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NATIONAL REPORT OF SLOVENIA

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Presentation topics and highlights

- Terrestrial Reference Frame: "EUREF Slovenia 2016" GNSS Campaign
- National Combined Geodetic Network: In function since January 1, 2016
- Slovenian GBAS Network (SIGNAL): Towards a Systematical Quality Control of Network Services
- Local to ETRS89 Datum Transformation Model: *Improvements and Verification for the Cadastre*
- Vertical Reference Frame: *Towards a New Height Reference System New Quasi-Geoid Model*

Terrestrial Reference Frame

"EUREF Slovenia 2016" GNSS Campaign

- Conducted between August 22 and November 10, 2016
- 80 consecutive daily sessions with the mean epoch of 2016.75
- 46 passive GNSS sites occupied for at least 72 hours each
- 23 Slovenian continuously operating reference stations
- 51 other (IGS, EPN, APOS, CROPOS ...) reference stations
- ~12 km is the median baseline length for passive GNSS sites
- ~28 km is the median baseline length for Slovenian CORS sites
- ~178 km is the median baseline length for EPN and IGS sites



"EUREF Slovenia 2016" GNSS Campaign



Terrestrial Reference Frame

"EUREF Slovenia 2016" GNSS Campaign

- Data have been collected (~6000 daily RINEX files) and preprocessed (header checking and corrections, epoch analyses, conversion to v2.11 etc.)
- Need to resolve dilemmas concerning the ETRS89 realization (EUREF Questionnaire)
- The aim of this campaign is a new realization of ETRS89 in Slovenia

National Combined Geodetic Network (Zero-Order Netvork)

Operational since January 1, 2016

- 6 network sites with distances of ~100 km
- 8 continuously operating GNSS stations
 two of them are "double stations"
- Connected to levelling and gravimetric networks
- Local analytical centre is being established to produce daily solutions for all Slovenian permanent GNSS stations
- Will be proposed to be included to EPN





SIGNAL Network and Combined Geodetic Network



SIGNAL Network

- Slovenian GBAS network of 16 continuously operating GNSS stations (KOPE is also zero-order station, GSR1 is also EPN station)
- Decline of CSD modem connections, increase of use of MAC access points
- New network integrity and real-time service availability monitoring software
- New quality control of the RTK services based on field measurements – a special network of marked control points is being established for this purpose

Datum Transformation Model

National Local to ETRS89 Datum Transformation Model

- Triangle based transformation model of Slovenia is a continuous and reversible direct grid-to-grid (2D) transformation model
- The quality of the model was evaluated for ~2500 cadastral boundary points all over the country (80 test areas, mostly towns)
- 1600 additional tie points (80% increase) were determined to improve the transformation accuracy
- For most of the country, the sub-decimetre accuracy is achieved
- The new version (4.0) of the model is now ready to be used for transformation of national cadastral database into ETRS89

Improvement of transformation accuracy



Vertical Reference Frame

Towards a New Height Reference System

- Changing from normal orthometric to normal heights
- Changing from Trieste 1875 to Koper 2010 height datum
- Renewed and remeasured levelling networks (~2000 km)
- Renewed and remeasured gravimetric networks
- New adjustment by geopotential numbers
- Resulting in over 12,000 newly determined benchmarks heights
- To be implemented by 2018 ???



Closure Errors of Levelling Loops



Vertical Reference Frame

New Quasi-Geoid Model

- Referring to the future new height reference system
- Based on the new regional gravimetric survey
- Accuracy estimation based on over 800 control points gives standard deviation of computed geoid heights of 2.6 cm





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Thank you for your attention