

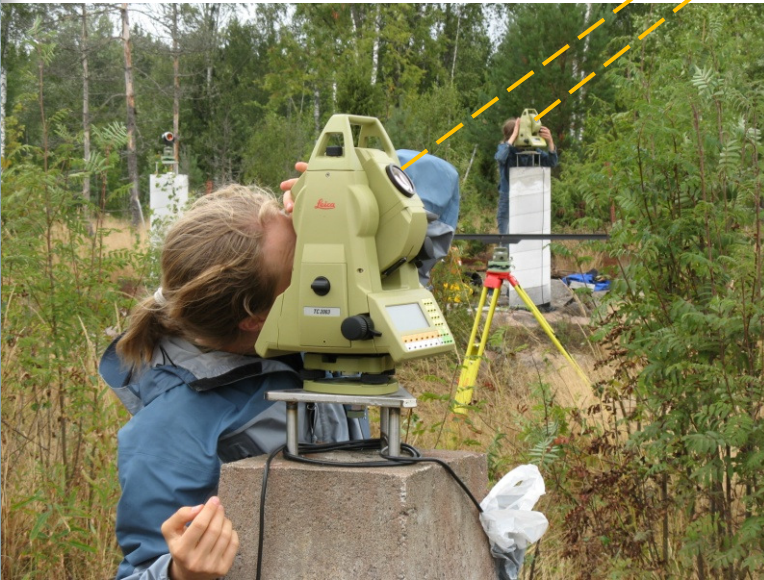


# **National Report of Finland**

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# Change of GPS antenna of METS IGS/EPN station

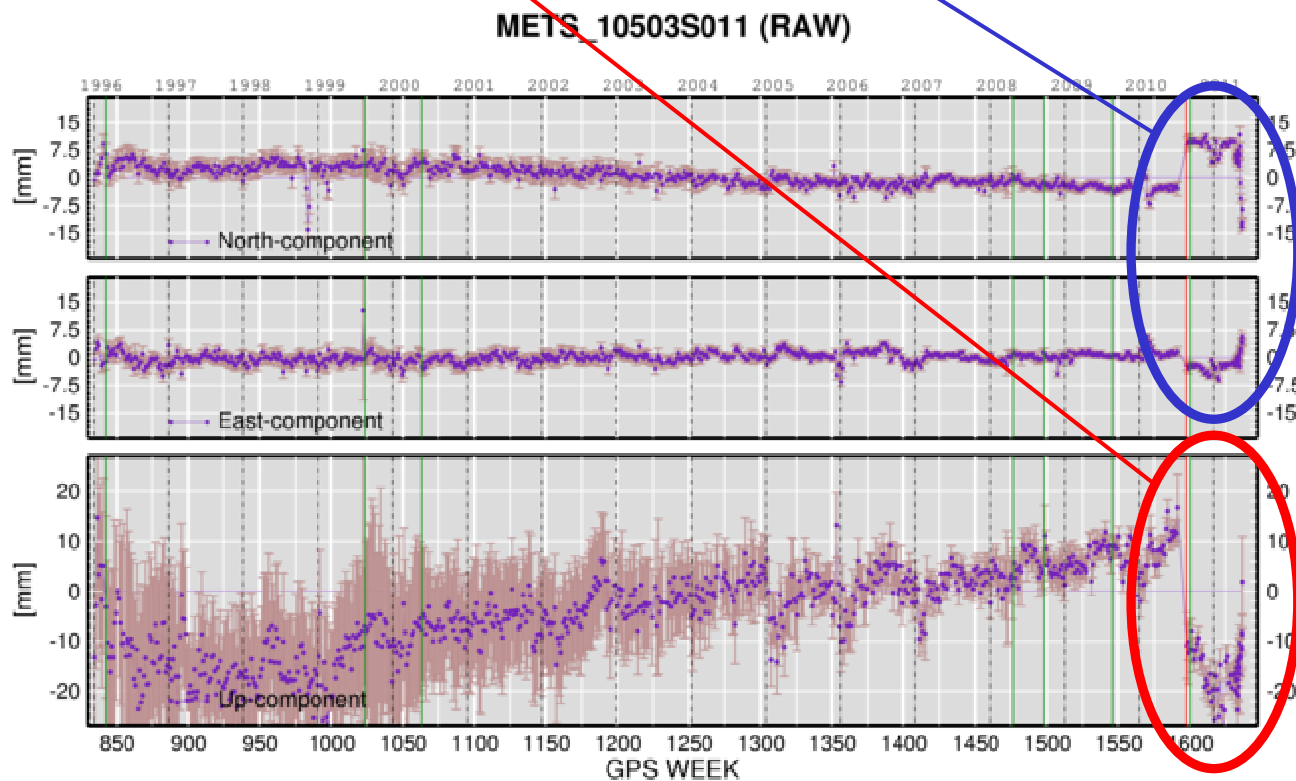
- antenna on top of **20-m-high mast**; **invar stabilized**
- Antenna kept untouched since 1992; broken down in 2010 - new individually calibrated antenna installed
- **Local tie measurements before and after change** in order to ensure the exact re-location of the antenna to the stabilization system
- Measurements with **space intersection technique**: two Leica TC2003 tacheometers, scale from carbon fibre rod
- Results verify that **stabilization system was preserved**





