

National Report Renovation of Estonian geodetic networks

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Topics

Currently renewing the realizations of national geodetic system:

- Levelling network
- Geodetic reference network
- Permanent GNSS network (state-owned)
- Gravity network

Levelling network

- Measurements started in 2004 (reconstr. in 2001)
- By 2007 network was reconstructed (about 50 % of old BMs were destroyed)
- 9+2 main loops, additionally 9 miniloops (total dist. 3300 km)
- Rigorous methodology (“Rote hose” method (BFFB – FBBF), from Aug.to Dec., envir.recording, etc)
- Instruments and staffs regularly calibrated (in FGI lab.)
- Promising results: random and systematic errors so far $\eta = 0.18 \text{ mm}/\sqrt{\text{km}}$, $\sigma = 0.03 \text{ mm}/\text{km}$
- plan to finish measurements in 2010

Levelling network



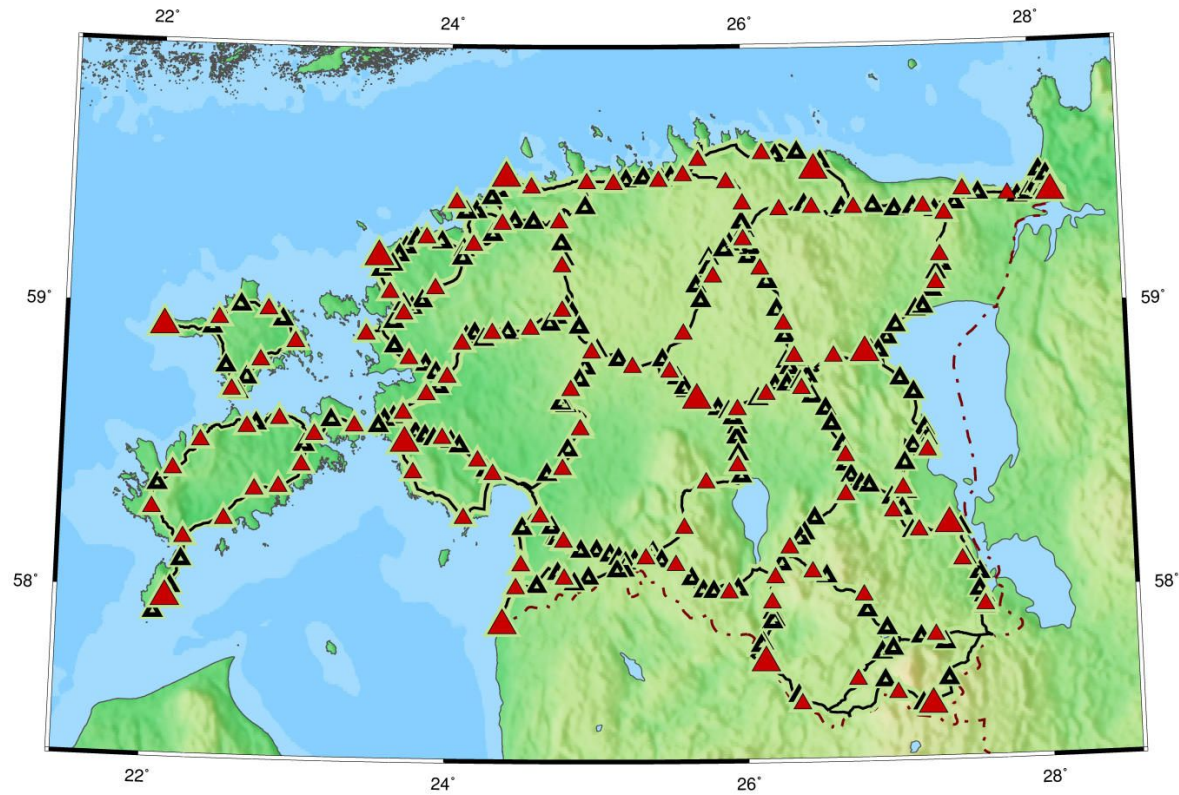
Levelling network



Map Compiled by A.Rüdja

Integration with...

