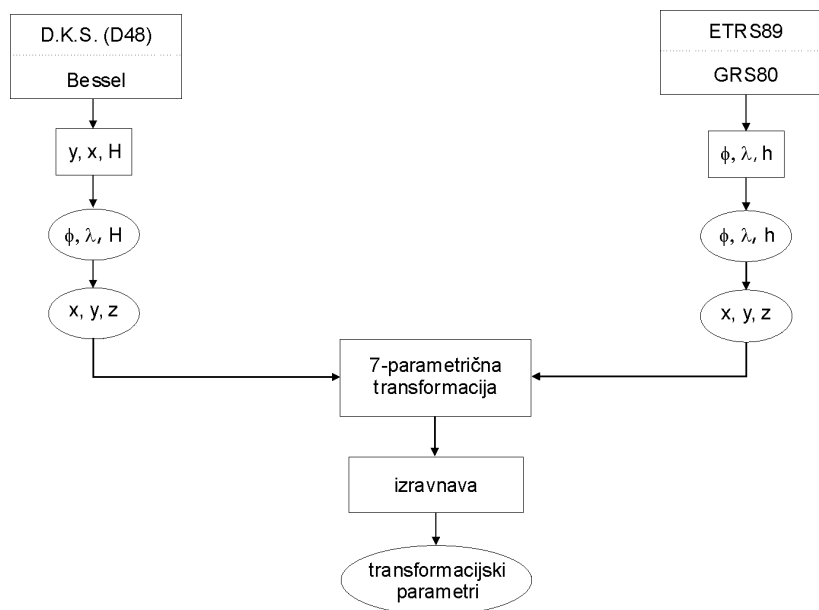


1.1.1 Enostavni model transformacije: prostorska podobnostna transformacija

Izračun transformacijskih parametrov

Izračun transformacijskih parametrov je bil izveden s programom SiTra. Model transformacije je Helmertova podobnostna 7-parametrična transformacija. V izračunu transformacijskih parametrov so upoštevane višine veznih točk.

Schema izračuna transformacijskih parametrov:



Transformacijski parametri služijo za določitev položaja v državnem koordinatnem sistemu D48. Nadmorska višina se lahko določi direktno s transformacijo ali z upoštevanjem absolutnega modela geoida Slovenije:

