NATIONAL REPORT OF FINLAND

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FINNREF AND FINPOS

- Densification of the net ready: 47 stns operational + 4 old GPS-only stations
- 20 EPN stations (green)
- N2000 heights for all stations by ~2024 (mostly precise levellings)
 - Levellings started in 2018
 - Height transfer w/ tachymeter
- FINPOS: the new positioning service for the NLS internal use
 - Operational in summer 2020
 - Test phase going on this year
 - Which software? Geo++, Topcon, Trimble
 - Challenges with current GNSMART with Galileo and Beidou data



TRIMNET VELOCITIES

- Trimnet commercial GNSS reference stations (network-RTK) reprocessed with Bernese
 - Data 2006-2018
- Time series analysis by Jaanus Metsar using Tsview
 and Hector
 - Data quality good enough
 - 8/90 rejected totally (short, high rms etc.)
 - Results fit well with the NKG velocities (Aug 2018) of the FinnRef stations
 - · Some checks on eastern side needed



PRECISE LEVELLING 2018

- Finnref (permanent GNSS) stations connected to the precise levelling network
 - Hälvälä (Lahti)
 Savonlinna
 - Kristiinankaupunki Ilomantsi
- 3rd order precise levellings 220 km. Mostly in Åland and Kainuu. Some levellings in South Ostrobothnia and Uusimaa.
- Ten connections to water level stations of the Finnish Environment Institute (SYKE)
- Upgrade of FGI rod comparator completed





NEW GNSS-LEVELLING DATABASE

- 78 points measured in 2016 & 2017
- 1st order levelling points with heights in N2000 (~10 points 2nd order)
- Where possible EUVN and EUVN-DA points used
- GPS observations 1.5 to 2 days
- Processing of GNSS data completed in the beginning of 2019





- Satellite laser ranging system build continues, delays with telescope commissioning, estimated operational 2020.
- VLBI telescope installed in summer 2018, receiver under construction in Yebes (Spain), installation and tests in autumn 2019. First test sessions estimated in 2020.
- Metsähovi is Finland's contribution to the United Nations General Assembly resolution in 2015 on sustainable Global Geodetic Reference Frame



RENEWAL OF BENCHMARK REGISTRY

- Current registry outdated regarding the platform (updates, security,...) and supports only passive benchmarks
 - Includes e.g. levelling adjustment module too
- New will include/handle:
 - Traditional passive benchmarks
 - Active benchmarks (permanent GNSS stations)
 - Gravity benchmarks
- New data model division of database:
 - information of physical benchmark
 - 1D, 2D, 3D, gravity (measurement-related information)
 - Code tables
 - Active benchmarks
 - Supports velocity, uncertainty and time information and validity of coordinates (time windows) and global reference frames
- GUI will be built on QGIS



DIM3

THANK YOU!

