# **National Report**
# Hungary

**Sandor Toth**, Ambrus Kenyeres, Istvan Galambos

Lechner Non-Profit Ltd. – Satellite Geodetic Observatory, Penc, Hungary

# Hungarian Geodetic Infrastructures

NATIONAL GEODETIC CONTROL NETWORKS:
a) Horizontal Network (EOVA)
b) Levelling Network (EOMA)
c) Passive GNSS Network (OGPSH)
d) **Permanent GNSS network (GNSSnet.hu)**
e) GPS Geodynamic Network (MGGA)
f) Integrated Geodetic Base Network (INGA)
g) Gravimetric Network (MGH-2010)

Responsible agencies:

a)-f):      Lechner Non-Profit Ltd. (in the role of National Mapping Agency since 2019)

g):          Mining and Geological Survey of Hungary (MBFSZ)

- Focus mainly on the maintenance of geodetic marks

- No nationwide leveling campaigns in the near future



**National Levelling Network (EOMA)**

# GNSS stations in Hungary

- GNSSnet.hu GNSS network provides the official spatial reference

- Currently 35+19 stations in use (35 in Hungary)

- In the process of changing the equipment (Galileo capability). Modernization has been going on for years. 4-6 new hardware in every year

- Building geo-redundant server infrastructure for the network RTK service

- All information and results on the website (http://gnssnet.hu)
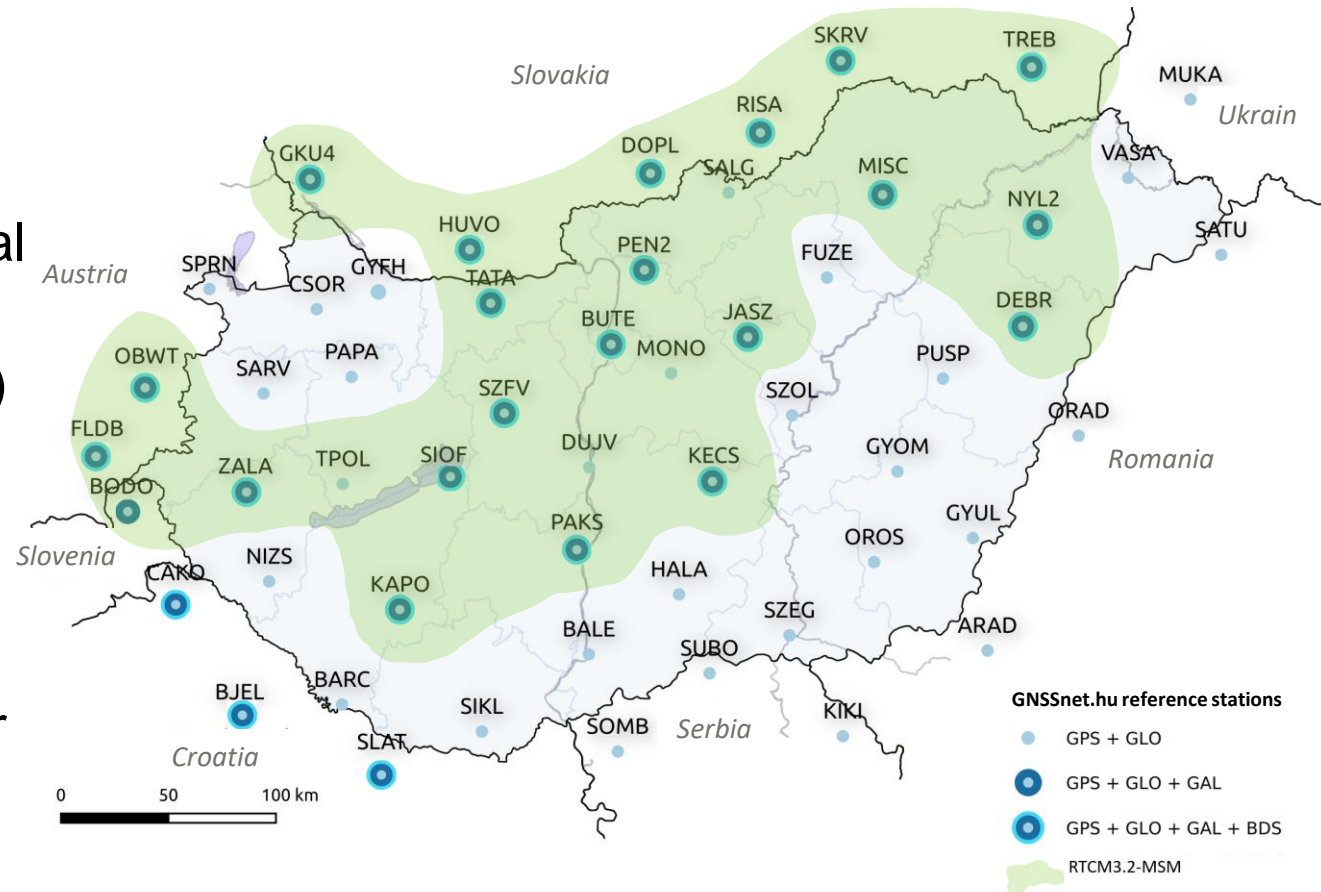