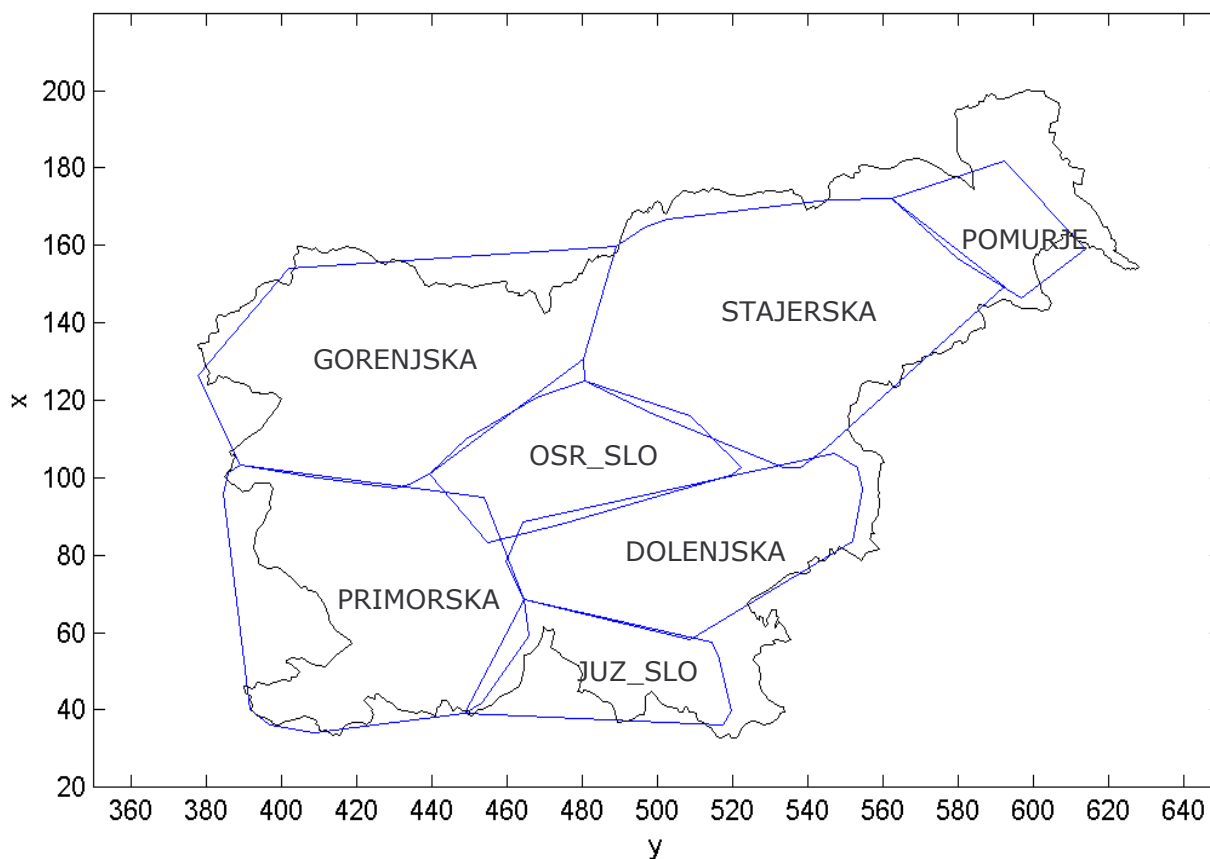
$$H = h - N,$$

kjer je h elipsoidna višina v ETRS89, N pa interpolirana geoidna višina.

1.1.1.1 Izračun transformacijskih parametrov za 7 regij, 3 pokrajine in celotno ozemlje države

1.1.1.1.1 Razdelitev državnega območja na 7 regij – nivo natančnosti transformacije okoli 30 cm

Skica območij



Rezultati izračuna transformacijskih parametrov

JUŽNA SLOVENIJA			
Srednji st. odklon: 0.053 m			
Najmanjše in največje vrednosti odstopanj:			
	dx (cm)	dy (cm)	dH (cm)
min	-8.47	-11.03	-13.09
max	3.71	13.71	11.91

sr.v.	0.00	-0.00	0.00
sr.v. (abs)	2.85	6.16	7.03
Površina območja transformacije: 1577.26 km ²			
Število veznih točk: 11			
Transf. parametri:			
deltaX	-427.888553	m	
deltaY	-105.559998	m	
deltaZ	-510.911367	m	
alfa	4.992818	"	
beta	5.898563	"	
gama	-10.306816	"	
merilo	-12.431354	ppm	

