BACKGROUND : ITRF2005/IGS05

1. ITRF2005 released Oct. 2006
2. IGS contribution to ITRF2005 was based on IGS cumulative solution computed with relative antenna phase center (APC) models
3. ITRF2005 not consistent with absolute antenna calibrations
4. Absolute antenna calibrations to be introduced simultaneously with ITRF2005
5. Creation of IGS05: aligned to ITRF2005 and consistent with absolute antenna models

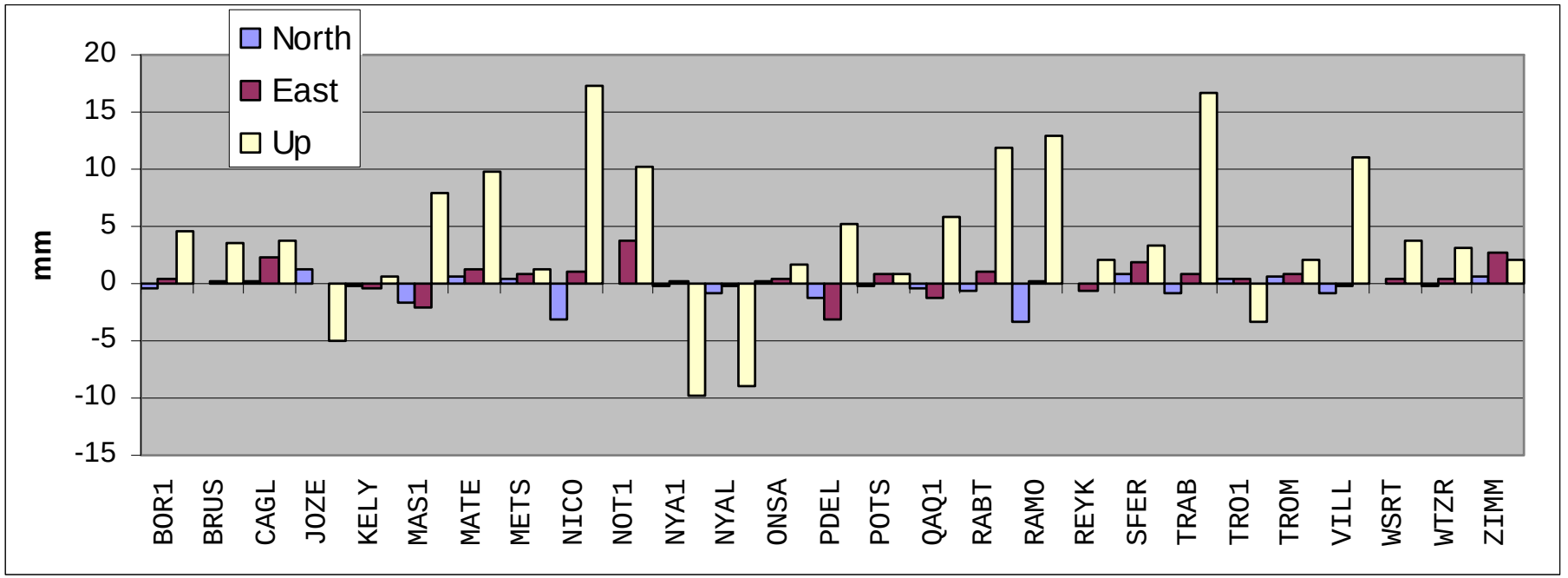
Procedure (Ferland, IGS mail 5447, Oct 19, 2006):

- ✓ Determine station-dependent coordinate correction for switch relative to absolute

