45	45	32.55	9	9	31.23
21	21	30.34	30	30	29.22	15	15	28.43
13	13	28.07	12	12	27.95	18	18	27.73
17	17	26.14	23	23	25.14	26	26	24.78
11	11	20.84	3	3	20.45	27	27	19.40
35	35	18.78	48	48	18.49	37	37	17.00
25	25	16.86	1	1	16.56	2	2	14.03
4	4	13.19	31	31	12.92	7	7	12.71
19	19	12.10	24	24	11.68	34	34	11.10
50	50	10.82	8	8	9.43	40	40	8.86
33	33	7.99	14	14	7.52	28	28	6.47
AVERAGE:		35.53						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
43	43	207.28	16	16	198.58	22	22	129.21
29	29	80.90	51	51	77.42	6	6	68.29
46	46	63.94	10	10	63.26	32	32	62.53
35	35	60.53	41	41	60.41	39	39	60.19
44	44	47.33	49	49	47.15	5	5	46.75
36	36	39.93	38	38	39.55	15	15	35.05
9	9	35.01	12	12	34.35	17	17	32.72
45	45	31.52	42	42	31.11	47	47	29.40
30	30	28.33	18	18	28.17	20	20	27.09
13	13	26.81	26	26	24.78	11	11	23.41
48	48	19.67	27	27	19.40	3	3	19.29
37	37	18.39	31	31	17.91	25	25	17.56
50	50	17.42	2	2	15.54	1	1	13.49
23	23	13.41	4	4	12.81	19	19	12.49
7	7	12.37	40	40	11.85	24	24	11.27
34	34	11.25	21	21	10.39	8	8	9.65
28	28	8.21	33	33	7.99	14	14	7.02
AVERAGE:		39.77						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
16	16	0.18	23	23	0.18	18	18	0.18
49	49	0.16	32	32	0.12	43	43	0.12
14	14	0.11	35	35	0.11	10	10	0.11
8	8	0.08	44	44	0.08	12	12	0.07
4	4	0.06	22	22	0.06	17	17	0.06
15	15	0.05	1	1	0.05	47	47	0.05
48	48	0.04	2	2	0.04	38	38	0.04
20	20	0.04	31	31	0.03	39	39	0.03

CARPATCLIM			Date		Version		Page		
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>		<i>78</i>		
37	37	0.02	45	45	0.02	3	3	0.00	
5	5	0.00	6	6	0.00	7	7	0.00	
9	9	0.00	11	11	0.00	13	13	0.00	
19	19	0.00	21	21	0.00	24	24	0.00	
25	25	0.00	26	26	0.00	27	27	0.00	
28	28	0.00	29	29	0.00	30	30	0.00	
33	33	0.00	34	34	0.00	36	36	0.00	
40	40	0.00	41	41	0.00	42	42	0.00	
46	46	0.00	50	50	0.00	51	51	0.00	
AVERAGE:		0.04							

Table 3.7c. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 201
 Total number of errors: 223
 Maximal positive error: 60.38
 Minimal negative error: -11.41

Annex 4. Relative Humidity

Table 4.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
53101	30	68.84	55502	33	45.65	36500	18	41.33
56300	35	38.39	khust	61	37.27	stos	66	31.56
46303	25	30.83	44121	22	29.20	43613	21	27.19
26505	12	27.16	daruv	45	26.91	16414	6	24.83
uzhgo	62	24.49	arad	55	23.95	15307	4	23.58
28700	14	23.55	53521	31	23.39	sacui	57	22.96
13703	2	22.78	valpo	50	22.78	bjelo	44	22.74
sanni	58	22.69	donji	47	22.15	36407	17	22.07
djurd	46	21.85	61709	39	21.82	44214	23	21.32
sombo	53	20.93	66519	42	19.98	kosic	67	19.59
backi	51	19.36	38605	19	19.36	48101	27	18.59
17308	7	18.51	64704	41	18.39	27815	13	18.35
54306	32	18.25	36100	16	18.12	palic	52	18.03
orade	56	17.99	34211	15	17.96	14706	3	17.47
bereg	60	17.38	slavo	49	17.37	55706	34	17.20
44527	24	17.17	63411	40	16.52	52819	29	16.38
hurba	64	16.33	47106	26	16.24	58113	37	16.21
kikin	54	16.11	16601	1	16.02	73302	43	15.97
milho	68	15.91	osije	48	15.63	brati	63	15.48
57311	36	14.41	58300	38	14.11	25212	11	13.21
lucen	65	12.95	16203	5	10.90	39113	20	10.86
23201	9	10.65	satu	59	10.63	23703	10	10.13
51705	28	9.53	17809	8	8.71			
AVERAGE:		20.94						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
backi	51	645.66	bjelo	44	472.96	valpo	50	425.32
56300	35	393.81	osije	48	376.25	25212	11	323.06
arad	55	246.65	daruv	45	242.15	14706	3	241.43
46303	25	234.29	53521	31	226.92	kikin	54	192.34
sombo	53	166.64	donji	47	162.93	61709	39	159.36
52819	29	146.81	27815	13	146.40	44121	22	144.16
57311	36	132.31	djurd	46	119.35	slavo	49	113.31
kosic	67	111.94	17308	7	107.16	48101	27	103.21
55502	33	103.08	36407	17	102.41	43613	21	99.48
16601	1	94.47	66519	42	89.79	17809	8	87.53
sanni	58	86.81	58300	38	85.90	58113	37	84.43
54306	32	82.68	palic	52	78.75	44527	24	77.87
15307	4	67.36	uzhgo	62	65.23	hurba	64	61.41
orade	56	60.05	16414	6	58.97	brati	63	58.93
53101	30	58.55	36500	18	55.73	bereg	60	53.14
sacui	57	53.01	23201	9	52.68	28700	14	51.35
36100	16	50.36	34211	15	49.63	lucen	65	49.62
16203	5	45.75	satu	59	44.82	stos	66	41.32
51705	28	41.05	55706	34	39.79	64704	41	39.48
44214	23	38.88	26505	12	38.70	13703	2	38.17
38605	19	38.02	khust	61	35.36	39113	20	34.50
milho	68	28.75	63411	40	26.97	23703	10	25.33
73302	43	20.36	47106	26	16.93			
AVERAGE:		119.82						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
khust	61	1.68	daruv	45	1.60	uzhgo	62	1.52
48101	27	1.44	donji	47	1.38	16601	1	1.33
bjelo	44	1.32	backi	51	1.28	valpo	50	1.26
djurd	46	1.23	36100	16	1.21	36407	17	1.10
sombo	53	1.00	slavo	49	0.97	sacui	57	0.94
14706	3	0.89	17308	7	0.88	17809	8	0.88
osije	48	0.79	stos	66	0.77	brati	63	0.75
53521	31	0.73	sanni	58	0.72	44527	24	0.70
44121	22	0.70	orade	56	0.69	25212	11	0.65
palic	52	0.62	54306	32	0.60	52819	29	0.60
58113	37	0.58	56300	35	0.56	51705	28	0.55
milho	68	0.54	16203	5	0.54	61709	39	0.53
lucen	65	0.53	44214	23	0.53	hurba	64	0.52
53101	30	0.50	16414	6	0.50	55706	34	0.49
27815	13	0.49	66519	42	0.49	arad	55	0.47
13703	2	0.47	36500	18	0.46	58300	38	0.46
23201	9	0.45	kosic	67	0.44	28700	14	0.44
46303	25	0.44	kikin	54	0.42	43613	21	0.42
15307	4	0.40	bereg	60	0.40	63411	40	0.39
55502	33	0.39	57311	36	0.37	34211	15	0.37
26505	12	0.34	satu	59	0.33	64704	41	0.32
39113	20	0.27	38605	19	0.22	47106	26	0.21
73302	43	0.15	23703	10	0.02			
AVERAGE:		0.68						

The Stations are the same as at Table 1.1a.

Table 4.1b. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 1214
 Total number of errors: 1313
 Maximal positive error: 22.4
 Minimal negative error: -35.4

Table 4.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
PO	31	118.12	LO	19	92.46	NS	15	67.05
OR	8	53.75	SZ	4	49.47	SC	9	48.93
KI	17	45.96	ZR	16	45.43	SU	22	44.82
KS	33	41.62	BL	11	41.35	VL	2	39.41
CA	12	38.87	BN	7	38.11	CU	34	37.67
NE	27	36.83	SN	5	36.15	TI	6	36.14
TS	10	35.31	KV	32	35.22	ZG	29	34.39
SE	28	34.37	VA	21	32.40	VS	18	28.64
VG	26	27.72	SM	20	27.68	KG	24	26.67
BJ	3	26.22	ZA	35	26.02	OS	1	22.03
ZL	30	21.39	SO	14	20.99	BG	23	20.69
SP	25	18.44	PA	13	16.56			
AVERAGE:		39.05						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
SE	28	579.11	CA	12	406.98	VL	2	386.30
ZG	29	383.55	SZ	4	357.77	SO	14	343.71
OS	1	273.33	LO	19	211.21	ZR	16	179.98
BN	7	177.94	TI	6	164.27	SN	5	152.90
BL	11	145.27	BJ	3	141.69	KS	33	136.52
TS	10	130.44	PO	31	126.30	SU	22	124.09
KI	17	120.64	SC	9	116.53	NS	15	104.64
CU	34	103.28	OR	8	101.78	ZA	35	87.87
SM	20	81.35	KG	24	53.99	NE	27	53.11
KV	32	43.17	VS	18	41.62	VG	26	41.53
PA	13	39.99	VA	21	31.93	BG	23	25.43
ZL	30	20.85	SP	25	19.67			
AVERAGE:		157.39						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
SE	28	1.96	VL	2	1.28	SO	14	1.13
KS	33	1.10	TS	10	1.05	ZG	29	0.85
CA	12	0.80	TI	6	0.66	OS	1	0.65
BN	7	0.64	BJ	3	0.63	SN	5	0.55
SU	22	0.54	BL	11	0.53	CU	34	0.52
ZA	35	0.46	SM	20	0.38	SC	9	0.33
OR	8	0.32	ZR	16	0.28	PA	13	0.25
PO	31	0.23	VA	21	0.22	KI	17	0.21
SZ	4	0.20	NS	15	0.17	BG	23	0.16
VG	26	0.14	NE	27	0.10	VS	18	0.09
LO	19	0.09	KG	24	0.08	KV	32	0.06
SP	25	0.03	ZL	30	0.02			
AVERAGE:		0.48						

Table 4.2b. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

index	lambda(x)	fi(y)	station
1	18.63300000	45.53300000	Osijek
2	18.35000000	45.66700000	Valpovo
3	19.01666667	46.18333334	Baja
4	20.09027778	46.25611112	Szeged
5	20.60156002	46.07128625	Sannicolau Mare
6	21.25807108	45.77105643	Timisoara
7	21.13639857	45.38270108	Banloc
8	21.71048271	45.03871153	Oravita
9	22.05580461	45.18139466	Semenic
10	22.62607371	44.62645870	Drobeta Turnu Severin
11	23.11307189	44.47618111	Bacles
12	22.94605240	43.98489980	Calafat
13	19.76402300	46.09721800	Palic
14	19.14313500	45.76700000	Sombor
15	19.83000300	45.32221500	Novi Sad
16	20.37600800	45.39872400	Zrenjanin
17	20.46464000	45.84263400	Kikinda
18	21.30552400	45.14413700	Vršac
19	19.22693300	44.54109900	Loznica
20	19.55503600	45.00937300	Sremska Mitrovica
21	19.91247300	44.27546400	Valjevo
22	20.29106300	44.82423700	Surcin
23	20.46482200	44.79845700	Beograd
24	20.92777100	44.02722200	Kragujevac
25	20.94214600	44.36960000	Smederevska Palanka
26	21.49843000	44.75261400	Veliko Gradište
27	22.53634000	44.23915700	Negotin
28	20.09604500	45.92344200	Senta
29	21.77957700	44.19973700	Žagubica
30	19.71302300	43.73780700	Zlatibor
31	20.02952100	43.84307000	Pozega
32	20.69983600	43.70888400	Kraljevo
33	21.33995400	43.56405400	Krusevac
34	21.38063600	43.94061600	Cuprija
35	22.28856500	43.88312800	Zajecar

Table 4.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s):	684
Total number of errors:	726
Maximal positive error:	21.5
Minimal negative error:	-42.2

Table 4.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
412721	11	89.33	2802	130	85.65	439534	23	84.79
511912	48	83.88	414352	13	66.19	511349	46	63.03
523328	55	62.47	634322	95	61.57	456526	35	60.51
33647	139	58.74	528518	62	58.47	539357	66	57.27
452452	31	56.51	538416	65	56.40	428307	18	55.95
359257	5	54.86	33658	137	54.57	525215	58	53.73
710736	111	53.30	557334	76	53.02	541601	68	51.34
413838	12	51.11	614436	85	49.70	546115	70	49.15
722205	115	48.65	608121	82	47.04	722657	116	46.48
33657	140	45.73	610244	83	45.32	66519	125	44.72
13285	133	44.57	639744	98	43.84	347357	2	42.99
445718	29	41.81	527527	61	41.80	438238	22	41.80
502317	40	41.38	453344	32	41.29	551716	74	40.65
647334	101	40.36	57311	127	39.88	635658	97	39.74
709352	110	39.74	655522	104	39.11	446853	30	39.02
13295	132	38.98	523530	56	38.49	551621	73	38.38
444820	28	37.85	454936	33	37.80	602213	78	37.69
604037	79	37.46	656555	106	36.97	611355	84	36.89
406421	8	36.82	632130	92	36.21	425606	17	36.15
13183	134	35.98	517545	51	35.17	622544	91	35.08
519622	53	34.59	606705	81	33.99	600608	77	33.94
758355	124	33.86	349835	3	33.73	711305	112	33.15
632432	94	33.12	509649	44	32.85	530801	64	32.81
714623	113	32.46	523108	54	32.39	741640	120	32.36
541154	67	32.26	617220	87	32.02	457600	36	31.39
747356	121	31.12	651305	103	31.01	444417	27	30.99
655650	105	30.75	703156	108	30.04	548409	71	29.80
737439	117	29.51	542532	69	29.33	506422	41	29.30
525323	59	28.85	632229	93	28.85	417530	15	28.85
407500	9	28.68	13173	135	28.60	58300	129	28.43
509441	43	28.42	507158	42	28.33	646247	100	28.26
617637	88	28.00	530535	63	27.94	455200	34	27.94
739615	118	27.92	708430	109	27.86	436447	21	27.63
502141	39	27.19	415816	14	27.08	444127	26	26.91
656621	107	26.66	33634	136	26.58	428632	19	26.03
622303	90	26.01	551459	72	25.91	443639	25	25.80
33638	138	25.73	511849	47	24.86	518231	52	24.78
500432	37	24.53	441757	24	23.71	642540	99	23.63
515231	49	23.25	740330	119	22.99	401321	7	22.83
635347	96	21.78	517507	50	21.11	525358	60	21.09
553254	75	20.28	352557	4	19.83	751555	123	19.73
422751	16	19.27	64704	126	19.05	618518	89	19.01
13174	131	18.59	614740	86	17.21	408800	10	17.17
346452	1	17.04	605537	80	16.64	719507	114	16.36
359521	6	16.23	509940	45	16.10	650727	102	15.90
523703	57	13.79	73302	128	13.15	430608	20	12.76
748253	122	12.53	501252	38	11.19			
AVERAGE:		35.46						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
614436	85	520.95	709352	110	499.06	511349	46	429.38
444417	27	362.89	632432	94	317.76	2802	130	313.81
359257	5	303.86	747356	121	288.19	511912	48	287.72
13295	132	258.35	608121	82	241.35	66519	125	228.27
639744	98	224.28	425606	17	222.03	611355	84	218.21
525215	58	217.43	655522	104	212.94	606705	81	212.02
541601	68	205.44	656555	106	201.75	438238	22	192.29
445718	29	190.12	548409	71	182.14	546115	70	174.19
13174	131	170.13	412721	11	166.49	538416	65	166.40
428307	18	166.19	509649	44	158.37	634322	95	152.50
349835	3	151.89	439534	23	151.57	428632	19	148.81
414352	13	147.85	523328	55	141.60	758355	124	138.47
453344	32	134.44	551459	72	130.76	454936	33	130.42
347357	2	129.44	456526	35	128.23	452452	31	126.65
632229	93	126.48	13285	133	124.48	600608	77	121.04
507158	42	119.39	710736	111	119.38	647334	101	118.47
441757	24	118.01	604037	79	117.76	13173	135	115.67
523108	54	113.83	542532	69	113.82	530801	64	111.40
444820	28	110.62	708430	109	109.89	617220	87	108.73
635658	97	107.46	642540	99	107.07	408800	10	106.83
655650	105	105.07	651305	103	103.46	33647	139	99.79
632130	92	97.62	57311	127	97.36	519622	53	96.28
446853	30	93.02	457600	36	92.28	539357	66	90.64
346452	1	89.85	656621	107	86.04	553254	75	86.02
551621	73	85.62	407500	9	85.34	551716	74	84.93
740330	119	84.35	622303	90	82.72	33634	136	81.62
602213	78	80.62	413838	12	80.01	528518	62	79.55
610244	83	79.32	33657	140	78.72	525323	59	78.59
541154	67	78.56	722657	116	76.85	517507	50	75.23
739615	118	74.73	33638	138	73.97	719507	114	72.82
506422	41	72.51	406421	8	71.59	417530	15	68.48
622544	91	66.75	455200	34	66.74	557334	76	64.37
722205	115	64.10	502317	40	63.76	502141	39	62.02
518231	52	58.41	748253	122	58.01	605537	80	57.97
646247	100	57.00	13183	134	56.94	401321	7	56.83
703156	108	56.26	415816	14	55.88	618518	89	55.60
443639	25	55.13	741640	120	54.66	422751	16	53.23
436447	21	52.54	352557	4	50.07	617637	88	48.41
523530	56	47.89	711305	112	47.32	517545	51	46.86
751555	123	45.72	444127	26	45.71	714623	113	45.32
58300	129	43.37	527527	61	42.82	530535	63	40.62
635347	96	40.25	650727	102	39.69	359521	6	38.07
614740	86	37.11	500432	37	37.00	430608	20	35.45
511849	47	34.96	501252	38	33.61	737439	117	32.83
33658	137	30.88	509441	43	29.76	525358	60	27.34
509940	45	26.05	515231	49	22.78	64704	126	21.87
523703	57	21.33	73302	128	18.69			
AVERAGE:		115.33						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
709352	110	2.44	445718	29	1.55	425606	17	1.18
632130	92	1.17	548409	71	1.16	438238	22	1.14
618518	89	1.09	611355	84	1.05	501252	38	1.03
444417	27	1.01	454936	33	1.00	541601	68	0.95
33647	139	0.88	509649	44	0.86	656555	106	0.86
600608	77	0.86	511349	46	0.84	511912	48	0.84
525215	58	0.84	538416	65	0.81	632432	94	0.81
525323	59	0.81	747356	121	0.80	13295	132	0.77
542532	69	0.77	546115	70	0.76	614436	85	0.75

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>		Version <i>final</i>		Page <i>86</i>		
346452	1	0.75	758355	124	0.75	610244	83	0.74
741640	120	0.74	507158	42	0.73	606705	81	0.72
33638	138	0.71	359257	5	0.67	523703	57	0.66
352557	4	0.66	708430	109	0.65	517507	50	0.62
655522	104	0.61	33657	140	0.61	530801	64	0.60
441757	24	0.59	444127	26	0.59	605537	80	0.59
414352	13	0.58	2802	130	0.58	639744	98	0.55
553254	75	0.55	406421	8	0.54	408800	10	0.54
33658	137	0.54	608121	82	0.52	401321	7	0.52
33634	136	0.52	509441	43	0.51	13174	131	0.51
422751	16	0.50	518231	52	0.49	428307	18	0.48
617220	87	0.48	646247	100	0.47	13285	133	0.47
415816	14	0.46	523108	54	0.46	13173	135	0.46
413838	12	0.45	412721	11	0.44	614740	86	0.44
347357	2	0.44	635658	97	0.43	453344	32	0.43
523328	55	0.43	456526	35	0.41	647334	101	0.40
656621	107	0.40	506422	41	0.39	551716	74	0.38
655650	105	0.38	428632	19	0.38	541154	67	0.38
739615	118	0.37	457600	36	0.37	622544	91	0.37
439534	23	0.36	604037	79	0.36	551459	72	0.36
740330	119	0.36	703156	108	0.35	642540	99	0.35
650727	102	0.33	602213	78	0.33	349835	3	0.33
632229	93	0.31	407500	9	0.31	634322	95	0.30
722657	116	0.29	511849	47	0.29	446853	30	0.28
710736	111	0.27	66519	125	0.27	452452	31	0.26
711305	112	0.25	58300	129	0.24	617637	88	0.23
527527	61	0.23	13183	134	0.22	417530	15	0.22
519622	53	0.21	622303	90	0.21	500432	37	0.20
502141	39	0.19	557334	76	0.19	651305	103	0.19
502317	40	0.18	635347	96	0.18	737439	117	0.18
530535	63	0.16	539357	66	0.16	430608	20	0.16
714623	113	0.16	57311	127	0.15	515231	49	0.15
722205	115	0.15	509940	45	0.15	525358	60	0.14
455200	34	0.14	551621	73	0.14	517545	51	0.13
748253	122	0.13	751555	123	0.13	359521	6	0.12
528518	62	0.12	719507	114	0.12	443639	25	0.11
436447	21	0.11	444820	28	0.10	523530	56	0.08
64704	126	0.06	73302	128	0.02			
AVERAGE:		0.49						

The Stations are the same as at Table 1.3a.

Table 4.3b. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 1536
Total number of errors: 1809
Maximal positive error: 29.4
Minimal negative error: -33.9

Table 4.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
14	14	45.05	11	11	40.42	20	20	35.90
24	24	34.93	3	3	34.27	26	26	28.24
9	9	27.86	49	49	26.12	30	30	26.11
52	52	25.76	36	36	25.39	34	34	24.76
40	40	23.37	29	29	22.08	33	33	21.64
46	46	21.24	42	42	21.21	27	27	21.09
12	12	20.66	35	35	20.59	32	32	20.01
2	2	19.80	23	23	19.47	45	45	18.49
51	51	18.36	16	16	18.24	22	22	18.10
17	17	17.96	7	7	17.80	47	47	17.26
44	44	17.19	43	43	17.16	19	19	16.76
41	41	16.60	50	50	16.38	48	48	16.20
18	18	16.16	4	4	15.91	39	39	15.76
10	10	15.37	53	53	14.94	25	25	14.35
38	38	14.33	37	37	13.79	1	1	13.72
5	5	13.63	15	15	13.58	6	6	12.56
28	28	12.35	21	21	11.61	31	31	10.31
13	13	7.97	8	8	6.75			
AVERAGE:		19.92						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
51	51	422.87	32	32	311.89	20	20	298.25
26	26	231.15	4	4	200.54	48	48	200.38
13	13	199.01	43	43	171.75	33	33	170.05
27	27	164.53	1	1	149.03	9	9	140.21
50	50	130.33	40	40	128.78	16	16	124.60
21	21	118.65	29	29	111.92	14	14	108.31
45	45	102.79	28	28	98.41	17	17	94.15
19	19	85.52	39	39	83.22	36	36	83.02
3	3	82.80	23	23	78.56	25	25	78.20
52	52	77.10	35	35	76.29	22	22	72.47
11	11	69.01	24	24	65.38	49	49	61.37
2	2	57.85	12	12	57.84	44	44	53.73
46	46	52.40	30	30	50.24	5	5	49.99
15	15	49.33	7	7	48.20	38	38	47.60
53	53	43.52	31	31	42.31	6	6	42.05
18	18	37.75	37	37	36.65	41	41	33.65
34	34	33.10	10	10	29.44	42	42	28.98
47	47	19.53	8	8	11.13			
AVERAGE:		102.19						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
38	38	1.14	51	51	1.02	35	35	1.02
36	36	1.02	48	48	0.94	13	13	0.90
9	9	0.80	32	32	0.79	39	39	0.78
21	21	0.76	23	23	0.73	28	28	0.69
1	1	0.69	25	25	0.67	44	44	0.65
8	8	0.63	26	26	0.63	37	37	0.59

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>88</i>		
49	49	0.59	45	45	0.59	3	3	0.53
4	4	0.51	16	16	0.49	50	50	0.48
43	43	0.48	11	11	0.48	24	24	0.46
52	52	0.45	5	5	0.45	7	7	0.41
46	46	0.40	40	40	0.40	27	27	0.39
42	42	0.39	33	33	0.39	15	15	0.38
22	22	0.37	30	30	0.36	10	10	0.35
6	6	0.32	14	14	0.32	2	2	0.30
53	53	0.28	47	47	0.27	12	12	0.26
20	20	0.23	17	17	0.22	31	31	0.22
41	41	0.22	29	29	0.21	18	18	0.20
34	34	0.14	19	19	0.12			
AVERAGE:		0.51						

The Stations are the same as at Table 1.4a.

Table 4.4c. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s):	1524
Total number of errors:	1697
Maximal positive error:	76.7
Minimal negative error:	-73.6

Table 4.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
6605	38	59.41	660	36	49.01	650	35	48.31
44121	27	47.89	11774	39	44.56	11779	40	44.22
11782	44	44.21	11910	13	43.95	11868	8	43.08
23201	31	41.57	11968	19	40.11	11803	1	39.84
11785	42	39.68	11961	18	39.62	625	34	39.50
11931	15	38.81	11903	12	38.24	11978	21	36.41
11902	11	36.21	11993	22	35.09	23703	28	34.43
33511	24	33.81	11867	7	32.73	11819	4	32.26
11876	10	31.41	11977	20	31.28	11938	16	31.23
11813	3	30.87	53101	30	30.76	33514	26	29.36
11866	6	27.45	11858	5	26.94	11927	14	26.86
600	33	25.96	11806	2	25.94	61709	32	25.90
33634	23	24.94	11946	17	23.37	51705	29	21.73
33631	25	20.94	690	37	18.83	11874	9	15.66
11766	41	12.32	11787	43	9.83			
AVERAGE:		33.51						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11779	40	812.87	11785	42	757.21	6605	38	380.19
11910	13	318.06	11819	4	218.53	11993	22	159.54
11868	8	129.88	11803	1	122.24	11902	11	120.15
61709	32	116.41	11968	19	107.02	11903	12	89.95
33514	26	72.24	44121	27	70.48	625	34	62.86
11806	2	61.81	600	33	59.15	51705	29	58.55
23201	31	57.36	33631	25	56.39	11858	5	56.19
11876	10	55.64	11782	44	55.30	660	36	53.98
11961	18	53.75	33511	24	52.03	33634	23	50.44
11931	15	47.81	11946	17	47.31	23703	28	46.52
11813	3	44.73	650	35	44.63	11938	16	43.86
53101	30	43.70	11977	20	43.62	11978	21	41.01
11927	14	37.13	11867	7	26.87	11866	6	26.73
11774	39	22.43	690	37	21.89	11874	9	21.53
11766	41	14.44	11787	43	10.63			
AVERAGE:		108.93						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
11785	42	1.08	11779	40	0.97	11803	1	0.87
11876	10	0.70	11910	13	0.70	33514	26	0.68
51705	29	0.64	11806	2	0.58	6605	38	0.55
600	33	0.46	11961	18	0.46	44121	27	0.46
11819	4	0.45	23201	31	0.45	33634	23	0.42
33631	25	0.41	61709	32	0.41	11977	20	0.40
660	36	0.39	11978	21	0.37	11968	19	0.35
11903	12	0.34	11782	44	0.34	11787	43	0.32
11993	22	0.31	11927	14	0.31	11902	11	0.27
11868	8	0.22	11866	6	0.20	11938	16	0.20
11946	17	0.19	690	37	0.18	11774	39	0.17
11867	7	0.16	11874	9	0.15	11766	41	0.15

CARPATCLIM <i>Report</i>			Date <i>02/10/2012</i>			Version <i>final</i>			Page <i>90</i>
11931	15	0.15	11858	5	0.13	625	34	0.12	
33511	24	0.11	650	35	0.10	23703	28	0.09	
53101	30	0.09	11813	3	0.04				
AVERAGE:		0.37							

Table 4.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 656
Total number of errors: 737
Maximal positive error: 97.2
Minimal negative error: -105.7

Table 4.5c. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

index	lambda(x)	fi(y)	h	Station
1	18.02916667	48.89694449	209.0	11803
2	17.57805559	48.75055559	409.0	11806
3	17.11055556	48.16861112	287.0	11813
4	17.68055559	48.49194447	178.0	11819
5	18.19416668	47.87305560	115.0	11858
6	18.77527782	49.43916669	423.0	11866
7	18.59388892	48.76972226	260.0	11867
8	19.18305556	49.36833335	780.0	11868
9	19.72527782	49.03916667	640.0	11874
10	19.91055560	49.14000001	972.0	11876
11	19.09388889	48.31916668	355.0	11902
12	19.14194445	48.64250003	313.0	11903
13	19.64666670	48.64444448	1015.0	11910
14	19.66666670	48.32916668	187.0	11927
15	20.23583335	49.18944445	1778.0	11931
16	20.18916668	48.84861115	901.0	11938
17	20.80138893	48.71666670	575.0	11946
18	20.84583338	49.25972224	485.0	11961
19	21.22250001	48.67222226	230.0	11968
20	21.91388894	49.25333335	305.0	11977
21	21.73472226	48.66805559	104.0	11978
22	22.00611111	48.93888894	176.0	11993
23	22.60000003	48.20000001	113.0	33634
24	23.00000000	49.20000001	594.0	33511
25	22.30000002	48.60000003	115.0	33631
26	22.50000003	48.90000005	205.0	33514
27	19.02805556	47.06111111	153.0	44121
28	17.67472226	47.71000004	117.0	23703
29	20.53611114	48.49527780	309.0	51705
30	20.01666667	47.86666671	1011.0	53101
31	17.26722224	47.88972227	121.0	23201
32	21.65888892	48.38083335	100.0	61709
33	19.00111111	49.80805560	398.0	600
34	19.96027783	49.29388890	855.0	625
35	19.98194450	49.23250001	1991.0	650
36	20.68916670	49.62722225	292.0	660
37	22.34166668	49.46638891	420.0	690
38	20.41833336	49.69361115	515.0	6605
39	17.56972225	49.32055557	222.0	11774
40	17.70777781	48.90277782	383.0	11779
41	17.54194447	49.77722226	749.0	11766
42	18.24055557	49.54111114	436.0	11785
43	18.44777780	49.54611114	1322.0	11787
44	18.12166667	49.69833337	250.0	11782

Table 4.6a. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
3	3	82.27	31	31	74.90	7	7	56.92
10	10	50.74	11	11	49.22	20	20	48.10
19	19	39.47	12	12	39.43	14	14	39.38
24	24	38.54	1	1	38.30	18	18	35.79
8	8	35.58	28	28	33.75	6	6	33.38
2	2	30.22	5	5	29.97	16	16	29.32
25	25	27.89	4	4	27.49	27	27	27.18
13	13	26.56	30	30	24.27	26	26	23.14
9	9	23.03	29	29	20.46	21	21	17.36
22	22	17.06	15	15	13.64	23	23	11.00
17	17	9.27						
AVERAGE:		33.99						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11	11	222.03	12	12	208.20	10	10	161.50
1	1	127.87	3	3	127.51	24	24	118.69
31	31	105.87	16	16	104.72	4	4	79.50
26	26	70.72	14	14	64.25	7	7	63.05
18	18	60.43	19	19	57.90	28	28	51.27
13	13	50.44	8	8	49.72	5	5	49.04
27	27	48.35	20	20	47.04	2	2	47.01
29	29	44.12	23	23	36.44	6	6	35.01
25	25	32.34	22	22	27.09	9	9	25.19
21	21	24.48	30	30	14.29	15	15	13.36
17	17	6.19						
AVERAGE:		70.12						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
16	16	1.20	29	29	0.89	12	12	0.64
10	10	0.49	24	24	0.48	3	3	0.48
28	28	0.43	14	14	0.41	26	26	0.41
1	1	0.40	11	11	0.39	22	22	0.36
25	25	0.27	18	18	0.26	4	4	0.25
31	31	0.24	7	7	0.21	8	8	0.20
13	13	0.19	30	30	0.18	27	27	0.17
23	23	0.16	5	5	0.16	21	21	0.15
2	2	0.11	9	9	0.11	20	20	0.10
6	6	0.09	17	17	0.09	19	19	0.07
15	15	0.05						
AVERAGE:		0.31						

Table 4.6b. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	19.09527778	50.08500000	255.0
11	19.95861116	50.06416667	206.0
12	20.41833336	49.69361115	515.0
13	17.57000003	49.32000002	222.0
14	17.71000004	48.90000005	383.0
15	17.54000003	49.78000004	749.0
16	18.24000001	49.54000003	436.0
17	18.45000002	49.55000003	1322.0
18	18.12000001	49.70000004	250.0
19	23.63333337	50.25000001	252.0
20	23.38333335	49.95000005	245.0
21	23.16666668	49.80000004	232.0
22	23.56694447	49.36222224	275.0
23	23.03333334	49.15000001	594.0
24	22.46666669	48.90000005	205.0
25	18.76583337	49.43611113	468.0
26	19.18305556	49.36833335	780.0
27	19.72527782	49.03916667	640.0
28	19.91055560	49.14000001	972.0
29	20.84277782	49.26027779	485.0
30	21.91388894	49.25333335	305.0
31	22.00611111	48.93888894	176.0

Table 4.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 729
 Total number of errors: 789
 Maximal positive error: 16.8
 Minimal negative error: -51.7

Table 4.7a. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 299
 Total number of errors: 310
 Maximal positive error: 96.9
 Minimal negative error: -37.9

Table 4.7b. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
2	2	48.12	17	17	45.76	10	10	43.11
6	6	40.68	7	7	40.26	1	1	39.12
4	4	36.78	9	9	34.99	15	15	33.55
13	13	32.27	14	14	28.99	11	11	25.48
8	8	23.04	12	12	17.11	16	16	15.91
3	3	15.54	5	5	9.71			
AVERAGE:		31.20						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
10	10	164.15	14	14	127.55	15	15	112.56
7	7	110.84	4	4	110.53	2	2	95.34
1	1	94.83	17	17	77.01	6	6	60.43
16	16	51.47	9	9	40.78	8	8	32.18
12	12	32.06	11	11	30.13	13	13	24.09
3	3	15.95	5	5	12.33			
AVERAGE:		70.13						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
7	7	1.08	4	4	1.03	8	8	0.71
14	14	0.57	16	16	0.55	10	10	0.51
15	15	0.45	2	2	0.38	13	13	0.31
17	17	0.30	6	6	0.30	1	1	0.22
12	12	0.20	5	5	0.09	9	9	0.09
11	11	0.05	3	3	0.04			
AVERAGE:		0.40						

Table 4.7c. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

1	17.57000003	49.32000002	222.0
2	17.71000004	48.90000005	383.0
3	17.54000003	49.78000004	749.0
4	18.24000001	49.54000003	436.0
5	18.45000002	49.55000003	1322.0
6	18.12000001	49.70000004	250.0
7	18.02916667	48.89694449	209.0
8	17.57805559	48.75055559	409.0
9	17.11055556	48.16861112	287.0
10	17.68055559	48.49194447	178.0
11	18.19416668	47.87305560	115.0
12	18.77527782	49.43916669	423.0
13	18.59388892	48.76972226	260.0
14	19.18305556	49.36833335	780.0
15	18.19166668	50.06166667	206.0
16	19.00111111	49.80805560	398.0
17	18.92027783	49.99638894	270.0