<p>DOLENJSKA</p> <p>Srednji st. odklon: 0.077 m</p> <p>Najmanjše in največje vrednosti odstopanj:</p> <table border="1"> <thead> <tr> <th></th> <th>dx (cm)</th> <th>dy (cm)</th> <th>dH (cm)</th> </tr> </thead> <tbody> <tr> <td>min</td> <td>-30.90</td> <td>-29.34</td> <td>-34.27</td> </tr> <tr> <td>max</td> <td>25.18</td> <td>27.44</td> <td>24.69</td> </tr> <tr> <td colspan="4">-----</td> </tr> <tr> <td>sr.v.</td> <td>-0.00</td> <td>-0.00</td> <td>0.00</td> </tr> <tr> <td>sr.v. (abs)</td> <td>7.57</td> <td>9.34</td> <td>8.02</td> </tr> </tbody> </table> <p>Površina območja transformacije: 2765.52 km²</p> <p>Število veznih točk: 97</p>		dx (cm)	dy (cm)	dH (cm)	min	-30.90	-29.34	-34.27	max	25.18	27.44	24.69	-----				sr.v.	-0.00	-0.00	0.00	sr.v. (abs)	7.57	9.34	8.02	<p>Transf. parametri:</p> <table border="1"> <tbody> <tr> <td>deltaX</td> <td>-468.611644 m</td> </tr> <tr> <td>deltaY</td> <td>-81.420064 m</td> </tr> <tr> <td>deltaZ</td> <td>-445.219731 m</td> </tr> <tr> <td>alfa</td> <td>3.839410 "</td> </tr> <tr> <td>beta</td> <td>3.262328 "</td> </tr> <tr> <td>gama</td> <td>-10.566926 "</td> </tr> <tr> <td>merilo</td> <td>-16.132504 ppm</td> </tr> </tbody> </table>	deltaX	-468.611644 m	deltaY	-81.420064 m	deltaZ	-445.219731 m	alfa	3.839410 "	beta	3.262328 "	gama	-10.566926 "	merilo	-16.132504 ppm
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<p>ŠTAJERSKA</p> <p>Srednji st. odklon: 0.114 m</p> <p>Najmanjše in največje vrednosti odstopanj:</p> <table border="1"> <thead> <tr> <th></th> <th>dx (cm)</th> <th>dy (cm)</th> <th>dH (cm)</th> </tr> </thead> <tbody> <tr> <td>min</td> <td>-31.75</td> <td>-31.61</td> <td>-59.89</td> </tr> <tr> <td>max</td> <td>27.72</td> <td>37.68</td> <td>37.57</td> </tr> <tr> <td colspan="4">-----</td> </tr> <tr> <td>sr.v.