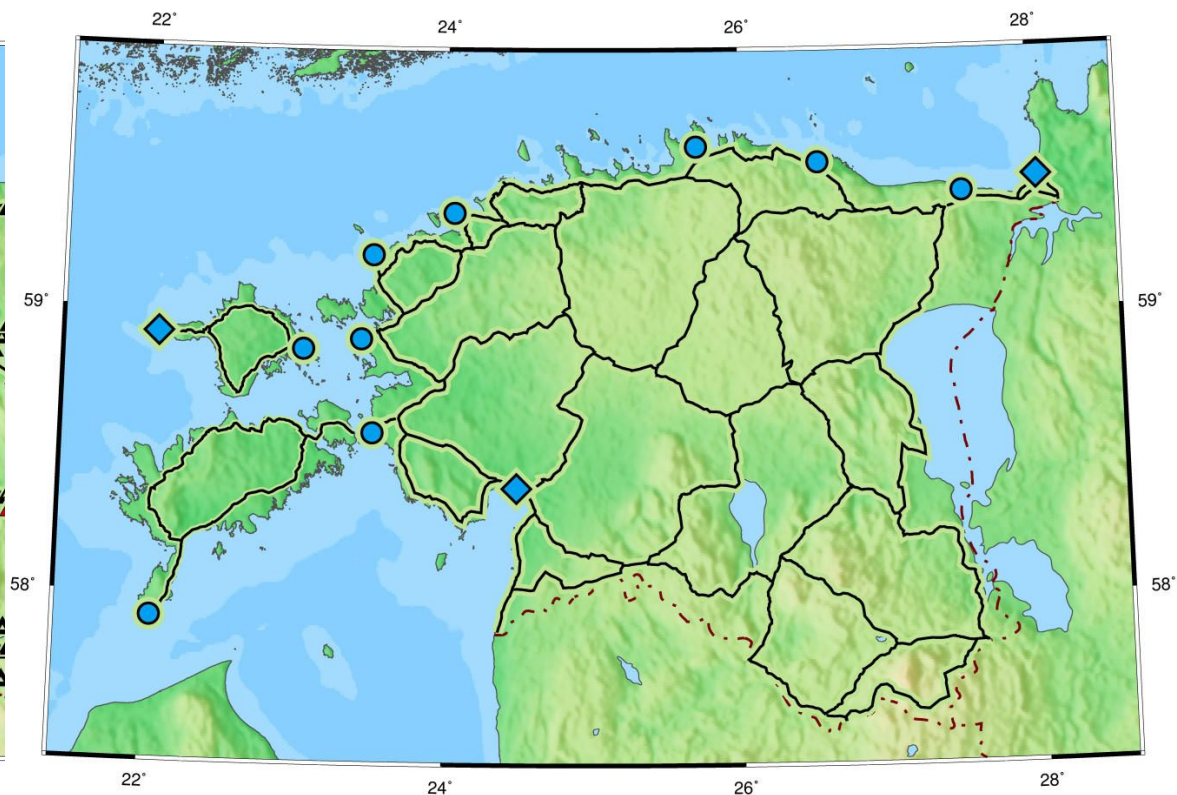