Annex 5. Cloud Cover

Table 5.1a. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda	fi	h		station	country
1	16.08083333	47.03083333	269.0	16601	Fürstenfeld	AU
2	16.60222222	47.67833333	233.8	13703	Sopron Kuruc-domb	HU
3	16.72916666	47.48138888	198.9	14706	Sopronhorpács	HU
4	16.64777777	47.19833333	201.1	15307	Szombathely	HU
5	16.30944444	46.91027777	311.7	16203	Szentgotthárd Farkasfa	HU
6	16.81280000	46.92580000	240.1	16414	Zalaegerszeg Nagyutas	HU
7	16.61305555	46.60555555	165.3	17308	Iklódbördőce	HU
8	16.97060000	46.45610000	139.8	17809	Nagykanizsa	HU
9	17.26720000	47.88970000	121.0	23201	Mosonmagyaróvár	HU
10	17.67470000	47.71000000	116.7	23703	Győr Likócs	HU
11	17.37220000	47.29220000	135.5	25212	Pápa Nyárád	HU
12	17.23860000	46.73560000	111.7	26505	Keszthely Tanyakereszt	HU
13	17.87380000	46.36270000	129.5	27815	Kaposvár	HU
14	17.52690000	46.10330000	159.0	28700	Homokszentgyörgy	HU
15	18.31080000	47.65170000	123.8	34211	Tata	HU
16	18.04080000	46.91080000	108.2	36100	Siófok	HU
17	18.95220000	46.95060000	147.7	36407	Dunaújváros	HU
18	18.18360000	46.68560000	165.0	36500	Iregszemcse	HU
19	18.25220000	46.13470000	395.7	38605	Pécs Árpádtető	HU
20	18.23500000	45.99500000	200.2	39113	Pécs Pogány	HU
21	19.28360000	47.79000000	242.9	43613	Penc	HU
22	19.02810000	47.51110000	153.3	44121	Budapest belterület	HU
23	19.47640000	47.65560000	162.4	44214	Aszód	HU
24	19.18220000	47.42920000	139.1	44527	Budapest Pestszentlőrinc	HU
25	19.74830000	46.91310000	114.0	46303	Kecskemét külterület	HU
26	19.09890000	46.51030000	93.6	47106	Kalocsa Öregcsertő	HU
27	19.01670000	46.18330000	113.0	48101	Baja Csávoly	HU
28	20.53610000	48.49530000	308.9	51705	Jósvafő	HU
29	20.77140000	48.09690000	232.8	52819	Miskolc Avas	HU
30	20.01670000	47.86670000	111.3	53101	Kékestető	HU
31	20.23580000	47.73970000	123.3	53521	Kompolt	HU
32	20.20000000	47.12860000	90.0	55502	Szolnok Szandaszőlős	HU
33	20.52780000	46.86940000	85.4	56300	Szarvas	HU
34	20.68750000	46.54420000	88.8	57311	Orosháza	HU
35	20.09030000	46.25610000	81.8	58113	Szeged külterület	HU
36	20.73670000	46.31720000	94.8	58300	Pitvaros	HU
37	21.65890000	48.38080000	100.4	61709	Sátoraljaújhely	HU
38	21.88690000	47.96220000	142.1	63411	Nyíregyháza Napkor	HU
39	21.61080000	47.49030000	107.6	64704	Debrecen	HU
40	21.16060000	46.67940000	84.0	66519	Békéscsaba	HU
41	22.62560000	47.86220000	118.3	73302	Pátyod	HU
42	16.85000000	45.91700000	141.0		bjelo Bjelovar	CR
43	17.23300000	45.60000000	161.0		daruv Daruvar	CR
44	17.06700000	46.05000000	121.0		djurd Djurdjevac	CR
45	18.16700000	45.76700000	97.0		donji Donji Miholjac	CR
46	18.63300000	45.53300000	89.0		osije Osijek	CR
47	18.00000000	45.16600000	88.0		slavo Slavonski Brod	CR
48	18.35000000	45.66700000	92.0		valpo Valpovo	CR
49	19.67050000	45.33660000	85.0		backi Backi Petrovac	RS
50	19.76410000	46.09720000	102.0		palic Palic	RS
51	19.14310000	45.76700000	87.0		sombo Sombor	RS
52	20.46460000	45.84260000	80.0		kikin Kikinda	RS
53	21.35362152	46.13351640	117.0		arad Arad	RO
54	21.89592406	47.03570901	136.0		orade Oradea	RO
55	22.09450716	47.34415862	124.0		sacui Sacuieni	RO
56	20.60156003	46.07128625	85.0		sanni Sannicolau	RO
57	22.88714903	47.72148469	128.0		satu Satu Mare	RO
58	22.60000000	48.20000000	113.0		bereg Bereg	UA
59	23.30000000	48.20000000	164.0		khust Khust	UA
60	22.30000000	48.60000000	115.0		uzhgo Uzhgorod	UA
61	17.11060000	48.16860000	287.0		brati Bratislava-Koliba	SK
62	18.19420000	47.87310000	115.0		hurba Hurbanovo	SK
63	19.73600000	48.33900000	214.0		lucen Lucenec-Bolkovce	SK
64	20.79750000	48.71810000	580.0		stos Stos	SK
65	21.22250000	48.67220000	230.0		kosic Kosice-Letisko	SK
66	21.72400000	48.66300000	105.0		milho Milhostov	SK

Table 5.1b. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
stos	64	73.54	lucen	63	58.78	milho	66	58.46
44214	23	53.09	16203	5	51.91	34211	15	45.43
bjelo	42	45.19	51705	28	42.72	57311	34	40.69
66519	40	40.56	valpo	48	40.42	47106	26	40.38
16414	6	39.57	17809	8	37.45	36500	18	37.30
43613	21	35.06	28700	14	34.02	52819	29	34.02
bereg	58	33.94	73302	41	32.71	15307	4	32.26
26505	12	31.25	58113	35	30.37	25212	11	29.28
36407	17	28.98	sanni	56	28.82	39113	20	28.81
daruv	43	27.84	kikin	52	27.43	brati	61	27.37
djurd	44	27.32	palic	50	27.25	23703	10	26.70
sombo	51	26.14	17308	7	24.80	23201	9	24.67
36100	16	24.08	orade	54	23.82	16601	1	23.54
63411	38	23.00	hurba	62	22.42	58300	36	22.37
uzhgo	60	22.17	donji	45	20.80	38605	19	20.58
56300	33	19.84	khust	59	18.40	14706	3	18.11
64704	39	17.28	arad	53	17.09	satu	57	17.06
osije	46	16.94	13703	2	15.84	44121	22	15.74
53101	30	14.97	backi	49	14.51	kosic	65	14.08
53521	31	13.86	46303	25	13.52	27815	13	13.48
slavo	47	12.75	61709	37	12.65	sacui	55	11.48
44527	24	11.16	55502	32	11.06	48101	27	6.90
AVERAGE:		27.79						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
63411	38	1827.39	milho	66	1312.85	28700	14	1247.28
57311	34	1161.67	66519	40	1115.16	44214	23	946.20
16203	5	814.05	arad	53	790.32	64704	39	741.81
38605	19	738.04	palic	50	615.15	valpo	48	607.53
52819	29	573.73	44121	22	499.54	16414	6	498.19
47106	26	467.97	56300	33	444.95	bjelo	42	441.85
17809	8	432.18	34211	15	417.57	stos	64	397.40
uzhgo	60	370.50	36100	16	355.94	26505	12	344.15
16601	1	333.39	lucen	63	302.00	orade	54	299.92
23201	9	274.49	73302	41	264.86	27815	13	264.76
58300	36	202.05	53521	31	195.50	55502	32	172.79
17308	7	172.10	48101	27	151.51	14706	3	144.75
43613	21	144.40	slavo	47	143.83	51705	28	127.49
daruv	43	122.70	13703	2	119.62	donji	45	118.39
23703	10	112.87	36407	17	108.51	djurd	44	99.02
satu	57	93.04	kikin	52	91.20	25212	11	87.59
61709	37	85.86	brati	61	83.84	hurba	62	82.11
sombo	51	76.09	osije	46	70.49	bereg	58	70.05
46303	25	66.76	53101	30	65.62	kosic	65	63.59
sanni	56	62.25	khust	59	61.22	15307	4	59.56
44527	24	58.41	36500	18	53.42	39113	20	44.42
backi	49	40.56	sacui	55	36.81	58113	35	35.14
AVERAGE:		339.76						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
stos	64	1.74	57311	34	1.46	47106	26	1.33
66519	40	1.29	63411	38	0.96	73302	41	0.91
valpo	48	0.91	58300	36	0.90	lucen	63	0.88
arad	53	0.87	28700	14	0.87	38605	19	0.81

CARPATCLIM			Date			Version		Page
<i>Report</i>			<i>02/10/2012</i>			<i>final</i>		<i>97</i>
44214	23	0.79	44121	22	0.79	43613	21	0.77
milho	66	0.75	17308	7	0.72	56300	33	0.72
64704	39	0.72	34211	15	0.71	palic	50	0.71
daruv	43	0.67	17809	8	0.66	slavo	47	0.66
53521	31	0.65	61709	37	0.64	16601	1	0.64
13703	2	0.63	23201	9	0.62	14706	3	0.58
sombo	51	0.58	satu	57	0.57	bereg	58	0.57
26505	12	0.57	51705	28	0.55	36407	17	0.53
16414	6	0.52	sacui	55	0.51	bjelo	42	0.50
orade	54	0.49	donji	45	0.48	16203	5	0.47
27815	13	0.46	kikin	52	0.45	25212	11	0.40
48101	27	0.39	brati	61	0.39	55502	32	0.38
osije	46	0.35	36100	16	0.35	djurd	44	0.33
36500	18	0.32	uzhgo	60	0.31	53101	30	0.30
backi	49	0.28	23703	10	0.27	44527	24	0.26
15307	4	0.26	39113	20	0.25	58113	35	0.24
hurba	62	0.24	sanni	56	0.23	46303	25	0.23
52819	29	0.22	khust	59	0.19	kosic	65	0.10
AVERAGE:		0.59						

Table 5.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 3432
Total number of errors: 4884
Maximal positive error: 5.42
Minimal negative error: -7.20

Table 5.2a. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 2601
Total number of errors: 3289
Maximal positive error: 6.23
Minimal negative error: -6.45

Table 5.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
TI	6	118.65	VL	2	114.87	SE	29	93.59
TS	10	90.44	ZA	38	90.37	SM	20	85.46
BN	7	82.64	ZR	16	81.43	SO	14	72.53
KI	17	71.40	VS	18	70.67	KV	35	66.41
BJ	3	59.85	SU	22	57.15	LJ	30	56.78
PA	13	51.96	BB	39	50.01	CU	37	46.94
ZG	32	45.52	SP	25	45.14	NE	27	41.58
OS	1	41.18	VG	26	40.35	CA	12	39.65
BC	31	37.92	KG	24	37.17	BG	23	36.87
ZL	33	34.53	BL	11	33.19	OR	8	32.69
SC	9	30.51	SN	5	28.49	SZ	4	28.16
BP	28	26.62	PO	34	25.70	LO	19	24.86
KS	36	16.95	VA	21	15.29	NS	15	14.47
AVERAGE:		52.26						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
SE	29	6379.88	ZA	38	574.52	TI	6	496.32
VL	2	484.32	VS	18	316.59	CA	12	291.31
TS	10	290.01	BN	7	266.98	PA	13	250.89
VG	26	242.35	KI	17	210.47	SP	25	170.56
BJ	3	155.30	NE	27	154.89	ZG	32	141.22
ZR	16	137.96	BC	31	137.42	SM	20	128.97
OS	1	128.96	KV	35	114.73	KS	36	112.00
BG	23	108.03	SC	9	97.71	SU	22	88.62
CU	37	86.14	SO	14	85.40	BP	28	81.52
BB	39	80.65	LJ	30	79.90	OR	8	68.84
KG	24	65.18	ZL	33	62.79	SN	5	57.21
PO	34	54.21	NS	15	51.96	BL	11	48.94
SZ	4	33.55	VA	21	32.96	LO	19	21.77
AVERAGE:		317.72						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
SE	29	2.11	ZG	32	0.95	VL	2	0.76
ZA	38	0.57	BC	31	0.51	CA	12	0.50
KI	17	0.43	BN	7	0.42	KS	36	0.40
SC	9	0.38	VG	26	0.38	VS	18	0.34
SU	22	0.31	BB	39	0.31	BP	28	0.31
BJ	3	0.30	NS	15	0.29	TI	6	0.27
PA	13	0.27	SO	14	0.22	TS	10	0.20
NE	27	0.17	BG	23	0.17	VA	21	0.17
ZR	16	0.16	SP	25	0.16	OS	1	0.16
SZ	4	0.16	ZL	33	0.14	OR	8	0.13
KG	24	0.12	PO	34	0.09	SM	20	0.08
CU	37	0.08	LO	19	0.08	LJ	30	0.08
BL	11	0.07	SN	5	0.03	KV	35	0.02
AVERAGE:		0.32						

The Stations are the same as at Table 1.2b.

Table 5.3a. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda(x)	fi(y)	St_ID	Station_name
1	24.879770	43.760420	346452	TURNU MAGURELE
2	23.945686	43.790056	347357	BECHET
3	28.588980	43.816470	349835	MANGALIA
4	25.934221	43.875470	352557	GIURGIU
5	22.947569	43.985246	359257	CALAFAT
6	25.354370	43.978290	359521	ALEXANDRIA
7	23.332620	44.029510	401321	BAILESTI
8	24.358813	44.100444	406421	CARACAL
9	24.980030	44.107740	407500	ROSIORII
10	27.967130	44.088620	408800	ADAMCLISI
11	27.339860	44.206430	412721	CALARASI
12	28.646380	44.214090	413838	CONSTANTA
13	23.868460	44.310600	414352	CRAIOVA
14	28.252880	44.243560	415816	MEDGIDIA
15	25.538540	44.283260	417530	VIDELE
16	26.095322	44.412355	425606	BUCURESTI
17	23.114580	44.476720	428307	BICLES
18	26.525051	44.453228	428632	FUNDULEA
19	26.079760	44.510820	430608	BUCURESTI
20	22.627650	44.626730	438238	DR. TR. SEVERIN
21	26.658560	44.721950	443639	URZICENI
22	24.238708	44.665755	444417	DRAGASANI
23	27.295990	44.740960	445718	GRIVITA
24	24.867460	44.849290	452452	PITESTI
25	23.710236	44.878418	453344	TG. LOGRESTI
26	25.427260	44.929910	456526	TIRGOVISTE
27	25.988990	44.956090	457600	PLOIESTI
28	24.571790	45.016290	500432	DEDULESTI
29	22.861054	44.997136	501252	PADES
30	21.711840	45.038960	502141	ORAVITA
31	23.260882	45.040958	502317	TG. JIU
32	24.380980	45.089190	506422	RM. VILCEA
33	22.057120	45.181730	507158	SEMENIC
34	24.671280	45.179170	509441	CURTEA DE ARGES
35	26.853000	45.132910	509649	BUZAU
36	29.760449	45.148694	509940	SULINA
37	23.810150	45.165870	511349	POLOVRAGI
38	28.825690	45.190840	511849	TULCEA
39	22.534340	45.281170	515231	TARCU
40	25.038140	45.275150	517507	CIMPULUNG
41	21.137974	45.383051	523108	BANLOC
42	23.464622	45.387686	523328	PARING
43	25.515713	45.355256	523530	SINAIA(1500)
44	27.040160	45.390750	523703	RM. SARAT
45	22.226840	45.417560	525215	CARANSEBES
46	23.378254	45.406610	525323	PETROSANI
47	23.968553	45.411503	525358	VOINEASA
48	25.458260	45.446140	527527	VF. OMU
49	25.273270	45.431910	528518	FUNDATA
50	25.585100	45.506460	530535	PREDEAL
51	28.033930	45.473300	530801	GALATI
52	24.273180	45.653180	538416	BOITA
53	23.934000	45.657510	539357	PALTINIS
54	21.934630	45.686730	541154	LUGOJ
55	26.058304	45.668545	541601	INT. BUZAU LUI
56	25.527720	45.696130	542532	BRASOV
57	21.259360	45.771460	546115	TIMISOARA
58	24.092940	45.789700	548409	SIBIU
59	24.936720	45.836360	551459	FAGARAS
60	26.377080	45.824010	551621	LACAUTI
61	27.410360	45.841950	551716	TECUCI
62	22.900460	45.865040	553254	DEVA
63	23.543090	45.964530	557334	SEBES-ALBA
64	26.116870	45.993240	600608	TG. SECUIESC
65	20.603163	46.071633	604037	SINNICOLU MARE
66	27.171810	46.105020	606705	ADJUD

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>	Version <i>final</i>	Page <i>100</i>
67	21.355219	46.133851	608121	ARAD
68	23.936770	46.178820	611355	BLAJ
69	24.593180	46.228250	614436	DUMBRAVENI
70	27.645580	46.231360	614740	BIRLAD
71	26.642590	46.272960	617637	TG. OCNA
72	25.774170	46.371580	622544	MIERCUREA CIUC
73	21.543000	46.518940	632130	CHISINEU CRIS
74	24.535330	46.533680	632432	TG.MURES
75	23.311820	46.535770	634322	BAISOARA
76	26.914070	46.532150	635658	BACAU
77	27.715830	46.646240	639744	VASLUI
78	25.514170	46.706080	642540	JOSENI
79	22.795790	46.759560	646247	VLADEASA 1800
80	23.572990	46.777990	647334	CLUJ-NAPOCA
81	25.951510	46.977760	656555	CEAHLAU TOACA
82	26.390900	46.934020	656621	PIATRA NEAMT
83	21.897545	47.036020	703156	ORADEA
84	24.515450	47.149420	708430	BISTRITA
85	23.900500	47.128260	709352	DEJ
86	27.630080	47.171060	710736	IASI
87	23.048360	47.195280	711305	ZALAU
88	26.927410	47.358670	722657	COTNARI
89	24.650730	47.602830	737439	IEZER
90	26.241960	47.633280	739615	SUCEAVA
91	23.493240	47.661210	740330	BAIA-MARE
92	26.647040	47.736050	741640	BOTOSANI
93	23.942140	47.777370	747356	OC.SUGATAG
94	22.888782	47.721768	748253	SATU MARE
95	21.16056	46.67944	66519	Bekescsaba
96	21.61083	47.49028	64704	Debrecen
97	20.68750	46.54417	57311	Oroshaza
98	22.62556	47.86222	73302	Patyod
99	20.73667	46.31722	58300	Pitvaros
100	21.32217	44.83615	2802	BELACRKVA
101	20.46464	45.84263	13174	KIKINDA
102	22.53634	44.23916	13295	NEGOTIN
103	21.49843	44.75261	13285	VELIKO GRADISTE
104	21.30552	45.14414	13183	VRAC
105	20.37601	45.39872	13173	ZRENJANIN
106	22.65000	48.20000	33634	Beregove
107	25.97250	48.26639	3658	Chernivtsi
108	23.30000	48.18333	33638	Khust
109	24.19806	48.04750	33647	Rakhiv
110	25.21667	47.88333	33657	Seliatyn

Table 5.3b. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 4967
Total number of errors: 8262
Maximal positive error: 5.80
Minimal negative error: -6.29

Table 5.3c. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
517507	40	165.79	523530	43	156.53	33657	110	147.84
13183	104	133.33	438238	20	122.31	66519	95	118.74
642540	78	117.29	703156	83	101.11	656621	82	100.41
634322	75	96.04	13285	103	92.41	747356	93	91.21
541601	55	87.96	546115	57	86.05	748253	94	82.40
502141	30	75.22	525358	47	74.74	600608	64	73.02
606705	66	72.77	523703	44	71.49	414352	13	71.08
57311	97	69.31	557334	63	69.07	73302	98	67.44
710736	86	66.47	346452	1	66.21	509441	34	65.13
452452	24	64.96	523328	42	64.78	33638	108	62.34
444417	22	62.27	507158	33	61.97	412721	11	61.77
64704	96	60.91	417530	15	60.16	502317	31	59.81
506422	32	59.59	527527	48	59.34	632432	74	57.41
509649	35	57.23	608121	67	56.93	541154	54	56.02
525323	46	55.03	739615	90	54.93	359257	5	52.61
425606	16	52.60	538416	52	52.29	407500	9	50.04
551716	61	49.58	511349	37	48.64	401321	7	48.38
13295	102	48.23	639744	77	46.84	614740	70	46.73
33647	109	46.59	501252	29	45.71	2802	100	45.30
33634	106	45.23	530801	51	45.15	428307	17	44.31
530535	50	43.87	617637	71	43.61	646247	79	43.34
525215	45	43.26	347357	2	43.17	737439	89	43.17
428632	18	42.71	635658	76	42.36	523108	41	41.61
722657	88	41.41	551621	60	41.33	614436	69	40.50
632130	73	40.18	741640	92	40.02	33658	107	39.70
349835	3	39.43	445718	23	39.11	711305	87	38.95
13174	101	38.20	647334	80	37.94	539357	53	37.55
406421	8	36.52	542532	56	36.29	453344	25	35.58
13173	105	35.43	457600	27	35.07	551459	59	34.87
443639	21	34.48	430608	19	33.88	604037	65	33.88
58300	99	32.49	709352	85	32.13	408800	10	29.81
656555	81	29.50	528518	49	29.24	352557	4	28.33
548409	58	26.83	456526	26	26.28	740330	91	26.16
622544	72	25.97	500432	28	23.94	553254	62	23.60
509940	36	22.84	515231	39	22.82	511849	38	21.91
611355	68	21.79	413838	12	21.72	415816	14	20.67
359521	6	20.59	708430	84	12.43			
AVERAGE:		54.56						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
642540	78	1117.23	517507	40	756.83	66519	95	742.51
425606	16	687.07	525358	47	591.94	509441	34	554.47
553254	62	510.73	73302	98	493.83	57311	97	456.22
64704	96	431.48	557334	63	425.31	13183	104	390.80
445718	23	389.62	506422	32	383.75	438238	20	360.46
456526	26	348.34	634322	75	346.97	608121	67	340.95
523530	43	324.75	722657	88	312.59	747356	93	298.73
523108	41	291.94	500432	28	289.54	541601	55	287.22
606705	66	282.49	407500	9	281.23	614740	70	266.97
656621	82	248.34	523703	44	247.61	346452	1	244.56
639744	77	232.46	703156	83	220.99	502141	30	219.92
417530	15	219.82	748253	94	216.06	546115	57	214.26
13285	103	206.03	414352	13	204.24	58300	99	197.76
443639	21	193.24	412721	11	189.18	525323	46	185.49
13295	102	185.00	527527	48	176.16	539357	53	176.03
401321	7	171.56	530535	50	171.07	33657	110	170.07
541154	54	168.80	359257	5	158.42	600608	64	158.02

632432	74	154.70	415816	14	150.47	622544	72	149.51
507158	33	149.34	444417	22	147.28	502317	31	142.20
349835	3	141.58	710736	86	132.28	551716	61	130.01
538416	52	127.61	452452	24	124.30	2802	100	122.10
430608	19	121.98	408800	10	117.19	530801	51	111.87
646247	79	110.55	635658	76	106.04	509649	35	99.81
501252	29	98.78	406421	8	94.87	352557	4	93.44
33647	109	93.22	453344	25	88.64	33634	106	87.29
740330	91	84.69	359521	6	82.28	739615	90	82.21
617637	71	81.57	523328	42	81.53	737439	89	79.97
548409	58	77.68	511349	37	77.39	33638	108	75.91
647334	80	72.90	428632	18	72.64	542532	56	68.57
528518	49	64.30	347357	2	62.97	611355	68	60.49
33658	107	60.48	709352	85	59.71	428307	17	59.06
711305	87	58.00	551459	59	57.99	604037	65	57.37
457600	27	55.50	741640	92	55.13	632130	73	51.54
413838	12	51.26	525215	45	47.60	13174	101	43.98
614436	69	43.98	13173	105	42.83	509940	36	39.49
551621	60	37.77	656555	81	36.93	515231	39	31.87
511849	38	22.11	708430	84	16.27			
AVERAGE:		197.16						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
57311	97	1.30	66519	95	1.12	557334	63	0.93
58300	99	0.81	722657	88	0.79	509441	34	0.74
525358	47	0.68	642540	78	0.67	73302	98	0.65
614740	70	0.63	523108	41	0.62	539357	53	0.60
456526	26	0.60	608121	67	0.56	553254	62	0.56
500432	28	0.56	634322	75	0.55	445718	23	0.53
417530	15	0.49	425606	16	0.48	438238	20	0.47
415816	14	0.44	525323	46	0.43	530535	50	0.43
64704	96	0.42	349835	3	0.42	408800	10	0.42
517507	40	0.41	13295	102	0.40	656621	82	0.39
33634	106	0.39	413838	12	0.38	523530	43	0.38
541601	55	0.33	453344	25	0.32	352557	4	0.32
2802	100	0.31	412721	11	0.31	741640	92	0.30
359521	6	0.30	407500	9	0.29	632432	74	0.28
507158	33	0.28	33657	110	0.27	33647	109	0.27
527527	48	0.27	509649	35	0.27	502317	31	0.26
346452	1	0.25	401321	7	0.25	13174	101	0.24
13183	104	0.24	347357	2	0.23	428307	17	0.22
709352	85	0.22	546115	57	0.21	428632	18	0.21
523703	44	0.21	530801	51	0.21	541154	54	0.20
639744	77	0.20	747356	93	0.20	647334	80	0.19
606705	66	0.19	13285	103	0.19	737439	89	0.19
457600	27	0.19	443639	21	0.18	646247	79	0.18
548409	58	0.18	406421	8	0.17	551716	61	0.17
611355	68	0.17	703156	83	0.17	600608	64	0.17
656555	81	0.17	740330	91	0.17	528518	49	0.17
506422	32	0.16	511349	37	0.16	502141	30	0.16
551459	59	0.16	13173	105	0.15	748253	94	0.15
523328	42	0.13	414352	13	0.12	452452	24	0.12
551621	60	0.11	444417	22	0.11	617637	71	0.11
739615	90	0.11	632130	73	0.10	33658	107	0.10
501252	29	0.10	359257	5	0.09	515231	39	0.09
538416	52	0.08	635658	76	0.08	511849	38	0.08
430608	19	0.06	509940	36	0.06	33638	108	0.06
708430	84	0.06	710736	86	0.04	711305	87	0.04
622544	72	0.04	542532	56	0.04	604037	65	0.03
525215	45	0.03	614436	69	0.03			
AVERAGE:		0.30						

Table 5.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
29	29	78.56	21	21	57.11	46	46	56.46
44	44	55.46	43	43	43.72	13	13	41.12
17	17	37.87	40	40	36.90	14	14	31.70
38	38	28.42	42	42	27.99	47	47	26.59
45	45	24.73	31	31	24.55	27	27	24.37
4	4	24.13	20	20	23.67	35	35	23.62
19	19	22.80	25	25	22.41	32	32	21.35
5	5	20.96	6	6	20.06	36	36	19.81
8	8	19.65	49	49	19.62	30	30	19.01
28	28	18.71	50	50	18.50	18	18	18.42
39	39	18.30	1	1	17.94	10	10	17.10
41	41	16.48	51	51	16.09	9	9	16.01
37	37	15.84	11	11	15.70	22	22	15.65
15	15	15.28	53	53	15.00	33	33	14.77
34	34	14.55	12	12	14.53	26	26	13.46
7	7	12.99	48	48	12.63	23	23	12.24
24	24	12.04	3	3	11.66	2	2	11.03
52	52	10.10	16	16	9.78			
AVERAGE:		23.35						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
44	44	1157.93	46	46	687.22	13	13	616.81
24	24	552.03	29	29	345.30	23	23	342.02
9	9	335.35	12	12	294.09	18	18	268.40
10	10	259.71	48	48	251.65	26	26	234.99
4	4	227.88	15	15	194.19	3	3	192.96
6	6	173.74	37	37	166.32	52	52	164.69
20	20	152.18	21	21	148.04	47	47	139.45
39	39	130.77	36	36	129.98	30	30	128.96
35	35	128.63	28	28	124.03	11	11	122.65
50	50	120.01	45	45	114.92	43	43	110.52
17	17	108.85	41	41	98.05	42	42	86.01
49	49	82.03	53	53	75.46	25	25	73.72
14	14	71.36	22	22	67.41	38	38	67.26
7	7	66.39	2	2	60.93	16	16	58.71
31	31	56.91	1	1	53.90	19	19	51.61
32	32	44.14	33	33	36.54	40	40	36.35
27	27	28.48	51	51	27.30	8	8	25.91
34	34	17.82	5	5	17.37			
AVERAGE:		176.00						

2. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
10	10	1.09	47	47	0.97	24	24	0.96
44	44	0.91	15	15	0.89	12	12	0.88
3	3	0.80	46	46	0.77	35	35	0.75
41	41	0.69	39	39	0.66	7	7	0.65
17	17	0.65	45	45	0.62	48	48	0.61
26	26	0.59	40	40	0.59	23	23	0.57

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>104</i>		
4	4	0.53	11	11	0.52	21	21	0.51
51	51	0.50	38	38	0.50	13	13	0.50
9	9	0.50	20	20	0.49	18	18	0.44
30	30	0.43	36	36	0.41	49	49	0.39
53	53	0.39	22	22	0.37	28	28	0.35
37	37	0.34	31	31	0.33	52	52	0.30
1	1	0.27	29	29	0.25	14	14	0.23
32	32	0.23	6	6	0.20	27	27	0.18
2	2	0.17	33	33	0.17	42	42	0.16
34	34	0.16	16	16	0.15	25	25	0.12
43	43	0.12	50	50	0.09	19	19	0.08
5	5	0.08	8	8	0.03			
AVERAGE:		0.46						

The Stations are the same as at Table 1.4a.

Table 5.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 3900
 Total number of errors: 5765
 Maximal positive error: 294.25
 Minimal negative error: -6.14

Table 5.5a. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

index	lambda	fi	h	station
1	18.02916667	48.89694449	209.0	11803
2	17.57805559	48.75055559	409.0	11806
3	17.11055556	48.16861112	287.0	11813
4	17.68055559	48.49194447	178.0	11819
5	18.19416668	47.87305560	115.0	11858
6	18.77527782	49.43916669	423.0	11866
7	18.59388892	48.76972226	260.0	11867
8	19.18305556	49.36833335	780.0	11868
9	19.72527782	49.03916667	640.0	11874
10	19.91055560	49.14000001	972.0	11876
11	19.09388889	48.31916668	355.0	11902
12	19.14194445	48.64250003	313.0	11903
13	19.64666670	48.64444448	1015.0	11910
14	19.66666670	48.32916668	187.0	11927
15	20.23583335	49.18944445	1778.0	11931
16	20.18916668	48.84861115	901.0	11938
17	20.80138893	48.71666670	575.0	11946
18	20.84583338	49.25972224	485.0	11961
19	21.22250001	48.67222226	230.0	11968
20	21.91388894	49.25333335	305.0	11977
21	21.73472226	48.66805559	104.0	11978
22	22.00611111	48.93888894	176.0	11993
23	22.60000003	48.20000001	113.0	33634
24	23.00000000	49.20000001	594.0	33511
25	22.30000002	48.60000003	115.0	33631
26	22.50000003	48.90000005	205.0	33514
27	19.02805556	47.06111111	153.0	44120
28	17.67472226	47.71000004	117.0	23702
29	20.53611114	48.49527780	309.0	51700
30	20.01666667	47.86666671	1011.0	53100
31	17.26722224	47.88972227	121.0	23212
32	21.65888892	48.38083335	100.0	62305
33	19.00111111	49.80805560	398.0	600
34	19.96027783	49.29388890	855.0	625
35	19.98194450	49.23250001	1991.0	650
36	20.68916670	49.62722225	292.0	660
37	22.34166668	49.46638891	420.0	690
38	19.68805559	49.72583337	360.0	6507
39	19.51888892	49.61166670	697.0	6513
40	19.69583337	49.47194447	615.0	6518
41	20.41833336	49.69361115	515.0	6605
42	20.43166669	49.44555558	445.0	6618
43	20.88638894	49.34972224	445.0	6628
44	21.29583335	49.73527782	285.0	6702
45	21.17250001	49.43805558	519.0	6707
46	22.06333334	49.33916668	470.0	6809
47	17.56972225	49.32055557	222.0	11774
48	17.70777781	48.90277782	383.0	11779
49	17.54194447	49.77722226	749.0	11766
50	18.24055557	49.54111114	436.0	11785
51	18.44777780	49.54611114	1322.0	11787
52	18.12166667	49.69833337	250.0	11782

Table 5.5b. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
11867	7	59.80	51705	29	47.83	11910	13	43.88
11927	14	43.73	11938	16	43.49	6628	43	42.91
6618	42	39.67	11961	18	38.83	11766	49	33.20
11774	47	33.09	11978	21	30.59	11858	5	30.35
23703	28	30.02	11902	11	29.40	11968	19	28.47
6605	41	27.88	11782	52	26.73	11903	12	26.63
11931	15	26.57	33511	24	25.41	11946	17	24.11
11779	48	22.94	690	37	22.58	11813	3	21.88
6518	40	21.86	660	36	20.38	6707	45	20.25
33631	25	20.11	11819	4	20.08	6513	39	19.43
44121	27	19.31	23201	31	18.30	11876	10	18.13
6702	44	17.81	11993	22	17.77	600	33	17.23
33514	26	16.63	33634	23	15.67	11977	20	15.65
11874	9	15.20	61709	32	14.75	11806	2	14.44
6507	38	14.33	11803	1	13.88	11866	6	13.84
625	34	13.67	11787	51	13.29	53101	30	13.11
11868	8	12.99	650	35	11.37	11785	50	11.32
6809	46	10.68						
AVERAGE:		24.07						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11803	1	3364.76	11902	11	1709.43	6507	38	805.20
11978	21	796.22	11785	50	596.33	11961	18	418.36
11946	17	388.23	600	33	380.88	660	36	326.10
33634	23	319.78	23201	31	275.37	11874	9	260.18
11876	10	250.47	33511	24	241.95	44121	27	237.25
11868	8	233.66	11866	6	202.52	11931	15	190.76
11779	48	186.00	11938	16	177.14	11993	22	171.47
6518	40	168.08	11782	52	163.70	6605	41	161.06
6618	42	158.80	51705	29	157.28	11858	5	147.95
11968	19	132.53	690	37	132.02	33514	26	126.02
11766	49	119.58	61709	32	117.64	11819	4	109.15
33631	25	104.65	11910	13	101.02	6702	44	97.22
11806	2	86.81	11867	7	81.26	11787	51	80.99
23703	28	78.41	6707	45	69.82	6513	39	68.83
625	34	66.95	11774	47	66.42	53101	30	61.28
650	35	54.17	11927	14	53.90	11813	3	52.65
6628	43	49.79	11977	20	38.43	11903	12	31.01
6809	46	12.86						
AVERAGE:		278.51						

2. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
6618	42	1.85	11874	9	1.75	11946	17	1.67
11868	8	1.35	11902	11	1.11	44121	27	1.03
11961	18	1.02	11803	1	0.99	6513	39	0.93
11866	6	0.90	23201	31	0.87	11779	48	0.86
660	36	0.86	33634	23	0.85	11978	21	0.80
600	33	0.80	6507	38	0.79	33511	24	0.77
11931	15	0.75	11806	2	0.75	11785	50	0.73
6605	41	0.69	51705	29	0.65	61709	32	0.64
6628	43	0.58	11993	22	0.54	53101	30	0.53
6518	40	0.52	11876	10	0.52	11927	14	0.51
33514	26	0.50	690	37	0.47	11787	51	0.46
11977	20	0.46	11813	3	0.44	11938	16	0.43

CARPATCLIM			Date	Version			Page	
<i>Report</i>			<i>02/10/2012</i>	<i>final</i>			<i>107</i>	
33631	25	0.40	6702	44	0.36	11766	49	0.34
11867	7	0.34	6707	45	0.30	11858	5	0.29
625	34	0.26	11968	19	0.26	11910	13	0.20
650	35	0.17	6809	46	0.15	11782	52	0.13
11819	4	0.12	23703	28	0.10	11774	47	0.06
11903	12	0.06						
AVERAGE:		0.63						

Table 5.5c. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 2814
Total number of errors: 3773
Maximal positive error: 995.79
Minimal negative error: -6.35

Table 5.6a. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda	fi	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	18.92027783	49.99638894	270.0
11	19.09527778	50.08500000	255.0
12	19.95861116	50.06416667	206.0
13	19.68805559	49.72583337	360.0
14	19.51888892	49.61166670	697.0
15	19.69583337	49.47194447	615.0
16	20.41833336	49.69361115	515.0
17	20.43166669	49.44555558	445.0
18	20.88638894	49.34972224	445.0
19	21.29583335	49.73527782	285.0
20	21.17250001	49.43805558	519.0
21	22.06333334	49.33916668	470.0
22	17.57000003	49.32000002	222.0
23	17.71000004	48.90000005	383.0
24	17.54000003	49.78000004	749.0
25	18.24000001	49.54000003	436.0
26	18.45000002	49.55000003	1322.0
27	18.12000001	49.70000004	250.0
28	18.76583337	49.43611113	468.0
29	19.18305556	49.36833335	780.0
30	19.72527782	49.03916667	640.0
31	19.91055560	49.14000001	972.0
32	20.84277782	49.26027779	485.0
33	21.91388894	49.25333335	305.0
34	22.00611111	48.93888894	176.0
35	23.63333337	50.25000001	252.0
36	23.38333335	49.95000005	245.0
37	23.16666668	49.80000004	232.0
38	23.56694447	49.36222224	275.0
39	23.03333334	49.15000001	594.0
40	22.46666669	48.90000005	205.0

Table 5.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
23	23	134.67	4	4	131.28	37	37	112.24
24	24	105.78	30	30	99.52	27	27	81.21
12	12	74.94	1	1	74.66	17	17	71.73
15	15	69.65	25	25	65.03	3	3	63.33
34	34	60.32	29	29	59.19	35	35	58.53
28	28	54.83	13	13	48.17	10	10	47.60
40	40	47.59	33	33	46.92	14	14	46.49
31	31	44.34	22	22	43.32	8	8	42.90
39	39	41.99	32	32	40.92	16	16	38.03
19	19	37.27	20	20	37.23	11	11	34.48
38	38	32.66	36	36	32.20	26	26	31.17
7	7	30.51	5	5	27.67	9	9	26.30
18	18	24.61	6	6	18.83	2	2	16.83
21	21	15.79						
AVERAGE:		54.27						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
13	13	840.71	11	11	672.07	25	25	508.03
32	32	423.71	37	37	313.19	23	23	283.37
4	4	272.24	30	30	244.97	34	34	234.39
29	29	233.66	1	1	225.40	28	28	213.28
5	5	185.23	27	27	171.22	17	17	161.35
15	15	146.70	19	19	127.66	12	12	124.40
3	3	120.21	24	24	119.38	16	16	117.14
8	8	113.23	35	35	108.19	40	40	98.99
9	9	94.92	10	10	92.79	39	39	86.47
2	2	82.27	22	22	74.55	31	31	73.09
14	14	67.56	6	6	66.33	20	20	56.14
33	33	53.09	38	38	51.06	18	18	42.11
7	7	36.39	36	36	31.31	26	26	27.76
21	21	20.72						
AVERAGE:		175.38						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
17	17	0.99	11	11	0.94	32	32	0.88
29	29	0.87	30	30	0.84	13	13	0.65
37	37	0.53	25	25	0.52	28	28	0.47
23	23	0.46	40	40	0.41	8	8	0.38
10	10	0.37	14	14	0.37	20	20	0.34
9	9	0.33	39	39	0.33	1	1	0.31
4	4	0.30	34	34	0.26	15	15	0.26
12	12	0.25	16	16	0.23	5	5	0.22
31	31	0.22	19	19	0.21	3	3	0.20
21	21	0.16	38	38	0.16	18	18	0.14
6	6	0.11	2	2	0.11	26	26	0.09
7	7	0.08	35	35	0.08	36	36	0.07
33	33	0.05	24	24	0.04	27	27	0.04
22	22	0.03						
AVERAGE:		0.33						

Table 5.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 2563
 Total number of errors: 3298
 Maximal positive error: 5.65
 Minimal negative error: -6.32

Table 5.7a. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 1151
 Total number of errors: 1313
 Maximal positive error: 996.83
 Minimal negative error: -5.11

Table 5.7b. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
3	3	109.35	11	11	71.05	17	17	65.38
12	12	58.33	16	16	56.34	6	6	55.99
4	4	54.18	14	14	49.10	1	1	47.85
2	2	46.60	9	9	45.07	8	8	42.48
15	15	40.33	7	7	35.19	10	10	33.70
13	13	26.21	5	5	20.88			
AVERAGE:		50.47						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
7	7	4577.17	4	4	508.01	14	14	285.37
15	15	229.84	16	16	227.52	2	2	205.80
12	12	176.67	6	6	173.00	13	13	131.98
3	3	119.38	17	17	115.16	10	10	112.65
11	11	87.46	8	8	80.47	1	1	66.44
9	9	65.93	5	5	27.76			
AVERAGE:		422.98						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
7	7	1.00	14	14	0.97	4	4	0.57
2	2	0.49	15	15	0.40	12	12	0.40
17	17	0.39	8	8	0.29	16	16	0.27
13	13	0.26	9	9	0.20	5	5	0.13
6	6	0.11	3	3	0.09	10	10	0.08
11	11	0.07	1	1	0.02			
AVERAGE:		0.34						

The Stations are the same as at Table 4.7c.