</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>sr.v. (abs)</td> <td>10.32</td> <td>8.51</td> <td>17.62</td> </tr> </tbody> </table> <p>Površina območja transformacije: 5126.97 km²</p> <p>Število veznih točk: 124</p>		dx (cm)	dy (cm)	dH (cm)	min	-31.75	-31.61	-59.89	max	27.72	37.68	37.57	-----				sr.v.	0.00	0.00	0.00	sr.v. (abs)	10.32	8.51	17.62	<p>Transf. parametri:</p> <table border="1"> <tbody> <tr> <td>deltaX</td> <td>-439.481548 m</td> </tr> <tr> <td>deltaY</td> <td>11.748185 m</td> </tr> <tr> <td>deltaZ</td> <td>-494.977936 m</td> </tr> <tr> <td>alfa</td> <td>0.026815 "</td> </tr> <tr> <td>beta</td> <td>4.656409 "</td> </tr> <tr> <td>gama</td> <td>-10.155824 "</td> </tr> <tr> <td>merilo</td> <td>-16.269825 ppm</td> </tr> </tbody> </table>	deltaX	-439.481548 m	deltaY	11.748185 m	deltaZ	-494.977936 m	alfa	0.026815 "	beta	4.656409 "	gama	-10.155824 "	merilo	-16.269825 ppm
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<p>POMURJE</p> <p>Srednji st. odklon: 0.061 m</p> <p>Najmanjše in največje vrednosti odstopanj:</p> <table border="1"> <thead> <tr> <th></th> <th>dx (cm)</th> <th>dy (cm)</th> <th>dH (cm)</th> </tr> </thead> <tbody> <tr> <td>min</td> <td>-15.87</td> <td>-19.52</td> <td>-18.55</td> </tr> <tr> <td>max</td> <td>21.11</td> <td>14.20</td> <td>18.71</td> </tr> <tr> <td colspan="4">-----</td> </tr> <tr> <td>sr.v.</td> <td>-0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>sr.v. (abs)</td> <td>5.76</td> <td>7.32</td> <td>6.59</td> </tr> </tbody> </table> <p>Površina območja transformacije: 929.01 km²</p> <p>Število veznih točk: 30</p>		dx (cm)	dy (cm)	dH (cm)	min	-15.87	-19.52	-18.55	max	21.11	14.20	18.71	-----				sr.v.	-0.00	0.00	0.00	sr.v. (abs)	5.76	7.32	6.59	<p>Transf. parametri:</p> <table border="1"> <tbody> <tr> <td>deltaX</td> <td>-524.431250 m</td> </tr> <tr> <td>deltaY</td> <td>-3.301198 m</td> </tr> <tr> <td>deltaZ</td> <td>-519.006791 m</td> </tr> <tr> <td>alfa</td> <td>-0.013132 "</td> </tr> <tr> <td>beta</td> <td>3.119715 "</td> </tr> <tr> <td>gama</td> <td>-10.232694 "</td> </tr> <tr> <td>merilo</td> <td>-4.185096 ppm</td> </tr> </tbody> </table>	deltaX	-524.431250 m	deltaY	-3.301198 m	deltaZ	-519.006791 m	alfa	-0.013132 "	beta	3.119715 "	gama	-10.232694 "	merilo	-4.185096 ppm
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Razdelitev okvirno-navezovalnih mrež na posamezne regije