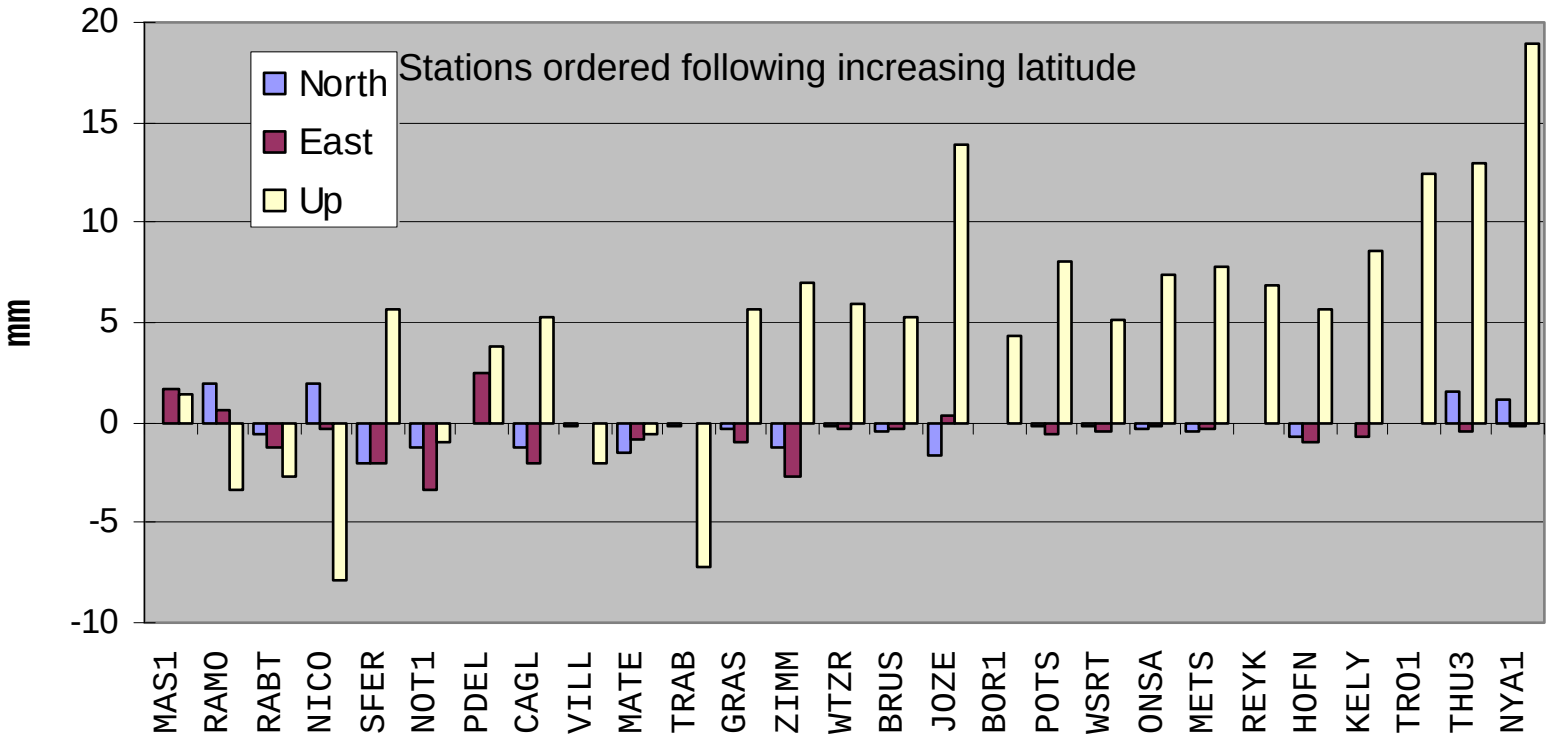
  Computation of two simultaneous solutions for 12 months by IGS AC
- ✓ Correct IGS05 stations in ITRF2005 for the station-dependent offset (rel.→ abs.)
- ✓ Align corrected "ITRF2005" solution with ITRF2005 using 7 parameter Helmert transformation → IGS05 positions (IGS05 vel.=ITRF2005 vel.)

INTRODUCTION ABSOLUTE ANTENNA MODELS

Influence of introduction of absolute antenna phase center models on IGS reference frame stations - Extraction of EPN stations



Differences ITRF2005-IGS05



Mean differences:

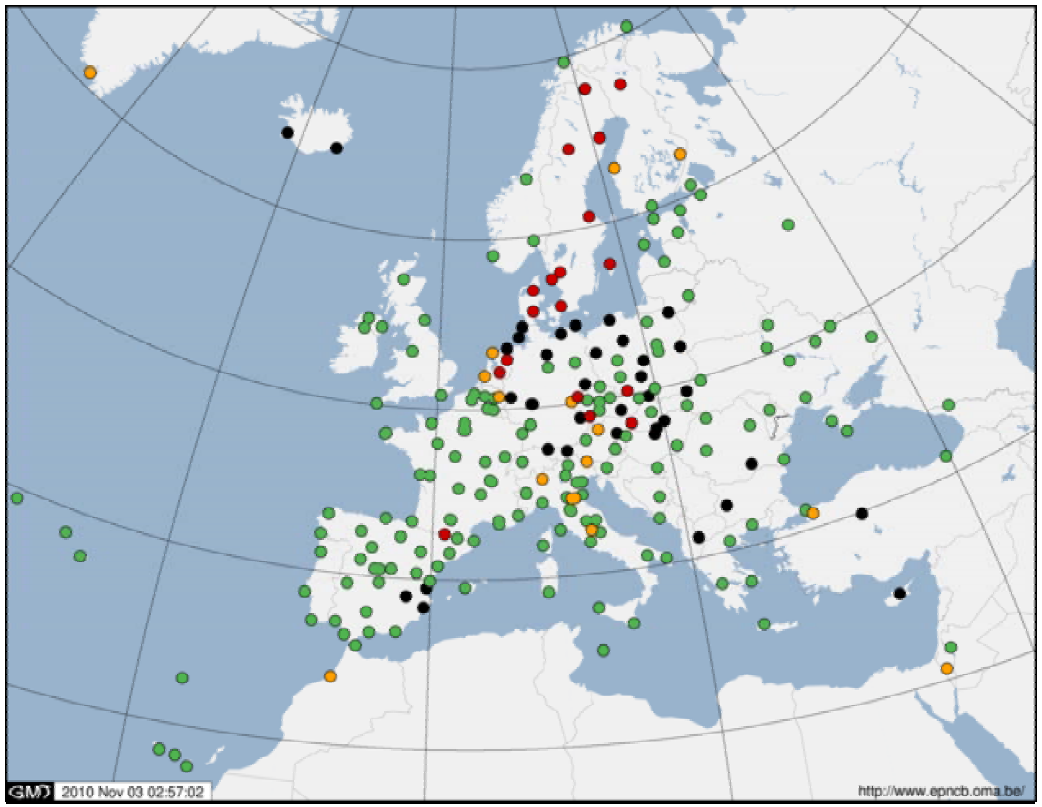
N= -0,2 mm ±1.0 mm E= -0,4 mm ± 1.4 mm U= 5.3 mm ± 6.5 mm