Annex 6. Surface vapour pressure

Table 6.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
sanni	58	54.24	26505	12	42.04	arad	55	37.59
16601	1	36.39	53521	31	35.31	53101	30	34.18
39113	20	32.97	kosic	67	30.53	sacui	57	28.71
16414	6	28.40	sombo	53	28.04	donji	47	27.73
15310	4	27.55	55706	34	27.50	56300	35	27.47
daruv	45	26.64	brati	63	26.48	38605	19	25.75
13704	2	25.38	52819	29	25.18	36500	18	24.58
73302	43	24.03	16204	5	24.00	17306	7	23.86
stos	66	23.73	satu	59	23.65	27815	13	23.60
slavo	49	22.95	54306	32	20.69	64704	41	20.57
58113	37	19.89	44214	23	19.81	palic	52	19.79
48101	27	19.39	36407	17	18.99	58300	38	18.52
orade	56	18.43	bereg	60	17.91	milho	68	17.67
61709	39	17.59	55502	33	17.49	63411	40	17.33
34211	15	17.04	djurd	46	16.81	23703	10	16.57
28700	14	16.53	lucen	65	15.92	44121	22	15.89
44527	24	15.69	uzhgo	62	14.89	hurba	64	14.55
46303	25	14.48	khust	61	14.32	bjelo	44	14.07
14706	3	13.86	kikin	54	13.79	valpo	50	13.59
57311	36	13.39	17809	8	13.19	backi	51	12.20
47106	26	11.17	66519	42	10.91	36100	16	10.83
23201	9	10.43	25212	11	9.84	43613	21	9.77
osije	48	8.66	51705	28	8.33			
AVERAGE:		21.02						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
backi	51	737.19	bjelo	44	590.33	osije	48	421.85
sombo	53	361.74	djurd	46	303.50	kikin	54	234.09
hurba	64	232.98	27815	13	211.41	43613	21	194.50
16601	1	189.57	daruv	45	183.46	46303	25	173.85
slavo	49	169.82	56300	35	168.77	17306	7	160.19
valpo	50	157.76	25212	11	147.75	palic	52	146.62
53521	31	133.38	51705	28	120.75	54306	32	119.96
44121	22	114.03	58300	38	112.43	17809	8	110.69
52819	29	110.23	26505	12	105.54	38605	19	103.44
donji	47	100.14	39113	20	95.93	36500	18	86.00
16414	6	85.02	14706	3	83.86	khust	61	83.13
73302	43	80.02	16204	5	78.99	brati	63	75.10
lucen	65	74.93	34211	15	70.65	57311	36	69.63
kosic	67	67.74	61709	39	66.59	55502	33	65.90
13704	2	65.12	stos	66	61.93	sanni	58	61.35
15310	4	59.38	55706	34	57.94	44214	23	55.79
23201	9	48.62	arad	55	47.80	28700	14	47.07
63411	40	44.76	36100	16	41.26	milho	68	38.08
36407	17	36.94	53101	30	35.60	uzhgo	62	34.56
66519	42	33.50	64704	41	32.37	58113	37	30.61
sacui	57	28.64	satu	59	27.79	48101	27	23.04
orade	56	20.23	47106	26	15.78	23703	10	15.63
44527	24	13.13	bereg	60	11.83			
AVERAGE:		117.47						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
16601	1	1.51	43613	21	1.50	51705	28	1.34
valpo	50	1.24	26505	12	1.17	backi	51	1.16
donji	47	1.15	djurd	46	1.04	58300	38	1.00
52819	29	0.98	sombo	53	0.96	bjelo	44	0.96
brati	63	0.94	daruv	45	0.91	15310	4	0.85
osije	48	0.83	57311	36	0.83	36500	18	0.80
hurba	64	0.79	38605	19	0.78	27815	13	0.73
44214	23	0.72	14706	3	0.72	73302	43	0.70
slavo	49	0.67	milho	68	0.65	44121	22	0.63
16204	5	0.62	54306	32	0.60	25212	11	0.56
17306	7	0.56	34211	15	0.56	23201	9	0.56
kikin	54	0.55	khust	61	0.54	53521	31	0.52
61709	39	0.52	36100	16	0.48	lucen	65	0.48
13704	2	0.46	46303	25	0.46	44527	24	0.46
stos	66	0.44	39113	20	0.41	kosic	67	0.39
55502	33	0.36	17809	8	0.36	16414	6	0.35
36407	17	0.35	48101	27	0.31	63411	40	0.31
56300	35	0.29	55706	34	0.28	palic	52	0.27
58113	37	0.27	28700	14	0.27	53101	30	0.22
arad	55	0.22	bereg	60	0.21	66519	42	0.20
64704	41	0.19	satu	59	0.15	47106	26	0.14
sanni	58	0.11	sacui	57	0.09	orade	56	0.08
uzhgo	62	0.08	23703	10	0.02			
AVERAGE:		0.59						

The Stations are the same as at Table 1.1a.

Table 6.1b. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 2561
 Total number of errors: 3087
 Maximal positive error: 109.94
 Minimal negative error: -20.26

Table 6.2a. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 1387
 Total number of errors: 1657
 Maximal positive error: 8.91
 Minimal negative error: -8.59

Table 6.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
TI	6	154.17	NS	15	102.57	LO	19	62.15
SZ	4	57.84	ZR	16	57.49	CA	12	51.28
ZA	35	50.61	VG	26	44.11	ZG	29	43.92
PO	31	36.88	CU	34	35.50	ZL	30	33.87
PA	13	32.78	KS	33	30.97	VL	2	29.98
KI	17	29.33	NE	27	28.38	TS	10	27.16
VS	18	26.86	BL	11	26.57	BG	23	23.78
BN	7	23.08	KV	32	22.20	BJ	3	21.97
OS	1	20.96	SE	28	19.20	SU	22	18.97
SN	5	18.66	OR	8	18.42	SM	20	17.19
KG	24	14.45	SP	25	14.29	VA	21	13.62
SO	14	12.62	SC	9	11.14			
AVERAGE:		35.23						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
SE	28	614.68	VL	2	391.85	ZG	29	287.56
NS	15	270.29	ZR	16	222.71	OS	1	222.16
SU	22	213.32	TI	6	205.24	SO	14	193.56
CU	34	181.50	LO	19	161.81	SM	20	151.58
KI	17	147.90	VG	26	127.86	ZA	35	123.61
NE	27	105.71	CA	12	80.41	PO	31	79.61
VS	18	74.77	SZ	4	73.01	PA	13	70.11
KS	33	58.77	BG	23	50.79	BL	11	43.33
KV	32	42.15	BJ	3	42.12	ZL	30	35.92
BN	7	32.78	SP	25	24.47	VA	21	24.11
TS	10	21.51	SN	5	19.25	KG	24	18.45
OR	8	18.44	SC	9	12.32			
AVERAGE:		126.96						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
SE	28	1.64	VL	2	1.46	SO	14	1.37
VA	21	0.82	SU	22	0.65	KS	33	0.59
ZG	29	0.57	OS	1	0.56	ZR	16	0.42
NE	27	0.38	CU	34	0.33	SM	20	0.32
KI	17	0.32	NS	15	0.32	ZA	35	0.29
VG	26	0.26	PO	31	0.26	PA	13	0.24
KV	32	0.23	BJ	3	0.23	BG	23	0.16
CA	12	0.15	SZ	4	0.15	ZL	30	0.14
LO	19	0.12	SC	9	0.10	KG	24	0.08
SP	25	0.07	VS	18	0.04	BN	7	0.02
BL	11	0.02	SN	5	0.02	TS	10	0.01
OR	8	0.01	TI	6	0.00			
AVERAGE:		0.35						

The Stations are the same as at Table 4.2b.

Table 6.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
634322	95	117.06	538416	65	114.54	455200	34	114.19
548409	71	106.95	523108	54	96.32	751555	123	92.23
546115	70	90.59	708430	109	88.02	655522	104	83.16
413838	12	80.10	714623	113	75.24	530801	64	73.24
349835	3	73.14	635658	97	70.87	446853	30	69.29
639744	98	67.52	352557	4	66.65	642540	99	66.43
622544	91	65.78	506422	41	64.55	500432	37	62.48
415816	14	61.33	444417	27	61.15	417530	15	60.71
539357	66	60.52	530535	63	58.32	454936	33	57.50
13173	135	56.86	758355	124	55.42	452452	31	55.36
605537	80	52.17	443639	25	51.78	632432	94	51.72
632229	93	51.33	748253	122	50.83	655650	105	50.30
551459	72	49.38	617220	87	49.21	346452	1	48.29
608121	82	48.21	407500	9	47.98	709352	110	47.53
430608	20	47.10	610244	83	46.82	445718	29	46.26
502317	40	45.81	618518	89	45.69	13285	133	45.61
622303	90	45.56	553254	75	45.21	441757	24	45.20
511849	47	44.84	57311	127	44.51	541154	67	43.99
551716	74	43.88	406421	8	43.00	711305	112	42.82
557334	76	42.40	456526	35	41.67	656555	106	40.57
719507	114	40.44	359521	6	40.23	511912	48	40.08
528518	62	39.62	453344	32	39.29	542532	69	39.11
602213	78	38.58	517507	50	38.35	614740	86	38.01
444820	28	36.79	33657	140	35.66	509441	43	35.62
525323	59	35.41	604037	79	35.03	722205	115	32.41
519622	53	32.27	13174	131	31.92	33658	137	31.85
511349	46	31.61	66519	125	31.52	436447	21	31.50
656621	107	31.22	647334	101	30.66	646247	100	29.44
33638	138	29.34	509649	44	29.04	651305	103	28.84
347357	2	28.07	525215	58	27.97	401321	7	27.93
722657	116	27.86	414352	13	27.58	438238	22	27.45
551621	73	27.26	502141	39	27.14	422751	16	27.07
439534	23	26.61	2802	130	26.27	518231	52	26.20
457600	36	25.09	523530	56	24.81	740330	119	24.38
517545	51	24.35	73302	128	24.08	606705	81	24.01
501252	38	23.97	632130	92	22.99	507158	42	22.25
710736	111	22.19	13295	132	22.19	58300	129	22.06
611355	84	21.53	614436	85	21.12	359257	5	21.09
635347	96	20.99	425606	17	20.92	523328	55	20.87
412721	11	20.68	525358	60	20.13	428307	18	20.11
13183	134	20.10	64704	126	20.05	739615	118	19.85
747356	121	19.71	515231	49	19.69	408800	10	18.97
527527	61	18.49	33634	136	18.39	617637	88	17.31
741640	120	16.88	444127	26	16.74	600608	77	15.47
428632	19	14.81	33647	139	14.73	737439	117	13.89
703156	108	13.59	523703	57	12.80	650727	102	12.67
541601	68	12.05	509940	45	9.54			

AVERAGE: 40.87

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
430608	20	611.17	642540	99	444.34	2802	130	425.28
634322	95	407.00	708430	109	387.85	622544	91	367.45
456526	35	336.25	635658	97	326.34	511349	46	324.59
656621	107	320.79	548409	71	269.34	538416	65	264.46
443639	25	222.12	655522	104	220.84	13285	133	218.08
58300	129	174.68	617220	87	171.68	414352	13	171.23
446853	30	164.80	530801	64	163.53	413838	12	160.80
452452	31	151.95	457600	36	150.36	13174	131	148.23
417530	15	142.41	605537	80	142.05	632432	94	141.31
352557	4	139.82	66519	125	137.13	714623	113	136.75
758355	124	135.67	709352	110	132.08	349835	3	126.37
539357	66	120.15	455200	34	119.19	13173	135	118.56
610244	83	111.52	453344	32	109.97	57311	127	105.57
647334	101	104.87	436447	21	103.41	506422	41	103.04
523108	54	101.90	502317	40	99.88	509649	44	97.12
511849	47	94.73	519622	53	92.67	546115	70	91.26
553254	75	88.54	557334	76	85.33	73302	128	84.98
602213	78	83.45	441757	24	80.84	425606	17	78.74
618518	89	78.24	415816	14	75.74	656555	106	75.38
33657	140	75.37	542532	69	75.26	551716	74	75.17
606705	81	74.54	517507	50	73.67	617637	88	72.98
622303	90	72.43	722657	116	72.16	632229	93	71.70
359521	6	71.64	500432	37	70.50	655650	105	69.82
646247	100	67.41	530535	63	67.39	454936	33	66.82
651305	103	66.65	33638	138	65.02	422751	16	64.20
639744	98	62.97	445718	29	62.44	551459	72	60.99
748253	122	60.79	608121	82	59.73	406421	8	56.43
346452	1	55.81	511912	48	55.20	347357	2	54.61
741640	120	53.78	614740	86	50.78	541154	67	48.87
444820	28	47.56	528518	62	45.92	359257	5	44.92
407500	9	44.22	711305	112	42.92	751555	123	42.74
444417	27	42.72	614436	85	42.14	551621	73	42.09
428307	18	41.98	719507	114	40.60	722205	115	40.30
509441	43	38.17	33658	137	38.16	518231	52	37.01
604037	79	36.99	13183	134	35.70	439534	23	35.08
64704	126	34.52	525215	58	34.17	740330	119	34.08
517545	51	34.00	525323	59	32.43	515231	49	32.31
523328	55	31.53	401321	7	28.66	747356	121	28.49
611355	84	28.45	33647	139	28.00	502141	39	27.90
632130	92	27.81	650727	102	27.55	635347	96	27.36
523530	56	26.15	408800	10	25.07	501252	38	24.99
438238	22	24.45	525358	60	24.38	739615	118	23.13
412721	11	22.98	13295	132	22.53	428632	19	20.60
444127	26	20.50	33634	136	20.32	710736	111	20.20
507158	42	19.41	527527	61	18.94	523703	57	17.99
600608	77	17.46	737439	117	17.32	541601	68	16.32
509940	45	14.74	703156	108	14.63			
AVERAGE:		97.90						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
58300	129	1.00	430608	20	0.71	57311	127	0.63
2802	130	0.57	73302	128	0.54	519622	53	0.44
13173	135	0.41	13174	131	0.38	511349	46	0.36
456526	35	0.36	64704	126	0.32	656621	107	0.31
515231	49	0.29	13285	133	0.27	622544	91	0.27
610244	83	0.25	551621	73	0.23	452452	31	0.22
708430	109	0.22	530801	64	0.20	443639	25	0.20
457600	36	0.20	642540	99	0.19	66519	125	0.18
647334	101	0.16	656555	106	0.16	651305	103	0.16
539357	66	0.15	506422	41	0.15	614436	85	0.15

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>	Version <i>final</i>		Page <i>116</i>			
33657	140	0.15	632432	94	0.15	527527	61	0.14
617220	87	0.13	634322	95	0.13	548409	71	0.13
33634	136	0.13	414352	13	0.13	446853	30	0.13
13295	132	0.12	502317	40	0.12	455200	34	0.12
557334	76	0.12	453344	32	0.12	509649	44	0.11
436447	21	0.10	605537	80	0.10	33638	138	0.10
741640	120	0.10	352557	4	0.10	417530	15	0.10
507158	42	0.10	542532	69	0.09	33658	137	0.09
511849	47	0.09	422751	16	0.08	748253	122	0.08
618518	89	0.08	359257	5	0.08	509441	43	0.08
737439	117	0.08	439534	23	0.08	650727	102	0.08
413838	12	0.07	758355	124	0.07	428307	18	0.07
551459	72	0.07	425606	17	0.07	551716	74	0.07
538416	65	0.07	347357	2	0.07	635658	97	0.07
528518	62	0.06	606705	81	0.06	622303	90	0.06
518231	52	0.06	523328	55	0.06	646247	100	0.06
553254	75	0.06	530535	63	0.05	33647	139	0.05
655522	104	0.05	523530	56	0.05	444417	27	0.05
714623	113	0.05	441757	24	0.05	639744	98	0.05
428632	19	0.05	608121	82	0.05	602213	78	0.04
13183	134	0.04	523703	57	0.04	349835	3	0.04
517507	50	0.04	407500	9	0.04	525323	59	0.04
739615	118	0.03	501252	38	0.03	722657	116	0.03
655650	105	0.03	509940	45	0.03	401321	7	0.03
751555	123	0.03	517545	51	0.03	525358	60	0.03
500432	37	0.03	511912	48	0.03	710736	111	0.03
635347	96	0.03	709352	110	0.03	740330	119	0.03
614740	86	0.03	444820	28	0.02	632229	93	0.02
711305	112	0.02	346452	1	0.02	359521	6	0.02
632130	92	0.02	541154	67	0.02	611355	84	0.02
445718	29	0.02	454936	33	0.02	415816	14	0.02
406421	8	0.02	747356	121	0.01	604037	79	0.01
525215	58	0.01	617637	88	0.01	412721	11	0.01
600608	77	0.01	502141	39	0.01	546115	70	0.01
408800	10	0.00	438238	22	0.00	444127	26	0.00
523108	54	0.00	541601	68	0.00	703156	108	0.00
719507	114	0.00	722205	115	0.00			
AVERAGE:		0.11						

The Stations are the same as at Table 1.3a.

Table 6.3b. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 3899
Total number of errors: 9036
Maximal positive error: 41.17
Minimal negative error: -7.95

Table 6.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
2	2	91.81	41	41	65.68	11	11	62.72
9	9	53.26	6	6	51.01	7	7	50.32
48	48	48.98	32	32	48.92	16	16	47.67
33	33	45.47	49	49	45.21	28	28	43.99
26	26	42.04	23	23	41.86	30	30	41.72
27	27	40.86	36	36	40.41	17	17	40.13
43	43	39.00	13	13	37.35	5	5	37.13
34	34	34.45	50	50	34.22	4	4	33.95
19	19	31.92	3	3	31.41	1	1	30.74
37	37	30.08	14	14	29.73	31	31	29.57
40	40	29.12	10	10	28.84	8	8	28.75
52	52	27.66	25	25	27.65	20	20	27.36
35	35	26.44	15	15	25.44	45	45	25.01
47	47	24.40	51	51	23.92	22	22	22.08
39	39	21.72	53	53	20.71	12	12	18.76
21	21	18.74	44	44	17.96	29	29	17.35
24	24	16.16	38	38	15.57	18	18	15.29
46	46	15.17	42	42	14.82			
AVERAGE:		34.16						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
32	32	224.59	13	13	222.03	9	9	199.83
14	14	160.06	23	23	157.83	30	30	125.03
27	27	123.37	25	25	106.98	34	34	106.52
15	15	97.52	7	7	94.99	48	48	94.18
16	16	90.46	41	41	89.02	11	11	86.63
45	45	85.43	33	33	85.16	47	47	84.95
6	6	84.40	36	36	82.46	12	12	80.74
1	1	67.80	26	26	64.35	43	43	62.85
4	4	61.96	50	50	60.54	17	17	56.48
5	5	52.84	28	28	51.65	37	37	51.46
8	8	51.39	2	2	47.36	3	3	45.45
29	29	45.09	19	19	45.07	20	20	41.08
21	21	40.64	49	49	40.36	31	31	40.23
46	46	39.16	39	39	38.47	40	40	35.24
10	10	33.46	38	38	33.31	51	51	29.57
52	52	28.29	44	44	28.21	22	22	27.85
35	35	25.05	42	42	24.08	24	24	18.16
18	18	17.21	53	53	14.36			
AVERAGE:		71.72						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
47	47	0.70	46	46	0.56	37	37	0.56
44	44	0.43	14	14	0.40	13	13	0.39
45	45	0.39	15	15	0.35	9	9	0.33
39	39	0.33	25	25	0.33	32	32	0.31
43	43	0.31	30	30	0.29	21	21	0.26
28	28	0.26	33	33	0.25	36	36	0.21

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>118</i>		
23	23	0.20	42	42	0.20	16	16	0.19
50	50	0.17	3	3	0.15	41	41	0.15
10	10	0.14	48	48	0.14	34	34	0.13
12	12	0.13	31	31	0.13	35	35	0.13
38	38	0.12	5	5	0.11	24	24	0.10
4	4	0.09	20	20	0.09	1	1	0.09
51	51	0.08	27	27	0.08	7	7	0.08
26	26	0.07	19	19	0.06	6	6	0.06
52	52	0.06	17	17	0.06	11	11	0.05
22	22	0.05	53	53	0.05	49	49	0.05
2	2	0.05	40	40	0.04	8	8	0.04
29	29	0.03	18	18	0.03			
AVERAGE:		0.19						

The Stations are the same as at Table 1.4a.

Table 6.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 2133
Total number of errors: 2546
Maximal positive error: 41.43
Minimal negative error: -12.44

Table 6.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
6618	42	73.88	11931	15	50.48	6707	45	48.11
11866	6	46.83	600	33	45.40	11867	7	45.35
33511	24	42.70	33514	26	42.38	6605	41	41.40
11961	18	37.51	11868	8	35.69	6507	38	33.09
11782	52	32.26	11774	47	31.71	11766	49	31.30
11813	3	30.87	23201	27	29.89	650	35	29.88
690	37	29.42	11968	19	28.14	33631	25	27.41
11779	48	26.43	6518	40	24.55	11946	17	23.90
6702	44	22.90	33634	23	22.01	11876	10	21.85
11993	22	21.37	11927	14	21.17	11902	11	20.92
11874	9	20.91	660	36	20.11	11910	13	19.10
625	34	18.38	11787	51	18.37	11785	50	18.07
51705	30	17.87	11803	1	17.58	61709	32	17.56
11806	2	16.09	11903	12	15.90	6513	39	15.66
11819	4	15.36	11938	16	15.28	44121	29	15.04
11977	20	14.94	53101	31	13.72	11978	21	13.43
23703	28	10.80	6628	43	10.59	11858	5	10.44
6809	46	8.39						
AVERAGE:		26.20						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
6518	40	229.42	6618	42	226.89	11785	50	157.14
6605	41	146.03	11774	47	135.76	11779	48	100.11
51705	30	91.40	11858	5	91.15	11968	19	87.44
11993	22	86.90	6507	38	83.92	11931	15	80.00
11866	6	77.49	6707	45	77.05	600	33	76.70
11874	9	76.14	11867	7	75.99	11902	11	74.86
11910	13	71.46	11819	4	69.69	61709	32	68.74
11946	17	65.15	11868	8	64.16	11782	52	63.68
690	37	63.23	44121	29	55.44	33511	24	55.44
11978	21	55.37	11803	1	55.09	11903	12	52.73
11927	14	51.90	33514	26	49.83	6702	44	47.94
53101	31	46.34	11766	49	45.68	625	34	43.61
33631	25	43.16	11813	3	41.71	23201	27	39.59
6628	43	37.82	6513	39	35.85	660	36	35.03
11806	2	33.90	11977	20	33.18	11961	18	32.23
11787	51	30.73	11876	10	29.23	23703	28	26.92
650	35	26.85	11938	16	18.49	33634	23	17.40
6809	46	13.53						
AVERAGE:		67.22						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
11785	50	1.17	44121	29	1.02	11803	1	1.02
51705	30	0.99	11978	21	0.92	11910	13	0.81
11774	47	0.79	11977	20	0.77	11779	48	0.71
11961	18	0.70	690	37	0.63	61709	32	0.61
11787	51	0.60	11903	12	0.59	11766	49	0.56
11968	19	0.46	23201	27	0.45	11927	14	0.45

CARPATCLIM			Date	Version			Page	
<i>Report</i>			<i>02/10/2012</i>	<i>final</i>			<i>120</i>	
11876	10	0.40	11858	5	0.40	11866	6	0.39
6618	42	0.39	11813	3	0.38	11993	22	0.35
11868	8	0.33	53101	31	0.33	6507	38	0.33
6518	40	0.32	11806	2	0.32	11819	4	0.30
33514	26	0.29	11782	52	0.28	600	33	0.26
11946	17	0.25	11874	9	0.24	11902	11	0.22
11931	15	0.22	660	36	0.20	33634	23	0.16
6513	39	0.14	6605	41	0.14	625	34	0.14
11867	7	0.12	11938	16	0.10	23703	28	0.09
6809	46	0.08	6702	44	0.07	6707	45	0.06
33511	24	0.05	33631	25	0.04	650	35	0.02
6628	43	0.00						
AVERAGE:		0.40						

The Stations are the same as at Table 5.5a.

Table 6.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 1694
 Total number of errors: 2115
 Maximal positive error: 9.11
 Minimal negative error: -3.44

Table 6.6a. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda	fi	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	18.92027783	49.99638894	270.0
11	19.09527778	50.08500000	255.0
12	19.95861116	50.06416667	206.0
13	19.68805559	49.72583337	360.0
14	19.51888892	49.61166670	697.0
15	19.69583337	49.47194447	615.0
16	20.41833336	49.69361115	515.0
17	20.43166669	49.44555558	445.0
18	20.88638894	49.34972224	445.0
19	21.29583335	49.73527782	285.0
20	21.17250001	49.43805558	519.0
21	22.06333334	49.33916668	470.0
22	17.57000003	49.32000002	222.0
23	17.71000004	48.90000005	383.0
24	17.54000003	49.78000004	749.0
25	18.24000001	49.54000003	436.0
26	18.45000002	49.55000003	1322.0
27	18.12000001	49.70000004	250.0
28	23.63333337	50.25000001	252.0
29	23.16666668	49.80000004	232.0
30	23.38333335	49.95000005	245.0
31	23.56694447	49.36222224	275.0
32	23.03333334	49.15000001	594.0
33	22.46666669	48.90000005	205.0
34	19.18305556	49.36833335	780.0
35	19.72527782	49.03916667	640.0
36	19.91055560	49.14000001	972.0
37	20.84277782	49.26027779	485.0
38	21.91388894	49.25333335	305.0
39	22.00611111	48.93888894	176.0
40	18.76583337	49.43611113	468.0

Table 6.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
22	22	95.97	39	39	86.24	14	14	84.30
31	31	81.89	30	30	66.87	26	26	56.92
15	15	54.23	25	25	48.51	13	13	46.85
27	27	46.09	4	4	43.26	12	12	39.79
35	35	38.49	17	17	37.84	8	8	37.02
16	16	36.91	38	38	36.79	11	11	36.72
20	20	36.16	32	32	35.53	34	34	33.78
9	9	33.62	23	23	33.04	37	37	32.77
28	28	32.62	2	2	31.57	3	3	30.79
5	5	30.05	1	1	29.18	19	19	27.82
29	29	26.91	24	24	25.73	10	10	24.95
6	6	24.44	36	36	24.08	7	7	21.92
18	18	20.87	33	33	15.55	21	21	15.48
40	40	15.18						
AVERAGE:		39.42						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
31	31	186.60	17	17	180.52	25	25	176.93
16	16	171.66	15	15	154.68	13	13	141.90
22	22	135.73	30	30	109.84	39	39	108.26
14	14	98.57	19	19	87.99	35	35	85.80
20	20	77.05	1	1	72.03	26	26	67.91
34	34	64.12	27	27	63.68	9	9	62.61
28	28	57.31	40	40	55.39	37	37	52.33
24	24	49.38	23	23	49.21	5	5	47.30
11	11	47.21	32	32	46.50	4	4	45.17
8	8	41.34	18	18	37.82	29	29	37.77
12	12	37.19	2	2	35.39	6	6	34.12
38	38	32.89	33	33	32.69	3	3	31.15
36	36	30.41	10	10	29.23	7	7	20.50
21	21	14.54						
AVERAGE:		72.77						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
25	25	1.22	37	37	0.55	23	23	0.47
22	22	0.42	31	31	0.39	5	5	0.33
36	36	0.31	13	13	0.29	40	40	0.25
1	1	0.23	33	33	0.19	35	35	0.17
10	10	0.15	16	16	0.14	17	17	0.14
26	26	0.12	29	29	0.12	34	34	0.12
9	9	0.11	11	11	0.11	38	38	0.11
15	15	0.10	27	27	0.09	3	3	0.09
2	2	0.09	6	6	0.09	24	24	0.08
19	19	0.08	7	7	0.07	14	14	0.07
12	12	0.07	32	32	0.07	30	30	0.06
8	8	0.05	39	39	0.04	4	4	0.04
20	20	0.04	18	18	0.03	21	21	0.02
28	28	0.01						
AVERAGE:		0.18						

Table 6.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 1594
 Total number of errors: 2083
 Maximal positive error: 16.88
 Minimal negative error: -3.31

Table 6.7a. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 697
 Total number of errors: 769
 Maximal positive error: 5.90
 Minimal negative error: -2.47

Table 6.7b. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
1	1	87.53	4	4	52.63	16	16	40.50
14	14	37.18	9	9	34.46	5	5	33.73
15	15	33.16	17	17	32.58	2	2	32.23
12	12	31.31	11	11	30.41	6	6	29.71
3	3	25.42	7	7	25.22	8	8	18.23
13	13	17.36	10	10	12.10			
AVERAGE:		33.75						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
4	4	176.93	1	1	135.95	2	2	108.98
16	16	94.09	15	15	82.63	14	14	76.30
12	12	75.15	5	5	67.95	6	6	63.68
7	7	62.44	17	17	50.70	3	3	49.32
11	11	41.52	10	10	37.71	9	9	36.33
13	13	32.21	8	8	30.73			
AVERAGE:		71.92						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
4	4	1.18	7	7	1.03	2	2	0.47
1	1	0.44	17	17	0.40	16	16	0.36
12	12	0.33	8	8	0.31	10	10	0.29
11	11	0.25	15	15	0.25	3	3	0.23
5	5	0.23	14	14	0.18	13	13	0.11
6	6	0.10	9	9	0.08			
AVERAGE:		0.37						

The Stations are the same as at Table 4.7c.

Annex 7. Surface air pressure

Table 7.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
17809	5	70.29	53101	17	58.95	39113	11	54.52
16203	3	51.23	osije	25	49.50	23201	6	45.97
bereg	35	39.91	23703	7	39.79	16414	4	37.89
uzhgo	37	37.02	52819	16	35.35	arad	30	33.94
satu	34	33.69	26505	9	32.99	brati	38	31.59
kosic	41	31.55	36100	10	29.82	58113	19	28.80
slavo	26	28.31	44121	12	26.83	64704	21	25.69
66519	22	24.62	48101	15	23.86	lucen	40	23.51
khust	36	23.31	daruv	24	22.82	orade	31	20.46
bjelo	23	19.80	46303	14	19.44	63411	20	18.60
sanni	33	18.27	55502	18	16.97	sombo	28	16.44
palic	27	16.07	15307	2	15.12	hurba	39	14.69
13703	1	14.54	44527	13	14.39	25212	8	13.27
sacui	32	13.11	kikin	29	12.40			
AVERAGE:		28.91						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
16203	3	27152.90	63411	20	9967.20	13703	1	8719.17
arad	30	6086.53	16414	4	4707.32	44121	12	3573.51
brati	38	3326.29	39113	11	3042.08	48101	15	2297.53
osije	25	2040.52	palic	27	2001.38	25212	8	1857.95
15307	2	1742.18	26505	9	1662.77	52819	16	1441.66
uzhgo	37	1103.15	orade	31	928.86	bereg	35	802.99
slavo	26	669.58	55502	18	633.25	kikin	29	602.56
17809	5	601.72	64704	21	586.28	23703	7	521.87
satu	34	515.39	66519	22	358.02	36100	10	292.15
23201	6	250.84	44527	13	233.37	sacui	32	225.00
58113	19	222.06	lucen	40	202.18	hurba	39	160.07
daruv	24	148.29	khust	36	142.72	53101	17	110.24
sanni	33	88.96	bjelo	23	86.94	sombo	28	61.51
kosic	41	55.29	46303	14	51.81			
AVERAGE:		2177.42						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
16414	4	1.89	52819	16	1.66	15307	2	1.66
63411	20	1.61	16203	3	1.37	44121	12	1.18
arad	30	0.89	brati	38	0.88	13703	1	0.87
39113	11	0.79	palic	27	0.79	25212	8	0.63
26505	9	0.63	64704	21	0.62	uzhgo	37	0.51
55502	18	0.48	53101	17	0.45	48101	15	0.44
osije	25	0.40	slavo	26	0.37	bereg	35	0.34
46303	14	0.34	orade	31	0.34	23703	7	0.28
sacui	32	0.28	satu	34	0.28	44527	13	0.27
17809	5	0.24	hurba	39	0.24	khust	36	0.24
kikin	29	0.22	23201	6	0.22	66519	22	0.22
daruv	24	0.18	sombo	28	0.17	lucen	40	0.14
58113	19	0.11	sanni	33	0.10	bjelo	23	0.09
36100	10	0.09	kosic	41	0.06			
AVERAGE:		0.55						

Table 7.1b. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda(x)	fi(y)	h	stno	stna	country
1	16.60222222	47.67833333	233.8	13703	Sopron Kuruc-domb	HU
2	16.64777777	47.19833333	201.1	15307	Szombathely	HU
3	16.30944444	46.91027777	311.7	16203	Szentgotthárd Farkasfa	HU
4	16.81280000	46.92580000	240.1	16414	Zalaegerszeg Nagyutas	HU
5	16.97060000	46.45610000	139.8	17809	Nagykanizsa	HU
6	17.26720000	47.88970000	121.0	23201	Mosonmagyaróvár	HU
7	17.67470000	47.71000000	116.7	23703	Győr Likócs	HU
8	17.37220000	47.29220000	135.5	25212	Pápa Nyárád	HU
9	17.23860000	46.73560000	111.7	26505	Keszthely Tanyakereszt	HU
10	18.04080000	46.91080000	108.2	36100	Siófok	HU
11	18.23500000	45.99500000	200.2	39113	Pécs Pogány	HU
12	19.02810000	47.51110000	153.3	44121	Budapest belterület	HU
13	19.18220000	47.42920000	139.1	44527	Budapest Pestszentlőrinc-külterület	HU
14	19.74830000	46.91310000	114.0	46303	Kecskemét külterület	HU
15	19.01670000	46.18330000	113.0	48101	Baja Csávoly	HU
16	20.77140000	48.09690000	232.8	52819	Miskolc Avas	HU
17	20.01670000	47.86670000	111.3	53101	Kékestető	HU
18	20.20000000	47.12860000	90.0	55502	Szolnok Szandaszőlős	HU
19	20.09030000	46.25610000	81.8	58113	Szeged külterület	HU
20	21.88690000	47.96220000	142.1	63411	Nyíregyháza Napkor	HU
21	21.61080000	47.49030000	107.6	64704	Debrecen	HU
22	21.16060000	46.67940000	84.0	66519	Békéscsaba	HU
23	16.85000000	45.91700000	141.0	bjelo	Bjelovar	CR
24	17.23300000	45.60000000	161.0	daruv	Daruvár	CR
25	18.63300000	45.53300000	89.0	osije	Osijek	CR
26	18.00000000	45.16600000	88.0	slavo	Slavonski Brod	CR
27	19.76410000	46.09720000	102.0	palic	Palic	RS
28	19.14310000	45.76700000	87.0	sombo	Sombor	RS
29	20.46460000	45.84260000	80.0	kikin	Kikinda	RS
30	21.35362152	46.13351640		arad	Arad	RO
31	21.89592406	47.03570901		oradea	Oradea	RO
32	22.09450716	47.34415862		sacui	Sacuieni	RO
33	20.60156003	46.07128625		sanni	Sannicolau	RO
34	22.88714903	47.72148469		satu	Satu Mare	RO
35	22.60000000	48.20000000	113.0	bereg	Bereg	UA
36	23.30000000	48.20000000	164.0	khust	Khust	UA
37	22.30000000	48.60000000	115.0	uzhgo	Uzhgorod	UA
38	17.11060000	48.16860000	287.0	brati	Bratislava-Koliba	SK
39	18.19420000	47.87310000	115.0	hurba	Hurbanovo	SK
40	19.73600000	48.33900000	214.0	lucen	Lucenec-Bolkovce	SK
41	21.22250000	48.67220000	230.0	kosic	Kosice-Letisko	SK

Table 7.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 2688
 Total number of errors: 2900
 Maximal positive error: 22.6
 Minimal negative error: -13.9