JUŽNA SLOVENIJA: cer_semi, dragatus; dodane: 448_III (Primorska), 161s_III in 68s_IIIg (Dolenjska).

DOLENJSKA: bizeljsk (južni del), cer_log, dolenvas, he_sava, hinje, ivancna, kostanje, lasce, nmesto, ob_mreza, posavje, ribnica, skocjan, smarjeta, trebnje; odstranjena: 278_IV.

ŠTAJERSKA: andraz, celje, drav_dol, dravog, galicija, koroska, lenart, lenartAC, lesje, maribor, mislinja1, oploznic, pl_kozje, poljc, ptujxx, razv98, spsavin1, zgasa, zrece_6; odstranjeni: 59_II, 155z2_IV.

POMURJE: g_radgon, jeruz, ljutomer, m_sobota; dodani: KAME, 386_I (Štajerska); odstranjena: 58z2_IV.

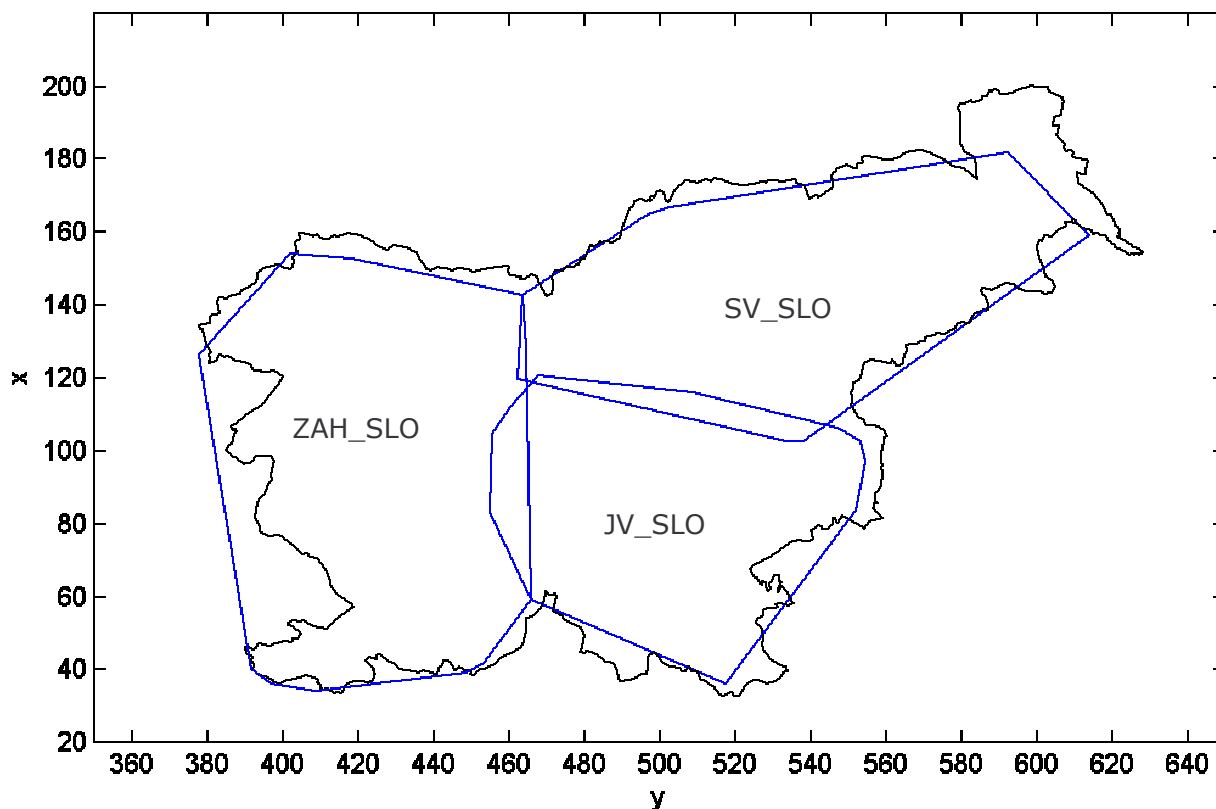
GORENJSKA: 26_27sek, boh, bregin, bukovca, gor2004, tolmin, ziri; dodane: 518_I (Primorska), 451_II in 371_IV (Štajerska).