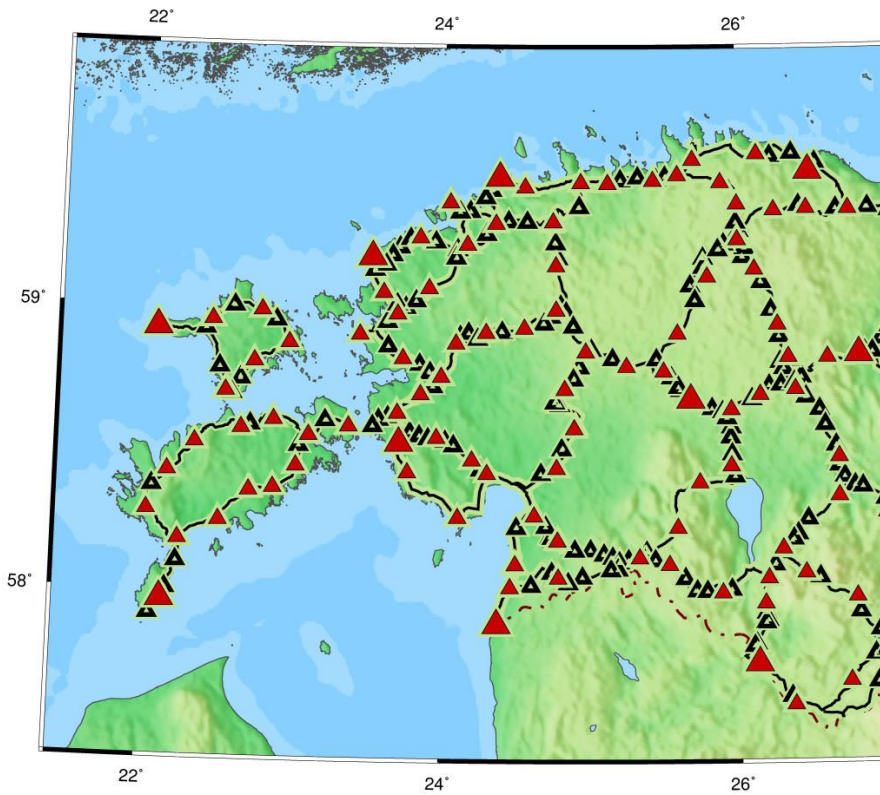
- geodetic ref. network