Table 7.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
BGD	19	165.71	BCL	11	135.83	POZ	24	101.34
SEM	9	86.03	CUP	26	75.32	KRV	25	71.56
NEG	22	57.63	OSI	1	56.62	CAL	12	54.36
VGR	21	52.83	VLJ	17	48.44	SZE	4	48.08
SLB	2	44.81	SNM	5	38.87	BAN	7	36.59
VRS	15	35.74	BAJ	3	35.18	ZLA	23	33.66
ORA	8	27.91	TIM	6	27.01	PAL	13	26.45
SUR	18	24.86	LOZ	16	21.55	SPL	20	20.32
NSA	14	20.01	DTS	10	19.67			
AVERAGE:		52.55						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
NSA	14	2432.87	KRV	25	2246.41	BGD	19	2154.06
PAL	13	1934.73	LOZ	16	1821.19	OSI	1	1623.32
BAJ	3	1383.88	VGR	21	1159.59	SPL	20	1098.89
NEG	22	969.12	CAL	12	780.73	CUP	26	403.08
ORA	8	382.88	SLB	2	378.75	BAN	7	284.30
SUR	18	284.18	VLJ	17	274.63	SEM	9	257.77
SZE	4	244.50	VRS	15	212.28	BCL	11	172.46
POZ	24	151.72	TIM	6	132.02	DTS	10	118.71
SNM	5	77.38	ZLA	23	43.93			
AVERAGE:		808.59						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
PAL	13	0.82	CAL	12	0.81	ORA	8	0.69
NEG	22	0.62	KRV	25	0.53	VGR	21	0.51
SPL	20	0.49	TIM	6	0.45	BAJ	3	0.41
LOZ	16	0.40	BAN	7	0.39	OSI	1	0.37
SLB	2	0.31	DTS	10	0.31	NSA	14	0.29
SEM	9	0.29	BCL	11	0.20	VRS	15	0.19
SNM	5	0.18	BGD	19	0.17	SUR	18	0.15
CUP	26	0.15	VLJ	17	0.15	SZE	4	0.10
POZ	24	0.10	ZLA	23	0.01			
AVERAGE:		0.35						

Table 7.2b. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

index	lambda(x)	fi(y)	station
1	18.63300000	45.53300000	Osijek
2	18.00000000	45.16600000	Slavonski Brod
3	19.01666667	46.18333334	Baja
4	20.09027778	46.25611112	Szeged
5	20.60156002	46.07128625	Sannicolau Mare
6	21.25807108	45.77105643	Timisoara
7	21.13639857	45.38270108	Banloc
8	21.71048271	45.03871153	Oravita
9	22.05580461	45.18139466	Semenic
10	22.62607371	44.62645870	Drobeta Turnu Severin
11	23.11307189	44.47618111	Bacles
12	22.94605240	43.98489980	Calafat
13	19.76402300	46.09721800	Palic
14	19.83000300	45.32221500	Novi Sad
15	21.30552400	45.14413700	Vrsac
16	19.22693300	44.54109900	Loznica
17	19.91247300	44.27546400	Valjevo
18	20.29106300	44.82423700	Surcin
19	20.46482200	44.79845700	Beograd
20	20.94214600	44.36960000	Smederevska Palanka
21	21.49843000	44.75261400	Veliko Gradise
22	22.53634000	44.23915700	Negotin
23	19.71302300	43.73780700	Zlatibor
24	20.02952100	43.84307000	Pozega
25	20.69983600	43.70888400	Kraljevo
26	21.38063600	43.94061600	Cuprija

Table 7.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 744
 Total number of errors: 770
 Maximal positive error: 4.17
 Minimal negative error: -3.20

Table 7.3a. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda(x)	fi(y)	stno		stna	country
1	24.879770	43.760420	346452	31	TURNU MAGU	RO
2	23.945686	43.790056	347357	37	BECHET	RO
3	28.588980	43.816470	349835	6	MANGALIA	RO
4	25.934221	43.875470	352557	23	GIURGIU	RO
5	22.947569	43.985246	359257	62	CALAFAT	RO
6	25.354370	43.978290	359521	74	ALEXANDRIA	RO
7	23.332620	44.029510	401321	58	BAILESTI	RO
8	24.358813	44.100444	406421	107	CARACAL	RO
9	24.980030	44.107740	407500	105	ROSIORII D	RO
10	27.967130	44.088620	408800	159	ADAMCLISI	RO
11	27.339860	44.206430	412721	19	CALARASI	RO
12	28.646380	44.214090	413838	12	CONSTANTA	RO
13	23.868460	44.310600	414352	194	CRAIOVA	RO
14	28.252880	44.243560	415816	66	MEDGIDIA	RO
15	25.538540	44.283260	417530	106	VIDELE	RO
16	27.840478	44.391784	422751	57	FETESTI	RO
17	26.095322	44.412355	425606	84	BUCURESTI	RO
18	23.114580	44.476720	428307	316	BICLES	RO
19	26.525051	44.453228	428632	65	FUNDULEA	RO
20	26.079760	44.510820	430608	92	BUCURESTI	RO
21	24.791530	44.562880	436447	210	STOLNICI	RO
22	22.627650	44.626730	438238	73	DR.TR.SEVE	RO
23	25.580740	44.653200	439534	155	TITU	RO
24	27.965080	44.692000	441757	33	HIRSOVA	RO
25	26.658560	44.721950	443639	57	URZICENI	RO
26	21.634610	44.722850	444127	79	MOLDOVA VE	RO
27	24.238708	44.665755	444417	274	DRAGASANI	RO
28	28.343580	44.734700	444820	221	CORUGEA	RO
29	27.295990	44.740960	445718	43	GRIVITA	RO
30	28.877930	44.766410	446853	37	JURILOVCA	RO
31	24.867460	44.849290	452452	322	PITESTI	RO
32	23.710236	44.878418	453344	267	TG.LOGREST	RO
33	29.600520	44.896870	454936	1	SF. GH. DE	RO
34	22.007738	44.918651	455200	251	BOZOVICI	RO
35	25.427260	44.929910	456526	297	TIRGOVISTE	RO
36	25.988990	44.956090	457600	181	PLOIESTI	RO
37	24.571790	45.016290	500432	552	DEDULESTI	RO
38	22.861054	44.997136	501252	261	PADES(APA	RO
39	21.711840	45.038960	502141	303	ORAVITA	RO
40	23.260882	45.040958	502317	203	TG.JIU	RO
41	24.380980	45.089190	506422	229	RM. VILCEA	RO
42	22.057120	45.181730	507158	1432	SEMENIC	RO
43	24.671280	45.179170	509441	455	CURTEA DE	RO
44	26.853000	45.132910	509649	90	BUZAU	RO
45	29.760449	45.148694	509940	-9999	SULINA	RO
46	23.810150	45.165870	511349	531	POLOVRAGI	RO
47	28.825690	45.190840	511849	2	TULCEA	RO
48	29.158274	45.177107	511912	1	GORGOVA	RO
49	22.534340	45.281170	515231	2184	TARCU	RO
50	25.038140	45.275150	517507	684	CIMPULUNG	RO
51	25.753950	45.144480	517545	486	CIMPINA	RO
52	22.503050	45.300810	518231	1478	CUNTU	RO
53	26.370800	45.324960	519622	285	PATIRLAGEL	RO
54	21.137974	45.383051	523108	80	BANLOC	RO
55	23.464622	45.387686	523328	1560	PARING	RO
56	25.515713	45.355256	523530	1511	SINAIA(150	RO
57	27.040160	45.390750	523703	145	RM. SARAT	RO
58	22.226840	45.417560	525215	210	CARANSEBES	RO
59	23.378254	45.406610	525323	610	PETROSANI	RO
60	23.968553	45.411503	525358	579	VOINEASA	RO
61	25.458260	45.446140	527527	2514	VF. OMU	RO
62	25.273270	45.431910	528518	1372	FUNDATA	RO
63	25.585100	45.506460	530535	1101	PREDEAL	RO
64	28.033930	45.473300	530801	68	GALATI	RO
65	24.273180	45.653180	538416	506	BOITA	RO
66	23.934000	45.657510	539357	1466	PALTINIS	RO
67	21.934630	45.686730	541154	122	LUGOJ	RO
68	26.058304	45.668545	541601	697	INT.BUZAUL	RO
69	25.527720	45.696130	542532	537	BRASOV	RO
70	21.259360	45.771460	546115	87	TIMISOARA	RO
71	24.092940	45.789700	548409	446	SIBIU	RO
72	24.936720	45.836360	551459	428	FAGARAS	RO
73	26.377080	45.824010	551621	1783	LACAUTI	RO
74	27.410360	45.841950	551716	58	TECUCI	RO
75	22.900460	45.865040	553254	236	DEVA	RO
76	23.543090	45.964530	557334	254	SEBES-ALBA	RO

77	26.116870	45.993240	600608	570	TG.SECUIES	RO
78	22.152420	46.019490	602213	152	VARADIA DE	RO
79	20.603163	46.071633	604037	82	SINNICOLU	RO
80	25.597400	46.081040	605537	508	BARAOLT	RO
81	27.171810	46.105020	606705	103	ADJUD	RO
82	21.355219	46.133851	608121	115	ARAD	RO
83	22.727700	46.169760	610244	268	TEBEA	RO
84	23.936770	46.178820	611355	327	BLAJ	RO
85	24.593180	46.228250	614436	320	DUMBRAVENI	RO
86	27.645580	46.231360	614740	167	BIRLAD	RO
87	22.334897	46.279508	617220	175	GURAHONT	RO
88	26.642590	46.272960	617637	245	TG. OCNA	RO
89	25.293340	46.297090	618518	522	ODORHEIUL	RO
90	23.041950	46.364100	622303	618	CIMPENI (BI	RO
91	25.774170	46.371580	622544	665	MIERCUREA	RO
92	21.543000	46.518940	632130	93	CHISINEU C	RO
93	22.468092	46.528317	632229	282	STEI	RO
94	24.535330	46.533680	632432	306	TG.MURES	RO
95	23.311820	46.535770	634322	1355	BAISOARA	RO
96	23.792840	46.583390	635347	424	TURDA	RO
97	26.914070	46.532150	635658	184	BACAU	RO
98	27.715830	46.646240	639744	117	VASLUI	RO
99	25.514170	46.706080	642540	752	JOSENI	RO
100	22.795790	46.759560	646247	1843	VLADEASA 1	RO
101	23.572990	46.777990	647334	407	CLUJ-NAPOC	RO
102	27.443695	46.838328	650727	132	NEGRESTI (V	RO
103	23.034120	46.857650	651305	560	HUEDIN	RO
104	25.361530	46.926640	655522	675	TOPLITA	RO
105	26.913390	46.969460	655650	220	ROMAN	RO
106	25.951510	46.977760	656555	1873	CEAHLAU TO	RO
107	26.390900	46.934020	656621	360	PIATRA NEA	RO
108	21.897545	47.036020	703156	134	ORADEA	RO
109	24.515450	47.149420	708430	370	BISTRITA	RO
110	23.900500	47.128260	709352	236	DEJ	RO
111	27.630080	47.171060	710736	100	IASI	RO
112	23.048360	47.195280	711305	294	ZALAU	RO
113	26.380590	47.212430	714623	386	TG. NEAMT	RO
114	25.136044	47.324920	719507	922	POIANA STA	RO
115	22.095800	47.344470	722205	119	SACUIENI	RO
116	26.927410	47.358670	722657	286	COTNARI	RO
117	24.650730	47.602830	737439	1789	IEZER	RO
118	26.241960	47.633280	739615	360	SUCEAVA	RO
119	23.493240	47.661210	740330	211	BAIA-MARE	RO
120	26.647040	47.736050	741640	152	BOTOSANI	RO
121	23.942140	47.777370	747356	503	OC.SUGATAG	RO
122	22.888782	47.721768	748253	121	SATU MARE	RO
123	25.891850	47.838010	751555	385	RADAUTI	RO
124	23.905880	47.939570	758355	272	SIGHETUL M	RO
125	21.160556	46.679444	66519		Békéscsaba	HU
126	21.610833	47.490278	64704		Debrecen	HU
127	20.200000	47.128600	55502		Szolnok Sz	HU
128	20.090300	46.256100	58113		Szeged kül	HU
129	21.886900	47.962200	63411		Nyíregyház	HU
130	20.464640	45.842634	13174		KIKINDA	SR
131	22.536340	44.239157	13295		NEGOTIN	SR
132	21.498430	44.752614	13285		VELIKO GRA	SR
133	21.305524	45.144137	13183		VRSAC-kont	SR
134	20.376008	45.398724	13173		ZRENJANIN	SR
135	22.650000	48.200000	33634		Beregove	UA
136	25.972500	48.266389	33658		Chernivtsi	UA
137	23.300000	48.183330	33638		Khust	UA
138	24.198056	48.047500	33647		Rakhiv	UA
139	25.216667	47.883333	33657		Seliatyn	UA

Table 7.3b. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
13183	133	229.11	634322	95	213.55	507158	42	186.72
622544	91	154.32	714623	113	146.90	523328	55	144.31
33657	139	142.89	515231	49	134.86	546115	70	111.42
656621	107	107.27	600608	77	104.60	646247	100	104.00
501252	38	103.46	455200	34	102.52	553254	75	97.57
528518	62	95.26	66519	125	95.09	502317	40	87.14
441757	24	82.49	415816	14	81.91	445718	29	80.87
527527	61	80.36	611355	84	71.62	13285	132	67.95
509649	44	65.06	444417	27	64.54	509940	45	63.86
413838	12	62.71	604037	79	61.29	635347	96	59.79
446853	30	58.27	438238	22	57.99	359521	6	57.54
414352	13	55.81	708430	109	55.75	541154	67	54.58
511349	46	54.00	747356	121	53.94	349835	3	53.16
622303	90	52.84	542532	69	51.92	614740	86	51.73
439534	23	51.53	632130	92	51.39	359257	5	50.89
709352	110	50.58	58113	128	50.32	525215	58	50.00
656555	106	48.64	525323	59	48.31	518231	52	48.24
453344	32	47.71	530535	63	47.60	457600	36	47.03
557334	76	46.43	417530	15	46.32	739615	118	45.88
737439	117	45.66	55502	127	44.87	651305	103	44.80
13174	130	44.21	33647	138	43.25	711305	112	42.23
548409	71	42.16	425606	17	40.49	539357	66	40.33
13295	131	40.28	33634	135	39.73	500432	37	39.66
551621	73	39.52	538416	65	39.39	347357	2	39.29
608121	82	39.09	655522	104	38.44	444127	26	38.32
346452	1	37.18	647334	101	36.54	428632	19	36.09
551716	74	36.04	606705	81	34.31	63411	129	34.19
551459	72	34.15	33658	136	33.94	412721	11	33.92
523530	56	33.74	602213	78	33.68	722657	116	33.63
642540	99	33.24	719507	114	33.11	33638	137	32.91
639744	98	32.12	408800	10	31.76	511849	47	30.89
525358	60	30.88	454936	33	29.47	517507	50	29.23
655650	105	29.17	452452	31	28.95	741640	120	28.87
430608	20	28.43	523108	54	28.38	64704	126	27.76
632229	93	27.53	519622	53	27.38	422751	16	27.35
530801	64	26.54	502141	39	26.53	758355	124	26.36
517545	51	26.08	632432	94	25.63	710736	111	24.82
635658	97	24.58	722205	115	24.13	610244	83	23.73
352557	4	23.31	407500	9	23.13	748253	122	22.48
740330	119	22.38	443639	25	22.08	13173	134	21.59
506422	41	21.01	509441	43	20.58	511912	48	20.07
650727	102	19.74	703156	108	19.33	401321	7	18.12
605537	80	18.07	617637	88	17.74	406421	8	17.61
617220	87	17.53	541601	68	17.44	428307	18	16.97
618518	89	16.94	456526	35	16.75	523703	57	16.53
614436	85	15.73	751555	123	15.11	444820	28	14.91
436447	21	13.69						
AVERAGE:		50.26						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
647334	101	93928.69	414352	13	28622.34	553254	75	27068.42
656621	107	23776.97	614436	85	12698.99	617220	87	12695.62
446853	30	12162.44	608121	82	11088.78	622544	91	10929.27
614740	86	8642.94	722657	116	8092.31	740330	119	6925.44
655650	105	5118.80	622303	90	4734.94	618518	89	4685.44
413838	12	4319.96	63411	129	4237.25	452452	31	3915.62
635347	96	3377.19	739615	118	3234.42	502141	39	3228.97
523703	57	2972.74	639744	98	2911.04	546115	70	2807.48
527527	61	2744.44	501252	38	2721.71	605537	80	2485.51
747356	121	2405.21	517507	50	2397.44	456526	35	2122.26
557334	76	2103.30	13295	131	1961.83	511849	47	1925.10
359257	5	1872.03	352557	4	1871.77	634322	95	1795.74
610244	83	1677.66	454936	33	1542.91	602213	78	1525.86
525358	60	1454.88	611355	84	1418.59	741640	120	1384.80
444127	26	1322.08	523328	55	1309.48	444417	27	1298.98
13174	130	1210.89	541601	68	1196.75	455200	34	1098.56
439534	23	1058.46	443639	25	964.56	651305	103	954.62
632432	94	905.93	430608	20	898.02	33658	136	891.37
617637	88	875.91	650727	102	874.81	417530	15	860.16
506422	41	853.01	748253	122	813.72	422751	16	789.39
415816	14	700.49	517545	51	683.95	711305	112	674.22
606705	81	662.10	346452	1	648.33	408800	10	646.82
509441	43	633.06	519622	53	614.68	708430	109	609.46
635658	97	596.90	632130	92	581.89	428632	19	570.91
703156	108	563.49	530535	63	549.17	511912	48	546.98
530801	64	535.62	13285	132	532.93	359521	6	517.30
445718	29	511.23	542532	69	507.21	401321	7	503.59
406421	8	466.40	33657	139	457.55	655522	104	456.07
548409	71	452.14	438238	22	443.14	33638	137	432.27
642540	99	414.58	714623	113	385.34	551459	72	383.91
719507	114	374.64	66519	125	371.49	55502	127	358.29
525323	59	348.03	758355	124	346.22	523530	56	332.94
33634	135	327.40	502317	40	326.31	646247	100	320.63
347357	2	315.90	709352	110	314.92	453344	32	310.62
600608	77	291.93	528518	62	288.08	523108	54	284.30
412721	11	277.48	525215	58	277.11	509940	45	269.36
541154	67	265.72	33647	138	260.41	507158	42	257.77
441757	24	253.69	64704	126	251.14	515231	49	248.21
425606	17	240.69	710736	111	239.44	511349	46	219.77
436447	21	214.37	428307	18	213.00	722205	115	205.79
509649	44	196.44	13173	134	190.27	13183	133	176.22
518231	52	161.38	444820	28	160.00	407500	9	148.68
457600	36	137.61	656555	106	120.28	551716	74	117.79
500432	37	107.56	751555	123	104.53	632229	93	103.92
538416	65	97.97	551621	73	96.59	58113	128	94.87
604037	79	94.29	349835	3	67.45	737439	117	46.68
539357	66	30.37						
AVERAGE:		2754.71						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
622303	90	2.03	63411	129	1.60	656621	107	1.43
553254	75	1.37	452452	31	1.21	719507	114	1.19
647334	101	1.14	651305	103	1.14	635347	96	1.10
605537	80	1.04	523703	57	1.03	414352	13	1.02
518231	52	0.99	519622	53	0.97	525358	60	0.96
618518	89	0.96	614740	86	0.91	608121	82	0.89
614436	85	0.88	739615	118	0.87	525215	58	0.87
722657	116	0.84	501252	38	0.83	359257	5	0.82
634322	95	0.82	507158	42	0.81	740330	119	0.78

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>	Version <i>final</i>		Page <i>132</i>			
747356	121	0.78	527527	61	0.77	622544	91	0.77
541601	68	0.75	456526	35	0.73	557334	76	0.73
602213	78	0.73	502141	39	0.71	650727	102	0.70
446853	30	0.70	413838	12	0.68	406421	8	0.66
441757	24	0.64	523328	55	0.61	655650	105	0.61
511849	47	0.61	13295	131	0.61	617220	87	0.58
436447	21	0.58	430608	20	0.55	509940	45	0.54
517507	50	0.53	703156	108	0.50	13285	132	0.49
530801	64	0.49	548409	71	0.48	439534	23	0.48
708430	109	0.48	517545	51	0.48	408800	10	0.47
523530	56	0.47	506422	41	0.46	632432	94	0.45
617637	88	0.44	606705	81	0.44	523108	54	0.44
415816	14	0.43	546115	70	0.43	542532	69	0.42
455200	34	0.42	610244	83	0.41	635658	97	0.41
509441	43	0.39	632130	92	0.38	443639	25	0.36
346452	1	0.36	33658	136	0.35	741640	120	0.35
444127	26	0.35	438238	22	0.35	639744	98	0.35
509649	44	0.34	646247	100	0.34	33634	135	0.34
525323	59	0.34	66519	125	0.33	457600	36	0.33
541154	67	0.32	642540	99	0.32	453344	32	0.32
551716	74	0.31	417530	15	0.30	528518	62	0.29
611355	84	0.28	454936	33	0.28	748253	122	0.27
632229	93	0.27	530535	63	0.27	55502	127	0.27
444417	27	0.26	711305	112	0.26	502317	40	0.25
352557	4	0.24	758355	124	0.23	655522	104	0.23
422751	16	0.22	511349	46	0.22	428632	19	0.22
33657	139	0.22	13174	130	0.22	33638	137	0.21
511912	48	0.21	407500	9	0.20	722205	115	0.20
428307	18	0.20	600608	77	0.19	347357	2	0.19
604037	79	0.19	33647	138	0.18	709352	110	0.18
425606	17	0.18	500432	37	0.17	359521	6	0.17
551459	72	0.17	64704	126	0.15	13183	133	0.15
444820	28	0.15	401321	7	0.14	412721	11	0.13
751555	123	0.12	710736	111	0.11	58113	128	0.09
551621	73	0.08	714623	113	0.08	445718	29	0.07
539357	66	0.07	349835	3	0.06	538416	65	0.02
515231	49	0.00	656555	106	0.00	737439	117	0.00
13173	134	0.00						
AVERAGE:		0.49						

Table 7.3c. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 8310
Total number of errors: 13676
Maximal positive error: 98.1
Minimal negative error: -98.5

Table 7.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
11	11	182.85	24	24	72.82	1	1	63.00
19	19	51.35	37	37	45.74	38	38	42.14
39	39	39.54	4	4	38.79	26	26	36.08
6	6	35.37	5	5	33.90	20	20	31.36
49	49	28.69	23	23	27.92	27	27	26.50
32	32	26.24	35	35	25.69	48	48	25.64
28	28	23.66	3	3	23.61	46	46	23.55
29	29	22.97	8	8	22.44	25	25	22.33
10	10	22.14	47	47	21.84	21	21	21.66
31	31	21.44	36	36	21.00	44	44	19.94
15	15	19.57	22	22	19.13	13	13	18.96
30	30	18.89	41	41	18.44	7	7	18.37
42	42	17.22	12	12	17.20	14	14	16.50
9	9	16.31	43	43	15.92	2	2	15.73
45	45	15.12	33	33	14.85	40	40	14.22
17	17	13.97	18	18	12.07	34	34	10.67
16	16	7.09						
AVERAGE:		28.58						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
15	15	36335.42	41	41	23243.24	33	33	17726.84
18	18	12048.89	4	4	8335.93	48	48	7293.49
37	37	5926.54	8	8	5655.97	19	19	4457.74
26	26	4380.33	32	32	3177.25	9	9	3147.50
25	25	2963.71	22	22	2917.03	47	47	2293.80
12	12	2265.06	7	7	2238.49	24	24	1899.86
40	40	1603.50	35	35	1073.11	49	49	1015.60
14	14	788.02	34	34	756.58	29	29	743.22
46	46	687.48	43	43	430.00	21	21	395.20
36	36	344.11	1	1	316.69	39	39	288.94
2	2	283.46	31	31	283.04	17	17	282.52
44	44	280.53	30	30	267.44	6	6	265.69
38	38	251.72	45	45	249.11	13	13	242.79
20	20	177.20	16	16	145.89	28	28	136.27
3	3	121.96	11	11	96.99	42	42	93.69
27	27	90.18	10	10	87.28	5	5	74.42
23	23	44.47						
AVERAGE:		3229.06						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
15	15	1.43	37	37	1.41	41	41	1.36
40	40	1.34	8	8	1.04	33	33	0.97
26	26	0.95	4	4	0.90	47	47	0.87
18	18	0.86	24	24	0.86	48	48	0.79
32	32	0.78	25	25	0.77	19	19	0.76
12	12	0.76	28	28	0.69	43	43	0.68
22	22	0.64	9	9	0.59	7	7	0.56
29	29	0.52	2	2	0.47	30	30	0.46
11	11	0.37	35	35	0.36	16	16	0.35
34	34	0.34	49	49	0.34	5	5	0.32

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>134</i>		
46	46	0.32	45	45	0.31	6	6	0.31
39	39	0.29	14	14	0.29	27	27	0.28
44	44	0.26	36	36	0.26	38	38	0.26
10	10	0.25	13	13	0.22	21	21	0.22
17	17	0.20	3	3	0.20	20	20	0.19
31	31	0.18	1	1	0.16	42	42	0.12
23	23	0.06						
AVERAGE:		0.55						

Table 7.4b. Station parameters of the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

index	lambda	fi	h
1	24.75000004	50.90000005	198.0
2	23.63333337	50.25000001	252.0
3	27.04027778	50.16194445	277.0
4	25.73333337	50.13333334	259.0
5	24.35000002	50.11666667	212.0
6	25.15000001	50.08333334	227.0
7	23.38333335	49.95000005	245.0
8	26.20500001	49.94805560	274.0
9	23.96527783	49.80750004	319.0
10	23.16666668	49.80000004	232.0
11	27.93333338	49.56666670	284.0
12	25.68333337	49.53333336	327.0
13	24.95000005	49.43333336	303.0
14	23.56694447	49.36222224	275.0
15	26.93750005	49.35361113	350.0
16	23.81666671	49.25000001	302.0
17	23.03333334	49.15000001	594.0
18	25.76666671	49.01666667	320.0
19	28.13333334	49.01666667	313.0
20	24.00000000	48.96666672	470.0
21	22.46666669	48.90000005	205.0
22	24.68888892	48.88944449	275.0
23	23.45000002	48.85000004	592.0
24	27.26666668	48.85000004	292.0
25	23.10000001	48.76666671	496.0
26	23.36666669	48.70000004	615.0
27	26.60861114	48.69333337	217.0
28	23.20694446	48.65888892	1330.0
29	22.26666668	48.63333337	113.0
30	25.03333334	48.53333336	295.0
31	23.50444447	48.52666669	456.0
32	24.55000003	48.45000002	531.0
33	27.78333337	48.45000002	77.0
34	25.97250005	48.26638890	242.0
35	22.65000003	48.20000001	113.0
36	23.30000002	48.18333334	164.0
37	24.53333336	48.15000001	1451.0
38	24.19805557	48.04750000	430.0
39	25.21666668	47.88333338	762.0
40	22.05000000	50.10000001	212.0
41	22.33333335	49.46666669	420.0
42	22.00583333	48.93888894	176.0
43	21.61083336	47.49027780	107.6
44	23.90416671	47.93916672	276.0
45	25.89027782	47.83777782	100.0
46	22.88722227	47.72138893	124.0
47	23.94055560	47.77694448	100.0
48	23.49138891	47.66083337	100.0
49	24.64888892	47.60277781	100.0

Table 7.4c. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s):	2690
Total number of errors:	4047
Maximal positive error:	299.62
Minimal negative error:	-32.01

Table 7.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
53101	17	147.06	690	23	129.53	33511	10	105.76
11787	25	67.95	33514	12	65.58	660	22	49.84
11993	8	49.65	11938	6	46.59	650	21	39.46
11813	1	33.24	33634	9	28.79	625	20	25.55
23201	13	25.46	600	19	24.15	44121	15	19.92
11968	7	19.75	11858	3	19.56	11782	26	19.56
23703	14	19.26	11927	5	19.21	33631	11	17.33
52819	16	16.13	63411	18	15.65	11903	4	14.60
11774	24	10.43	11819	2	10.00			
AVERAGE:		40.00						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
690	23	32413.02	625	20	3741.77	44121	15	2954.99
52819	16	2466.74	11813	1	2443.66	600	19	1146.41
11819	2	1121.22	63411	18	1042.76	11858	3	816.99
33631	11	626.83	11774	24	613.83	660	22	466.88
23703	14	460.07	33514	12	416.19	53101	17	308.82
11787	25	290.27	23201	13	259.38	11938	6	237.47
11903	4	218.53	11927	5	197.25	11993	8	186.20
11782	26	182.32	33511	10	181.42	11968	7	132.62
33634	9	74.69	650	21	49.40			
AVERAGE:		2040.37						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
63411	18	2.02	52819	16	1.70	690	23	1.31
44121	15	1.30	11813	1	0.99	625	20	0.74
11819	2	0.57	33631	11	0.45	11903	4	0.41
600	19	0.40	11782	26	0.35	33634	9	0.35
53101	17	0.33	23703	14	0.29	11787	25	0.28
33514	12	0.23	11858	3	0.22	33511	10	0.21
11774	24	0.20	23201	13	0.19	660	22	0.16
11927	5	0.15	11938	6	0.12	11968	7	0.11
11993	8	0.07	650	21	0.01			
AVERAGE:		0.51						

Table 7.5b. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

index	lambda	fi	h	station
1	17.11055556	48.16861112	287.0	11813
2	17.68055559	48.49194447	178.0	11819
3	18.19416668	47.87305560	115.0	11858
4	19.14194445	48.64250003	313.0	11903
5	19.66666670	48.32916668	187.0	11927
6	20.18916668	48.84861115	901.0	11938
7	21.22250001	48.67222226	230.0	11968
8	22.00611111	48.93888894	176.0	11993
9	22.60000003	48.20000001	113.0	33634
10	23.00000000	49.20000001	594.0	33511
11	22.30000002	48.60000003	115.0	33631
12	22.50000003	48.90000005	205.0	33514
13	19.02805556	47.06111111	153.0	44121
14	17.67472226	47.71000004	117.0	23703
15	20.01666667	47.86666671	111.3	53101
16	17.26722224	47.88972227	121.0	23201
17	20.77140000	48.09690000	232.8	52819
18	21.88690000	47.96220000	142.1	63411
19	19.00111111	49.80805560	398.0	600
20	19.96027783	49.29388890	855.0	625
21	19.98194450	49.23250001	1991.0	650
22	20.68916670	49.62722225	292.0	660
23	22.34166668	49.46638891	420.0	690
24	17.56972225	49.32055557	222.0	11774
25	18.44777780	49.54611114	1322.0	11787
26	18.12166667	49.69833337	250.0	11782

Table 7.5c. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 1425
 Total number of errors: 1480
 Maximal positive error: 64.5
 Minimal negative error: -70.5

Table 7.6a. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
13	13	133.38	11	11	91.90	15	15	83.21
6	6	82.31	16	16	81.57	23	23	68.15
26	26	66.45	18	18	62.14	12	12	61.38
8	8	60.40	4	4	59.71	24	24	59.61
5	5	58.07	2	2	57.83	17	17	53.04
22	22	50.34	7	7	39.72	25	25	37.56
9	9	35.51	14	14	33.98	10	10	30.48
21	21	30.09	19	19	27.12	3	3	25.73
1	1	24.13	20	20	12.01			
AVERAGE:		54.84						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
9	9	7147.35	6	6	7013.77	4	4	2714.53
19	19	2443.66	2	2	2382.81	1	1	1659.08
5	5	1516.44	15	15	1498.04	21	21	927.17
10	10	757.46	16	16	746.58	20	20	565.76
12	12	361.76	11	11	290.27	8	8	240.58
22	22	218.53	13	13	213.63	18	18	212.51
23	23	197.25	26	26	175.99	24	24	172.11
7	7	162.22	25	25	121.13	17	17	102.79
14	14	90.31	3	3	83.37			
AVERAGE:		1231.35						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
9	9	1.28	4	4	1.02	19	19	0.85
1	1	0.77	6	6	0.68	2	2	0.53
20	20	0.49	5	5	0.41	16	16	0.36
15	15	0.33	12	12	0.27	11	11	0.25
8	8	0.24	24	24	0.18	26	26	0.17
17	17	0.16	23	23	0.14	10	10	0.13
25	25	0.12	22	22	0.10	14	14	0.10
18	18	0.09	13	13	0.08	3	3	0.05
21	21	0.04	7	7	0.03			
AVERAGE:		0.34						

Table 7.6b. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda	fi	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	17.57000003	49.32000002	222.0
11	18.45000002	49.55000003	1322.0
12	18.12000001	49.70000004	250.0
13	23.63333337	50.25000001	252.0
14	23.16666668	49.80000004	232.0
15	23.38333335	49.95000005	245.0
16	23.56694447	49.36222224	275.0
17	23.03333334	49.15000001	594.0
18	22.46666669	48.90000005	205.0
19	17.11055556	48.16861112	287.0
20	17.68055559	48.49194447	178.0
21	18.19416668	47.87305560	115.0
22	19.14194445	48.64250003	313.0
23	19.66666670	48.32916668	187.0
24	20.18916668	48.84861115	901.0
25	21.22250001	48.67222226	230.0
26	22.00611111	48.93888894	176.0

Table 7.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 469
 Total number of errors: 486
 Maximal positive error: 64.6
 Minimal negative error: -298.3

Table 7.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
6	6	86.43	1	1	69.87	2	2	67.16
8	8	53.00	3	3	44.42	4	4	41.48
7	7	37.94	5	5	25.46			
AVERAGE:		53.22						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
4	4	2443.66	6	6	1795.17	7	7	1294.64
1	1	757.46	8	8	715.39	5	5	565.76
3	3	332.43	2	2	136.63			
AVERAGE:		1005.14						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
4	4	0.73	7	7	0.73	8	8	0.42
5	5	0.35	3	3	0.28	1	1	0.21
2	2	0.21	6	6	0.12			
AVERAGE:		0.38						

Table 7.7b. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

index	lambda	fi	h
1	17.57000003	49.32000002	222.0
2	18.45000002	49.55000003	1322.0
3	18.12000001	49.70000004	250.0
4	17.11055556	48.16861112	287.0
5	17.68055559	48.49194447	178.0
6	18.19416668	47.87305560	115.0
7	18.19166668	50.06166667	206.0
8	19.00111111	49.80805560	398.0

Table 7.7c. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s):	119
Total number of errors:	123
Maximal positive error:	1.15
Minimal negative error:	-1.23

Annex 8. Sunshine duration

Table 8.1a. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda(x)	fi(y)	h	stno	stna	country
1	16.60222222	47.67833333	233.8	13703	Sopron Kuruc-domb	HU
2	16.72916666	47.48138888	198.9	14706	Sopronhorpács	HU
3	16.64777777	47.19833333	201.1	15307	Szombathely	HU
4	16.30944444	46.91027777	311.7	16203	Szentgotthárd Farkasfa	HU
5	16.97060000	46.45610000	139.8	17809	Nagykanizsa	HU
6	17.26720000	47.88970000	121.0	23201	Mosonmagyaróvár	HU
7	17.67470000	47.71000000	116.7	23703	Győr Likócs	HU
8	17.37220000	47.29220000	135.5	25212	Pápa Nyárád	HU
9	17.23860000	46.73560000	111.7	26505	Keszthely Tanyakereszt	HU
10	18.04080000	46.91080000	108.2	36100	Siófok	HU
11	18.18360000	46.68560000	165.0	36500	Iregszemcse	HU
12	18.23500000	45.99500000	200.2	39113	Pécs Pogány	HU
13	19.02810000	47.51110000	153.3	44121	Budapest belterület	HU
14	19.47640000	47.65560000	162.4	44214	Aszód	HU
15	19.18220000	47.42920000	139.1	44527	Budapest Pestszentlőrinc	HU
16	19.74830000	46.91310000	114.0	46303	Kecskemét külterület	HU
17	19.09890000	46.51030000	93.6	47106	Kalocsa Öregcsertő	HU
18	19.01670000	46.18330000	113.0	48101	Baja Csávoly	HU
19	20.53610000	48.49530000	308.9	51705	Jósvafő	HU
20	20.77140000	48.09690000	232.8	52819	Miskolc Avas	HU
21	20.01670000	47.86670000	111.3	53101	Kékestető	HU
22	20.23580000	47.73970000	123.3	53521	Kompolt	HU
23	20.20000000	47.12860000	90.0	55502	Szolnok Szandaszőlős	HU
24	20.74000000	47.10640000	85.9	55706	Túrkeve	HU
25	20.52780000	46.86940000	85.4	56300	Szarvas	HU
26	20.09030000	46.25610000	81.8	58113	Szeged külterület	HU
27	21.65890000	48.38080000	100.4	61709	Sátoraljaújhely	HU
28	21.88690000	47.96220000	142.1	63411	Nyíregyháza Napkor	HU
29	21.61080000	47.49030000	107.6	64704	Debrecen	HU
30	21.16060000	46.67940000	84.0	66519	Békéscsaba	HU
31	17.23300000	45.60000000	161.0	daruv	Daruvar	CR
32	18.63300000	45.53300000	89.0	osije	Osijek	CR
33	18.00000000	45.16600000	88.0	slavo	Slavonski Brod	CR
34	19.76410000	46.09720000	102.0	palic	Palic	RS
35	19.14310000	45.76700000	87.0	sombo	Sombor	RS
36	20.46460000	45.84260000	80.0	kikin	Kikinda	RS
37	21.35362152	46.13351640		arad	Arad	RO
38	21.89592406	47.03570901		orade	Oradea	RO
39	22.09450716	47.34415862		sacui	Sacuieni	RO
40	20.60156003	46.07128625		sanni	Sannicolau	RO
41	22.88714903	47.72148469		satu	Satu Mare	RO
42	22.60000000	48.20000000	113.0	bereg	Bereg	UA
43	23.30000000	48.20000000	164.0	khust	Khust	UA
44	22.30000000	48.60000000	115.0	uzhgo	Uzhgorod	UA
45	17.11060000	48.16860000	287.0	brati	Bratislava-Koliba	SK
46	18.19420000	47.87310000	115.0	hurba	Hurbanovo	SK
47	19.73600000	48.33900000	214.0	lucen	Lucenec-Bolkovce	SK
48	20.79750000	48.71810000	580.0	stos	Stos	SK
49	21.22250000	48.67220000	230.0	kosic	Kosice-Letisko	SK
50	21.72400000	48.66300000	105.0	milho	Milhostov	SK