PRIMORSKA in NOTRANJSKA: cerknica, g_brda, gorica, ilirska1, kostxxp, loz, sez, sezana_3, vrhlog.

OSREDNJA SLOVENIJA: gros, kam, litija, ljubljana, moravce, zasavje; dodane: 487_IIIg (Gorenjska), 10-3-253-30 (Primorska), 131_IV (Stajerska).

1.1.1.1.2 Razdelitev državnega območja na 3 pokrajine – nivo natančnosti transformacije okoli 50 cm

Skica območij



Rezultati izračuna transformacijskih parametrov

ZAHODNA SLOVENIJA					
Srednji st. odklon: 0.189 m				Transf. parametri:	
Najmanjše in največje vrednosti odstopanj:				deltaX	-315.352931 m
	dx (cm)	dy (cm)	dH (cm)	deltaY	-186.253842 m
min	-36.65	-25.40	-115.40	deltaZ	-499.603434 m
max	28.15	23.93	97.99	alfa	6.446475 "
-----				beta	8.131219 "
sr.v.	0.00	-0.00	0.00	gama	-13.208894 "
sr.v. (abs)	9.75	9.96	33.63	merilo	-23.448627 ppm
Površina območja transformacije:					
8777.85 km ²					
Število veznih točk: 169					

<p>SEVEROVZHODNA SLOVENIJA</p> <p>Srednji st. odklon: 0.135 m</p> <p>Najmanjše in največje vrednosti odstopanj:</p> <table border="1"> <thead> <tr> <th></th> <th>dx (cm)</th> <th>dy (cm)</th> <th>dH (cm)</th> </tr> </thead> <tbody> <tr> <td>min</td> <td>-37.76</td> <td>-39.09</td> <td>-66.25</td> </tr> <tr> <td>max</td> <td>43.46</td> <td>52.87</td> <td>106.96</td> </tr> <tr> <td colspan="4">-----</td> </tr> <tr> <td>sr.v.</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>sr.v. (abs)</td> <td>13.41</td> <td>12.65</td> <td>18.53</td> </tr> </tbody> </table> <p>Površina območja transformacije: 7237.39 km²</p> <p>Število veznih točk: 154</p>		dx (cm)	dy (cm)	dH (cm)	min	-37.76	-39.09	-66.25	max	43.46	52.87	106.96	-----				sr.v.	0.00	0.00	0.00	sr.v. (abs)	13.41	12.65	18.53	<p>Transf. parametri:</p> <table border="1"> <tbody> <tr> <td>deltaX</td> <td>-464.923389</td> <td>m</td> </tr> <tr> <td>deltaY</td> <td>21.456739</td> <td>m</td> </tr> <tr> <td>deltaZ</td> <td>-504.499613</td> <td>m</td> </tr> <tr> <td>alfa</td> <td>-0.402796</td> <td>"</td> </tr> <tr> <td>beta</td> <td>4.228767</td> <td>"</td> </tr> <tr> <td>gama</td> <td>-9.954933</td> <td>"</td> </tr> <tr> <td>merilo</td> <td>-12.795283</td> <td>ppm</td> </tr> </tbody> </table>	deltaX	-464.923389	m	deltaY	21.456739	m	deltaZ	-504.499613	m	alfa	-0.402796	"	beta	4.228767	"	gama	-9.954933	"	merilo	-12.795283	ppm
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<p>JUGOVZHODNA SLOVENIJA</p> <p>Srednji st. odklon: 0.092 m</p> <p>Najmanjše in največje vrednosti odstopanj:</p> <table border="1"> <thead> <tr> <th></th> <th>dx (cm)</th> <th>dy (cm)</th> <th>dH (cm)</th> </tr> </thead> <tbody> <tr> <td>min</td> <td>-38.91</td> <td>-29.70</td> <td>-32.76</td> </tr> <tr> <td>max</td> <td>31.54</td> <td>30.20</td> <td>30.89</td> </tr> <tr> <td colspan="4">-----</td> </tr> <tr> <td>sr.v.</td> <td>-0.00</td> <td>-0.00</td> <td>0.00</td> </tr> <tr> <td>sr.v. (abs)</td> <td>9.66</td> <td>10.83</td> <td>10.56</td> </tr> </tbody> </table> <p>Površina območja transformacije: 5779.03 km²</p> <p>Število veznih točk: 150</p>		dx (cm)	dy (cm)	dH (cm)	min	-38.91	-29.70	-32.76	max	31.54	30.20	30.89	-----				sr.v.	-0.00	-0.00	0.00	sr.v. (abs)	9.66	10.83	10.56	<p>Transf. parametri:</p> <table border="1"> <tbody> <tr> <td>deltaX</td> <td>-459.947808</td> <td>m</td> </tr> <tr> <td>deltaY</td> <td>-82.224279</td> <td>m</td> </tr> <tr> <td>deltaZ</td> <td>-458.755555</td> <td>m</td> </tr> <tr> <td>alfa</td> <td>3.565429</td> <td>"</td> </tr> <tr> <td>beta</td> <td>3.700405</td> <td>"</td> </tr> <tr> <td>gama</td> <td>-10.860587</td> <td>"</td> </tr> <tr> <td>merilo</td> <td>-15.507373</td> <td>ppm</td> </tr> </tbody> </table>	deltaX	-459.947808	m	deltaY	-82.224279	m	deltaZ	-458.755555	m	alfa	3.565429	"	beta	3.700405	"	gama	-10.860587	"	merilo	-15.507373	ppm
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Sestava pokrajin