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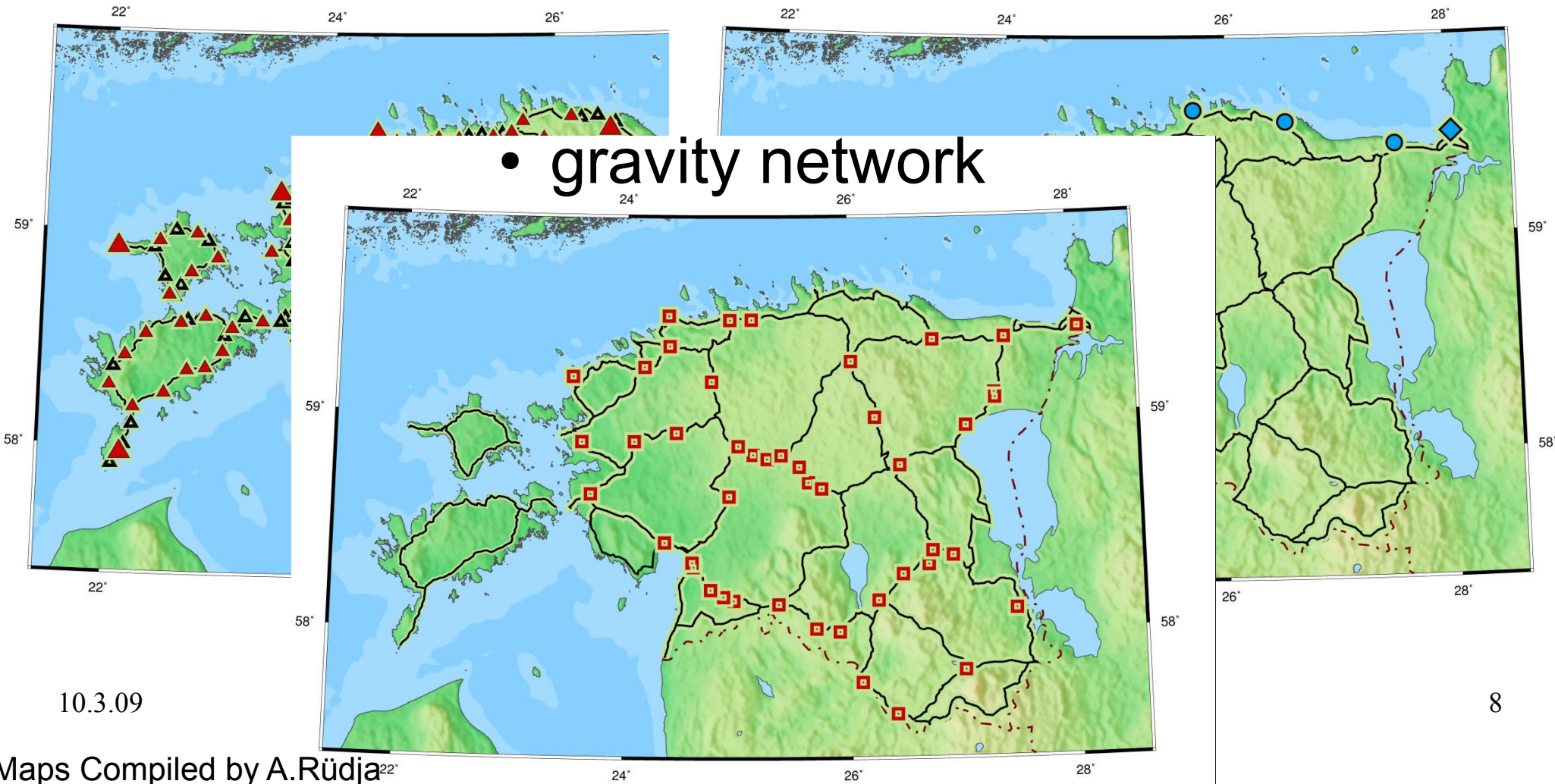
Integration with...