Table 8.1b. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
66519	30	43.08	sombo	35	39.80	osije	32	38.46
stos	48	30.61	44527	15	30.08	khust	43	28.96
48101	18	28.84	23201	6	27.32	sanni	40	27.30
kosic	49	26.78	14706	2	26.19	lucen	47	25.89
46303	16	25.13	53101	21	23.33	slavo	33	22.56
16203	4	22.36	36100	10	22.26	61709	27	20.18
15307	3	20.16	44214	14	19.95	47106	17	19.14
55706	24	18.87	bereg	42	18.82	arad	37	18.51
58113	26	18.24	26505	9	18.16	orade	38	18.13
kikin	36	17.93	13703	1	17.89	sacui	39	17.75
17809	5	17.63	55502	23	16.44	44121	13	16.32
daruv	31	15.91	51705	19	15.49	52819	20	14.66
25212	8	14.35	36500	11	13.89	brati	45	13.65
satu	41	12.84	63411	28	12.54	uzhgo	44	12.50
56300	25	12.38	hurba	46	11.96	53521	22	11.91
23703	7	11.73	milho	50	11.26	64704	29	9.86
39113	12	9.80	palic	34	9.14			
AVERAGE:		19.94						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
satu	41	1535.49	44527	15	612.06	61709	27	491.34
13703	1	463.93	58113	26	442.50	arad	37	432.26
stos	48	370.80	47106	17	329.94	17809	5	316.62
46303	16	306.33	khust	43	302.48	53101	21	269.39
milho	50	202.02	39113	12	183.76	66519	30	174.57
63411	28	166.75	44214	14	161.37	23201	6	159.21
kosic	49	149.19	sombo	35	142.41	52819	20	140.13
26505	9	131.65	55706	24	129.23	sanni	40	129.13
64704	29	129.04	44121	13	125.03	55502	23	118.16
56300	25	107.37	36500	11	106.39	23703	7	103.42
palic	34	102.36	daruv	31	95.37	48101	18	92.10
14706	2	87.78	osije	32	85.51	15307	3	82.32
16203	4	76.13	kikin	36	73.72	lucen	47	64.88
bereg	42	60.08	sacui	39	56.45	orade	38	54.69
51705	19	44.35	25212	8	41.06	slavo	33	39.06
36100	10	37.24	brati	45	35.76	hurba	46	29.29
uzhgo	44	27.38	53521	22	26.28			
AVERAGE:		192.88						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
stos	48	2.05	61709	27	1.69	53101	21	1.16
47106	17	1.01	55502	23	0.84	26505	9	0.84
satu	41	0.78	66519	30	0.76	63411	28	0.72
lucen	47	0.63	39113	12	0.60	13703	1	0.57
52819	20	0.56	milho	50	0.56	kosic	49	0.53
58113	26	0.53	bereg	42	0.53	44527	15	0.52
arad	37	0.50	64704	29	0.49	khust	43	0.47

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>143</i>		
sanni	40	0.45	44121	13	0.44	15307	3	0.41
46303	16	0.39	44214	14	0.39	osije	32	0.38
sombo	35	0.37	brati	45	0.33	14706	2	0.32
23703	7	0.31	palic	34	0.31	56300	25	0.29
23201	6	0.28	slavo	33	0.27	48101	18	0.26
daruv	31	0.25	17809	5	0.25	kikin	36	0.25
51705	19	0.24	hurba	46	0.23	55706	24	0.22
sacui	39	0.22	25212	8	0.22	53521	22	0.20
36100	10	0.14	16203	4	0.13	36500	11	0.12
orade	38	0.12	uzhgo	44	0.10			
AVERAGE:		0.48						

Table 8.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 5072
Total number of errors: 7237
Maximal positive error: 35.1
Minimal negative error: -10.30

Table 8.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
POZ	16	110.36	PAL	3	85.58	BAC	21	70.69
KRV	17	67.63	ZAJ	20	64.98	VRS	8	63.88
ZRE	6	62.89	ZLA	15	60.06	BGD	11	58.18
TIM	28	55.58	SZE	1	54.37	OSI	2	49.26
KIK	7	44.32	CAL	23	41.12	KRG	12	40.94
NEG	14	40.92	SNM	26	38.26	SEM	27	37.77
SOM	4	34.40	NSA	5	33.92	VLJ	10	29.38
BAN	22	28.72	KRS	18	26.82	ORA	25	24.42
SPA	13	23.38	CUP	19	22.14	LOZ	9	17.97
DTS	24	9.25						
AVERAGE:		44.40						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
ZAJ	20	423.69	TIM	28	252.28	PAL	3	245.81
BAC	21	234.47	POZ	16	177.62	KRV	17	176.74
SZE	1	163.54	ZRE	6	148.35	SOM	4	147.73
KIK	7	141.41	NEG	14	138.58	CAL	23	111.67
OSI	2	104.00	KRS	18	88.86	BGD	11	87.60
NSA	5	80.40	KRG	12	74.94	VRS	8	61.86
CUP	19	59.83	SEM	27	52.15	ZLA	15	49.94
SNM	26	40.76	VLJ	10	36.87	BAN	22	34.93
LOZ	9	32.85	ORA	25	27.43	SPA	13	22.38
DTS	24	8.47						
AVERAGE:		108.94						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
TIM	28	1.41	ZAJ	20	0.65	KRS	18	0.59
BAC	21	0.33	POZ	16	0.26	KRV	17	0.24
SEM	27	0.23	NEG	14	0.22	OSI	2	0.20
PAL	3	0.18	SZE	1	0.18	KRG	12	0.17
ZRE	6	0.17	VRS	8	0.14	SOM	4	0.14
LOZ	9	0.13	DTS	24	0.13	CUP	19	0.10
VLJ	10	0.09	BAN	22	0.08	CAL	23	0.08
KIK	7	0.07	BGD	11	0.06	ZLA	15	0.06
SNM	26	0.05	NSA	5	0.05	SPA	13	0.02
ORA	25	0.00						

Table 8.2b. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

index	lambda(x)	fi(y)	
1	20.0902778	46.2561111	Szeged
2	18.5614167	45.4998889	Osijek
3	19.7640230	46.0972180	Palic
4	19.1431350	45.7670000	Sombor
5	19.8300030	45.3222150	Novi Sad
6	20.3760080	45.3987240	Zrenjanin
7	20.4646400	45.8426340	Kikinda
8	21.3055240	45.1441370	Vrsac
9	19.2269330	44.5410990	Loznica
10	19.9124730	44.2754640	Valjevo
11	20.4648220	44.7984570	Beograd
12	20.9277710	44.0272220	Kragujevac
13	20.9421460	44.3696000	Smederevska Palanka
14	22.5363400	44.2391570	Negotin
15	19.7130230	43.7378070	Zlatibor
16	20.0295210	43.8430700	Pozega
17	20.6998360	43.7088840	Kraljevo
18	21.3399540	43.5640540	Krusevac
19	21.3806360	43.9406160	Cuprija
20	22.2885650	43.8831280	Zajecar
21	23.1130719	44.4761811	Bacles
22	21.1363986	45.3827011	Banloc
23	22.9460524	43.9848998	Calafat
24	22.6260737	44.6264587	Drobeta Turnu Severin
25	21.7104827	45.0387115	Oravita
26	20.6015600	46.0712863	Sannicolau Mare
27	22.0558046	45.1813947	Semenic
28	21.2580711	45.7710564	Timisoara

Table 8.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 3666
 Total number of errors: 4625
 Maximal positive error: 9.59
 Minimal negative error: -8.79

Table 8.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
457600	30	235.25	539357	51	172.06	525215	44	157.17
359521	5	131.55	611355	66	126.84	740330	96	126.56
553254	58	124.99	441757	20	120.24	655650	83	94.49
741640	97	89.73	748253	98	89.12	444820	23	85.00
538416	50	84.29	617637	69	81.85	439534	19	81.18
352557	3	79.23	515231	40	77.91	401321	6	75.90
751555	99	75.17	506422	34	72.56	542532	52	71.89
655522	82	68.17	428632	15	67.56	635658	76	66.83
530535	48	66.71	13183	108	64.41	656621	85	63.47
436447	17	61.45	557334	59	61.19	635347	75	60.41
647334	80	60.24	523703	43	59.97	507158	35	59.81
414352	11	58.60	722657	94	57.79	517507	41	57.35
530801	49	57.18	639744	77	55.97	528518	47	55.82
509649	37	55.79	359257	4	55.30	711305	90	55.27
739615	95	55.01	408800	9	54.08	551459	55	53.59
604037	62	53.58	614740	68	52.73	13295	106	52.45
454936	28	52.04	551621	56	50.44	608121	64	50.35
551716	57	50.27	406421	7	49.92	443639	21	49.16
605537	63	47.61	428307	14	46.78	412721	10	43.86
632130	71	43.25	511912	39	43.17	13173	109	42.88
430608	16	42.84	527527	46	42.79	347357	2	41.55
614436	67	41.42	656555	84	39.75	33638	112	39.69
502141	32	38.82	438238	18	38.23	509441	36	36.79
546115	53	36.70	719507	92	36.62	523108	42	35.07
632229	72	34.36	600608	60	34.32	714623	91	33.38
33658	111	32.59	58113	103	32.57	758355	100	32.20
710736	89	31.38	415816	12	31.10	456526	29	29.81
548409	54	29.57	634322	74	29.34	66519	101	28.64
709352	88	27.19	622544	70	27.14	722205	93	27.08
444417	22	26.60	511349	38	26.31	64704	102	26.19
650727	81	25.28	417530	13	25.18	708430	87	25.07
33634	110	25.05	642540	78	24.79	445718	24	24.72
63411	104	24.25	602213	61	19.92	452452	26	19.24
453344	27	18.42	407500	8	17.86	13174	105	17.06
703156	86	16.64	632432	73	16.36	502317	33	13.95
446853	25	13.73	500432	31	12.68	646247	79	12.08
610244	65	12.07	525323	45	11.24	13285	107	10.72
346452	1	9.43						
AVERAGE:		51.96						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
441757	20	3807.34	509441	36	2370.05	611355	66	1869.92
748253	98	1535.49	523703	43	1508.17	401321	6	1372.15
457600	30	1321.41	33638	112	903.13	655650	83	562.95
751555	99	481.62	530801	49	418.35	711305	90	408.21
428307	14	389.93	546115	53	372.58	608121	64	353.37
509649	37	323.37	359521	5	323.19	517507	41	316.71
740330	96	298.43	639744	77	284.20	553254	58	272.68
439534	19	252.16	507158	35	229.59	632130	71	213.39
530535	48	201.49	647334	80	196.17	515231	40	189.56
352557	3	176.07	605537	63	175.83	635658	76	172.32

436447	17	168.62	655522	82	166.70	539357	51	165.03
58113	103	153.05	741640	97	150.58	650727	81	146.04
542532	52	144.43	33658	111	141.53	414352	11	139.59
635347	75	134.52	66519	101	134.39	614740	68	131.07
656621	85	130.11	13183	108	129.69	604037	62	129.15
417530	13	127.73	406421	7	124.79	551716	57	124.38
523108	42	121.80	710736	89	119.02	617637	69	118.89
359257	4	112.53	456526	29	107.58	614436	67	98.20
33634	110	97.79	445718	24	97.30	64704	102	93.70
444820	23	93.63	758355	100	93.07	453344	27	92.56
443639	21	89.43	511912	39	87.97	722657	94	84.74
428632	15	81.72	347357	2	74.84	13173	109	74.08
511349	38	73.04	739615	95	72.16	506422	34	70.96
551459	55	70.78	708430	87	70.58	502317	33	70.04
525323	45	69.99	452452	26	67.23	444417	22	65.61
430608	16	63.18	407500	8	63.14	408800	9	62.93
538416	50	60.53	528518	47	58.53	557334	59	58.36
415816	12	57.98	454936	28	57.92	703156	86	56.43
551621	56	53.93	719507	92	51.41	502141	32	46.70
13295	106	44.62	438238	18	44.55	412721	10	42.69
656555	84	41.10	63411	104	40.88	548409	54	39.35
709352	88	37.96	13285	107	37.70	714623	91	34.65
13174	105	34.65	632229	72	33.81	642540	78	33.48
527527	46	32.27	600608	60	31.74	500432	31	31.00
722205	93	30.03	525215	44	29.78	634322	74	25.96
602213	61	25.30	622544	70	21.93	632432	73	19.20
446853	25	15.78	346452	1	14.68	646247	79	13.62
610244	65	11.29						
AVERAGE:		247.05						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
530801	49	1.67	546115	53	1.42	414352	11	1.23
647334	80	1.13	525323	45	1.07	530535	48	0.93
539357	51	0.86	441757	20	0.82	611355	66	0.78
523703	43	0.72	553254	58	0.70	509441	36	0.68
444820	23	0.68	401321	6	0.68	748253	98	0.67
457600	30	0.65	710736	89	0.58	359521	5	0.50
751555	99	0.49	13285	107	0.47	655650	83	0.46
507158	35	0.45	33638	112	0.43	557334	59	0.41
517507	41	0.40	417530	13	0.40	443639	21	0.37
436447	17	0.37	525215	44	0.36	632130	71	0.36
352557	3	0.35	634322	74	0.34	515231	40	0.32
428307	14	0.31	608121	64	0.30	711305	90	0.30
13183	108	0.30	33658	111	0.29	502317	33	0.27
614740	68	0.27	605537	63	0.27	604037	62	0.25
642540	78	0.25	639744	77	0.25	66519	101	0.24
635658	76	0.24	412721	10	0.24	63411	104	0.23
739615	95	0.23	430608	16	0.22	511349	38	0.22
453344	27	0.21	58113	103	0.21	359257	4	0.21
741640	97	0.19	439534	19	0.19	452452	26	0.19
551459	55	0.18	551621	56	0.18	33634	110	0.18
655522	82	0.17	347357	2	0.17	527527	46	0.17
523108	42	0.17	740330	96	0.17	346452	1	0.17
509649	37	0.16	656621	85	0.16	64704	102	0.15
415816	12	0.15	444417	22	0.15	632432	73	0.15
709352	88	0.15	703156	86	0.14	758355	100	0.14
542532	52	0.14	656555	84	0.14	13173	109	0.13
635347	75	0.13	500432	31	0.13	407500	8	0.13
511912	39	0.13	456526	29	0.11	646247	79	0.10
614436	67	0.10	708430	87	0.09	445718	24	0.09
528518	47	0.09	617637	69	0.09	719507	92	0.08
406421	7	0.08	602213	61	0.07	408800	9	0.07

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>			Version <i>final</i>		Page <i>148</i>	
13174	105	0.07	502141	32	0.07	548409	54	0.07
446853	25	0.07	428632	15	0.07	722657	94	0.06
506422	34	0.06	610244	65	0.05	632229	72	0.05
551716	57	0.05	622544	70	0.05	454936	28	0.04
714623	91	0.04	13295	106	0.03	722205	93	0.01
438238	18	0.00	538416	50	0.00	600608	60	0.00
650727	81	0.00						
AVERAGE:		0.30						

Table 8.3b. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda	phi	ST_ID	ST_NAME	Country
1	24.879770		43.760420	346452 31	TURNU MAGUR RO
2	23.945686		43.790056	347357 37	BECHET RO
3	25.934221		43.875470	352557 23	GIURGIU RO
4	22.947569		43.985246	359257 62	CALAFAT RO
5	25.354370		43.978290	359521 74	ALEXANDRIA RO
6	23.332620		44.029510	401321 58	BAILESTI RO
7	24.358813		44.100444	406421 107	CARACAL RO
8	24.980030		44.107740	407500 105	ROSIORII DE RO
9	27.967130		44.088620	408800 159	ADAMCLISI RO
10	27.339860		44.206430	412721 19	CALARASI RO
11	23.868460		44.310600	414352 194	CRAIOVA RO
12	28.252880		44.243560	415816 66	MEDGIDIA RO
13	25.538540		44.283260	417530 106	VIDELE RO
14	23.114580		44.476720	428307 316	BICLES RO
15	26.525051		44.453228	428632 65	FUNDULEA RO
16	26.079760		44.510820	430608 92	BUCURESTI B RO
17	24.791530		44.562880	436447 210	STOLNICI RO
18	22.627650		44.626730	438238 73	DR. TR. SEVER RO
19	25.580740		44.653200	439534 155	TITU RO
20	27.965080		44.692000	441757 33	HIRSOVA RO
21	26.658560		44.721950	443639 57	URZICENI RO
22	24.238708		44.665755	444417 274	DRAGASANI RO
23	28.343580		44.734700	444820 221	CORUGEA RO
24	27.295990		44.740960	445718 43	GRIVITA RO
25	28.877930		44.766410	446853 37	JURILOVCA RO
26	24.867460		44.849290	452452 322	PITESTI RO
27	23.710236		44.878418	453344 267	TG. LOGRESTI RO
28	29.600520		44.896870	454936 1	SF. GH. DEL RO
29	25.427260		44.929910	456526 297	TIRGOVISTE RO
30	25.988990		44.956090	457600 181	PLOIESTI RO
31	24.571790		45.016290	500432 552	DEDULESTI RO
32	21.711840		45.038960	502141 303	ORAVITA RO
33	23.260882		45.040958	502317 203	TG. JIU RO
34	24.380980		45.089190	506422 229	RM. VILCEA RO
35	22.057120		45.181730	507158 1432	SEMENIC RO
36	24.671280		45.179170	509441 455	CURTEA DE A RO
37	26.853000		45.132910	509649 90	BUZAU RO
38	23.810150		45.165870	511349 531	POLOVRAGI RO
39	29.158274		45.177107	511912 1	GORGOVA RO
40	22.534340		45.281170	515231 2184	TARCU RO
41	25.038140		45.275150	517507 684	CIMPULUNG RO
42	21.137974		45.383051	523108 80	BANLOC RO
43	27.040160		45.390750	523703 145	RM. SARAT RO
44	22.226840		45.417560	525215 210	CARANSEBES RO
45	23.378254		45.406610	525323 610	PETROSANI RO
46	25.458260		45.446140	527527 2514	VF. OMU RO
47	25.273270		45.431910	528518 1372	FUNDATA RO
48	25.585100		45.506460	530535 1101	PREDEAL RO
49	28.033930		45.473300	530801 68	GALATI RO
50	24.273180		45.653180	538416 506	BOITA RO
51	23.934000		45.657510	539357 1466	PALTINIS RO
52	25.527720		45.696130	542532 537	BRASOV RO
53	21.259360		45.771460	546115 87	TIMISOARA RO
54	24.092940		45.789700	548409 446	SIBIU RO
55	24.936720		45.836360	551459 428	FAGARAS RO
56	26.377080		45.824010	551621 822	LACAUTI RO

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>		Version <i>final</i>		Page <i>149</i>
57	27.410360	45.841950	551716	822	TECUCI	RO
58	22.900460	45.865040	553254	822	DEVA	RO
59	23.543090	45.964530	557334	822	SEBES-ALBA	RO
60	26.116870	45.993240	600608	822	TG.SECUIESC	RO
61	22.152420	46.019490	602213	822	VARADIA DE	RO
62	20.603163	46.071633	604037	822	SINNICOLU M	RO
63	25.597400	46.081040	605537	822	BARAOLT	RO
64	21.355219	46.133851	608121	822	ARAD	RO
65	22.727700	46.169760	610244	822	TEBEA	RO
66	23.936770	46.178820	611355	822	BLAJ	RO
67	24.593180	46.228250	614436	822	DUMBRAVENI	RO
68	27.645580	46.231360	614740	822	BIRLAD	RO
69	26.642590	46.272960	617637	822	TG. OCNA	RO
70	25.774170	46.371580	622544	822	MIERCUREA C	RO
71	21.543000	46.518940	632130	822	CHISINEU CR	RO
72	22.468092	46.528317	632229	282	STEI	RO
73	24.535330	46.533680	632432	306	TG.MURES	RO
74	23.311820	46.535770	634322	1355	BAISOARA	RO
75	23.792840	46.583390	635347	424	TURDA	RO
76	26.914070	46.532150	635658	184	BACAU	RO
77	27.715830	46.646240	639744	117	VASLUI	RO
78	25.514170	46.706080	642540	752	JOSENI	RO
79	22.795790	46.759560	646247	1843	VLADEASA 18	RO
80	23.572990	46.777990	647334	407	CLUJ-NAPOCA	RO
81	27.443695	46.838328	650727	132	NEGRESTI (VA	RO
82	25.361530	46.926640	655522	675	TOPLITA	RO
83	26.913390	46.969460	655650	220	ROMAN	RO
84	25.951510	46.977760	656555	1873	CEAHLAU TOA	RO
85	26.390900	46.934020	656621	360	PIATRA NEAM	RO
86	21.897545	47.036020	703156	134	ORADEA	RO
87	24.515450	47.149420	708430	370	BISTRITA	RO
88	23.900500	47.128260	709352	236	DEJ	RO
89	27.630080	47.171060	710736	100	IASI	RO
90	23.048360	47.195280	711305	294	ZALAU	RO
91	26.380590	47.212430	714623	822	TG. NEAMT	RO
92	25.136044	47.324920	719507	822	POIANA STAM	RO
93	22.095800	47.344470	722205	822	SACUIENI	RO
94	26.927410	47.358670	722657	822	COTNARI	RO
95	26.241960	47.633280	739615	822	SUCEAVA	RO
96	23.493240	47.661210	740330	822	BAIA-MARE	RO
97	26.647040	47.736050	741640	822	BOTOSANI	RO
98	22.888782	47.721768	748253	822	SATU MARE	RO
99	25.891850	47.838010	751555	822	RADAUTI	RO
100	23.905880	47.939570	758355	822	SIGHETUL MA	RO
101	21.160556	46.679444	66519	822	Bekescsaba	HU
102	21.610833	47.490278	64704	822	Debrecen R	HU
103	20.090300	46.256100	58113	822	Szeged	HU
104	21.886900	47.962200	63411	822	Nyiregyhaza	HU
105	20.464640	45.842634	13174		KIKINDA	SR
106	22.536340	44.239157	13295		NEGOTIN	SR
107	21.498430	44.752614	13285		VELIKO GRAD	SR
108	21.305524	45.144137	13183		VRSAK-kontr	SR
109	20.376008	45.398724	13173		ZRENJANIN	SR
110	22.650000	48.200000	33634		Beregove	UA
111	25.972500	48.266389	33658		Chernivtsi	UA
112	23.300000	48.183330	33638		Khust	UA

Table 8.3c. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 10409
Total number of errors: 19670
Maximal positive error: 14.95
Minimal negative error: -9.58

Table 8.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
24	24	87.33	21	21	84.48	13	13	79.06
20	20	61.40	3	3	53.30	9	9	46.78
23	23	45.89	22	22	45.89	16	16	45.31
17	17	45.05	1	1	40.66	19	19	39.83
6	6	32.70	2	2	32.06	18	18	31.55
11	11	29.53	14	14	27.80	10	10	27.36
5	5	26.32	12	12	25.43	8	8	23.94
15	15	17.17	7	7	15.98	4	4	13.82
AVERAGE:		40.78						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
3	3	1343.92	22	22	635.27	17	17	366.70
21	21	351.20	13	13	319.08	9	9	299.36
11	11	284.17	24	24	276.42	6	6	274.41
2	2	263.29	16	16	220.54	1	1	152.41
5	5	108.27	18	18	78.78	19	19	72.18
20	20	66.53	14	14	60.36	10	10	56.56
4	4	55.75	15	15	53.35	23	23	52.17
12	12	28.43	8	8	21.23	7	7	17.45
AVERAGE:		227.41						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
17	17	1.36	13	13	1.24	3	3	0.99
22	22	0.72	1	1	0.70	21	21	0.61
6	6	0.61	16	16	0.42	11	11	0.38
10	10	0.27	2	2	0.22	24	24	0.21
18	18	0.18	9	9	0.18	14	14	0.15
20	20	0.15	8	8	0.15	12	12	0.11
5	5	0.08	19	19	0.07	15	15	0.05
7	7	0.05	23	23	0.03	4	4	0.02
AVERAGE:		0.37						

Table 8.4b. Station parameters of the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

index	lambda	fi	h
1	27.04027778	50.16194445	277.0
2	23.38333335	49.95000005	245.0
3	24.95000005	49.43333336	303.0
4	24.00000000	48.96666672	470.0
5	27.26666668	48.85000004	292.0
6	26.60861114	48.69333337	217.0
7	22.26666668	48.63333337	113.0
8	23.50444447	48.52666669	456.0
9	25.97250005	48.26638890	242.0
10	22.65000003	48.20000001	113.0
11	23.30000002	48.18333334	164.0
12	24.53333336	48.15000001	1451.0
13	22.05000000	50.10000001	212.0
14	22.33333335	49.46666669	420.0
15	22.00583333	48.93888894	176.0
16	21.73472226	48.66805559	104.0
17	21.65888892	48.38055558	100.0
18	21.88694449	47.96222227	142.0
19	21.61083336	47.49027780	107.6
20	23.90416671	47.93916672	276.0
21	25.89027782	47.83777782	100.0
22	22.88722227	47.72138893	124.0
23	23.94055560	47.77694448	100.0
24	23.49138891	47.66083337	100.0

Table 8.4c. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 2366
 Total number of errors: 2649
 Maximal positive error: 112.34
 Minimal negative error: -10.07

Table 8.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA	
53101	18	172.60	23703	15	77.17	23201	14	44.57	
11993	11	42.81	11774	24	39.96	33631	13	38.88	
11910	5	36.58	11819	2	33.37	11813	1	28.31	
690	23	25.68	11787	26	24.17	11858	3	24.10	
11903	4	23.31	61709	19	21.39	11931	7	21.26	
11782	27	19.70	650	21	19.61	11978	10	17.84	
51705	17	16.26	44121	16	15.88	11968	9	15.50	
11927	6	15.31	33634	12	15.11	660	22	13.81	
11766	25	11.97	625	20	10.76	11938	8	10.34	
AVERAGE:		30.97							

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB	
61709	19	798.36	53101	18	782.50	11910	5	381.84	
11978	10	225.17	23201	14	175.48	23703	15	148.41	
11938	8	119.71	51705	17	107.33	11968	9	102.71	
11819	2	86.11	11931	7	79.79	11993	11	63.06	
33634	12	62.89	11813	1	62.72	44121	16	61.12	
690	23	60.07	11774	24	58.02	660	22	51.45	
11927	6	47.03	11782	27	37.75	11903	4	33.92	
11858	3	33.58	650	21	32.27	33631	13	30.57	
625	20	27.28	11787	26	25.44	11766	25	23.45	
AVERAGE:		137.70							

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2	
61709	19	1.37	11910	5	0.59	11978	10	0.57	
53101	18	0.46	33634	12	0.40	11968	9	0.37	
23703	15	0.37	625	20	0.36	660	22	0.34	
11903	4	0.33	11819	2	0.33	11927	6	0.30	
11931	7	0.28	23201	14	0.25	51705	17	0.21	
11782	27	0.20	44121	16	0.19	11813	1	0.15	
11766	25	0.14	33631	13	0.11	690	23	0.07	
11993	11	0.07	650	21	0.06	11938	8	0.05	
11858	3	0.05	11774	24	0.00	11787	26	0.00	
AVERAGE:		0.28							

Table 8.5b. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

index	lambda	fi	h	station
1	17.11055556	48.16861112	287.0	11813
2	17.68055559	48.49194447	178.0	11819
3	18.19416668	47.87305560	115.0	11858
4	19.14194445	48.64250003	313.0	11903
5	19.64666670	48.64444448	1015.0	11910
6	19.66666670	48.32916668	187.0	11927
7	20.23583335	49.18944445	1778.0	11931
8	20.18916668	48.84861115	901.0	11938
9	21.22250001	48.67222226	230.0	11968
10	21.73472226	48.66805559	104.0	11978
11	22.00611111	48.93888894	176.0	11993
12	22.60000003	48.20000001	113.0	33634
13	22.30000002	48.60000003	115.0	33631
14	19.02805556	47.06111111	153.0	44121
15	17.67472226	47.71000004	117.0	23703
16	20.53611114	48.49527780	309.0	51705
17	20.01666667	47.86666671	111.3	53101
18	17.26722224	47.88972227	121.0	23201
19	21.65888892	48.38083335	100.0	61709
20	19.96027783	49.29388890	855.0	625
21	19.98194450	49.23250001	1991.0	650
22	20.68916670	49.62722225	292.0	660
23	22.34166668	49.46638891	420.0	690
24	17.56972225	49.32055557	222.0	11774
25	17.54194447	49.77722226	749.0	11766
26	18.44777780	49.54611114	1322.0	11787
27	18.12166667	49.69833337	250.0	11782

Table 8.5c. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 2101
 Total number of errors: 2379
 Maximal positive error: 36.39
 Minimal negative error: -9.37

Table 8.6a. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 1364
 Total number of errors: 1460
 Maximal positive error: 0.54
 Minimal negative error: -0.76

Table 8.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
11	11	122.19	16	16	70.79	5	5	53.90
9	9	52.96	4	4	45.00	1	1	41.32
2	2	40.86	3	3	34.65	14	14	31.45
8	8	31.25	15	15	21.22	7	7	19.33
13	13	17.90	12	12	16.95	10	10	11.68
6	6	9.25	17	17	8.24			
AVERAGE:		37.00						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
4	4	385.29	1	1	196.25	5	5	192.11
11	11	153.47	9	9	102.01	2	2	88.48
6	6	56.53	16	16	53.52	13	13	37.33
14	14	34.53	3	3	30.34	15	15	25.98
8	8	25.85	12	12	17.87	10	10	17.71
7	7	17.29	17	17	8.24			
AVERAGE:		84.87						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
4	4	1.12	1	1	0.89	10	10	0.49
6	6	0.38	2	2	0.36	5	5	0.34
13	13	0.23	8	8	0.14	9	9	0.14
14	14	0.12	3	3	0.11	7	7	0.04
11	11	0.00	12	12	0.00	15	15	0.00
16	16	0.00	17	17	0.00			
AVERAGE:		0.26						

Table 8.6c. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda	fi	h
1	18.19166668	50.06166667	206.0
2	19.80194449	50.07194445	237.0
3	20.98444450	50.01888889	209.0
4	22.02916667	50.11527778	212.0
5	19.00111111	49.80805560	398.0
6	19.96027783	49.29388890	855.0
7	19.98194450	49.23250001	1991.0
8	20.68916670	49.62722225	292.0
9	22.34166668	49.46638891	420.0
10	23.38333335	49.95000005	245.0
11	17.57000003	49.32000002	222.0
12	17.54000003	49.78000004	749.0
13	18.45000002	49.55000003	1322.0
14	18.12000001	49.70000004	250.0
15	22.00611111	48.93888894	176.0
16	20.23583335	49.18944445	1778.0
17	20.18916668	48.84861115	901.0

Table 8.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA	
8	8	94.25	6	6	56.08	9	9	39.35	
1	1	36.69	5	5	32.96	7	7	28.59	
4	4	26.84	2	2	17.13	3	3	11.55	
AVERAGE:		38.16							

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
9	9	200.29	8	8	167.46	6	6	63.12
1	1	58.02	4	4	51.05	7	7	28.06
5	5	26.24	3	3	20.28	2	2	14.76
AVERAGE:		69.92						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
8	8	0.53	9	9	0.29	1	1	0.19
3	3	0.12	4	4	0.08	7	7	0.04
2	2	0.04	5	5	0.03	6	6	0.03
AVERAGE:		0.15						

Table 8.7b. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

1	17.57000003	49.32000002	222.0
2	17.54000003	49.78000004	749.0
3	18.45000002	49.55000003	1322.0
4	18.12000001	49.70000004	250.0
5	17.11055556	48.16861112	287.0
6	17.68055559	48.49194447	178.0
7	18.19416668	47.87305560	115.0
8	18.19166668	50.06166667	206.0
9	19.00111111	49.80805560	398.0

Table 8.7c. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s):	746
Total number of errors:	778
Maximal positive error:	3.98
Minimal negative error:	-5.83

Annex 9. Global radiation

Table 9.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
48101	18	67.04	53101	21	64.12	44527	15	61.06
44214	14	46.92	25212	8	41.43	osije	32	39.03
61709	27	36.23	sombo	35	34.79	khust	43	33.23
16203	4	31.99	stos	48	28.72	26505	9	28.28
17809	5	27.54	daruv	31	26.56	36500	11	26.08
bereg	42	25.17	36100	10	24.87	23201	6	24.71
55706	24	24.55	55502	23	24.32	kosic	49	23.79
lucen	47	22.82	66519	30	21.66	15307	3	20.61
47106	17	19.69	sacui	39	19.43	58113	26	19.37
46303	16	18.94	63411	28	18.45	39113	12	17.76
52819	20	17.61	kikin	36	16.62	13703	1	16.55
14706	2	16.45	sanni	40	16.40	53521	22	16.10
44121	13	14.80	23703	7	13.71	milho	50	12.99
56300	25	12.68	orade	38	12.61	hurba	46	12.58
slavo	33	12.15	uzhgo	44	12.11	brati	45	11.42
64704	29	10.97	51705	19	9.72	arad	37	9.59
satu	41	8.86	palic	34	6.15			
AVERAGE:		23.58						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
satu	41	1574.92	61709	27	570.24	44527	15	445.90
13703	1	431.82	47106	17	374.17	stos	48	362.10
53101	21	288.80	arad	37	268.10	khust	43	233.88
milho	50	233.20	39113	12	219.92	46303	16	190.93
sombo	35	183.17	58113	26	177.73	osije	32	159.05
55706	24	155.95	kosic	49	138.05	66519	30	130.07
17809	5	121.67	15307	3	120.44	44121	13	117.47
44214	14	107.81	23201	6	103.65	sanni	40	103.05
36500	11	101.52	55502	23	98.60	23703	7	97.35
64704	29	94.25	palic	34	86.74	53521	22	75.83
26505	9	74.22	52819	20	72.73	daruv	31	70.32
kikin	36	64.88	56300	25	64.48	lucen	47	62.24
bereg	42	60.77	sacui	39	59.67	orade	38	52.54
36100	10	50.29	14706	2	47.05	16203	4	46.13
48101	18	44.99	25212	8	36.34	brati	45	33.13
51705	19	30.90	63411	28	30.59	hurba	46	27.96
uzhgo	44	23.25	slavo	33	20.76			
AVERAGE:		166.79						

The Stations are the same as at Table 8.1a.

Table 9.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
KRV	17	100.83	ZAJ	20	85.30	SZE	1	76.32
KRG	12	64.53	BAC	21	62.62	SOM	4	56.15
NEG	14	54.74	PAL	3	54.43	BGD	11	54.26
ZRE	6	52.33	TIM	28	46.80	SEM	27	46.27
ORA	25	41.86	POZ	16	40.34	KRS	18	39.55
KIK	7	38.97	DTS	24	38.96	LOZ	9	37.93
VRS	8	36.46	ZLA	15	34.55	CUP	19	33.28
NSA	5	32.15	BAN	22	26.28	VLJ	10	25.77
SNM	26	24.90	OSI	2	21.95	SPA	13	16.06
CAL	23	13.66						
AVERAGE:		44.90						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
ZAJ	20	554.13	TIM	28	457.63	SZE	1	320.50
KRV	17	276.34	BAC	21	269.80	SOM	4	188.67
PAL	3	165.40	POZ	16	164.38	ZRE	6	162.49
DTS	24	161.88	SEM	27	134.78	SNM	26	126.28
KIK	7	122.29	NSA	5	113.79	KRG	12	103.42
VRS	8	93.94	BAN	22	82.57	ORA	25	77.84
KRS	18	75.36	CUP	19	58.01	LOZ	9	56.68
NEG	14	55.39	BGD	11	53.33	OSI	2	51.27
ZLA	15	44.09	VLJ	10	34.74	SPA	13	32.58
CAL	23	21.88						
AVERAGE:		144.98						

The Stations are the same as at Table 8.2b.

