

INTEGRATED GALILEO REFERENCE NETWORK FOR POSITIONING AND ENVIRONMENT MONITORING

AMBRUS KENYERES

S TÓTH - BMAGYAR - RHORVÁTH - GVIRÁG - I GALAMBOS



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MOTIVATION AND BACKGROUND

- TECHNICAL AND PHYSICAL STATUS OF THE GEODETIC REFERENCE INFRASTRUCTURE IN HUNGARY;
 - Last national scale levelling campaign was >30 years ago and no resource is foreseen to run the next cycle;
 - RTK network is only partially multi-GNSS capable and must be developped;
- > NEW OPPORTUNITIES OFFERED BY GNSS AND InSAR;
 - multi-GNSS must be fully exploited
 - GNSS-InSAR complementarity



GNSS - InSAR COMPLEMENTARITY

- GNSS: sparse network, but well defined geodetic reference
- InSAR: high, but uneven velocity information AND relative technique, fine for small scale infrastructure monitoring;
- Co-location points: corner reflectors and transponders installed on CORS GNSS masts;
- Remember the EUREF2018 symposium: the IGRS design
- Remember EGMS, where GNSS is used for InSAR referencing



EGMS – European Ground Motion Service





https://land.copernicus.eu/pan-european/european-ground-motion-service

EGMS – European Ground Motion Service

Geodetic reference is a gridded velocity field from from EPND + NGL





PROPOSED APPROACH

> COMPLETELY NEW HEIGHT REFERENCE INFRASTRUCTURE

- primary levelling benchmarks → MULTI-TECHNIQUE stations with MULTIPLIED application opportunities;
- > static → (semi)-kinematic HEIGHT REFERENCE;
- easy, well predictable, regular maintenance and update
- ENHANCED, GNSS-BASED HEIGHT DETERMINATION APPROACH
- INGRIM AS A PILOT FOR PROOF OF CONCEPT
 - pilot network to be extended nationwide



INGRIMINFRASTRUCTURE BUILD

- Multi-GNSS receiver
- InSAR corner reflector IGRS design
- Levelling benchmark
- Suitable for A10 measurement



DIGITAL HEIGHT REFERENCE



INGRIM AS ESA NAVISP PROJECT

- Physical network of 7 INGRIM stations (IGRS + multi-GNSS)
- National scale InSAR analysis in progress;
- New geoid is being computed (EAlps project is noted)
 - → (semi)-kinematic height reference database created
- GNSS heighting guidelines and technology
- Enhanced multi-GNSS RTK service (denser and more flexible network under present ionospheric circumstances)
- Project to be completed in winter 2023-24

Near future: co-existence of old and new technology!





On-going process to establish and promote the new approach!

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THANKS FOR YOUR KIND ATTENTION!