- geodetic ref. network
- tide gauges



Integration with...

- geodetic ref. network
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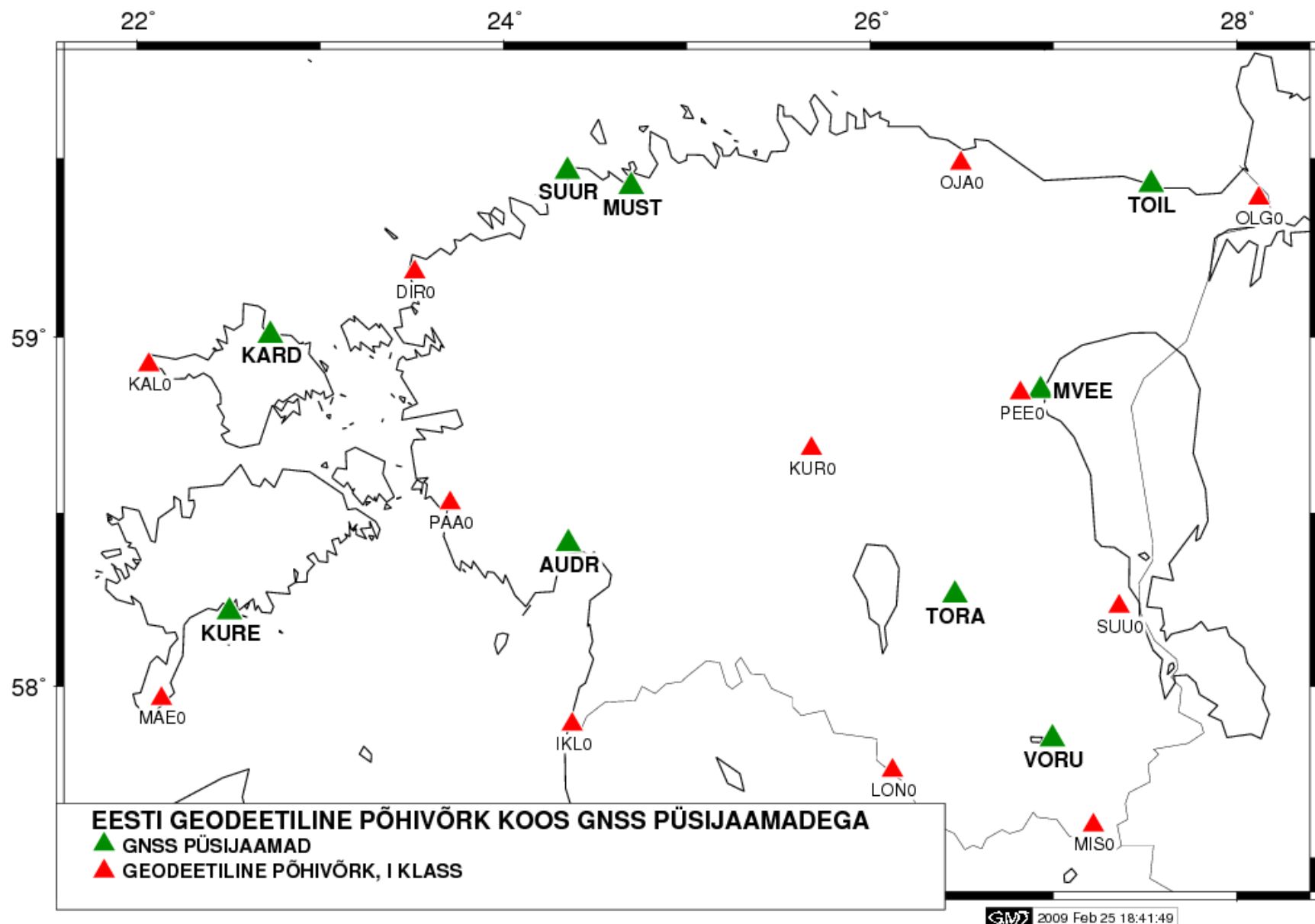