Table 9.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
457600	30	201.64	525215	44	201.32	441757	20	158.71
539357	51	143.86	740330	96	139.17	635658	76	133.18
553254	58	125.17	401321	6	122.93	408800	9	120.10
611355	66	110.31	748253	98	97.06	515231	40	95.23
33638	112	91.89	617637	69	91.46	655650	83	85.39
359521	5	83.81	33658	111	83.55	454936	28	83.41
13295	106	82.04	428307	14	75.23	538416	50	74.55
352557	3	74.53	507158	35	74.45	359257	4	73.93
751555	99	71.85	436447	17	71.81	711305	90	71.19
530535	48	70.58	428632	15	69.55	614740	68	69.53
530801	49	68.11	444820	23	67.95	656621	85	66.04
438238	18	66.04	542532	52	65.70	439534	19	65.47
741640	97	64.41	443639	21	62.90	655522	82	62.25
647334	80	62.06	412721	10	57.84	632130	71	56.73
551716	57	56.38	517507	41	56.13	13183	108	54.51
414352	11	54.48	546115	53	54.27	739615	95	53.51
528518	47	53.08	722657	94	52.55	523703	43	52.51
347357	2	51.91	639744	77	51.82	13173	109	50.71
58113	103	50.24	557334	59	48.66	635347	75	48.44
656555	84	47.93	608121	64	47.77	445718	24	47.44
511912	39	47.20	710736	89	46.62	523108	42	46.07
551459	55	45.48	444417	22	43.73	714623	91	43.56
509649	37	43.22	551621	56	42.05	527527	46	41.69
758355	100	39.95	525323	45	39.50	456526	29	39.06
604037	62	37.52	614436	67	37.47	709352	88	37.26
719507	92	36.58	417530	13	36.04	605537	63	35.91
509441	36	32.97	502141	32	32.33	602213	61	32.29
430608	16	30.32	500432	31	30.21	33634	110	30.17
407500	8	29.76	66519	101	27.97	646247	79	27.41
708430	87	26.87	548409	54	26.81	600608	60	26.75
650727	81	26.31	511349	38	25.73	63411	104	25.63
622544	70	25.18	634322	74	24.25	642540	78	24.25
415816	12	23.81	64704	102	23.07	452452	26	22.86
703156	86	21.80	632229	72	19.89	722205	93	18.56
632432	73	18.32	406421	7	18.08	610244	65	17.40
506422	34	16.62	346452	1	15.74	502317	33	15.46
13285	107	15.43	453344	27	14.49	13174	105	13.65
446853	25	11.59						
AVERAGE:		56.04						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
441757	20	5499.56	509441	36	3148.83	523703	43	2173.86
751555	99	1589.71	611355	66	1292.84	401321	6	1198.39
457600	30	913.16	748253	98	667.18	655650	83	570.02
539357	51	425.32	530801	49	422.68	546115	53	417.65
507158	35	357.32	428307	14	345.23	33638	112	338.44
439534	19	336.02	711305	90	329.42	608121	64	281.29
33658	111	272.36	635347	75	252.69	632130	71	252.09
352557	3	248.69	445718	24	246.81	740330	96	243.64
553254	58	243.27	647334	80	242.78	639744	77	239.98
436447	17	230.23	359521	5	216.46	517507	41	212.43
635658	76	209.32	655522	82	170.40	525323	45	162.65

CARPATCLIM <i>Report</i>		Date <i>02/10/2012</i>		Version <i>final</i>		Page <i>160</i>		
530535	48	159.82	617637	69	158.82	414352	11	156.97
359257	4	154.32	444820	23	147.95	542532	52	147.53
525215	44	146.31	515231	40	144.83	710736	89	141.34
417530	13	138.60	509649	37	136.86	605537	63	136.71
443639	21	127.35	614740	68	127.11	33634	110	113.00
406421	7	112.23	66519	101	109.06	551716	57	108.38
614436	67	106.90	58113	103	106.71	741640	97	105.14
656621	85	102.90	13183	108	101.20	709352	88	96.26
739615	95	94.15	453344	27	93.66	551621	56	93.24
438238	18	92.77	428632	15	90.60	456526	29	87.78
64704	102	82.23	347357	2	80.94	642540	78	79.02
523108	42	77.89	502317	33	77.59	650727	81	74.42
452452	26	73.69	758355	100	73.61	412721	10	73.37
13295	106	69.46	407500	8	68.44	511912	39	66.01
444417	22	65.52	454936	28	65.11	604037	62	64.72
548409	54	57.87	13174	105	57.50	528518	47	56.30
13173	109	56.13	722657	94	55.00	551459	55	54.72
430608	16	53.47	719507	92	53.11	656555	84	52.30
708430	87	51.07	538416	50	48.87	703156	86	48.64
408800	9	45.40	415816	12	43.09	13285	107	41.67
511349	38	38.84	714623	91	37.28	63411	104	36.90
506422	34	36.36	600608	60	34.94	527527	46	33.89
502141	32	33.07	632229	72	32.98	557334	59	32.00
722205	93	29.47	622544	70	29.14	632432	73	28.16
500432	31	26.32	346452	1	23.67	446853	25	23.04
602213	61	20.14	610244	65	17.96	634322	74	15.36
646247	79	14.53						
AVERAGE:		266.07						

The Stations are the same as at Table 8.3b.

Table 9.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
9	9	59.59	21	21	46.18	3	3	43.33
2	2	39.32	13	13	33.17	24	24	30.59
6	6	30.47	7	7	23.76	8	8	23.19
1	1	22.45	19	19	20.12	23	23	19.61
18	18	18.99	22	22	18.84	17	17	18.80
10	10	18.44	5	5	17.83	14	14	16.95
11	11	14.94	12	12	14.63	15	15	13.88
16	16	8.58	20	20	8.51	4	4	8.22
AVERAGE:		23.77						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
22	22	830.34	13	13	593.10	21	21	446.84
6	6	402.30	9	9	374.62	17	17	344.44
24	24	215.82	3	3	205.97	16	16	182.23
11	11	164.54	2	2	144.59	1	1	136.42
18	18	85.49	19	19	65.20	10	10	61.95
23	23	61.95	15	15	60.70	5	5	51.87
14	14	40.38	12	12	36.79	20	20	25.13
8	8	24.85	4	4	21.06	7	7	15.69
AVERAGE:		191.35						

The Stations are the same as at Table 8.4b.

Table 9.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
23703	16	63.29	11946	9	60.93	23201	15	47.31
11993	12	39.22	690	25	33.32	11782	29	33.16
53101	19	33.11	11931	7	26.66	660	24	26.24
600	21	25.87	33631	13	25.59	11819	2	25.52
33634	14	21.57	650	23	20.94	11787	28	19.69
11766	27	19.48	11910	5	18.79	11968	10	18.35
44121	17	18.19	11774	26	17.82	11858	3	16.43
11813	1	15.53	11978	11	14.85	11927	6	13.07
51705	18	12.95	11903	4	11.66	61709	20	10.68
625	22	10.12	11938	8	8.34			
AVERAGE:		24.44						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11946	9	1000.42	61709	20	599.33	53101	19	461.51
600	21	289.17	11910	5	275.21	11978	11	216.49
11968	10	188.89	23201	15	150.10	11819	2	134.02
51705	18	95.03	11938	8	94.20	23703	16	91.58
11813	1	87.55	44121	17	83.05	690	25	59.03
11993	12	58.87	11931	7	50.35	660	24	48.07
33634	14	45.37	11782	29	35.45	650	23	34.76
11858	3	30.15	11787	28	30.05	11766	27	29.36
11774	26	29.21	11927	6	28.60	11903	4	26.51
33631	13	22.53	625	22	20.99			
AVERAGE:		148.82						

Table 9.5b. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

1	17.11055556	48.16861112	287.0	11813
2	17.68055559	48.49194447	178.0	11819
3	18.19416668	47.87305560	115.0	11858
4	19.14194445	48.64250003	313.0	11903
5	19.64666670	48.64444448	1015.0	11910
6	19.66666670	48.32916668	187.0	11927
7	20.23583335	49.18944445	1778.0	11931
8	20.18916668	48.84861115	901.0	11938
9	20.80138893	48.71666670	575.0	11946
10	21.22250001	48.67222226	230.0	11968
11	21.73472226	48.66805559	104.0	11978
12	22.00611111	48.93888894	176.0	11993
13	22.60000003	48.20000001	113.0	33634
14	22.30000002	48.60000003	115.0	33631
15	19.02805556	47.06111111	153.0	44121
16	17.67472226	47.71000004	117.0	23703
17	20.53611114	48.49527780	309.0	51705
18	20.01666667	47.86666671	111.3	53101
19	17.26722224	47.88972227	121.0	23201
20	21.65888892	48.38083335	100.0	61709
21	19.00111111	49.80805560	398.0	600
22	19.96027783	49.29388890	855.0	625
23	19.98194450	49.23250001	1991.0	650
24	20.68916670	49.62722225	292.0	660
25	22.34166668	49.46638891	420.0	690
26	17.56972225	49.32055557	222.0	11774
27	17.54194447	49.77722226	749.0	11766
28	18.44777780	49.54611114	1322.0	11787
29	18.12166667	49.69833337	250.0	11782

Table 9.6a. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
1	1	71.31	5	5	66.08	2	2	62.40
10	10	61.73	4	4	41.95	13	13	35.29
3	3	28.39	9	9	27.76	14	14	25.83
7	7	25.59	8	8	25.56	6	6	24.45
16	16	22.18	11	11	20.63	12	12	13.34
15	15	11.36	17	17	5.40			
AVERAGE:		33.49						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
4	4	514.45	1	1	209.62	5	5	153.50
2	2	115.14	14	14	54.86	11	11	44.42
10	10	42.40	13	13	39.09	12	12	37.75
16	16	36.95	6	6	34.75	8	8	33.67
9	9	33.45	3	3	32.59	7	7	31.69
15	15	10.58	17	17	4.89			
AVERAGE:		84.11						

The Stations are the same as at Table 8.6c.

Table 9.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
8	8	76.51	4	4	49.23	9	9	42.46
6	6	36.11	2	2	20.63	1	1	18.39
5	5	16.12	7	7	15.98	3	3	13.34
AVERAGE:		32.08						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
9	9	195.78	8	8	158.23	6	6	109.59
4	4	50.93	5	5	47.63	1	1	29.21
2	2	27.23	3	3	22.75	7	7	21.02
AVERAGE:		73.59						

The Stations are the same as at Table 8.7b.

Annex 10. Wind speed

Table 10.1a. Station parameters of the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

index	lambda(x)	fi(y)	h	stno	stna	country
1	16.60222222	47.67833333	233.8	13703	Sopron Kuruc-domb	HU
2	16.72916666	47.48138888	198.9	14706	Sopronhorpács	HU
3	16.64777777	47.19833333	201.1	15307	Szombathely	HU
4	16.30944444	46.91027777	311.7	16203	Szentgotthárd Farkasfa	HU
5	16.81280000	46.92580000	240.1	16414	Zalaegerszeg Nagyutas	HU
6	16.61305555	46.60555555	165.3	17308	Iklódbördőce	HU
7	16.97060000	46.45610000	139.8	17809	Nagykanizsa	HU
8	17.26720000	47.88970000	121.0	23201	Mosonmagyaróvár	HU
9	17.67470000	47.71000000	116.7	23703	Győr Likócs	HU
10	17.37220000	47.29220000	135.5	25212	Pápa Nyárád	HU
11	17.23860000	46.73560000	111.7	26505	Keszthely Tanyakereszt	HU
12	17.87380000	46.36270000	129.5	27815	Kaposvár	HU
13	17.52690000	46.10330000	159.0	28700	Homokszentgyörgy	HU
14	18.31080000	47.65170000	123.8	34211	Tata	HU
15	18.04080000	46.91080000	108.2	36100	Siófok	HU
16	18.95220000	46.95060000	147.7	36407	Dunaújváros	HU
17	18.18360000	46.68560000	165.0	36500	Iregszemcse	HU
18	18.25220000	46.13470000	395.7	38605	Pécs Árpádtető	HU
19	18.23500000	45.99500000	200.2	39113	Pécs Pogány	HU
20	19.28360000	47.79000000	242.9	43613	Penc	HU
21	19.02810000	47.51110000	153.3	44121	Budapest belterület	HU
22	19.47640000	47.65560000	162.4	44214	Aszód	HU
23	19.18220000	47.42920000	139.1	44527	Budapest Pestszentlőrinc-külterület	HU
24	19.74830000	46.91310000	114.0	46303	Kecskemét külterület	HU
25	19.09890000	46.51030000	93.6	47106	Kalocsa Öregcsertő	HU
26	19.01670000	46.18330000	113.0	48101	Baja Csávoly	HU
27	20.53610000	48.49530000	308.9	51705	Jósvafő	HU
28	20.77140000	48.09690000	232.8	52819	Miskolc Avas	HU
29	20.01670000	47.86670000	111.3	53101	Kékestető	HU
30	20.23580000	47.73970000	123.3	53521	Kompolt	HU
31	20.64780000	47.64470000	90.2	54306	Poroszló	HU
32	20.20000000	47.12860000	90.0	55502	Szolnok Szandaszőlős	HU
33	20.74000000	47.10640000	85.9	55706	Túrkeve	HU
34	20.52780000	46.86940000	85.4	56300	Szarvas	HU
35	20.68750000	46.54420000	88.8	57311	Oroszáza	HU
36	20.09030000	46.25610000	81.8	58113	Szeged külterület	HU
37	20.73670000	46.31720000	94.8	58300	Pitvaros	HU
38	21.65890000	48.38080000	100.4	61709	Sátoraljaújhely	HU
39	21.88690000	47.96220000	142.1	63411	Nyíregyháza Napkor	HU
40	21.61080000	47.49030000	107.6	64704	Debrecen	HU
41	21.16060000	46.67940000	84.0	66519	Békéscsaba	HU
42	22.62560000	47.86220000	118.3	73302	Pátyod	HU
43	16.85000000	45.91700000	141.0	bjelo	Bjelovar	CR
44	17.23300000	45.60000000	161.0	daruv	Daruvar	CR
45	17.06700000	46.05000000	121.0	djurd	Djurdjevac	CR
46	18.16700000	45.76700000	97.0	donji	Donji Miholjac	CR
47	18.63300000	45.53300000	89.0	osije	Osiijek	CR
48	18.00000000	45.16600000	88.0	slavo	Slavonski Brod	CR
49	18.35000000	45.66700000	92.0	valpo	Valpovo	CR
50	19.76410000	46.09720000	102.0	palic	Palic	RS
51	19.14310000	45.76700000	87.0	sombo	Sombor	RS
52	20.46460000	45.84260000	80.0	kikin	Kikinda	RS
53	20.603163	46.071633	85.0	604037	SANNICOLAU MARE	RO
54	21.355219	46.133851	117.0	608121	ARAD	RO
55	21.897545	47.03602	136.0	703156	ORADEA	RO
56	22.888782	47.721768	128.0	748253	SATU MARE	RO
57	22.26666668	48.63333337	113.0	33631	Uzhgorod	UA
58	22.65000003	48.20000001	113.0	33634	Beregove	UA
59	23.30000002	48.18333334	164.0	33638	Khust	UA
60	18.02916667	48.89694449	209.0	11803		SK
61	17.11055556	48.16861112	287.0	11813		SK
62	18.19416668	47.87305560	115.0	11858		SK
63	19.66666670	48.32916668	187.0	11927		SK
64	20.80138893	48.71666670	575.0	11946		SK
65	21.22250001	48.67222226	230.0	11968		SK
66	21.73472226	48.66805559	104.0	11978		SK

Table 10.1b. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
604037	53	60.22	47106	25	53.65	66519	41	52.43
11968	65	49.01	bjelo	43	47.91	36407	16	42.99
57311	35	42.18	daruv	44	41.52	33638	59	41.10
osije	47	39.78	16204	4	39.77	14706	2	39.44
33634	58	34.75	PAL	50	34.33	56300	34	33.51
703156	55	33.01	13704	1	31.47	61709	38	29.78
23201	8	29.24	55706	33	28.67	51705	27	28.35
36500	17	27.49	djurd	45	26.95	11946	64	26.78
donji	46	26.53	36100	15	26.50	53101	29	26.37
43613	20	26.29	slavo	48	25.65	11813	61	25.19
63411	39	25.02	44527	23	24.76	39113	19	24.63
55502	32	24.16	52819	28	23.69	28700	13	22.97
64704	40	22.63	15310	3	22.30	11978	66	22.14
608121	54	22.12	16414	5	21.89	valpo	49	21.83
53521	30	20.57	27815	12	20.48	46303	24	20.44
SOM	51	20.26	58300	37	20.24	11858	62	19.36
58113	36	19.29	38605	18	19.18	23703	9	19.10
17306	6	18.92	748253	56	18.74	11803	60	18.43
44121	21	18.31	34211	14	17.56	KIK	52	16.94
54306	31	16.70	33631	57	16.21	26505	11	16.05
17809	7	15.91	44214	22	15.60	11927	63	14.78
48101	26	14.71	25212	10	14.68	73302	42	11.53
AVERAGE:		26.86						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
bjelo	43	2858.30	38605	18	2260.02	46303	24	2045.41
58300	37	1773.18	33634	58	1672.51	52819	28	1541.41
27815	12	1433.25	34211	14	1426.78	valpo	49	1291.31
13704	1	1200.98	23201	8	1197.05	36407	16	1101.68
748253	56	1042.31	54306	31	993.40	56300	34	980.56
57311	35	978.80	63411	39	962.42	55502	32	938.31
64704	40	883.20	17809	7	862.66	11946	64	859.06
73302	42	832.08	PAL	50	825.13	16414	5	784.04
66519	41	699.80	608121	54	658.93	44121	21	577.86
44527	23	565.11	44214	22	544.00	53101	29	538.08
53521	30	529.20	osije	47	493.19	16204	4	479.42
KIK	52	468.06	33638	59	466.19	61709	38	459.16
11968	65	430.09	28700	13	426.67	daruv	44	419.22
23703	9	418.73	25212	10	416.34	43613	20	326.08
11858	62	318.31	SOM	51	316.72	donji	46	311.97
36500	17	299.74	33631	57	282.79	48101	26	217.27
604037	53	197.96	47106	25	182.87	55706	33	173.13
11813	61	167.90	17306	6	155.10	39113	19	149.60
51705	27	143.43	slavo	48	142.66	11927	63	141.61
djurd	45	130.32	703156	55	130.12	11803	60	130.07
58113	36	128.37	36100	15	114.99	15310	3	107.86
26505	11	94.61	14706	2	89.95	11978	66	76.66
AVERAGE:		664.61						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
PAL	50	2.79	46303	24	2.48	16414	5	2.14
donji	46	1.97	55502	32	1.86	38605	18	1.85
63411	39	1.79	748253	56	1.66	52819	28	1.61
54306	31	1.54	17306	6	1.44	64704	40	1.40
27815	12	1.38	bjelo	43	1.35	23201	8	1.35
36500	17	1.34	11946	64	1.34	73302	42	1.32
47106	25	1.28	13704	1	1.28	56300	34	1.28
28700	13	1.20	66519	41	1.20	daruv	44	1.19
43613	20	1.17	57311	35	1.17	valpo	49	1.15
KIK	52	1.11	11803	60	1.10	33631	57	1.07
48101	26	1.02	55706	33	1.00	16204	4	1.00
17809	7	1.00	53521	30	1.00	36407	16	0.95
slavo	48	0.94	osije	47	0.90	44121	21	0.90
61709	38	0.90	703156	55	0.88	33638	59	0.86
58300	37	0.85	608121	54	0.85	25212	10	0.82
58113	36	0.81	34211	14	0.80	53101	29	0.80
djurd	45	0.78	44527	23	0.77	39113	19	0.76
SOM	51	0.76	33634	58	0.75	44214	22	0.75
23703	9	0.68	604037	53	0.68	11858	62	0.64
11927	63	0.64	15310	3	0.63	36100	15	0.60
51705	27	0.59	14706	2	0.59	11813	61	0.49
11978	66	0.48	26505	11	0.46	11968	65	0.28
AVERAGE:		1.10						

Table 10.1c. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 49
 Total number of errors: 49
 Maximal positive error: 24.07
 Minimal negative error: 0.00

Table 10.2a. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
ORA	37	128.92	VAL	2	111.51	TIM	39	111.39
VLJ	19	104.79	BPT	10	91.98	LOZ	14	89.46
ZAJ	33	86.53	ZLA	25	72.84	OSI	1	66.92
BCL	35	66.69	LJU	18	66.23	KIK	9	65.67
ALE	32	62.08	VBA	28	59.91	NEG	23	59.82
ZAG	22	58.33	BGD	16	55.03	SNM	40	54.51
SOM	6	51.58	KRG	21	50.51	PAL	5	48.87
CUP	31	47.27	NSA	11	46.26	SEN	8	46.02
VRS	13	45.09	KRV	27	44.00	SRM	15	43.69
BBA	24	42.03	BEC	7	40.62	ZRE	12	40.27
REK	29	40.25	KRS	30	39.20	VGR	17	39.19
POZ	26	36.65	BAN	38	32.76	CAL	34	31.64
DTS	36	27.52	BAJ	3	21.18	SPL	20	19.44
SZE	4	17.53						
AVERAGE:		56.60						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
BPT	10	1466.97	PAL	5	1268.60	KIK	9	1248.12
ZRE	12	911.10	VAL	2	819.80	VLJ	19	736.37
SEN	8	599.37	POZ	26	518.96	ZAG	22	510.24
CAL	34	461.82	NEG	23	459.05	TIM	39	431.17
ZAJ	33	421.15	ZLA	25	357.24	OSI	1	349.30
KRG	21	325.50	VGR	17	320.78	SRM	15	310.12
BAN	38	301.18	KRV	27	295.34	LOZ	14	255.90
ALE	32	239.12	BGD	16	236.37	BAJ	3	215.09
SOM	6	195.01	ORA	37	182.49	SNM	40	175.49
VBA	28	163.28	BEC	7	137.30	BBA	24	125.63
CUP	31	125.28	REK	29	120.15	BCL	35	115.22
SPL	20	112.72	NSA	11	106.19	LJU	18	81.90
KRS	30	77.60	VRS	13	66.82	SZE	4	59.55
DTS	36	35.70						
AVERAGE:		373.47						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
PAL	5	2.87	KIK	9	1.82	CAL	34	1.68
VBA	28	1.33	VAL	2	1.21	BPT	10	1.14
SEN	8	1.13	VLJ	19	1.07	OSI	1	0.95
ZAG	22	0.85	BAN	38	0.82	KRV	27	0.82
ZRE	12	0.79	SRM	15	0.73	VGR	17	0.68
ZAJ	33	0.66	SOM	6	0.64	LOZ	14	0.62
ZLA	25	0.62	POZ	26	0.59	LJU	18	0.56
NEG	23	0.56	BGD	16	0.54	BBA	24	0.54
ALE	32	0.53	TIM	39	0.52	BEC	7	0.52
KRG	21	0.50	BAJ	3	0.47	SPL	20	0.47
SNM	40	0.46	CUP	31	0.38	VRS	13	0.33
KRS	30	0.26	REK	29	0.20	DTS	36	0.18
NSA	11	0.17	SZE	4	0.15	ORA	37	0.13
BCL	35	0.08						
AVERAGE:		0.71						

Table 10.2b. Station parameters of the series system of Serbia and near border series from Croatia, Hungary, Romania

index	lambda(x)	fi(y)	
1	18.5614167	45.4998889	Osijek
2	18.3447778	45.6665278	Valpovo
3	19.0166667	46.1833333	Baja
4	20.0902778	46.2561111	Szeged
5	19.7640230	46.0972180	Palic
6	19.1431350	45.7670000	Sombor
7	20.0278611	45.6332500	Becej
8	20.0960450	45.9234420	Senta
9	20.4646400	45.8426340	Kikinda
10	19.6704870	45.3365990	Backi Petrovac
11	19.8300030	45.3222150	Novi Sad
12	20.3760080	45.3987240	Zrenjanin
13	21.3055240	45.1441370	Vrsac
14	19.2269330	44.5410990	Loznica
15	19.5550360	45.0093730	Sremska Mitrovica
16	20.4648220	44.7984570	Beograd
17	21.4984300	44.7526140	Veliko Gradiste
18	19.2978090	44.2752810	Ljubovija
19	19.9124730	44.2754640	Valjevo
20	20.9277710	44.0272220	Kragujevac
21	20.9421460	44.3696000	Smederevska Palanka
22	21.7795770	44.1997370	Zagubica
23	22.5363400	44.2391570	Negotin
24	19.5614595	43.9667870	Bajina Basta
25	19.7130230	43.7378070	Zlatibor
26	20.0295210	43.8430700	Pozega
27	20.6998360	43.7088840	Kraljevo
28	20.8890278	43.6177222	Vrnjacka Banja
29	21.0945833	43.8668611	Rekovac
30	21.3399540	43.5640540	Krusevac
31	21.3806360	43.9406160	Cuprija
32	21.7112222	43.5336111	Aleksinac
33	22.2885650	43.8831280	Zajecar
34	22.9475700	43.9852500	Calafat
35	23.1145800	44.4767200	Bicles
36	22.6276500	44.6267300	Drobeta Turnu Severin
37	21.7118400	45.0389600	Oravita
38	21.1379700	45.3830500	Banloc
39	21.2593600	45.7714600	Timisoara
40	20.6031600	46.0716300	Sinnicolau Mare

Table 10.2c. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 16
 Total number of errors: 16
 Maximal positive error: 46.03
 Minimal negative error: 0.00

Table 10.3a. Station parameters of the series system of Romania and near border series from Serbia, Hungary, Ukraine

index	lambda (x)	phi (y)	h(m)	ST_ID	ST_NAME	Country
1	24.879770	43.760420	25	346452	TURNU MAGURELE	RO
2	23.945686	43.790056	39	347357	BECHET	RO
3	28.588980	43.816470	1	349835	MANGALIA	RO
4	25.934221	43.875470	24	352557	GIURGIU	RO
5	22.947569	43.985246	61	359257	CALAFAT	RO
6	25.354370	43.978290	85	359521	ALEXANDRIA	RO
7	23.332620	44.029510	59	401321	BAILLESTI	RO
8	24.358813	44.100444	105	406421	CARACAL	RO
9	24.980030	44.107740	111	407500	ROSIORII DE VEDE	RO
10	27.967130	44.088620	156	408800	ADAMCLISI	RO
11	27.339860	44.206430	22	412721	CALARASI	RO
12	28.646380	44.214090	13	413838	CONSTANTA	RO
13	23.868460	44.310600	192	414352	CRAIOVA	RO
14	28.252880	44.243560	67	415816	MEDGIDIA	RO
15	25.538540	44.283260	118	417530	VIDELE	RO
16	26.095322	44.412355	82	425606	BUCURESTI FILARET	RO
17	23.114580	44.476720	313	428307	BICLES	RO
18	26.079760	44.510820	90	430608	BUCURESTI BANEASA	RO
19	24.791530	44.562880	225	436447	STOLNICI	RO
20	22.627650	44.626730	77	438238	DR.TR.SEVERIN	RO
21	25.580740	44.653200	174	439534	TITU	RO
22	27.965080	44.692000	41	441757	HIRSOVA	RO
23	26.658560	44.721950	65	443639	URZICENI	RO
24	21.634610	44.722850	82	444127	MOLDOVA VECHE	RO
25	24.238708	44.665755	275	444417	DRAGASANI	RO
26	27.295990	44.740960	51	445718	GRIVITA	RO
27	24.867460	44.849290	332	452452	PITESTI	RO
28	23.710236	44.878418	271	453344	TG.LOGRESTI	RO
29	25.427260	44.929910	285	456526	TIRGOVISTE	RO
30	25.988990	44.956090	172	457600	PLOIESTI	RO
31	24.571790	45.016290	550	500432	DEDULESTI	RO
32	22.861054	44.997136	260	501252	PADES(APA NEAGRA)	RO
33	21.711840	45.038960	309	502141	ORAVITA	RO
34	23.260882	45.040958	204	502317	TG.JIU	RO
35	24.380980	45.089190	242	506422	RM. VILCEA	RO
36	22.057120	45.181730	1432	507158	SEMENIC	RO
37	24.671280	45.179170	449	509441	CURTEA DE ARGES	RO
38	26.853000	45.132910	89	509649	BUZAU	RO
39	29.760449	45.148694	3	509940	SULINA	RO
40	23.810150	45.165870	525	511349	POLOVRAGI	RO
41	28.825690	45.190840	5	511849	TULCEA	RO
42	22.534340	45.281170	2180	515231	TARCU	RO
43	25.038140	45.275150	690	517507	CIMPULUNG	RO
44	21.137974	45.383051	83	523108	BANLOC	RO
45	23.464622	45.387686	1559	523328	PARING	RO
46	25.515713	45.355256	1510	523530	SINAIA(1500)	RO
47	27.040160	45.390750	155	523703	RM. SARAT	RO
48	22.226840	45.417560	241	525215	CARANSEBES	RO
49	23.378254	45.406610	607	525323	PETROSANI	RO
50	23.968553	45.411503	573	525358	VOINEASA	RO
51	25.458260	45.446140	2506	527527	VF. OMU	RO
52	25.273270	45.431910	1376	528518	FUNDATA	RO
53	25.585100	45.506460	1096	530535	PREDEAL	RO
54	28.033930	45.473300	71	530801	GALATI	RO
55	24.273180	45.653180	523	538416	BOITA	RO
56	23.934000	45.657510	1462	539357	PALTINIS	RO
57	21.934630	45.686730	168	541154	LUGOJ	RO
58	26.058304	45.668545	707	541601	INT.BUZAULUI	RO
59	25.527720	45.696130	535	542532	BRASOV	RO
60	21.259360	45.771460	86	546115	TIMISOARA	RO
61	24.092940	45.789700	453	548409	SIBIU	RO
62	24.936720	45.836360	435	551459	FAGARAS	RO
63	26.377080	45.824010	1778	551621	LACAUTI	RO
64	27.410360	45.841950	57	551716	TECUCI	RO
65	22.900460	45.865040	230	553254	DEVA	RO
66	23.543090	45.964530	267	557334	SEBES-ALBA	RO

67	26.116870	45.993240	571	600608	TG.SECUIESC	RO
68	20.603163	46.071633	85	604037	SINNICOLU MARE	RO
69	27.171810	46.105020	101	606705	ADJUD	RO
70	21.355219	46.133851	117	608121	ARAD	RO
71	23.936770	46.178820	342	611355	BLAJ	RO
72	24.593180	46.228250	323	614436	DUMBRAVENI	RO
73	27.645580	46.231360	168	614740	BIRLAD	RO
74	26.642590	46.272960	245	617637	TG. OCNA	RO
75	25.293340	46.297090	532	618518	ODORHEIUL SECUIESC	RO
76	25.774170	46.371580	667	622544	MIERCUREA CIUC	RO
77	21.543000	46.518940	96	632130	CHISINEU CRIS	RO
78	22.468092	46.528317	278	632229	STEI	RO
79	24.535330	46.533680	317	632432	TG.MURES	RO
80	23.311820	46.535770	1357	634322	BAISOARA	RO
81	26.914070	46.532150	183	635658	BACAU	RO
82	27.715830	46.646240	121	639744	VASLUI	RO
83	25.514170	46.706080	747	642540	JOSENI	RO
84	22.795790	46.759560	1840	646247	VLADEASA 1800	RO
85	23.572990	46.777990	417	647334	CLUJ-NAPOCA	RO
86	25.361530	46.926640	690	655522	TOPLITA	RO
87	26.913390	46.969460	218	655650	ROMAN	RO
88	25.951510	46.977760	1897	656555	CEAHLAU TOACA	RO
89	26.390900	46.934020	360	656621	PIATRA NEAMT	RO
90	21.897545	47.036020	136	703156	ORADEA	RO
91	24.515450	47.149420	374	708430	BISTRITA	RO
92	23.900500	47.128260	240	709352	DEJ	RO
93	27.630080	47.171060	103	710736	IASI	RO
94	23.048360	47.195280	303	711305	ZALAU	RO
95	26.380590	47.212430	385	714623	TG. NEAMT	RO
96	26.927410	47.358670	289	722657	COTNARI	RO
97	24.650730	47.602830	1792	737439	IEZER	RO
98	26.241960	47.633280	366	739615	SUCEAVA	RO
99	23.493240	47.661210	224	740330	BAIA-MARE	RO
100	26.647040	47.736050	160	741640	BOTOSANI	RO
101	23.942140	47.777370	508	747356	OC.SUGATAG	RO
102	22.888782	47.721768	128	748253	SATU MARE	RO
103	25.891850	47.838010	387	751555	RADAUTI	RO
104	23.905880	47.939570	283	758355	SIGHETUL MARMATIEI	RO
105	21.160556	46.679444		66519	Békéscsaba Békés Airport	HU
106	21.610833	47.490278		64704	Debrecen Repül?tér	HU
107	20.687500	46.544167		57311	Orosháza Szivattyútelep	HU
108	22.625556	47.862222		73302	Pátyod magántelek	HU
109	20.736667	46.317222		58300	Pitvaros Polgármesteri Hivata	HU
110	20.464640	45.842634		13174	KIKINDA	SR
111	22.536340	44.239157		13295	NEGOTIN	SR
112	21.498430	44.752614		13285	VELIKO GRADISTE	SR
113	21.305524	45.144137		13183	VRSAK-kontrolisanoJasna	SR
114	20.376008	45.398724		13173	ZRENJANIN	SR
115	22.650000	48.200000		33634	Beregove	UA
116	25.972500	48.266389		33658	Chernivtsi	UA
117	23.300000	48.183330		33638	Khust	UA
118	24.198056	48.047500		33647	Rakhiv	UA
119	25.216667	47.883333		33657	Seliatyn	UA

Table 10.3b. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
407500	9	154.01	66519	105	147.53	655650	87	137.04
33634	115	128.68	530801	54	127.86	452452	27	124.63
611355	71	114.25	506422	35	104.56	551716	64	97.44
542532	59	97.22	428307	17	95.99	722657	96	94.16
525323	49	89.40	740330	99	87.76	502141	33	83.39
517507	43	83.26	642540	83	83.10	13285	112	82.81
436447	19	82.66	614740	73	82.19	632229	78	80.69
523530	46	80.43	500432	31	79.38	444127	24	78.87
13173	114	78.84	557334	66	78.27	347357	2	77.98
741640	100	76.88	618518	75	76.44	604037	68	75.32
406421	8	75.13	430608	18	73.56	509649	38	73.42
33638	117	73.01	758355	104	72.54	710736	93	69.93
656621	89	69.51	546115	60	69.06	509441	37	68.91
608121	70	68.51	413838	12	68.10	457600	30	67.06
709352	92	67.02	714623	95	66.25	439534	21	66.19
634322	80	66.12	541154	57	65.49	539357	56	63.29
614436	72	62.81	64704	106	61.88	444417	25	61.73
622544	76	60.63	346452	1	60.03	703156	90	59.58
441757	22	58.92	352557	4	58.57	632432	79	58.19
606705	69	58.08	525358	50	58.00	73302	108	57.70
33658	116	57.18	748253	102	56.02	511349	40	55.97
58300	109	55.40	711305	94	54.64	538416	55	54.23
655522	86	52.86	401321	7	52.85	553254	65	52.74
425606	16	52.04	656555	88	52.03	525215	48	51.45
502317	34	51.03	639744	82	50.96	415816	14	50.15
445718	26	49.50	523108	44	48.05	708430	91	47.78
511849	41	47.60	443639	23	47.31	747356	101	47.30
501252	32	47.22	617637	74	47.17	751555	103	47.16
509940	39	47.04	737439	97	46.85	548409	61	46.54
527527	51	46.06	13183	113	45.50	414352	13	44.39
359257	5	43.68	551459	62	42.13	523703	47	42.08
600608	67	41.46	541601	58	41.25	646247	84	41.17
13295	111	38.93	349835	3	38.06	453344	28	37.84
456526	29	37.48	13174	110	37.27	507158	36	36.42
632130	77	36.26	359521	6	35.79	551621	63	35.33
530535	53	33.67	528518	52	32.52	57311	107	29.63
438238	20	28.63	33647	118	28.60	635658	81	28.02
523328	45	27.49	412721	11	26.59	515231	42	25.20
647334	85	24.99	739615	98	22.63	408800	10	22.43
417530	15	20.74	33657	119	13.88			
AVERAGE:		61.31						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
33634	115	2123.95	741640	100	1464.30	655650	87	1064.59
58300	109	970.02	457600	30	906.78	748253	102	885.87
73302	108	847.20	66519	105	833.67	608121	70	782.90
525323	49	705.09	346452	1	693.14	530801	54	686.19
413838	12	663.32	406421	8	651.55	407500	9	647.17
359257	5	615.31	539357	56	601.42	444127	24	583.49
13173	114	580.28	542532	59	575.13	509649	38	566.75

13174	110	552.98	614740	73	545.42	747356	101	531.87
452452	27	530.38	639744	82	530.08	347357	2	521.82
551716	64	517.32	13285	112	513.93	57311	107	503.21
614436	72	487.33	33638	117	482.39	13295	111	450.68
430608	18	425.73	758355	104	419.57	506422	35	417.26
33658	116	416.73	740330	99	399.22	456526	29	382.35
714623	95	377.10	415816	14	368.41	523108	44	347.88
453344	28	344.39	553254	65	334.34	525358	50	331.42
439534	21	290.32	606705	69	287.66	500432	31	285.98
33647	118	284.93	523530	46	280.61	751555	103	279.49
710736	93	279.47	611355	71	275.57	634322	80	275.15
509940	39	273.04	436447	19	269.67	64704	106	263.49
444417	25	252.95	548409	61	247.94	425606	16	244.54
443639	23	226.95	722657	96	226.56	445718	26	221.63
352557	4	218.88	635658	81	211.02	557334	66	210.71
632130	77	207.67	604037	68	200.64	600608	67	199.32
546115	60	188.00	739615	98	181.41	655522	86	173.35
517507	43	159.93	527527	51	158.71	642540	83	151.42
501252	32	141.80	622544	76	139.62	618518	75	134.30
708430	91	133.99	502141	33	124.71	709352	92	123.38
349835	3	122.52	737439	97	122.24	541154	57	116.74
525215	48	115.51	646247	84	115.29	632229	78	112.49
551621	63	111.25	502317	34	110.93	530535	53	110.48
703156	90	108.92	523328	45	106.73	509441	37	105.55
33657	119	104.75	515231	42	104.23	523703	47	100.25
551459	62	99.22	541601	58	99.16	13183	113	94.62
632432	79	94.14	511849	41	93.66	711305	94	93.19
401321	7	91.35	441757	22	89.26	511349	40	88.81
414352	13	88.58	656621	89	83.38	528518	52	74.38
617637	74	70.99	359521	6	67.88	538416	55	64.74
656555	88	62.23	438238	20	61.92	428307	17	60.92
417530	15	54.34	647334	85	48.94	507158	36	46.97
408800	10	46.03	412721	11	24.64			
AVERAGE:		330.86						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
655650	87	1.75	456526	29	1.47	13174	110	1.40
359257	5	1.35	415816	14	1.27	506422	35	1.26
439534	21	1.26	457600	30	1.20	73302	108	1.18
436447	19	1.17	509649	38	1.16	614436	72	1.12
542532	59	1.11	347357	2	1.08	548409	61	1.05
57311	107	1.04	66519	105	1.04	622544	76	1.03
741640	100	1.02	346452	1	1.00	722657	96	1.00
527527	51	0.97	523108	44	0.96	748253	102	0.92
632229	78	0.92	359521	6	0.92	502317	34	0.90
444417	25	0.85	406421	8	0.84	33647	118	0.82
13285	112	0.81	646247	84	0.81	739615	98	0.80
655522	86	0.80	500432	31	0.77	58300	109	0.77
539357	56	0.75	557334	66	0.74	13173	114	0.72
551716	64	0.72	407500	9	0.70	515231	42	0.69
608121	70	0.69	714623	95	0.68	525323	49	0.68
639744	82	0.66	606705	69	0.66	614740	73	0.64
33634	115	0.64	33658	116	0.64	709352	92	0.63
33638	117	0.62	604037	68	0.62	13295	111	0.62
352557	4	0.61	452452	27	0.59	425606	16	0.59
634322	80	0.58	546115	60	0.56	414352	13	0.54
611355	71	0.53	33657	119	0.52	525358	50	0.52
453344	28	0.51	747356	101	0.50	444127	24	0.49
430608	18	0.49	523530	46	0.48	511349	40	0.46
443639	23	0.46	413838	12	0.46	13183	113	0.46
523328	45	0.44	509940	39	0.42	642540	83	0.42
541154	57	0.41	551621	63	0.41	553254	65	0.41

CARPATCLIM			Date		Version		Page	
<i>Report</i>			<i>02/10/2012</i>		<i>final</i>		<i>174</i>	
737439	97	0.40	632130	77	0.40	538416	55	0.38
758355	104	0.37	530801	54	0.37	349835	3	0.37
751555	103	0.37	710736	93	0.36	618518	75	0.36
551459	62	0.34	525215	48	0.33	635658	81	0.32
64704	106	0.32	656555	88	0.32	528518	52	0.31
507158	36	0.30	656621	89	0.29	617637	74	0.29
708430	91	0.28	401321	7	0.27	740330	99	0.26
445718	26	0.25	511849	41	0.24	438238	20	0.24
408800	10	0.24	711305	94	0.22	632432	79	0.22
441757	22	0.20	501252	32	0.19	530535	53	0.17
502141	33	0.16	517507	43	0.16	600608	67	0.15
703156	90	0.15	523703	47	0.14	417530	15	0.12
509441	37	0.10	428307	17	0.09	412721	11	0.08
541601	58	0.06	647334	85	0.05			
AVERAGE:		0.61						

Table 10.3c. Quality Control results for the series system of Romania and near border series from Serbia, Hungary, Ukraine

Number of days with error(s): 88
Total number of errors: 93
Maximal positive error: 48.13
Minimal negative error: 0.00

Table 10.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
38	38	77.44	4	4	57.21	32	32	46.44
40	40	43.91	30	30	40.62	13	13	40.48
51	51	39.29	9	9	38.44	2	2	37.71
11	11	37.12	47	47	36.42	20	20	36.11
46	46	35.48	43	43	34.96	29	29	34.50
39	39	34.20	50	50	31.33	53	53	30.70
52	52	29.18	31	31	29.10	36	36	28.68
26	26	28.22	35	35	26.59	23	23	25.79
33	33	24.75	14	14	24.47	12	12	24.47
17	17	24.20	6	6	24.02	24	24	23.80
5	5	23.48	18	18	22.69	8	8	22.33
27	27	22.05	15	15	20.78	7	7	20.55
25	25	20.31	48	48	19.94	3	3	19.74
16	16	19.05	22	22	18.96	37	37	18.82
10	10	18.48	44	44	17.53	1	1	15.62
19	19	15.56	21	21	15.07	41	41	14.89
34	34	14.76	42	42	13.85	28	28	13.75
45	45	11.92	49	49	10.79			
AVERAGE:		27.48						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
35	35	2114.32	46	46	2079.08	11	11	1248.00
1	1	1145.63	50	50	914.32	47	47	875.79
15	15	687.45	28	28	683.29	8	8	627.10
52	52	576.54	51	51	558.96	45	45	552.06
10	10	475.61	7	7	403.05	18	18	402.87
30	30	375.64	40	40	370.53	34	34	361.07
31	31	358.49	3	3	351.15	27	27	345.27
23	23	332.79	32	32	325.34	53	53	315.39
38	38	307.83	48	48	295.02	17	17	289.38
5	5	273.97	42	42	263.15	21	21	253.03
6	6	239.96	36	36	234.48	33	33	221.94
22	22	220.91	29	29	217.89	16	16	182.18
39	39	180.86	49	49	177.82	19	19	170.93
12	12	168.70	25	25	163.50	20	20	162.49
2	2	149.35	43	43	147.89	13	13	137.09
26	26	118.61	9	9	106.16	14	14	104.84
24	24	99.80	41	41	97.71	4	4	94.93
44	44	41.24	37	37	27.55			
AVERAGE:		408.09						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
7	7	2.51	12	12	2.28	40	40	2.11
46	46	1.96	8	8	1.81	15	15	1.57
30	30	1.51	22	22	1.50	50	50	1.47
47	47	1.37	52	52	1.31	34	34	1.30
45	45	1.17	41	41	1.12	32	32	1.06
27	27	1.06	29	29	1.05	31	31	0.97
48	48	0.97	25	25	0.97	23	23	0.97
9	9	0.89	51	51	0.88	3	3	0.84
36	36	0.81	38	38	0.79	35	35	0.78
44	44	0.76	21	21	0.74	11	11	0.72
5	5	0.71	53	53	0.71	1	1	0.70
10	10	0.70	19	19	0.69	17	17	0.66

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>176</i>		
42	42	0.63	33	33	0.60	18	18	0.56
6	6	0.55	28	28	0.55	26	26	0.54
16	16	0.52	39	39	0.51	43	43	0.50
2	2	0.42	14	14	0.41	24	24	0.40
4	4	0.38	20	20	0.35	13	13	0.32
49	49	0.28	37	37	0.14			
AVERAGE:		0.93						

The Stations are the same as at Table 1.4a.