EPN ANTENNA CALIBRATIONS

ROB

Nov. 2010

Indiv. abs. calib	16%
True abs. calib	69 %
Calib. from field	7%
No calib.	8%



Identical to IGS calibrations, except for individual calibrations

Policy: do not change calibration values of antenna in operation within the network (jumps in coordinate time series)

igs05.atx / epn_05.atx does not contain most recent antenna calibrations

IGS08.ATX

- New available robot calibrations and updated robot calibrations
- Changed calibration values for AOAD/M_T (sub-mm):
  - Previously: 1 indiv. antenna with 42 calibration runs
  - Now: 2 indiv. antenna with 62 calibration runs

  change of all converted field calibrations

Switch IGS05.atx → IGS08.atx simultaneously with ITRF2005 → ITRF2008

Computed using IGS05.atx

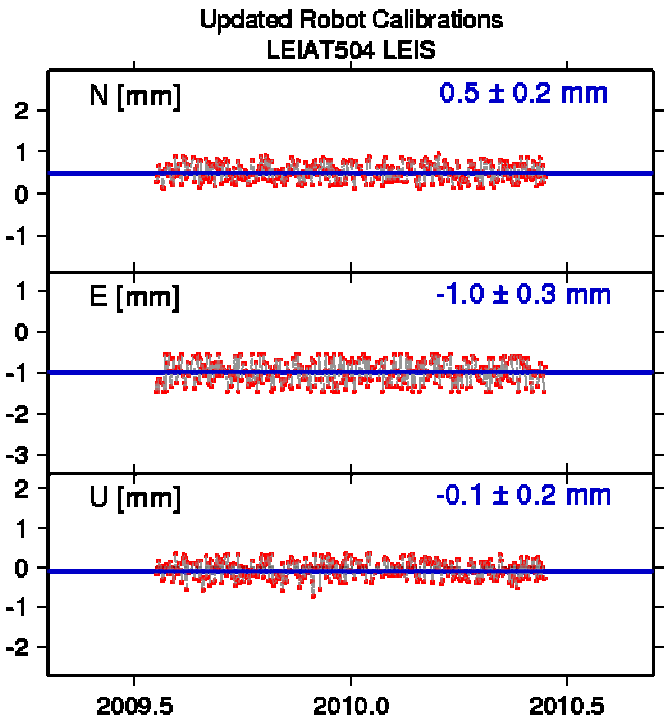
Question:

Influence of igs05.atx to igs08.atx on EPN site cooridinates?

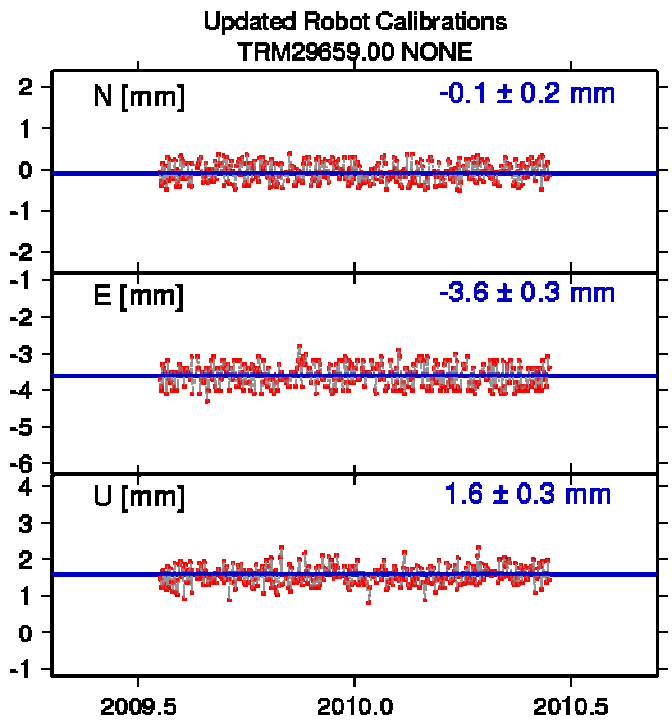
DIFFERENCE IGS05.ATX – IGS08.ATX

- Based on PPP analysis (Atomium): once with igs05.atx and one with igs08.atx (preliminary)
- 10 months of data → coordinate shift estimated with stdev of 0.3 mm (all three components)