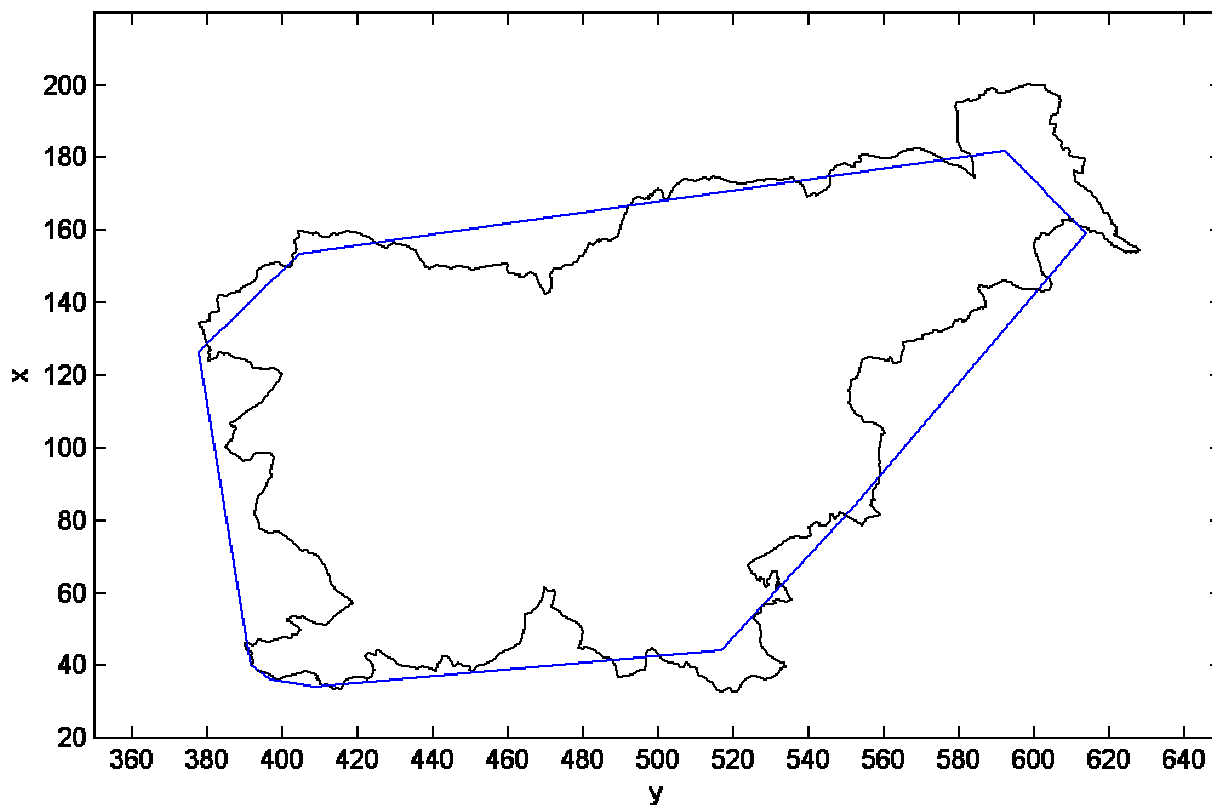
ZAHODNA SLOVENIJA: Primorska, Gorenjska; odstranjeni: 451_II in 371_IV.

SEVEROVZHODNA SLOVENIJA: Štajerska, Pomurje; dodani: 258 in 116z2_III (Gorenjska).

JUGOVZHODNA SLOVENIJA: Južna Slovenija, Dolenjska, Osrednja Slovenija; dodana: 359z_II (Primorska); odstranjene: 448_III, 161s_III, 548_IV, 337s_II, 85z2_III, 157_III, 161s_III, 131_IV, 322s_IIIg, 487_IIIg, 374_II.

1.1.1.1.3 Enotna državna transformacija – nivo natančnosti transformacije okoli 1 m (oziroma nekaj slabše na skrajnem severovzhodu države)

Skica območja



Rezultati izračuna transformacijskih parametrov

SLOVENIJA				Transf. parametri:	
Srednji st. odklon: 0.282 m				deltaX	-409.520465 m
Najmanjše in največje vrednosti odstopanj:				deltaY	-72.191827 m
	dx (cm)	dy (cm)	dH (cm)	deltaZ	-486.872387 m
min	-66.11	-61.37	-105.47	alfa	3.086250 "
max	125.12	71.05	179.20	beta	5.468945 "

sr.v.	0.00	-0.00	0.00	gama	-11.020370 "
sr.v. (abs)	22.98	16.47	44.05	merilo	-17.919456 ppm
Površina območja transformacije:					
23101.65 km ²					
Število veznih točk: 420					