Table 10.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s):	42
Total number of errors:	42
Maximal positive error:	77.23
Minimal negative error:	0.00

Table 10.5a. Station parameters of the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

1	18.02916667	48.89694449	209.0	11803
2	17.57805559	48.75055559	409.0	11806
3	17.11055556	48.16861112	287.0	11813
4	17.68055559	48.49194447	178.0	11819
5	18.19416668	47.87305560	115.0	11858
6	18.77527782	49.43916669	423.0	11866
7	18.59388892	48.76972226	260.0	11867
8	19.18305556	49.36833335	780.0	11868
9	19.72527782	49.03916667	640.0	11874
10	19.91055560	49.14000001	972.0	11876
11	19.09388889	48.31916668	355.0	11902
12	19.14194445	48.64250003	313.0	11903
13	19.64666670	48.64444448	1015.0	11910
14	19.66666670	48.32916668	187.0	11927
15	20.23583335	49.18944445	1778.0	11931
16	20.18916668	48.84861115	901.0	11938
17	20.80138893	48.71666670	575.0	11946
18	20.84583338	49.25972224	485.0	11961
19	21.22250001	48.67222226	230.0	11968
20	21.91388894	49.25333335	305.0	11977
21	21.73472226	48.66805559	104.0	11978
22	22.00611111	48.93888894	176.0	11993
23	22.60000003	48.20000001	113.0	33634
24	23.00000000	49.20000001	594.0	33511
25	22.30000002	48.60000003	115.0	33631
26	22.50000003	48.90000005	205.0	33514
27	23.10000001	48.76666671	496.0	33517
28	19.02810000	47.51110000	153.3	44121
29	17.67470000	47.71000000	116.7	23703
30	20.53610000	48.49530000	308.9	51705
31	20.01670000	47.86670000	111.3	53101
32	17.26720000	47.88970000	121.0	23201
33	21.65890000	48.38080000	100.4	61709
34	19.00111111	49.80805560	398.0	600
35	19.96027783	49.29388890	855.0	625
36	19.98194450	49.23250001	1991.0	650
37	20.68916670	49.62722225	292.0	660
38	22.34166668	49.46638891	420.0	690
39	19.68805559	49.72583337	360.0	6507
40	19.51888892	49.61166670	697.0	6513
41	19.69583337	49.47194447	615.0	6518
42	20.41833336	49.69361115	515.0	6605
43	20.43166669	49.44555558	445.0	6618
44	20.88638894	49.34972224	445.0	6628
45	21.29583335	49.73527782	285.0	6702
46	21.17250001	49.43805558	519.0	6707
47	22.06333334	49.33916668	470.0	6809
48	17.56972225	49.32055557	222.0	11774
49	17.70777781	48.90277782	383.0	11779
50	17.54194447	49.77722226	749.0	11766
51	18.24055557	49.54111114	436.0	11785
52	18.44777780	49.54611114	1322.0	11787
53	18.12166667	49.69833337	250.0	11782

Table 10.5b. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
650	36	176.06	33517	25	110.78	44121	28	100.29
11774	48	98.34	33511	23	97.08	23703	29	96.44
53101	31	89.33	690	38	83.58	23201	32	75.21
11866	6	74.49	33634	27	74.35	11874	9	73.73
6513	40	73.29	11806	2	68.12	11803	1	66.86
11938	16	65.62	11977	20	61.83	61709	33	60.23
600	34	57.75	6507	39	55.93	11876	10	53.68
11968	19	52.32	11766	50	52.19	660	37	51.70
6809	47	47.48	11858	5	47.42	6605	42	47.31
11779	49	43.84	11868	8	43.33	11946	17	43.02
11782	53	41.99	11903	12	41.95	11819	4	41.89
6707	46	41.65	6618	43	41.28	51705	30	40.07
11961	18	38.40	33514	24	35.80	11910	13	35.72
33631	26	35.63	11787	52	35.44	6702	45	33.40
625	35	31.63	11978	21	31.35	11902	11	29.38
11785	51	29.38	11927	14	26.83	11993	22	23.51
6628	44	23.30	11867	7	19.64	11813	3	16.94
6518	41	15.71	11931	15	10.73			
AVERAGE:		54.02						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
6618	43	2697.62	11779	49	1903.54	11819	4	1589.51
11946	17	1381.51	33634	27	1055.22	23201	32	953.89
23703	29	716.78	11968	19	645.63	6513	40	592.14
44121	28	526.71	11868	8	452.89	11858	5	432.33
33514	24	357.91	33511	23	352.09	11774	48	346.56
6707	46	345.04	11910	13	344.73	660	37	328.81
61709	33	310.97	650	36	289.18	53101	31	287.92
11766	50	278.25	11977	20	265.51	11787	52	241.35
6628	44	239.93	51705	30	221.88	11866	6	196.77
11961	18	183.44	11867	7	181.80	6507	39	181.12
33631	26	171.43	11876	10	171.00	6605	42	163.49
11874	9	157.34	6702	45	142.52	6809	47	139.15
11782	53	138.53	11902	11	132.92	690	38	131.27
11785	51	105.86	11806	2	98.86	11813	3	96.23
6518	41	89.52	625	35	76.24	11927	14	69.70
11803	1	64.16	11903	12	60.36	11993	22	57.22
11938	16	54.47	33517	25	51.10	11978	21	47.08
600	34	37.97	11931	15	31.37			
AVERAGE:		380.92						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
6618	43	1.46	11819	4	1.14	11946	17	1.04
11910	13	1.01	33631	26	1.00	23703	29	1.00
11858	5	0.93	11779	49	0.92	61709	33	0.82
6513	40	0.82	11787	52	0.82	23201	32	0.82
11785	51	0.75	6605	42	0.75	660	37	0.75
6628	44	0.73	11774	48	0.71	33634	27	0.70
11868	8	0.68	11902	11	0.67	6707	46	0.65

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>179</i>		
11968	19	0.60	11766	50	0.59	6809	47	0.58
33514	24	0.55	53101	31	0.54	11927	14	0.51
11806	2	0.51	11961	18	0.50	6702	45	0.50
51705	30	0.49	11867	7	0.49	6507	39	0.46
11876	10	0.46	6518	41	0.42	11977	20	0.41
650	36	0.41	11782	53	0.40	44121	28	0.38
11803	1	0.35	11866	6	0.35	690	38	0.35
11938	16	0.35	11874	9	0.34	11978	21	0.34
600	34	0.30	33511	23	0.26	11931	15	0.23
33517	25	0.20	11903	12	0.19	11993	22	0.18
11813	3	0.13	625	35	0.12			
AVERAGE:		0.58						

Table 10.5c. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 16
Total number of errors: 16
Maximal positive error: 31.04
Minimal negative error: 0.00

Table 10.6a. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
00650	7	149.45	11866	34	123.29	00600	5	88.32
33511	26	88.22	06513	14	82.70	05511	12	70.98
llysa	32	69.71	lmosn	33	67.92	00580	4	63.27
06605	16	62.12	11876	37	61.06	06507	13	59.40
11993	42	55.16	06618	17	52.09	00660	8	50.32
33391	24	49.39	11977	41	48.62	06809	21	48.24
lhole	28	48.11	11961	40	45.67	lstrn	29	45.25
06707	20	41.79	11868	35	41.79	33514	27	39.33
33398	25	38.65	00566	2	37.69	00540	1	36.25
00690	9	33.82	00625	6	33.36	33392	23	33.23
05508	11	32.12	00575	3	32.09	lcerv	30	31.56
06628	18	29.07	11874	36	28.81	11938	39	28.30
lfren	31	26.68	06702	19	23.25	33287	22	23.03
05409	10	22.11	06518	15	18.58	11931	38	9.80
AVERAGE:		49.30						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
06618	17	3473.62	00540	1	1307.98	lstrn	29	729.83
06513	14	592.14	33391	24	567.87	11868	35	445.99
11866	34	406.48	33511	26	399.93	06628	18	349.96
06702	19	346.44	11993	42	346.24	06707	20	320.57
33514	27	299.08	33392	23	294.72	00650	7	291.60
lcerv	30	278.08	00660	8	261.33	llysa	32	241.05
lhole	28	239.80	lmosn	33	230.80	00580	4	226.43
11876	37	219.51	06605	16	215.64	11874	36	181.83
00690	9	175.57	11961	40	173.69	06507	13	163.93
00566	2	138.86	05508	11	138.79	11977	41	122.61
05511	12	110.49	lfren	31	106.07	06809	21	102.32
00625	6	82.69	06518	15	81.91	00575	3	76.21
33398	25	67.61	11938	39	60.43	33287	22	59.76
11931	38	31.37	00600	5	30.05	05409	10	19.76
AVERAGE:		333.55						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
06618	17	1.40	00540	1	1.27	33392	23	1.01
06809	21	0.99	llysa	32	0.92	lstrn	29	0.90
33391	24	0.81	06513	14	0.80	06605	16	0.75
lfren	31	0.74	00580	4	0.72	11868	35	0.69
06628	18	0.69	05508	11	0.67	06707	20	0.65
lcerv	30	0.64	00660	8	0.64	33514	27	0.61
lhole	28	0.60	00575	3	0.57	00566	2	0.55
11961	40	0.52	00650	7	0.51	06702	19	0.51
00690	9	0.50	05409	10	0.49	11977	41	0.46
11874	36	0.43	06507	13	0.42	11876	37	0.39
lmosn	33	0.38	05511	12	0.37	33511	26	0.32
11866	34	0.31	06518	15	0.31	11993	42	0.26
33287	22	0.25	11938	39	0.21	11931	38	0.17
00600	5	0.11	00625	6	0.10	33398	25	0.08
AVERAGE:		0.56						

Table 10.6b. Station parameters of the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

index	lambda(x)	fi(y)	h	stno	stna	country
1	18.19166668	50.06166667	206.0	00540	raciborz-studzienna	PL
2	19.80194449	50.07194445	237.0	00566	krakow-balice	PL
3	20.98444450	50.01888889	209.0	00575	tarnow	PL
4	22.02916667	50.11527778	212.0	00580	rzeszow-jasionka	PL
5	19.00111111	49.80805560	398.0	00600	bielsko-biala	PL
6	19.96027783	49.29388890	855.0	00625	zakopane	PL
7	19.98194450	49.23250001	1991.0	00650	kasprowy wierch	PL
8	20.68916670	49.62722225	292.0	00660	nowy_sacz	PL
9	22.34166668	49.46638891	420.0	00690	lesko	PL
10	18.92027783	49.99638894	270.0	05409	pszczyzna	PL
11	19.09527778	50.08500000	255.0	05508	bierun_stary	PL
12	19.95861116	50.06416667	206.0	05511	krakow-obserwatorium	PL
13	19.68805559	49.72583337	360.0	06507	makow_podchalanski	PL
14	19.51888892	49.61166670	697.0	06513	zawoja	PL
15	19.69583337	49.47194447	615.0	06518	jablonka	PL
16	20.41833336	49.69361115	515.0	06605	limanowa	PL
17	20.43166669	49.44555558	445.0	06618	kroscienko	PL
18	20.88638894	49.34972224	445.0	06628	muszyna	PL
19	21.29583335	49.73527782	285.0	06702	biecz-grudna	PL
20	21.17250001	49.43805558	519.0	06707	wysowa	PL
21	22.06333334	49.33916668	470.0	06809	komancza	PL
22	23.63333337	50.25000001	252.0	33287	Rava-Ruska	UA
23	23.38333335	49.95000005	245.0	33392	Yavoriv	UA
24	23.16666668	49.80000004	232.0	33391	Mostyska	UA
25	23.56694447	49.36222224	275.0	33398	Drohobych	UA
26	23.03333334	49.15000001	594.0	33511	Turka	UA
27	22.46666669	48.90000005	205.0	33514	Velyky_Berezny	UA
28	17.57000003	49.32000002	222.0	1hole	Holesov	CZ
29	17.71000004	48.90000005	383.0	lstrn	Strani	CZ
30	17.54000003	49.78000004	749.0	lcerv	Cervena	CZ
31	18.24000001	49.54000003	436.0	lfren	Frenstat_pod_Radhostem	CZ
32	18.45000002	49.55000003	1322.0	llysa	Lysa_Hora	CZ
33	18.12000001	49.70000004	250.0	lmosn	Mosnov	CZ
34	18.77527782	49.43916669	423.0	11866	sk-11866	SK
35	19.18305556	49.36833335	780.0	11868	sk-11868	SK
36	19.72527782	49.03916667	640.0	11874	sk-11874	SK
37	19.91055560	49.14000001	972.0	11876	sk-11876	SK
38	20.23583335	49.18944445	1778.0	11931	sk-11931	SK
39	20.18916668	48.84861115	901.0	11938	sk-11938	SK
40	20.84583338	49.25972224	485.0	11961	sk-11961	SK
41	21.91388894	49.25333335	305.0	11977	sk-11977	SK
42	22.00611111	48.93888894	176.0	11993	sk-11993	SK

Table 10.6c. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 9
 Total number of errors: 9
 Maximal positive error: 15.00
 Minimal negative error: 0.00

Table 10.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA	
1	1	76.72	2	2	74.88	8	8	72.06	
6	6	69.99	12	12	69.28	7	7	68.31	
10	10	55.81	11	11	50.28	16	16	42.65	
14	14	41.23	15	15	40.54	5	5	39.85	
17	17	34.08	9	9	28.98	3	3	28.37	
4	4	23.64	13	13	20.88				
AVERAGE:		49.27							

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB	
2	2	1917.55	10	10	1609.86	15	15	1305.92	
11	11	786.22	14	14	360.49	1	1	348.15	
3	3	278.14	12	12	276.16	5	5	238.46	
6	6	168.90	17	17	166.83	7	7	132.22	
8	8	113.19	4	4	106.07	16	16	95.58	
9	9	40.88	13	13	36.74				
AVERAGE:		469.49							

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2	
15	15	1.27	10	10	1.22	2	2	0.95	
3	3	0.80	5	5	0.77	11	11	0.74	
4	4	0.72	1	1	0.70	14	14	0.60	
7	7	0.47	8	8	0.47	12	12	0.47	
17	17	0.45	16	16	0.35	13	13	0.27	
6	6	0.24	9	9	0.12				
AVERAGE:		0.62							

Table 10.7b. Station parameters of the series system of Czech Republic and near border series from Slovakia, Poland

1	17.57000003	49.32000002	222.0
2	17.71000004	48.90000005	383.0
3	17.54000003	49.78000004	749.0
4	18.24000001	49.54000003	436.0
5	18.45000002	49.55000003	1322.0
6	18.12000001	49.70000004	250.0
7	18.02916667	48.89694449	209.0
8	17.57805559	48.75055559	409.0
9	17.11055556	48.16861112	287.0
10	17.68055559	48.49194447	178.0
11	18.19416668	47.87305560	115.0
12	18.77527782	49.43916669	423.0
13	18.59388892	48.76972226	260.0
14	19.18305556	49.36833335	780.0
15	18.19166668	50.06166667	206.0
16	19.00111111	49.80805560	398.0
17	18.92027783	49.99638894	270.0

Table 10.7c. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Total number of errors:	1
Maximal positive error:	3.18
Minimal negative error:	0.00

Annex 11. Wind direction, component U

(The station systems are the same as in Annex 10)

Table 11.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
56300	34	55.11	57311	35	42.53	26505	11	38.70
daruv	44	38.52	47106	25	38.39	54306	31	38.38
11803	60	34.63	46303	24	32.76	44121	21	32.02
58300	37	30.52	11813	61	30.22	55502	32	29.50
48101	26	28.68	53521	30	27.65	23201	8	27.10
34211	14	26.93	11978	66	26.63	11927	63	26.35
17809	7	26.10	43613	20	25.93	38605	18	25.08
36407	16	24.89	bjelo	43	24.80	64704	40	24.15
23703	9	24.04	36500	17	23.12	25212	10	22.76
748253	56	22.25	djurd	45	21.36	36100	15	21.30
11946	64	21.13	53101	29	21.04	11858	62	21.01
donji	46	20.52	55706	33	19.73	44527	23	19.46
33634	58	18.90	16204	4	18.90	33631	57	18.90
valpo	49	18.84	58113	36	18.80	33638	59	18.35
66519	41	17.83	604037	53	17.73	15310	3	16.89
703156	55	16.68	16414	5	16.62	slavo	48	16.59
52819	28	16.27	63411	39	16.00	27815	12	15.95
osije	47	15.91	61709	38	15.09	SOM	51	15.06
28700	13	15.06	14706	2	15.01	17306	6	14.56
KIK	52	13.95	73302	42	13.77	PAL	50	13.53
44214	22	13.51	11968	65	13.01	51705	27	12.67
13704	1	12.00	608121	54	11.75	39113	19	11.19
AVERAGE:		22.46						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
17306	6	2210.67	57311	35	1630.83	61709	38	775.21
703156	55	701.60	47106	25	645.78	43613	20	634.02
608121	54	556.73	23201	8	477.70	63411	39	424.83
55502	32	391.88	28700	13	383.07	djurd	45	346.05
46303	24	341.44	33631	57	335.52	38605	18	318.23
36500	17	272.21	56300	34	250.68	11968	65	237.59
44527	23	224.10	11946	64	185.19	54306	31	177.43
33634	58	176.60	66519	41	172.95	55706	33	171.62
26505	11	166.45	bjelo	43	165.85	13704	1	147.23
64704	40	146.25	51705	27	143.22	36100	15	138.13
73302	42	136.87	11927	63	134.72	52819	28	128.40
58113	36	119.57	daruv	44	109.50	33638	59	109.23
58300	37	105.41	27815	12	99.33	48101	26	98.04
25212	10	96.75	slavo	48	89.27	16414	5	87.43
11813	61	85.78	osije	47	84.05	748253	56	82.56
14706	2	76.18	15310	3	74.63	34211	14	71.88
23703	9	68.72	36407	16	68.36	17809	7	67.58
44121	21	64.36	11803	60	63.41	53521	30	59.82
53101	29	57.01	SOM	51	51.22	11978	66	50.94
44214	22	43.77	11858	62	39.39	39113	19	38.81
KIK	52	37.58	604037	53	27.25	16204	4	23.17
valpo	49	22.17	donji	46	19.07	PAL	50	17.05
AVERAGE:		235.73						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
43613	20	1.49	34211	14	1.44	djurd	45	1.21
11968	65	1.19	703156	55	1.16	47106	25	1.12
17306	6	1.07	33631	57	1.07	51705	27	1.03
38605	18	1.02	57311	35	1.01	608121	54	0.97
11978	66	0.93	26505	11	0.91	28700	13	0.90
11946	64	0.89	25212	10	0.88	44527	23	0.83
61709	38	0.80	23201	8	0.79	604037	53	0.76
63411	39	0.75	46303	24	0.72	52819	28	0.71
11803	60	0.71	13704	1	0.70	14706	2	0.70
slavo	48	0.69	73302	42	0.67	55706	33	0.66
44214	22	0.64	11813	61	0.63	55502	32	0.63
27815	12	0.61	58113	36	0.61	54306	31	0.59
bjelo	43	0.58	33634	58	0.57	36500	17	0.54
17809	7	0.54	58300	37	0.53	daruv	44	0.53
36100	15	0.52	53521	30	0.49	16204	4	0.49
15310	3	0.42	56300	34	0.41	osije	47	0.40
33638	59	0.39	64704	40	0.39	748253	56	0.39
donji	46	0.37	44121	21	0.35	36407	16	0.33
KIK	52	0.32	23703	9	0.28	39113	19	0.27
16414	5	0.25	53101	29	0.24	valpo	49	0.22
SOM	51	0.20	48101	26	0.17	11927	63	0.11
11858	62	0.09	PAL	50	0.08	66519	41	0.07
AVERAGE:		0.64						

Table 11.1b. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 3498
 Total number of errors: 5573
 Maximal positive error: 35.21
 Minimal negative error: -31.73

Table 11.2a. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 2856
 Total number of errors: 4234
 Maximal positive error: 9.76
 Minimal negative error: -31.82

Table 11.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
ALE	32	163.81	KRV	27	120.07	DTS	36	116.00
BAN	38	115.52	POZ	26	113.33	CUP	31	101.79
REK	29	97.02	TIM	39	93.37	ORA	37	83.92
SZE	4	78.31	OSI	1	77.97	SRM	15	72.21
BEC	7	70.56	SPL	20	70.11	ZLA	25	69.20
VRS	13	65.64	BAJ	3	59.59	SEN	8	59.47
KRG	21	58.37	VBA	28	56.48	BPT	10	53.59
BGD	16	53.26	LJU	18	47.14	KRS	30	41.17
NEG	23	40.61	BBA	24	39.56	CAL	34	38.39
VGR	17	33.50	VLJ	19	32.41	SNM	40	32.32
NSA	11	31.55	SOM	6	30.27	VAL	2	26.15
LOZ	14	24.59	PAL	5	24.07	ZRE	12	22.79
KIK	9	21.38	ZAJ	33	20.74	BCL	35	20.05
ZAG	22	15.59						
AVERAGE:		59.80						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
KRV	27	462.55	ALE	32	288.66	ZRE	12	267.73
BGD	16	241.17	BBA	24	234.21	ZAJ	33	221.70
VBA	28	221.60	TIM	39	213.17	DTS	36	202.95
BAN	38	188.01	SEN	8	186.54	SRM	15	180.64
BAJ	3	151.65	VRS	13	151.55	ORA	37	148.56
ZLA	25	146.38	KRG	21	134.20	POZ	26	133.77
REK	29	116.69	SZE	4	105.18	BEC	7	100.56
SPL	20	89.72	SNM	40	87.29	OSI	1	84.33
KRS	30	66.79	LJU	18	63.70	BPT	10	63.14
NEG	23	51.47	VAL	2	51.33	CAL	34	51.30
VLJ	19	47.98	VGR	17	41.36	NSA	11	38.15
KIK	9	34.00	LOZ	14	33.55	SOM	6	33.52
PAL	5	32.38	BCL	35	30.51	CUP	31	22.06
ZAG	22	17.44						
AVERAGE:		125.94						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
TIM	39	1.02	KRV	27	0.82	SEN	8	0.67
ZAJ	33	0.62	BAN	38	0.60	BBA	24	0.59
BGD	16	0.59	VBA	28	0.57	ORA	37	0.51
DTS	36	0.44	SRM	15	0.43	ZRE	12	0.43
BAJ	3	0.33	VLJ	19	0.32	ALE	32	0.30
OSI	1	0.28	VRS	13	0.28	KIK	9	0.27
SNM	40	0.27	REK	29	0.26	ZLA	25	0.24
VAL	2	0.23	VGR	17	0.22	SZE	4	0.19
POZ	26	0.18	BEC	7	0.18	ZAG	22	0.18
NEG	23	0.17	KRG	21	0.16	BPT	10	0.14
KRS	30	0.13	CUP	31	0.12	BCL	35	0.10
NSA	11	0.09	LOZ	14	0.09	SPL	20	0.08
SOM	6	0.07	PAL	5	0.06	CAL	34	0.05
LJU	18	0.04						
AVERAGE:		0.31						

Table 11.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
511349	40	185.80	709352	92	163.28	714623	95	157.63
758355	104	150.53	453344	28	139.03	445718	26	138.25
618518	75	128.50	523530	46	120.91	430608	18	120.64
414352	13	114.87	740330	99	96.21	542532	59	93.78
359257	5	92.17	553254	65	90.08	655522	86	89.57
632432	79	89.56	739615	98	89.14	523328	45	85.58
617637	74	84.96	349835	3	82.74	506422	35	82.39
530535	53	82.38	647334	85	82.11	444417	25	81.30
656621	89	80.39	347357	2	79.94	523108	44	78.50
33658	116	77.24	456526	29	76.72	346452	1	70.44
606705	69	69.76	710736	93	69.41	438238	20	68.26
635658	81	67.45	73302	108	67.16	33634	115	66.19
436447	19	65.48	639744	82	64.47	413838	12	63.80
408800	10	62.66	415816	14	61.87	58300	109	61.40
525323	49	59.62	406421	8	59.06	66519	105	58.53
747356	101	57.41	352557	4	57.39	13173	114	56.11
741640	100	56.01	441757	22	54.99	608121	70	54.65
711305	94	52.93	655650	87	51.08	452452	27	51.05
33657	119	51.03	632130	77	50.92	500432	31	50.81
501252	32	50.66	523703	47	50.58	546115	60	50.50
525358	50	50.08	439534	21	48.57	417530	15	48.48
509441	37	48.20	509940	39	47.99	632229	78	47.50
13295	111	46.71	502141	33	46.03	428307	17	44.98
551459	62	44.97	611355	71	43.76	13183	113	43.62
703156	90	42.95	614740	73	42.59	64704	106	41.50
359521	6	41.11	551716	64	40.29	539357	56	39.39
507158	36	38.98	538416	55	38.32	57311	107	38.00
412721	11	37.57	515231	42	35.02	511849	41	34.93
600608	67	33.79	622544	76	33.73	708430	91	33.23
517507	43	33.18	13285	112	33.02	748253	102	32.16
530801	54	31.08	634322	80	31.03	604037	68	30.90
751555	103	30.53	502317	34	29.18	557334	66	28.84
528518	52	27.35	509649	38	25.93	548409	61	24.50
525215	48	24.23	33638	117	23.81	33647	118	22.35
642540	83	21.61	407500	9	20.98	444127	24	20.67
401321	7	20.36	656555	88	20.18	527527	51	19.64
541601	58	18.94	646247	84	18.24	722657	96	17.44
541154	57	17.10	737439	97	15.68	425606	16	15.14
551621	63	14.78	13174	110	14.66	443639	23	13.88
457600	30	11.18	614436	72	9.89			
AVERAGE:		56.44						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
57311	107	772.22	709352	92	622.68	703156	90	615.81
553254	65	603.48	618518	75	500.77	506422	35	448.81
608121	70	448.60	523108	44	357.52	714623	95	339.78
13173	114	325.81	352557	4	322.71	546115	60	318.90
511349	40	313.22	758355	104	295.62	347357	2	283.02
647334	85	280.20	655522	86	260.93	445718	26	245.02
523530	46	242.76	740330	99	237.80	346452	1	232.11
456526	29	224.30	632432	79	223.90	349835	3	212.84
606705	69	197.73	542532	59	187.47	438238	20	183.31
417530	15	174.96	73302	108	174.45	751555	103	170.66
523328	45	169.71	414352	13	167.23	453344	28	163.09
632130	77	162.07	359257	5	158.57	33634	115	156.86
415816	14	154.75	430608	18	152.73	444417	25	148.88
500432	31	144.73	502141	33	138.17	439534	21	137.25
655650	87	136.43	656621	89	130.41	632229	78	124.82

523703	47	123.74	66519	105	122.44	639744	82	121.28
539357	56	119.11	635658	81	116.21	501252	32	116.00
541154	57	115.32	406421	8	103.85	747356	101	100.78
33658	116	100.40	408800	10	99.50	538416	55	98.34
525358	50	96.56	614740	73	96.38	710736	93	93.01
452452	27	91.68	611355	71	91.24	64704	106	90.05
13295	111	89.30	530535	53	88.57	413838	12	85.75
708430	91	84.17	722657	96	78.87	509441	37	78.48
33657	119	75.22	441757	22	75.13	407500	9	74.91
741640	100	69.60	509940	39	68.13	13285	112	66.62
551459	62	64.12	13183	113	61.50	617637	74	60.95
428307	17	60.94	739615	98	60.59	711305	94	59.13
507158	36	57.57	634322	80	54.95	436447	19	54.03
502317	34	52.91	511849	41	50.74	551716	64	50.63
425606	16	49.31	557334	66	47.97	517507	43	47.94
604037	68	47.50	530801	54	46.83	600608	67	46.78
515231	42	45.87	359521	6	44.82	642540	83	43.56
525215	48	42.47	525323	49	40.11	58300	109	39.26
33638	117	38.93	528518	52	38.06	622544	76	37.84
33647	118	33.94	444127	24	32.51	748253	102	32.16
401321	7	28.81	527527	51	27.79	509649	38	26.99
548409	61	24.41	656555	88	22.82	13174	110	22.66
737439	97	21.24	412721	11	21.05	541601	58	20.35
646247	84	18.95	614436	72	16.99	443639	23	16.27
551621	63	14.95	457600	30	13.27			
AVERAGE:		139.78						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
523328	45	1.15	751555	103	1.01	546115	60	1.01
349835	3	0.98	608121	70	0.94	709352	92	0.90
452452	27	0.88	57311	107	0.88	703156	90	0.83
553254	65	0.82	506422	35	0.72	352557	4	0.69
523530	46	0.65	511349	40	0.63	33634	115	0.62
523108	44	0.59	502317	34	0.55	515231	42	0.53
456526	29	0.52	655650	87	0.52	444417	25	0.50
541154	57	0.49	722657	96	0.49	347357	2	0.49
647334	85	0.48	438238	20	0.48	606705	69	0.47
740330	99	0.45	655522	86	0.45	502141	33	0.44
523703	47	0.42	632229	78	0.41	618518	75	0.41
73302	108	0.40	500432	31	0.39	758355	104	0.39
614740	73	0.39	632130	77	0.37	656621	89	0.36
525215	48	0.36	632432	79	0.36	539357	56	0.36
747356	101	0.35	525358	50	0.35	714623	95	0.35
708430	91	0.34	444127	24	0.34	639744	82	0.33
13183	113	0.32	525323	49	0.31	635658	81	0.31
58300	109	0.30	13174	110	0.29	538416	55	0.29
453344	28	0.29	528518	52	0.28	417530	15	0.27
542532	59	0.27	614436	72	0.26	710736	93	0.25
64704	106	0.25	13173	114	0.25	656555	88	0.24
634322	80	0.24	414352	13	0.24	737439	97	0.24
501252	32	0.24	439534	21	0.23	415816	14	0.22
541601	58	0.22	611355	71	0.22	604037	68	0.21
66519	105	0.21	517507	43	0.20	509940	39	0.20
445718	26	0.19	33647	118	0.19	33657	119	0.19
441757	22	0.19	430608	18	0.18	509649	38	0.18
408800	10	0.18	13295	111	0.17	13285	112	0.17
548409	61	0.17	425606	16	0.17	551621	63	0.17
359257	5	0.16	33638	117	0.15	557334	66	0.15
551716	64	0.14	527527	51	0.14	646247	84	0.14
413838	12	0.14	507158	36	0.13	711305	94	0.12
511849	41	0.12	600608	67	0.12	617637	74	0.11
457600	30	0.11	741640	100	0.11	428307	17	0.11
33658	116	0.10	530535	53	0.10	401321	7	0.10
551459	62	0.10	622544	76	0.09	530801	54	0.09
407500	9	0.08	509441	37	0.08	443639	23	0.07
359521	6	0.07	739615	98	0.06	346452	1	0.06
406421	8	0.06	436447	19	0.06	642540	83	0.05
412721	11	0.03	748253	102	0.03			
AVERAGE:		0.33						

Table 11.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
27	27	89.86	20	20	65.10	30	30	52.95
38	38	49.53	16	16	47.86	28	28	41.45
43	43	41.11	1	1	37.82	49	49	36.64
26	26	36.51	7	7	34.23	39	39	33.42
10	10	32.47	47	47	31.18	25	25	30.67
45	45	30.64	21	21	30.20	34	34	29.98
2	2	28.98	50	50	27.54	14	14	26.15
18	18	25.77	19	19	25.52	44	44	25.39
40	40	24.23	22	22	24.11	35	35	23.93
24	24	22.00	17	17	21.96	36	36	21.45
42	42	21.30	48	48	21.22	41	41	21.07
31	31	21.05	4	4	20.23	6	6	19.69
9	9	18.56	3	3	18.37	5	5	16.77
53	53	16.51	32	32	16.34	15	15	16.19
29	29	15.74	11	11	15.09	12	12	15.01
13	13	14.99	51	51	14.82	23	23	14.19
46	46	12.42	52	52	12.32	8	8	11.20
37	37	11.03	33	33	10.74			
AVERAGE:		26.86						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
45	45	1022.82	25	25	498.91	29	29	239.55
52	52	236.15	19	19	233.25	49	49	230.97
6	6	223.48	30	30	156.66	47	47	141.88
44	44	137.86	16	16	135.96	46	46	135.24
3	3	124.31	7	7	123.87	27	27	118.78
21	21	109.35	39	39	107.63	35	35	105.28
51	51	101.79	41	41	99.85	50	50	99.79
43	43	96.74	20	20	92.39	10	10	92.03
1	1	87.38	14	14	85.49	12	12	84.83
24	24	78.29	4	4	77.58	40	40	74.74
18	18	72.41	9	9	71.03	26	26	70.47
38	38	68.01	34	34	62.55	11	11	58.19
17	17	53.55	8	8	50.85	42	42	50.51
48	48	48.63	36	36	42.40	22	22	41.56
13	13	41.49	5	5	38.71	31	31	37.94
28	28	37.63	2	2	36.67	32	32	25.61
23	23	22.78	15	15	22.41	53	53	20.30
37	37	11.03	33	33	9.18			
AVERAGE:		115.98						

2. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
49	49	1.93	29	29	1.22	21	21	1.17
43	43	1.05	25	25	1.02	45	45	0.93
35	35	0.92	52	52	0.83	42	42	0.81
44	44	0.79	31	31	0.75	16	16	0.74
47	47	0.66	46	46	0.63	51	51	0.61
39	39	0.55	41	41	0.46	26	26	0.44
6	6	0.43	17	17	0.43	19	19	0.42