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Geodetic ref. network

- First observed in 1997 (EUREF, class B)
- 12 stations (I order) re-observed in 2008
 - Ashtech Z-12, Choke Ring antennas
- 7 GNSS stations were operational
- Data process with Bernese GPS Software

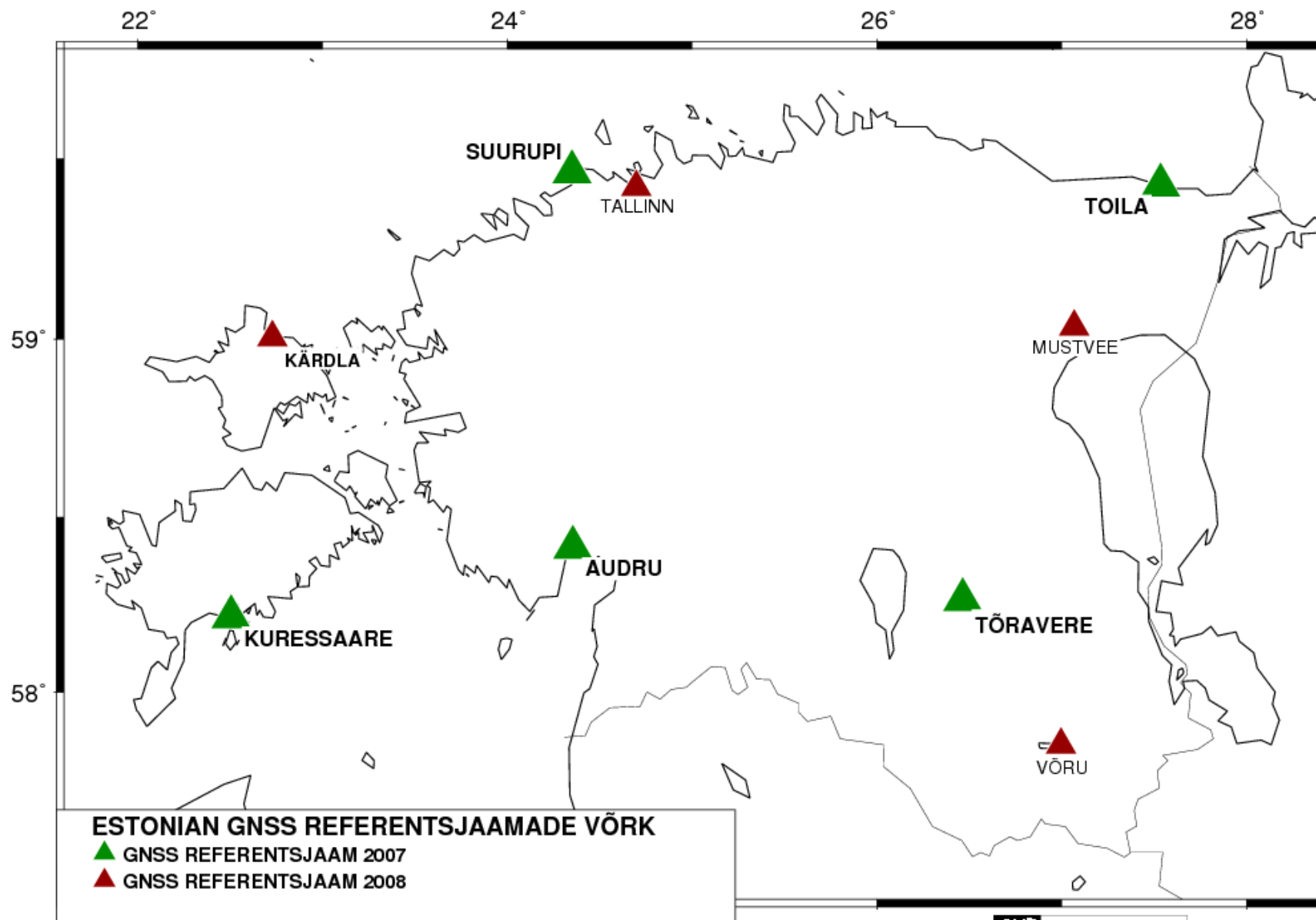
Geodetic network

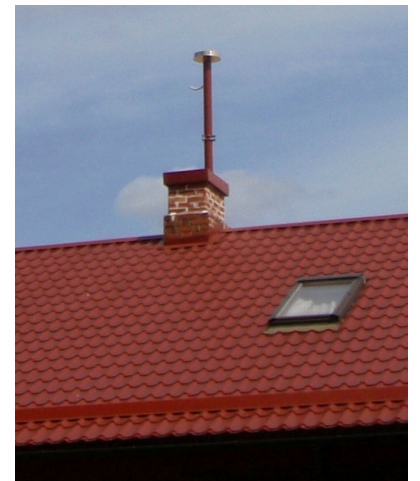


Permanent GNSS network

- Started in 1996 (Suurupi)
- In 2007 new 4 stations, in 2008 four more = 9
- Leica instrumentation:
 - Leica GRX1200GG PRO receivers, Leica GPS+GLONASS Choke Ring antennas with LEIS dome (SUUR,TOIL,TORA,AUDR,KURE)
 - SR520 with GPS Choke Ring antennas (others)
 - all absolutely calibrated
- Plan to install 12 stations (for GPS RTK?)