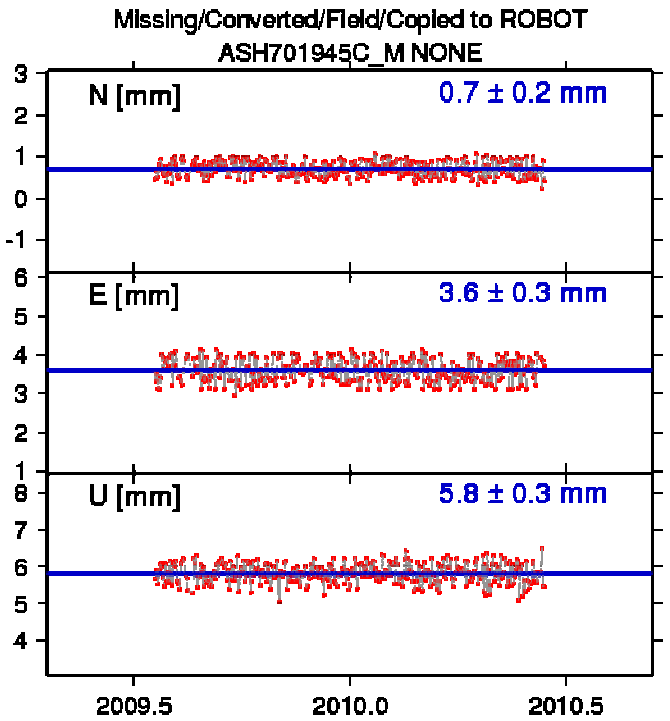
ACOR



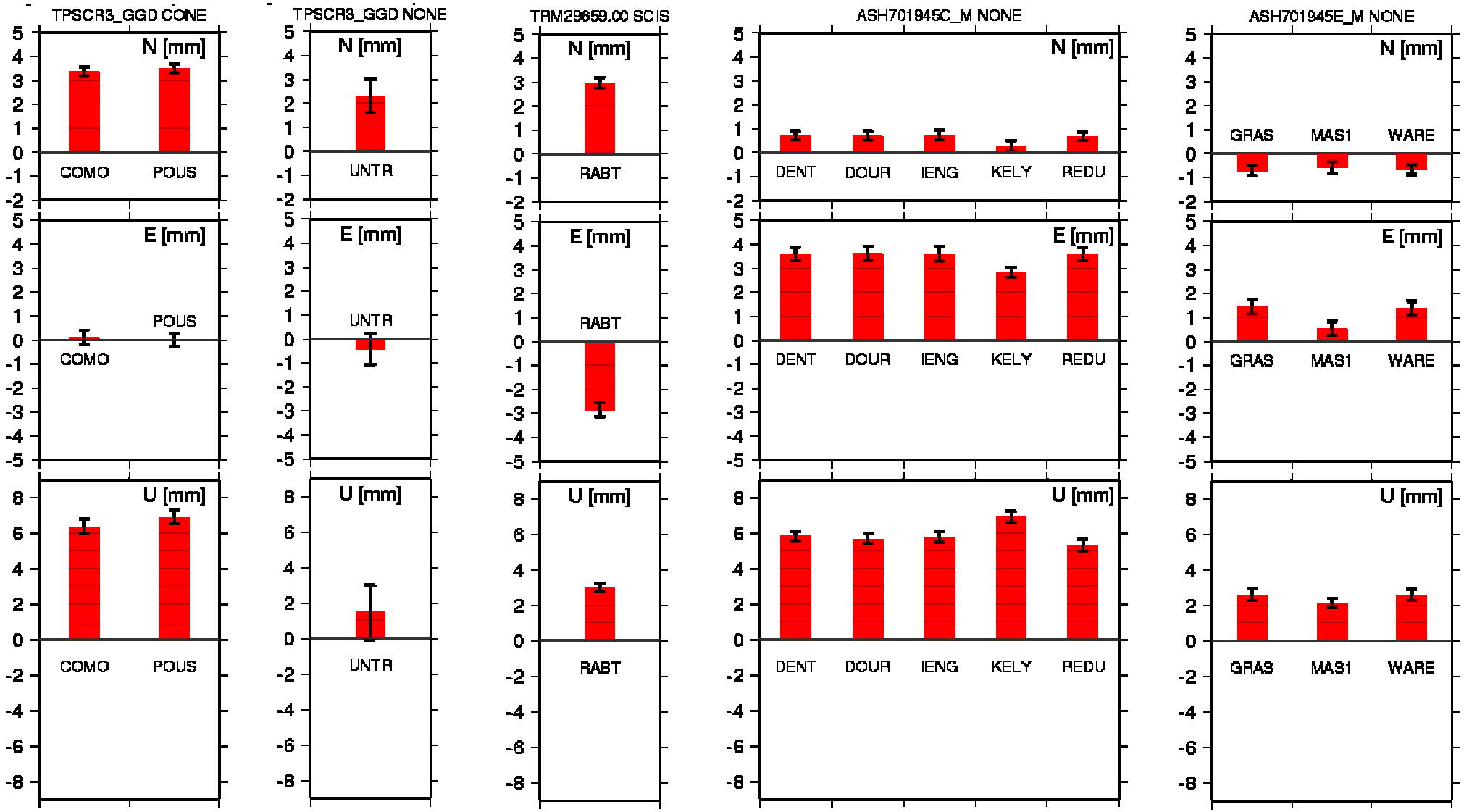
BORR



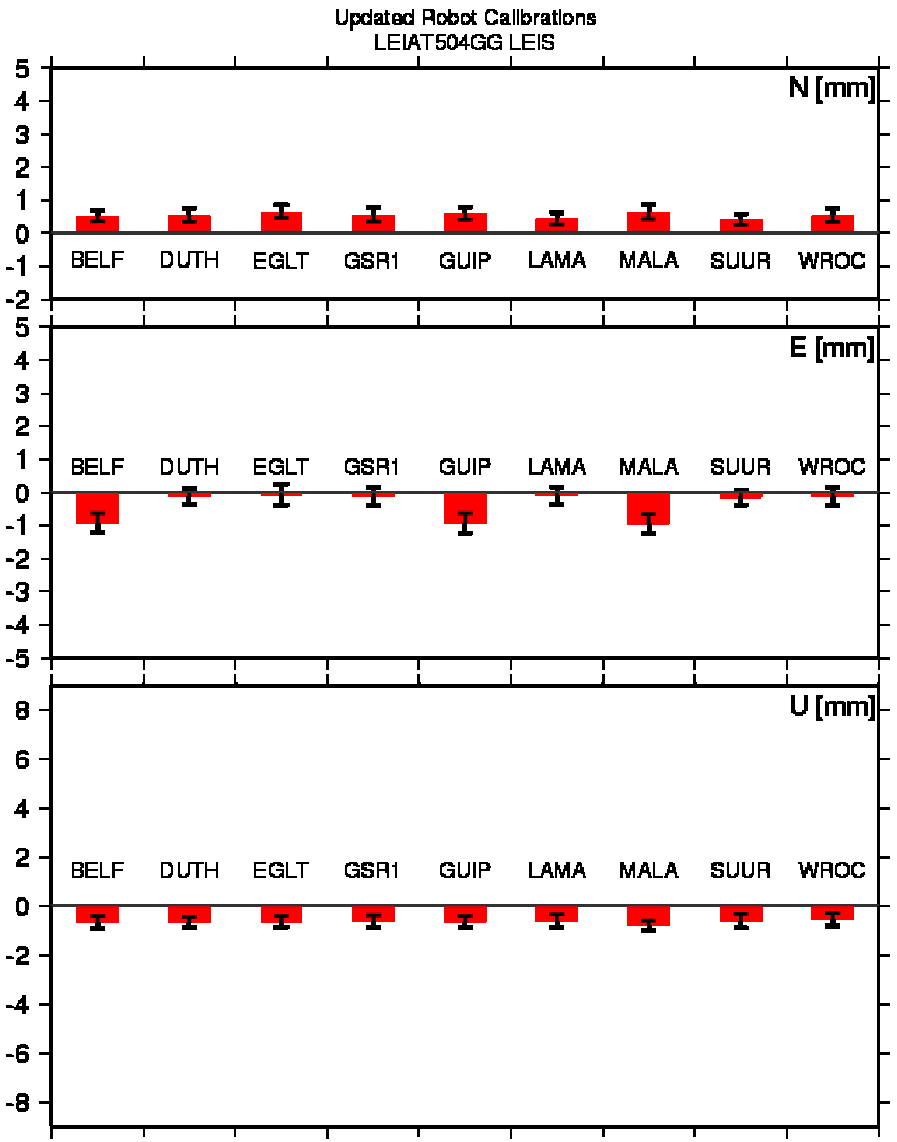
DENT

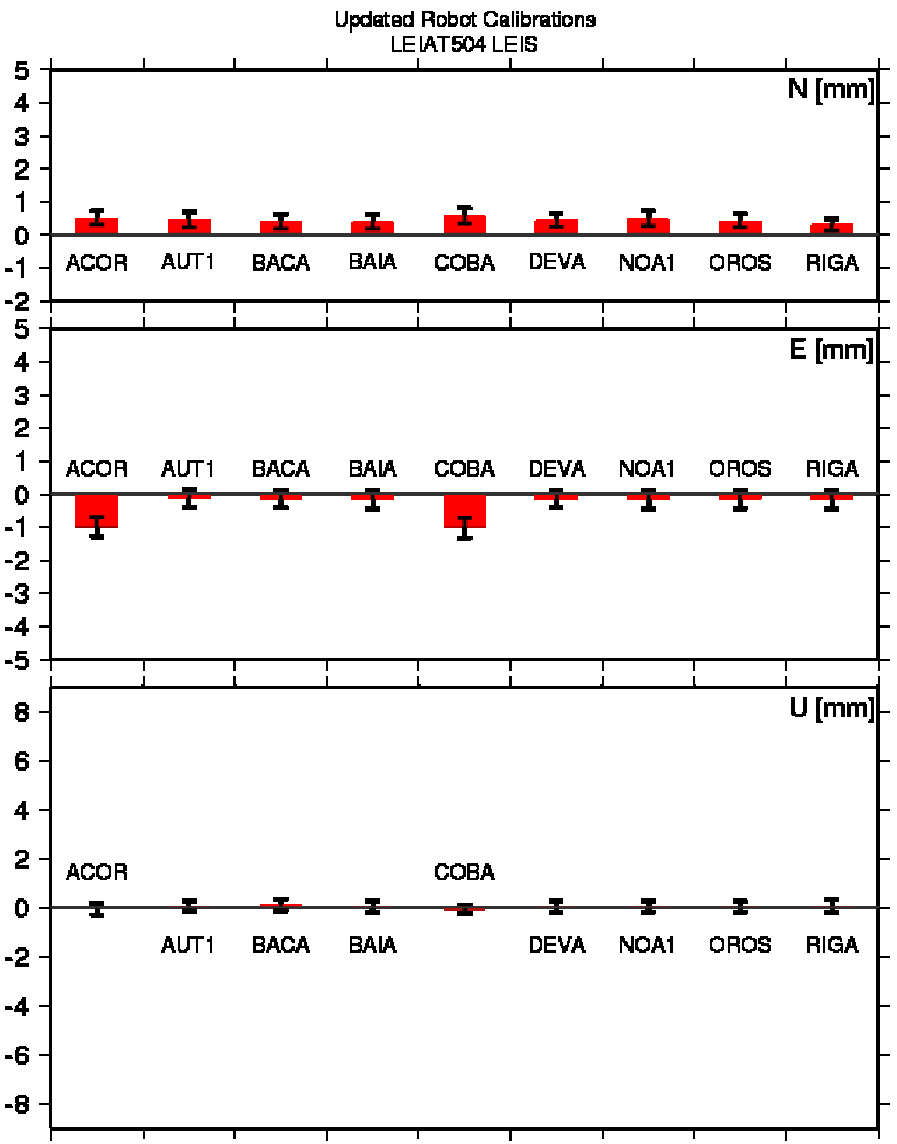


MISSING/CONVERTED/FIELD/COPIED to ROBOT

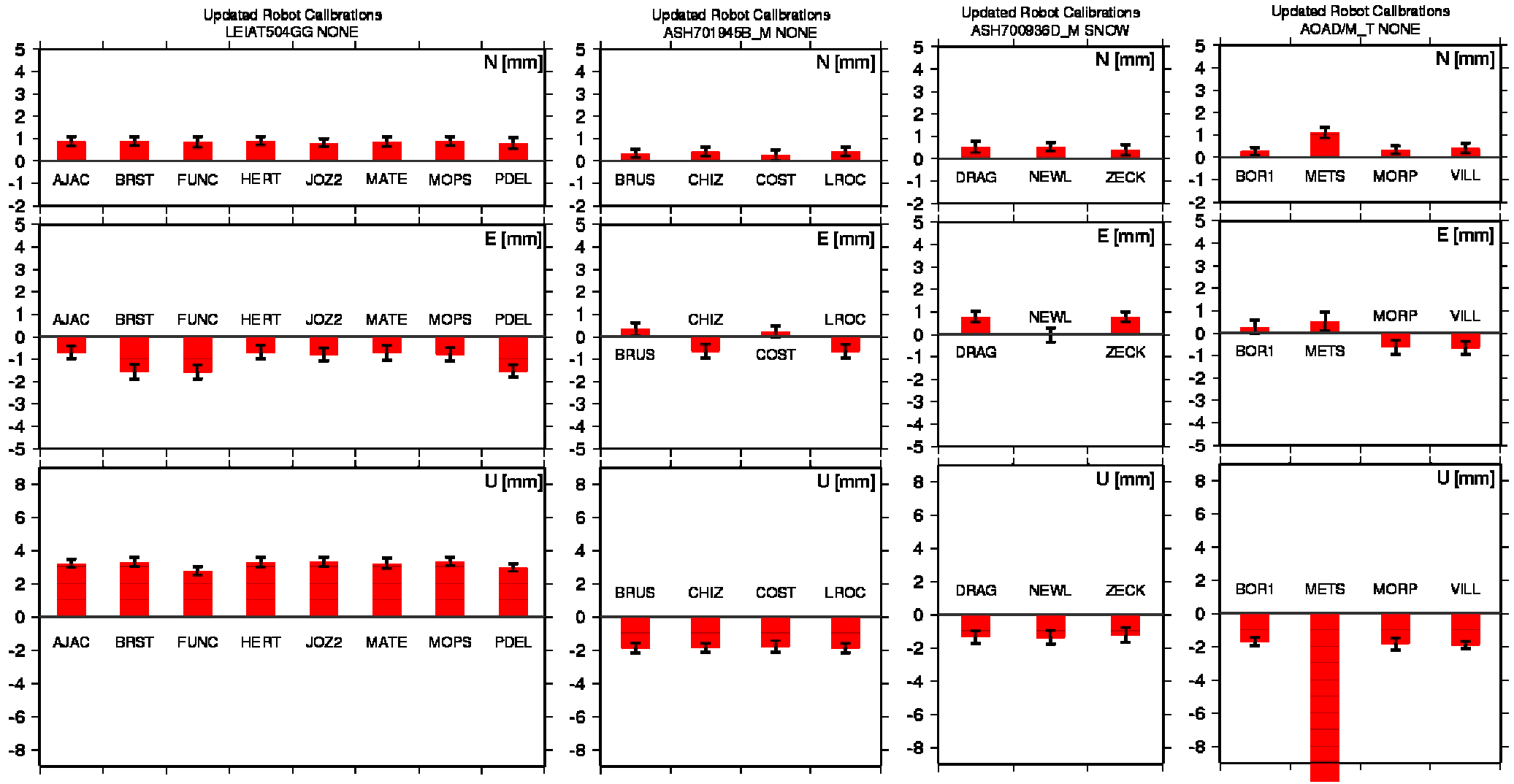


UPDATED ROBOT CALIBRATIONS

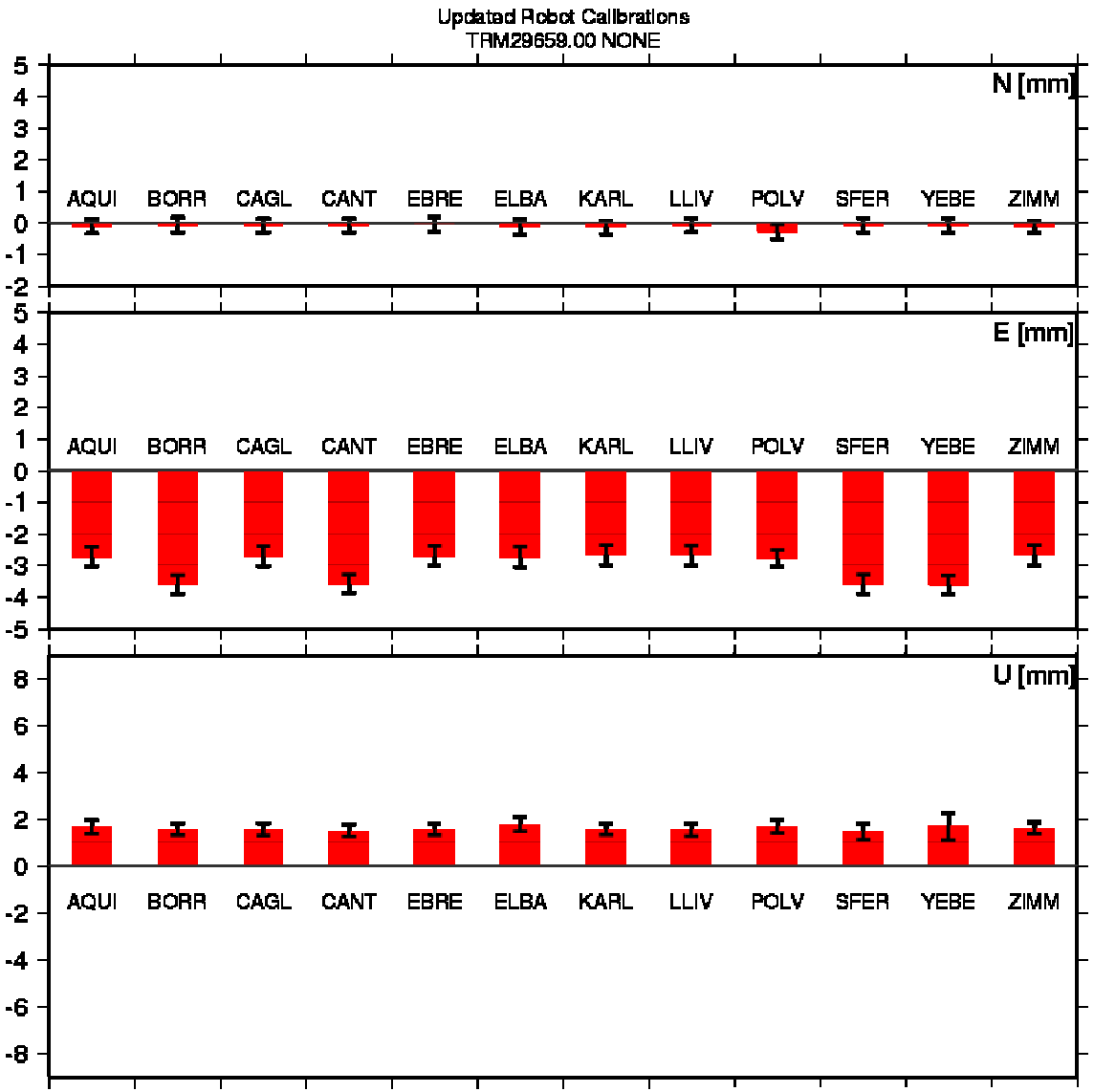