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>190</i>		
24	24	0.41	22	22	0.39	20	20	0.36
4	4	0.35	38	38	0.34	7	7	0.34
5	5	0.32	18	18	0.31	12	12	0.29
30	30	0.28	32	32	0.26	3	3	0.25
36	36	0.25	10	10	0.24	48	48	0.23
8	8	0.20	2	2	0.18	27	27	0.17
14	14	0.15	53	53	0.15	34	34	0.13
9	9	0.12	23	23	0.10	50	50	0.09
1	1	0.07	37	37	0.07	13	13	0.06
28	28	0.05	11	11	0.04	15	15	0.03
33	33	0.00	40	40	0.00			
AVERAGE:		0.43						

Table 11.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 3348
Total number of errors: 5083
Maximal positive error: 20.09
Minimal negative error: -17.09

Table 11.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
11766	50	47.51	11978	21	45.66	6507	39	42.38
53101	31	39.59	6518	41	37.12	11946	17	34.17
11868	8	33.88	690	38	32.73	6605	42	31.89
11902	11	31.33	11931	15	31.26	11910	13	30.83
650	36	30.79	11876	10	30.40	6618	43	30.32
11938	16	29.45	6513	40	29.30	23703	29	28.68
660	37	25.99	11813	3	25.64	6809	47	23.78
33634	27	23.30	11961	18	23.02	11977	20	22.66
11785	51	21.82	44121	28	21.39	11858	5	20.82
33631	26	19.80	11819	4	19.62	33514	24	18.89
11993	22	18.60	11968	19	18.22	6628	44	18.15
11779	49	17.93	11774	48	17.64	61709	33	17.51
51705	30	17.29	625	35	17.24	6707	46	16.63
11803	1	16.55	11903	12	15.96	11874	9	15.51
11782	53	15.10	6702	45	15.03	11806	2	13.47
23201	32	13.41	11927	14	13.28	11866	6	13.24
11867	7	12.90	11787	52	12.76	33511	23	10.69
33517	25	10.11	600	34	9.98			
AVERAGE:		23.23						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
61709	33	716.16	6618	43	254.05	23201	32	250.14
33631	26	247.88	11946	17	226.67	11993	22	203.48
33514	24	184.75	33517	25	180.07	11961	18	171.01
51705	30	162.20	11868	8	157.85	11978	21	145.45
6507	39	142.07	33634	27	115.35	6513	40	114.67
11876	10	111.22	6809	47	109.28	650	36	107.84
11813	3	107.82	11774	48	106.72	11902	11	103.77
6518	41	103.10	11968	19	101.49	11866	6	100.84
6628	44	93.66	11785	51	93.40	6702	45	92.02
11858	5	88.97	660	37	77.03	11803	1	73.44
53101	31	72.76	11910	13	63.31	11938	16	62.68
11806	2	62.30	690	38	61.15	11931	15	58.30
11867	7	50.72	6707	46	50.24	625	35	46.97
11766	50	45.97	11977	20	45.88	11779	49	45.11
11927	14	42.41	33511	23	41.25	6605	42	40.94
11819	4	34.11	44121	28	29.30	11874	9	23.82
11903	12	23.59	23703	29	19.60	11782	53	15.75
11787	52	11.98	600	34	9.64			
AVERAGE:		107.55						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
33631	26	1.58	33514	24	1.45	33634	27	1.45
11866	6	1.37	11946	17	1.11	61709	33	1.02
6518	41	0.94	11968	19	0.93	11876	10	0.90
23201	32	0.88	6507	39	0.84	6618	43	0.84
33517	25	0.80	11774	48	0.79	6809	47	0.77
11806	2	0.75	11813	3	0.70	11961	18	0.67

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>192</i>		
11779	49	0.63	6513	40	0.61	6628	44	0.61
11978	21	0.59	11902	11	0.57	11977	20	0.56
11785	51	0.54	11868	8	0.54	650	36	0.50
6707	46	0.46	6605	42	0.44	11803	1	0.40
44121	28	0.40	53101	31	0.38	6702	45	0.37
11993	22	0.36	11867	7	0.36	660	37	0.36
51705	30	0.32	11819	4	0.28	33511	23	0.27
11910	13	0.24	625	35	0.23	11858	5	0.19
11782	53	0.18	23703	29	0.17	11874	9	0.17
11931	15	0.15	11766	50	0.12	11927	14	0.10
11938	16	0.08	11787	52	0.08	600	34	0.05
11903	12	0.00	690	38	0.00			
AVERAGE:		0.55						

Table 11.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 2974
Total number of errors: 4497
Maximal positive error: 28.16
Minimal negative error: -22.98

Table 11.6a. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 2252
Total number of errors: 3107
Maximal positive error: 19.27
Minimal negative error: -17.75

Table 11.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
06618	17	165.72	11961	40	159.40	1hole	28	100.64
06518	15	82.20	11868	35	75.47	11866	34	69.95
06507	13	69.50	06809	21	61.68	00566	2	60.08
06702	19	59.50	00660	8	57.72	00650	7	57.36
06628	18	57.05	06513	14	56.82	33398	25	54.54
11876	37	47.51	06605	16	43.56	00625	6	39.47
00575	3	38.78	33514	27	38.16	33392	23	36.68
05511	12	36.36	00580	4	34.43	06707	20	33.63
11931	38	33.38	1fren	31	32.45	05409	10	32.03
00540	1	32.02	11874	36	31.33	1cerv	30	30.97
1strn	29	29.82	33287	22	28.87	11977	41	27.12
05508	11	23.54	11938	39	22.39	33511	26	21.28
11993	42	16.98	00600	5	13.09	00690	9	12.19
1mosn	33	11.23	33391	24	9.87	1lysa	32	8.17
AVERAGE:		46.50						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
06618	17	331.78	11961	40	224.40	06809	21	165.74
11868	35	139.55	06513	14	119.00	33514	27	112.40
05511	12	110.20	1hole	28	107.48	00650	7	106.27
06507	13	100.82	06518	15	97.08	06702	19	94.75
11866	34	88.54	06628	18	88.44	1fren	31	81.66
00660	8	79.81	11876	37	74.09	05508	11	65.97
00566	2	62.21	06707	20	62.00	00625	6	61.71
33398	25	61.53	00540	1	58.18	00575	3	57.49
11977	41	51.41	11931	38	49.69	11993	42	48.05
33511	26	46.53	06605	16	46.07	11938	39	40.31
1strn	29	39.52	11874	36	38.52	33392	23	36.50
00580	4	34.51	1cerv	30	31.84	05409	10	29.11
33287	22	27.32	00690	9	26.31	1mosn	33	18.35
33391	24	17.54	1lysa	32	12.45	00600	5	12.15
AVERAGE:		75.17						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
06707	20	0.71	06513	14	0.66	11993	42	0.59
11876	37	0.59	11977	41	0.53	06618	17	0.46
33514	27	0.38	06809	21	0.35	1fren	31	0.32
00540	1	0.32	05511	12	0.30	11868	35	0.30
11961	40	0.28	00625	6	0.28	00660	8	0.27
06628	18	0.25	06702	19	0.24	00650	7	0.24
06507	13	0.22	11874	36	0.19	11866	34	0.18
06518	15	0.17	00690	9	0.16	11931	38	0.15
33391	24	0.15	1cerv	30	0.14	33287	22	0.14
05409	10	0.13	1mosn	33	0.13	05508	11	0.13
06605	16	0.11	1strn	29	0.11	1hole	28	0.11
1lysa	32	0.10	11938	39	0.09	00600	5	0.09
33398	25	0.08	00575	3	0.07	33511	26	0.06
00566	2	0.00	00580	4	0.00	33392	23	0.00
AVERAGE:		0.23						

Table 11.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
12	12	93.91	9	9	65.92	14	14	64.85
8	8	62.39	15	15	48.81	7	7	45.11
1	1	41.56	4	4	39.79	2	2	34.48
6	6	30.78	13	13	30.21	11	11	28.06
3	3	26.90	16	16	21.30	10	10	20.50
17	17	19.21	5	5	7.39			
AVERAGE:		40.07						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
7	7	129.46	9	9	119.25	12	12	101.76
14	14	99.42	1	1	89.18	8	8	73.12
4	4	65.65	11	11	58.55	15	15	50.76
2	2	47.55	13	13	41.83	17	17	33.11
3	3	29.10	6	6	21.53	16	16	18.70
10	10	18.68	5	5	5.94			
AVERAGE:		59.03						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
7	7	0.44	14	14	0.35	4	4	0.31
12	12	0.25	6	6	0.23	9	9	0.22
8	8	0.20	1	1	0.19	11	11	0.18
10	10	0.16	16	16	0.15	13	13	0.13
17	17	0.12	3	3	0.12	5	5	0.10
15	15	0.09	2	2	0.08			
AVERAGE:		0.20						

Table 11.7b. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s):	767
Total number of errors:	840
Maximal positive error:	8.79
Minimal negative error:	-19.08

Annex 12. Wind direction, component V
(The station systems are the same as in Annex 10)

Table 12.1a. Statistics after and before homogenization for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
748253	56	73.74	33638	59	69.15	36100	15	55.22
33634	58	54.79	66519	41	54.23	23703	9	53.52
bjelo	43	45.04	17809	7	44.62	11858	62	44.55
38605	18	37.99	58113	36	36.85	donji	46	36.58
55502	32	35.33	28700	13	33.65	36407	16	33.05
703156	55	32.78	16414	5	32.65	61709	38	30.21
17306	6	28.26	46303	24	27.79	73302	42	27.37
54306	31	26.00	11803	60	25.83	25212	10	25.73
23201	8	24.10	osije	47	23.69	11927	63	23.44
daruv	44	23.37	36500	17	22.15	58300	37	21.42
11946	64	20.77	57311	35	20.76	27815	12	20.39
13704	1	20.34	SOM	51	20.29	34211	14	20.14
44527	23	20.10	604037	53	19.73	608121	54	19.69
47106	25	19.45	valpo	49	19.40	slavo	48	19.17
KIK	52	19.00	44214	22	18.06	39113	19	17.85
53101	29	17.60	PAL	50	17.52	33631	57	17.26
11978	66	17.21	11813	61	17.16	16204	4	17.14
43613	20	17.05	26505	11	17.00	64704	40	16.87
djurd	45	16.71	63411	39	15.85	53521	30	14.84
51705	27	14.80	15310	3	14.58	52819	28	14.52
14706	2	13.99	56300	34	13.58	44121	21	13.02
48101	26	12.83	11968	65	7.79	55706	33	7.73
AVERAGE:		25.96						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11946	64	334.81	47106	25	322.21	36407	16	320.14
63411	39	319.51	58300	37	305.23	57311	35	280.68
748253	56	269.20	38605	18	263.12	66519	41	246.10
27815	12	241.72	58113	36	234.33	54306	31	205.80
16204	4	198.91	djurd	45	179.29	608121	54	172.53
23703	9	171.66	28700	13	164.64	73302	42	163.98
valpo	49	161.42	51705	27	161.25	43613	20	158.33
703156	55	150.47	osije	47	140.55	44121	21	136.78
33634	58	134.28	56300	34	129.50	33638	59	127.08
PAL	50	126.60	36100	15	126.03	61709	38	118.86
44214	22	118.58	46303	24	113.14	55502	32	105.15
53521	30	104.92	44527	23	103.58	55706	33	102.59
14706	2	97.45	11813	61	96.83	11927	63	94.74
52819	28	92.48	17306	6	91.89	36500	17	86.78
SOM	51	86.54	15310	3	84.72	11858	62	79.95
604037	53	76.46	34211	14	73.71	16414	5	72.80
13704	1	72.29	25212	10	69.15	daruv	44	69.15
39113	19	68.05	64704	40	67.34	53101	29	65.98
11968	65	63.70	26505	11	61.01	23201	8	58.05
17809	7	57.48	bjelo	43	57.02	48101	26	49.39
33631	57	48.37	donji	46	48.18	11803	60	45.92
slavo	48	35.17	KIK	52	31.53	11978	66	22.68
AVERAGE:		132.39						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
43613	20	1.72	11813	61	1.44	valpo	49	1.24
33634	58	1.24	15310	3	1.23	47106	25	1.07
25212	10	1.07	14706	2	1.05	djurd	45	1.03
66519	41	0.96	44121	21	0.92	44527	23	0.92
11946	64	0.91	46303	24	0.90	58113	36	0.89
16204	4	0.87	27815	12	0.86	63411	39	0.85
58300	37	0.84	38605	18	0.82	11803	60	0.80
28700	13	0.80	703156	55	0.78	51705	27	0.75
36407	16	0.73	44214	22	0.72	55706	33	0.68
36500	17	0.65	26505	11	0.65	54306	31	0.65
17306	6	0.62	53101	29	0.61	33638	59	0.60
36100	15	0.59	57311	35	0.59	13704	1	0.58
73302	42	0.55	52819	28	0.54	23703	9	0.52
11968	65	0.52	608121	54	0.50	34211	14	0.49
39113	19	0.47	55502	32	0.46	53521	30	0.44
748253	56	0.42	61709	38	0.42	osije	47	0.41
33631	57	0.41	SOM	51	0.40	56300	34	0.38
PAL	50	0.35	11858	62	0.33	48101	26	0.31
11927	63	0.27	17809	7	0.25	11978	66	0.25
bjelo	43	0.24	23201	8	0.24	604037	53	0.23
16414	5	0.22	64704	40	0.22	KIK	52	0.19
slavo	48	0.18	daruv	44	0.12	donji	46	0.12
AVERAGE:		0.64						

Table 12.1b. Quality Control results for the series system of Hungary, Croatia and near border series from Austria, Serbia, Romania, Ukraine, Slovakia

Number of days with error(s): 3151
 Total number of errors: 4924
 Maximal positive error: 24.38
 Minimal negative error: -26.35

Table 12.2a. Quality Control results for the series system of Serbia and near border series from Croatia, Hungary, Romania

Number of days with error(s): 2688
 Total number of errors: 3786
 Maximal positive error: 8.74
 Minimal negative error: -17.09

Table 12.2b. Statistics after and before homogenization for the series system of Serbia and near border series from Croatia, Hungary, Romania

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
SZE	4	186.05	BPT	10	151.16	TIM	39	95.14
NEG	23	94.65	VBA	28	90.87	SNM	40	84.44
BBA	24	73.41	OSI	1	72.13	KIK	9	68.43
BEC	7	68.30	KRG	21	64.48	VAL	2	62.32
CAL	34	59.74	PAL	5	51.96	KRS	30	49.31
KRV	27	48.36	ORA	37	46.72	SPL	20	46.40
BAJ	3	46.20	NSA	11	44.11	VGR	17	43.08
ZAG	22	39.55	BAN	38	38.25	ZLA	25	37.38
SEN	8	34.32	VRS	13	34.17	ALE	32	33.17
ZRE	12	32.55	BGD	16	30.28	SOM	6	29.52
VLJ	19	28.80	DTS	36	27.97	POZ	26	27.56
BCL	35	27.42	ZAJ	33	26.64	REK	29	24.81
LOZ	14	23.09	LJU	18	22.89	CUP	31	22.58
SRM	15	14.55						
AVERAGE:		52.57						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
VBA	28	736.24	BBA	24	274.57	SZE	4	219.79
VAL	2	207.29	BEC	7	202.55	NEG	23	174.58
LOZ	14	169.59	SEN	8	165.08	KRV	27	158.57
BPT	10	146.23	ZAG	22	131.11	LJU	18	116.24
SOM	6	114.72	KRG	21	114.00	TIM	39	112.15
OSI	1	110.68	KIK	9	110.13	SNM	40	100.87
BAN	38	98.35	ORA	37	88.48	NSA	11	87.98
CAL	34	76.71	VLJ	19	76.19	POZ	26	75.01
KRS	30	64.31	PAL	5	61.81	ZRE	12	61.35
ZLA	25	59.40	SPL	20	53.14	REK	29	47.79
ALE	32	47.78	VRS	13	46.48	BGD	16	43.97
VGR	17	41.85	DTS	36	39.68	ZAJ	33	33.10
BCL	35	30.63	SRM	15	26.61	BAJ	3	24.79
CUP	31	19.96						
AVERAGE:		114.24						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
ZAG	22	1.41	BEC	7	0.85	POZ	26	0.83
BBA	24	0.78	VBA	28	0.67	VAL	2	0.65
LJU	18	0.64	CAL	34	0.53	LOZ	14	0.52
KRV	27	0.45	SOM	6	0.44	ALE	32	0.44
NEG	23	0.42	SRM	15	0.40	OSI	1	0.38
SEN	8	0.38	VLJ	19	0.36	KRG	21	0.30
ZLA	25	0.29	SPL	20	0.28	BAJ	3	0.28
NSA	11	0.28	KRS	30	0.27	ORA	37	0.26
BAN	38	0.25	BPT	10	0.23	DTS	36	0.22
BGD	16	0.17	PAL	5	0.17	REK	29	0.16
CUP	31	0.16	BCL	35	0.16	VRS	13	0.12
ZRE	12	0.11	ZAJ	33	0.09	KIK	9	0.09
SZE	4	0.09	VGR	17	0.08	TIM	39	0.07
SNM	40	0.05						
AVERAGE:		0.36						

Table 12.3a. Statistics after and before homogenization for the series system of Romania and near border series from Serbia, Hungary, Ukraine

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
528518	52	171.80	542532	59	143.27	639744	82	141.12
66519	105	132.22	408800	10	128.86	546115	60	125.39
500432	31	122.99	622544	76	118.74	530535	53	118.63
501252	32	116.40	548409	61	111.04	714623	95	103.37
428307	17	101.08	709352	92	100.20	441757	22	98.29
523328	45	98.15	608121	70	94.20	413838	12	91.94
614740	73	87.55	553254	65	86.25	33638	117	86.11
502141	33	82.96	642540	83	81.31	349835	3	79.81
541154	57	79.70	415816	14	78.97	401321	7	78.37
617637	74	77.42	747356	101	77.07	453344	28	76.14
457600	30	75.35	509441	37	75.16	417530	15	74.97
722657	96	74.89	444127	24	72.13	523530	46	70.23
710736	93	66.60	443639	23	66.51	33647	118	63.75
445718	26	63.59	502317	34	62.47	656621	89	62.36
525358	50	58.88	539357	56	58.23	655650	87	56.12
748253	102	56.05	58300	109	56.04	737439	97	54.96
444417	25	54.56	13174	110	53.93	347357	2	53.63
359257	5	53.13	13173	114	52.96	740330	99	52.77
517507	43	52.27	635658	81	52.12	507158	36	51.23
551716	64	51.09	346452	1	50.80	634322	80	50.15
557334	66	49.69	703156	90	49.61	406421	8	49.02
647334	85	49.01	523108	44	48.88	456526	29	48.49
414352	13	47.87	741640	100	47.01	646247	84	46.74
506422	35	44.73	452452	27	44.47	352557	4	44.25
509649	38	44.08	436447	19	44.00	632432	79	43.77
359521	6	43.58	711305	94	43.35	509940	39	43.09
606705	69	43.02	739615	98	41.98	551621	63	41.88
600608	67	41.84	525215	48	41.78	407500	9	40.94
614436	72	40.30	708430	91	39.53	13285	112	39.44
73302	108	38.78	439534	21	37.46	656555	88	36.50
33657	119	34.20	425606	16	33.92	13295	111	33.54
523703	47	33.05	525323	49	32.56	430608	18	31.77
604037	68	30.40	511349	40	29.67	33634	115	28.57
511849	41	28.12	57311	107	27.21	751555	103	26.86
13183	113	26.76	541601	58	26.68	758355	104	25.77
611355	71	25.73	438238	20	25.69	655522	86	25.61
618518	75	24.92	551459	62	24.06	412721	11	24.01
33658	116	23.79	632229	78	22.69	515231	42	19.44
64704	106	18.08	538416	55	16.08	527527	51	15.27
632130	77	13.38	530801	54	11.55			
AVERAGE:		58.33						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
417530	15	1343.37	444417	25	954.22	436447	19	745.45
656621	89	654.60	500432	31	644.76	525358	50	520.22
635658	81	437.55	509441	37	364.88	58300	109	359.69
740330	99	359.38	502317	34	355.86	710736	93	330.91
622544	76	327.55	553254	65	321.88	352557	4	320.33
501252	32	294.02	456526	29	293.97	548409	61	268.35
655650	87	248.46	517507	43	239.89	714623	95	229.46
708430	91	214.64	346452	1	212.70	408800	10	205.31
530535	53	203.03	722657	96	200.76	639744	82	189.97
546115	60	188.51	642540	83	182.96	413838	12	180.39
453344	28	175.76	66519	105	172.47	634322	80	170.61
542532	59	168.95	528518	52	167.45	443639	23	161.74
614740	73	160.69	541154	57	153.76	445718	26	153.72
349835	3	152.61	523530	46	149.12	425606	16	148.06
33638	117	144.97	414352	13	142.13	401321	7	140.93

608121	70	138.38	711305	94	137.54	606705	69	134.34
428307	17	132.11	441757	22	130.94	523328	45	130.86
57311	107	130.70	415816	14	122.37	739615	98	119.12
13174	110	118.40	502141	33	117.60	703156	90	115.95
741640	100	114.00	617637	74	113.74	33634	115	110.91
747356	101	110.76	359521	6	108.54	748253	102	106.81
511849	41	99.36	632432	79	97.14	656555	88	96.24
406421	8	95.60	709352	92	93.78	647334	85	92.08
557334	66	89.90	600608	67	89.18	439534	21	83.82
359257	5	79.60	509649	38	77.61	444127	24	76.35
539357	56	75.93	655522	86	75.33	646247	84	73.14
737439	97	71.70	523108	44	69.90	506422	35	69.52
33647	118	69.51	614436	72	69.08	604037	68	68.56
551716	64	67.15	13285	112	66.78	13183	113	62.79
525215	48	62.06	73302	108	61.67	13295	111	57.86
452452	27	57.62	507158	36	57.12	751555	103	55.90
13173	114	54.81	551621	63	50.66	347357	2	50.49
430608	18	48.86	33657	119	48.78	551459	62	48.61
523703	47	46.72	509940	39	46.49	541601	58	46.37
525323	49	45.25	407500	9	44.34	758355	104	42.52
457600	30	42.40	511349	40	38.61	412721	11	33.14
438238	20	32.33	632229	78	29.43	33658	116	26.60
538416	55	24.76	515231	42	23.80	611355	71	22.59
64704	106	22.28	527527	51	20.87	618518	75	16.53
632130	77	16.29	530801	54	9.37			
AVERAGE:		160.88						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
436447	19	1.48	406421	8	1.30	417530	15	1.07
525358	50	1.05	656621	89	0.96	359521	6	0.92
456526	29	0.88	444417	25	0.80	740330	99	0.78
352557	4	0.71	622544	76	0.70	509441	37	0.70
711305	94	0.69	346452	1	0.68	710736	93	0.67
58300	109	0.63	502317	34	0.60	414352	13	0.57
639744	82	0.56	500432	31	0.55	33634	115	0.52
635658	81	0.52	553254	65	0.52	656555	88	0.50
509649	38	0.49	73302	108	0.48	501252	32	0.47
634322	80	0.46	57311	107	0.46	703156	90	0.46
428307	17	0.45	359257	5	0.44	751555	103	0.44
523530	46	0.42	13295	111	0.40	737439	97	0.40
647334	85	0.40	538416	55	0.39	722657	96	0.39
747356	101	0.38	443639	23	0.36	642540	83	0.35
608121	70	0.34	347357	2	0.34	525215	48	0.33
452452	27	0.33	541601	58	0.33	614436	72	0.32
741640	100	0.31	541154	57	0.31	539357	56	0.31
13285	112	0.30	708430	91	0.29	548409	61	0.28
655522	86	0.28	646247	84	0.27	551459	62	0.27
511349	40	0.26	439534	21	0.26	407500	9	0.26
528518	52	0.26	444127	24	0.25	415816	14	0.25
66519	105	0.24	425606	16	0.24	655650	87	0.24
457600	30	0.24	438238	20	0.24	523328	45	0.23
408800	10	0.22	33638	117	0.22	523703	47	0.22
618518	75	0.22	542532	59	0.22	517507	43	0.22
604037	68	0.22	349835	3	0.22	511849	41	0.22
632432	79	0.21	445718	26	0.21	441757	22	0.21
13183	113	0.20	525323	49	0.20	506422	35	0.19
401321	7	0.19	502141	33	0.18	546115	60	0.18
551621	63	0.18	614740	73	0.17	758355	104	0.17
413838	12	0.17	714623	95	0.17	606705	69	0.16
632229	78	0.15	515231	42	0.15	453344	28	0.15
600608	67	0.14	33657	119	0.14	748253	102	0.14
430608	18	0.14	530535	53	0.14	33658	116	0.14
527527	51	0.13	617637	74	0.13	632130	77	0.12
523108	44	0.11	551716	64	0.11	13174	110	0.10
412721	11	0.10	33647	118	0.10	64704	106	0.09
509940	39	0.09	739615	98	0.08	13173	114	0.08
709352	92	0.06	507158	36	0.05	530801	54	0.05
557334	66	0.00	611355	71	0.00			
AVERAGE:		0.34						

Table 12.4a. Statistics after and before homogenization for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
49	49	59.36	48	48	57.87	7	7	55.28
20	20	41.95	24	24	41.36	23	23	40.90
19	19	39.96	52	52	39.04	30	30	37.16
9	9	36.61	11	11	36.04	40	40	34.02
13	13	32.61	43	43	32.37	8	8	31.85
33	33	31.83	22	22	31.52	31	31	30.19
14	14	28.75	36	36	28.48	39	39	28.17
2	2	27.48	1	1	27.01	25	25	26.99
4	4	26.86	10	10	26.12	15	15	24.96
5	5	24.61	29	29	24.31	3	3	24.20
41	41	23.87	26	26	22.85	35	35	22.26
12	12	21.72	34	34	21.58	53	53	19.63
44	44	19.22	51	51	19.02	50	50	18.83
27	27	17.78	17	17	17.45	47	47	17.11
16	16	16.19	21	21	16.08	45	45	15.60
6	6	15.44	46	46	14.95	32	32	14.35
42	42	13.65	28	28	13.48	37	37	12.48
38	38	12.09	18	18	11.59			
AVERAGE:		26.89						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
52	52	444.85	7	7	334.00	46	46	303.95
14	14	223.54	17	17	205.75	5	5	202.06
6	6	197.07	9	9	190.03	50	50	166.54
24	24	162.30	27	27	162.21	48	48	141.69
30	30	131.37	34	34	128.22	32	32	120.53
45	45	111.67	53	53	102.46	35	35	98.66
43	43	93.92	36	36	91.48	44	44	91.21
21	21	87.32	3	3	77.52	19	19	74.38
20	20	73.65	39	39	73.39	51	51	67.68
13	13	67.54	25	25	67.28	22	22	61.62
40	40	59.36	41	41	57.06	47	47	55.43
18	18	54.98	49	49	52.97	11	11	49.12
23	23	48.27	37	37	45.57	38	38	45.54
2	2	44.77	10	10	43.19	33	33	42.05
4	4	41.60	1	1	41.55	31	31	39.91
42	42	38.95	26	26	34.64	12	12	33.21
29	29	28.31	15	15	24.39	8	8	20.91
16	16	17.40	28	28	10.90			
AVERAGE:		99.70						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
36	36	1.83	14	14	1.27	21	21	1.11
45	45	1.07	52	52	1.00	6	6	0.99
1	1	0.93	50	50	0.91	5	5	0.90
17	17	0.87	38	38	0.86	12	12	0.79
53	53	0.77	46	46	0.74	37	37	0.73
32	32	0.72	48	48	0.72	41	41	0.72

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>202</i>		
49	49	0.71	9	9	0.68	44	44	0.65
51	51	0.64	20	20	0.63	8	8	0.59
35	35	0.59	34	34	0.55	39	39	0.53
3	3	0.53	7	7	0.52	4	4	0.50
40	40	0.50	25	25	0.49	47	47	0.48
27	27	0.46	13	13	0.45	30	30	0.45
18	18	0.40	2	2	0.39	24	24	0.36
29	29	0.31	22	22	0.27	19	19	0.25
42	42	0.19	28	28	0.17	26	26	0.16
10	10	0.15	15	15	0.15	33	33	0.15
43	43	0.13	31	31	0.10	16	16	0.08
23	23	0.07	11	11	0.05			
AVERAGE:		0.57						

Table 12.4b. Quality Control results for the series system of Ukraine and near border series from Romania, Hungary, Slovakia, Poland

Number of days with error(s): 2972
Total number of errors: 4456
Maximal positive error: 12.58
Minimal negative error: -14.33

Table 12.5a. Statistics after and before homogenization for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
6507	39	102.84	11876	10	91.56	11946	17	77.47
6628	44	75.21	11874	9	51.83	11902	11	40.39
6618	43	37.61	625	35	36.50	6513	40	35.78
11774	48	33.95	11779	49	33.93	6605	42	33.12
33634	27	30.70	11803	1	30.46	11868	8	30.34
11858	5	28.19	33517	25	27.89	11993	22	26.90
6518	41	26.88	11813	3	25.50	33514	24	24.64
11867	7	24.54	11927	14	24.22	690	38	24.03
11806	2	23.15	33631	26	22.66	600	34	21.42
11866	6	21.18	44121	28	20.87	11978	21	19.72
660	37	19.01	6702	45	18.87	61709	33	18.48
11910	13	18.39	11961	18	17.67	11938	16	17.59
33511	23	17.40	23703	29	16.69	53101	31	16.67
11819	4	15.98	11785	51	15.35	11903	12	15.18
6809	47	14.03	23201	32	13.71	51705	30	13.42
11977	20	12.64	11766	50	12.10	6707	46	11.86
11968	19	11.51	11931	15	10.67	650	36	9.44
11787	52	7.75	11782	53	6.82			
AVERAGE:		27.07						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11902	11	437.66	6702	45	393.59	6628	44	372.61
11946	17	353.30	44121	28	286.71	33511	23	276.57
23703	29	248.57	6507	39	229.99	11866	6	223.43
61709	33	219.73	11819	4	216.34	690	38	206.72
6618	43	164.29	33634	27	138.92	11779	49	132.65
6605	42	127.19	11876	10	126.44	6513	40	122.94
11910	13	120.91	11858	5	106.94	11785	51	106.48
11867	7	100.16	51705	30	96.93	11813	3	96.58
11874	9	87.76	6809	47	81.58	33517	25	80.43
6707	46	79.77	11868	8	76.86	660	37	76.77
6518	41	75.30	11774	48	73.47	53101	31	67.13
33514	24	67.03	11803	1	49.71	625	35	48.27
11961	18	46.35	11993	22	45.12	11766	50	42.79
11968	19	40.30	11938	16	38.41	11978	21	36.19
600	34	35.92	23201	32	35.71	11806	2	33.62
11903	12	32.73	33631	26	32.56	11927	14	31.36
650	36	23.69	11977	20	20.70	11931	15	16.39
11782	53	13.63	11787	52	12.23			
AVERAGE:		119.01						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
11813	3	1.59	11779	49	1.33	11946	17	1.20
33511	23	1.17	61709	33	1.17	11785	51	1.08
11968	19	1.04	11819	4	1.02	6605	42	1.01
6628	44	1.01	6518	41	0.93	6702	45	0.92
6507	39	0.91	11874	9	0.84	44121	28	0.81
51705	30	0.79	6707	46	0.79	33634	27	0.73

CARPATCLIM		Date		Version		Page		
<i>Report</i>		<i>02/10/2012</i>		<i>final</i>		<i>204</i>		
11803	1	0.71	11902	11	0.71	11910	13	0.70
33517	25	0.68	6618	43	0.67	23703	29	0.67
660	37	0.65	11866	6	0.64	11876	10	0.62
690	38	0.60	23201	32	0.58	53101	31	0.56
11978	21	0.53	11766	50	0.52	11931	15	0.48
11868	8	0.48	6513	40	0.47	6809	47	0.47
11806	2	0.45	11774	48	0.43	600	34	0.41
33514	24	0.37	11977	20	0.34	650	36	0.34
11927	14	0.27	11867	7	0.27	11903	12	0.25
625	35	0.24	11961	18	0.19	33631	26	0.17
11787	52	0.13	11993	22	0.13	11782	53	0.12
11858	5	0.12	11938	16	0.08			
AVERAGE:		0.63						

Table 12.5b. Quality Control results for the series system of Slovakia and near border series from Hungary, Ukraine, Poland, Czech Republic

Number of days with error(s): 2713
Total number of errors: 3917
Maximal positive error: 11.28
Minimal negative error: -41.85

Table 12.6a. Quality Control results for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

Number of days with error(s): 2420
Total number of errors: 3295
Maximal positive error: 20.66
Minimal negative error: -11.40

Table 12.6b. Statistics after and before homogenization for the series system of Poland and near border series from Ukraine, Slovakia, Czech Republic

I. TEST STATISTICS FOR SERIES INHOMOGENEITY

Null hypothesis: the examined series are homogeneous.

Critical value (significance level 0.05): 20.86

Test statistics (TS) can be compared to the critical value.

The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
06605	16	120.37	00566	2	113.42	1strn	29	100.83
33511	26	99.35	06702	19	97.75	06513	14	90.11
11876	37	88.23	11866	34	76.46	33514	27	72.19
05508	11	71.48	06518	15	71.33	05409	10	66.72
06809	21	64.33	06628	18	64.10	00600	5	62.26
11868	35	61.58	00540	1	59.54	05511	12	58.05
06707	20	57.98	11874	36	57.22	00580	4	55.08
1fren	31	53.59	06618	17	50.91	06507	13	49.40
1cerv	30	47.94	00690	9	45.42	33287	22	45.02
00660	8	37.85	00625	6	36.99	00575	3	35.42
33392	23	33.32	11961	40	30.38	33391	24	28.36
00650	7	27.06	33398	25	25.59	11993	42	22.54
1hole	28	17.43	11938	39	17.41	11977	41	16.86
11931	38	13.04	1mosn	33	10.04	1lysa	32	6.15
AVERAGE:		53.79						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
11866	34	520.18	06605	16	501.07	06702	19	377.53
06507	13	375.46	06513	14	337.26	33511	26	255.61
00566	2	231.82	1strn	29	215.86	06809	21	187.09
05409	10	184.37	05508	11	158.43	33514	27	151.75
06618	17	145.97	00600	5	145.66	05511	12	143.73
06628	18	141.75	00540	1	136.83	00690	9	126.15
1fren	31	121.19	11876	37	102.18	11868	35	97.45
00625	6	97.42	33392	23	96.31	11874	36	92.62
00580	4	90.60	33398	25	84.10	1cerv	30	67.61
06707	20	62.32	06518	15	61.59	00660	8	59.40
33287	22	54.19	1hole	28	42.60	11961	40	34.37
33391	24	30.42	00575	3	25.35	11977	41	25.13
00650	7	25.07	11993	42	20.24	11938	39	18.43
1mosn	33	17.91	11931	38	15.62	1lysa	32	14.49
AVERAGE:		135.55						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
33398	25	0.93	06513	14	0.74	06507	13	0.66
11931	38	0.58	33392	23	0.56	1fren	31	0.56
06605	16	0.56	1strn	29	0.54	00540	1	0.49
33514	27	0.47	11874	36	0.47	06702	19	0.47
05508	11	0.45	05409	10	0.44	00690	9	0.43
00625	6	0.41	00575	3	0.39	05511	12	0.39
11866	34	0.38	06809	21	0.38	06618	17	0.38
06628	18	0.35	00566	2	0.35	33511	26	0.34
00660	8	0.34	00580	4	0.28	33391	24	0.25
06518	15	0.24	1lysa	32	0.23	11961	40	0.22
1cerv	30	0.21	00600	5	0.20	33287	22	0.19
11938	39	0.17	11868	35	0.17	11876	37	0.16
1hole	28	0.15	06707	20	0.11	1mosn	33	0.11
11993	42	0.10	11977	41	0.06	00650	7	0.05
AVERAGE:		0.36						

Table 12.7a. Statistics after and before homogenization for the series system of Czech Republic and near border series from Slovakia, Poland

I. TEST STATISTICS FOR SERIES INHOMOGENEITY
 Null hypothesis: the examined series are homogeneous.
 Critical value (significance level 0.05): 20.86
 Test statistics (TS) can be compared to the critical value.
 The larger TS values are more suspicious!

1. Test Statistics After Homogenization

Series	Index	TSA	Series	Index	TSA	Series	Index	TSA
2	2	124.96	17	17	106.06	4	4	79.74
15	15	76.87	3	3	57.61	13	13	54.67
10	10	39.18	1	1	37.73	12	12	33.51
8	8	31.62	16	16	29.96	14	14	27.06
9	9	26.74	11	11	22.90	7	7	14.24
6	6	7.58	5	5	7.33			
AVERAGE:		45.75						

2. Test Statistics Before Homogenization

Series	Index	TSB	Series	Index	TSB	Series	Index	TSB
2	2	460.92	17	17	147.46	4	4	132.73
15	15	104.38	10	10	101.47	9	9	98.86
13	13	86.97	3	3	74.31	12	12	48.63
8	8	45.04	1	1	45.02	16	16	41.58
14	14	41.55	11	11	29.75	7	7	27.06
6	6	15.66	5	5	11.20			
AVERAGE:		88.98						

II. Relative Modification of Series

Series	Index	RI2	Series	Index	RI2	Series	Index	RI2
9	9	1.21	2	2	0.64	4	4	0.55
12	12	0.52	15	15	0.38	6	6	0.31
10	10	0.25	8	8	0.18	7	7	0.18
3	3	0.18	11	11	0.17	13	13	0.15
16	16	0.13	5	5	0.12	17	17	0.12
14	14	0.10	1	1	0.07			
AVERAGE:		0.31						

Table 12.7b. Quality Control results for the series system of Czech Republic and near border series from Slovakia, Poland

Number of days with error(s): 653
 Total number of errors: 719
 Maximal positive error: 12.31
 Minimal negative error: -11.76