Permanent GNSS network





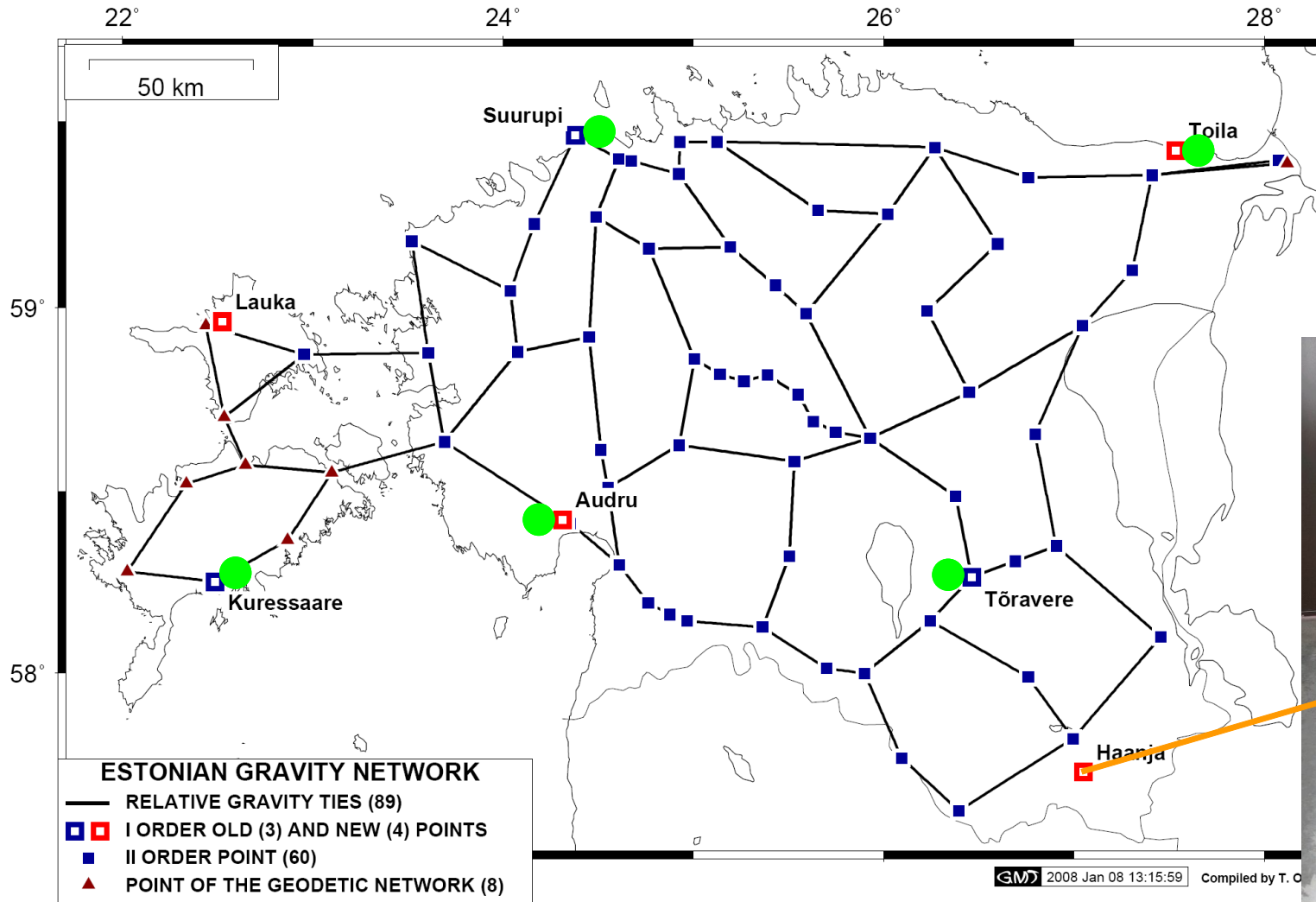
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Gravity network

- 2007-2008 1st order gravity network (abs. stations) was upgraded:
 - 4 new concrete pillars + 3 old (total 7)
 - 5 of them integrated with permanent GNSS
- Summer 2008: all 7 stations observed by FGI team (Mirjam, Jaakko), FG5-221 was used.
- New calibration line TOIL-TORA-HAAN, repeated with 2 CG5's 6-... times during and after abs.meas.
- Oct. 2008: 3rd time at Masala-Vihti calibration line

Gravity network



Calibration