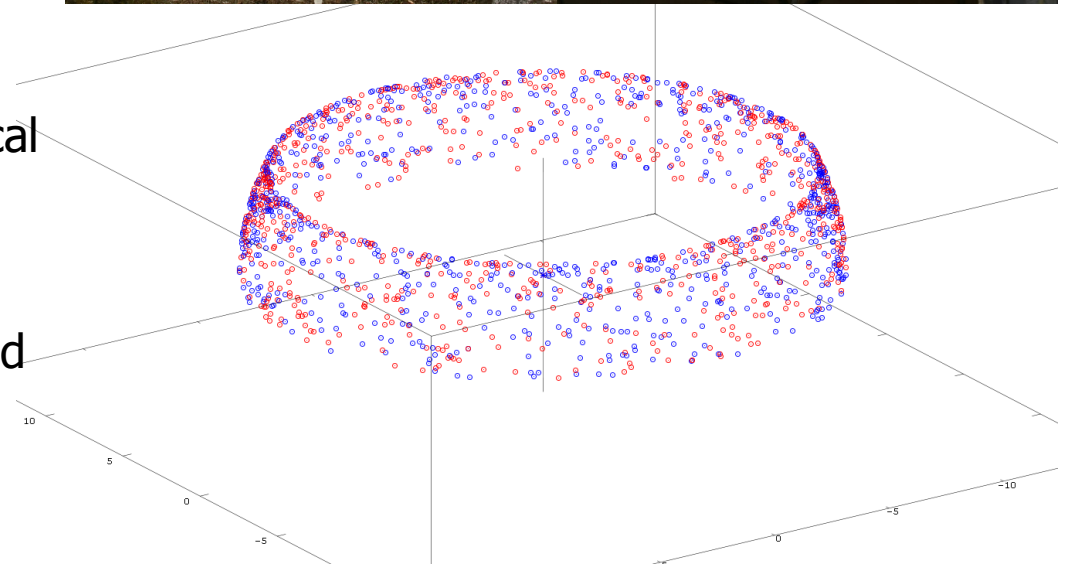
# Change of GPS antenna of METS IGS/EPN station

- Jump to time series:
  - Horizontal offsets due to different electrical properties of the antennas – decreases when *individual calibration values* are used
  - Vertical offset of 22mm due to *different ARPs*



# Local tie studies - VLBI

- GPS measurements **during geo-VLBI campaigns**:
  - 2 GPS antennas attached to the VLBI telescope
  - **Kinematic solution**
  - New mathematical model
- 10 campaigns in 2008-2011
- **Standard deviations** of determinations of the local tie vector:
  - **North, East: 0.8mm**
  - **Up: 4.8mm**
    - Worse geometry for vertical direction (see figure at bottom)
    - Thermal expansion of the telescope not yet corrected





# Renovation of the First Order Gravity Net (FOGN)

- Started in 2009
- 51 sites measured with the A10-020 (IGiK, Poland) outdoor absolute gravimeter in 2009-2010
  - comparisons with the FG5-221 of the FGI (circles in the figure)
  - Accuracy 4  $\mu\text{gal}$  (1-sigma)
- Levelling, GPS, vertical gradients 2010-2011