GNSSnet.hu reference stations

# Contribution to EUREF activities

EPN stations:

-BME1(GPS+GLO+GAL+BDS)

-BUTE (GPS+GLO+GAL+BDS)

-PENC (GPS+GLO)

-SPRN (GPS+GLO)

-OROS (GPS+GLO)

SGO – Analysis Center:

- 47 stations included in daily and weekly EPN solutions

- since GPS week 2118 (August 2020) rapid and final solutions include Galileo observations

- 99 stations (including GNSSnet.hu) processed and submitted to EPN densification

- Main part of 99 stations are included in the E-GVAP (EUMETNET GNSS water vapour programme)



**Stations included in EPN analysis**
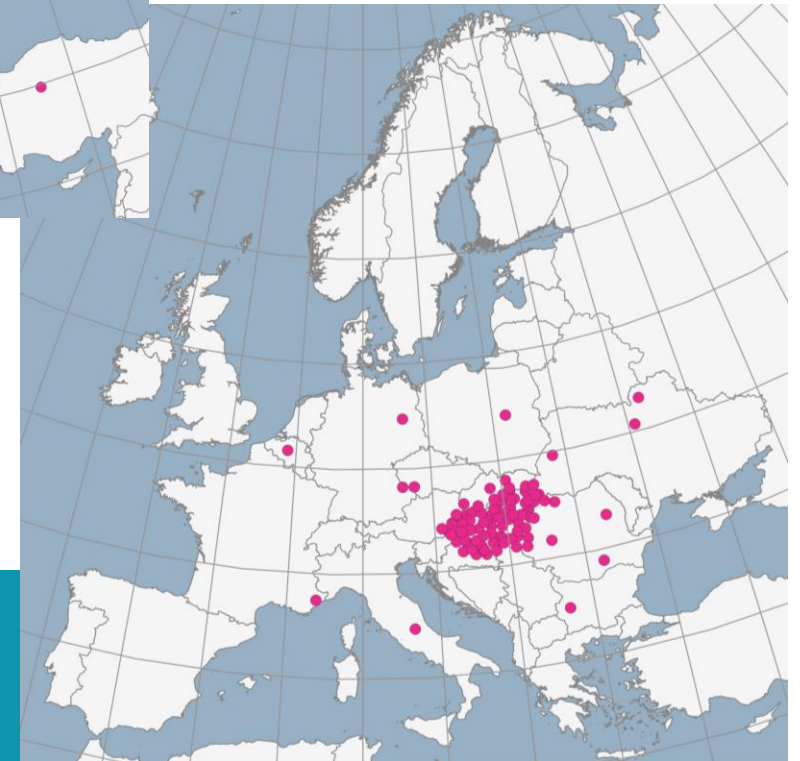
**GNSS network, contribution to EPN densification**

# InSAR and Geodesy

Integrated Geodetic Reference Station [IGRS] (design from TU Delft)
- levelling benchmark
- GNSS antenna
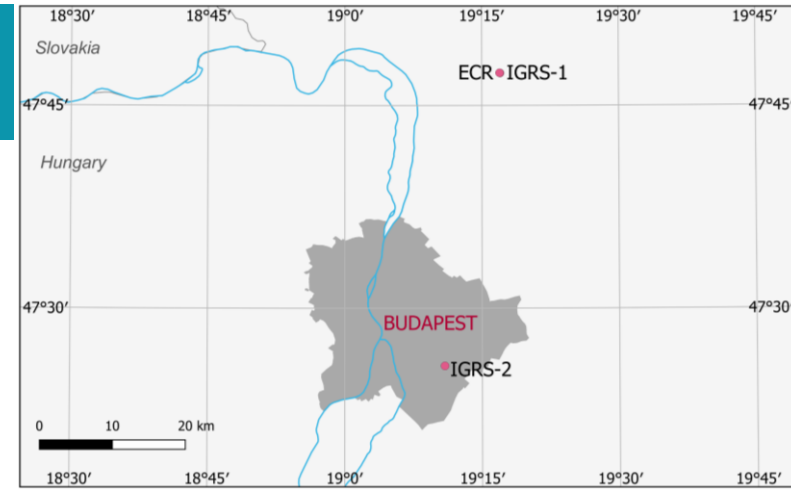- double backflipped triangular corner reflectors

Electronic Corner Reflector [ECR]
- amplifies the reflected radar signal
- Self-sustaining

Current activites:
- Establish test network of IGRS and ECR
- Evaluate ECR performance
- Will partially replace GNSSnet.hu

**IGRS-1**

**ECR**

# Thank you!

www.sgo-penc.hu

www.gnssnet.hu

www.lechnerkozpont.hu