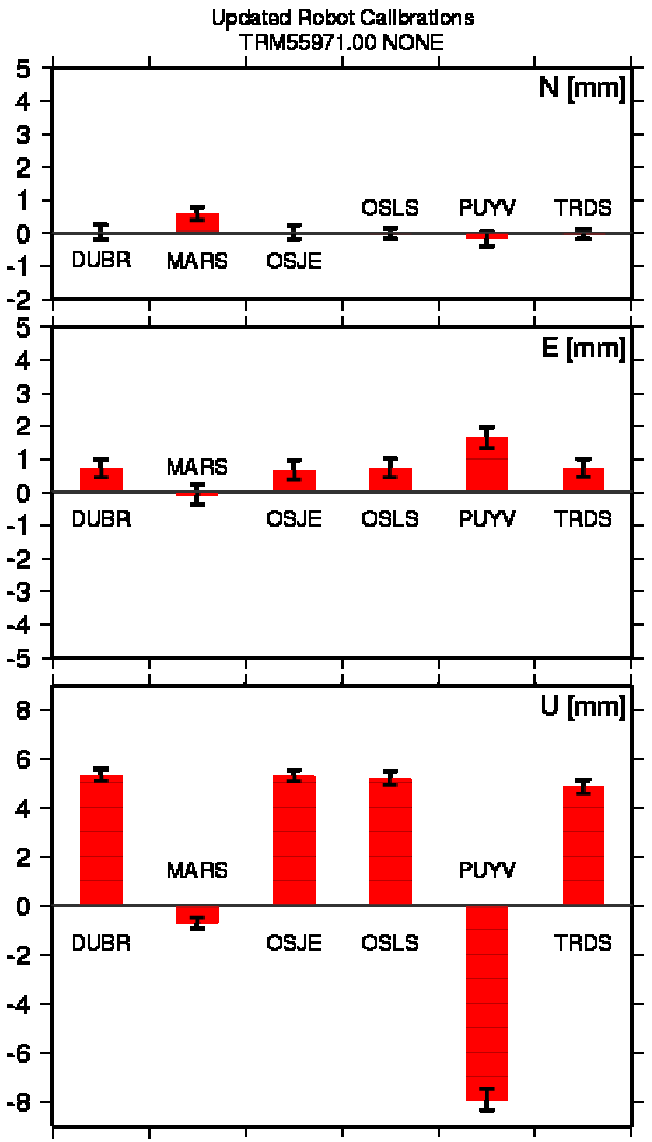


UPDATED ROBOT CALIBRATIONS



UPDATED ROBOT CALIBRATIONS





ANTENNA CALIBRATIONS

- igs05.atx → igs08.atx coordinate differences can reach up to 4 mm in horizontal and 8 mm in vertical
- Major differences igs05.atx/igs08.atx : introduction of robot calibrations
- Some updated robot calibrations (Trimble) also introduce significant coordinate offsets

Further investigations necessary

- Use latest release of igs08.atx
- Investigate outliers within a specific antenna/radome type (e.g. PUYV)
- Compare with IGS results (similar analysis done by different IGS AC & Bernese PPP)
- Study influence individual calibrations compared to type calibrations

LINK WITH REPROCESSING

- Presently EPN data are processed with igs05.atx using IGS orbits expressed in IGS05

- IGS REPRO1: reprocessing of historical IGS data with igs05.atx → IGS05 orbits (finalised, input in ITRF2008)
- EPN REPRO1 (in progress): reprocessing of historical EPN data with igs05.atx and IGS REPRO1 orbits
  - Homogenous EPN coordinate time series
- Introduction of IGS08/igs08.atx in IGS:
  - Production of IGS orbits in IGS08 + start of REPRO2 with IGS08/igs08.atx
  - Switch of EPN to IGS08 and igs08.atx
  - Coordinate discontinuity with old igs05.atx solutions → need for new EPN REPRO2 using igs08.atx and IGS REPRO2 products