



Antenna Monitoring: Wettzell GPS Antenna Array

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IERS Workshop 2003 on Site Co-location

**October 23-24, 2003
Matera, Italy**

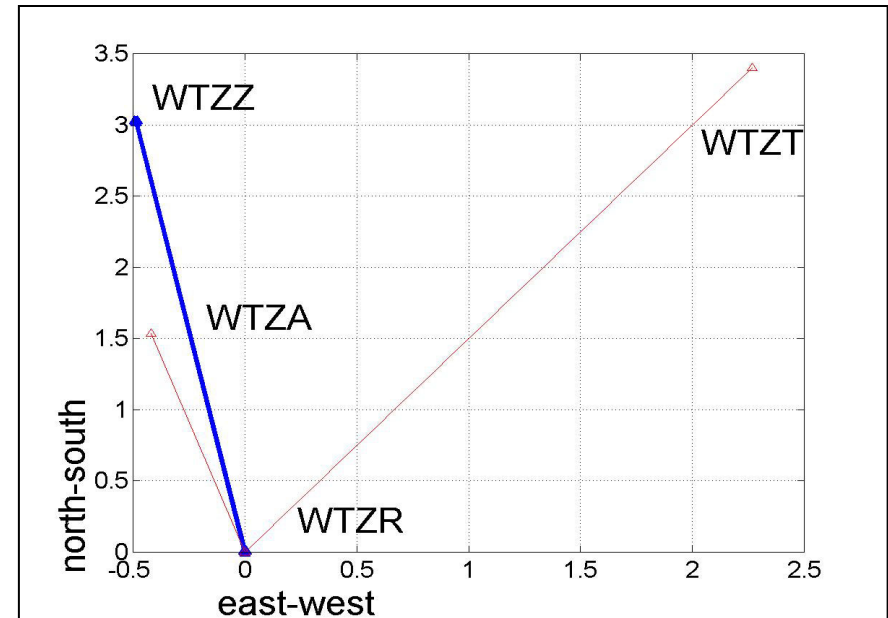
Content:

- **Wettzell GPS Antenna Array**
- **Monitoring of Antenna Changes**
- **Quality of GPS Results for Extremely Short Baselines**

GPS Antennas on the Roof at Wettzell



4 GPS antennas on the roof



WTZZ antenna/receiver change on June 9, 2003:

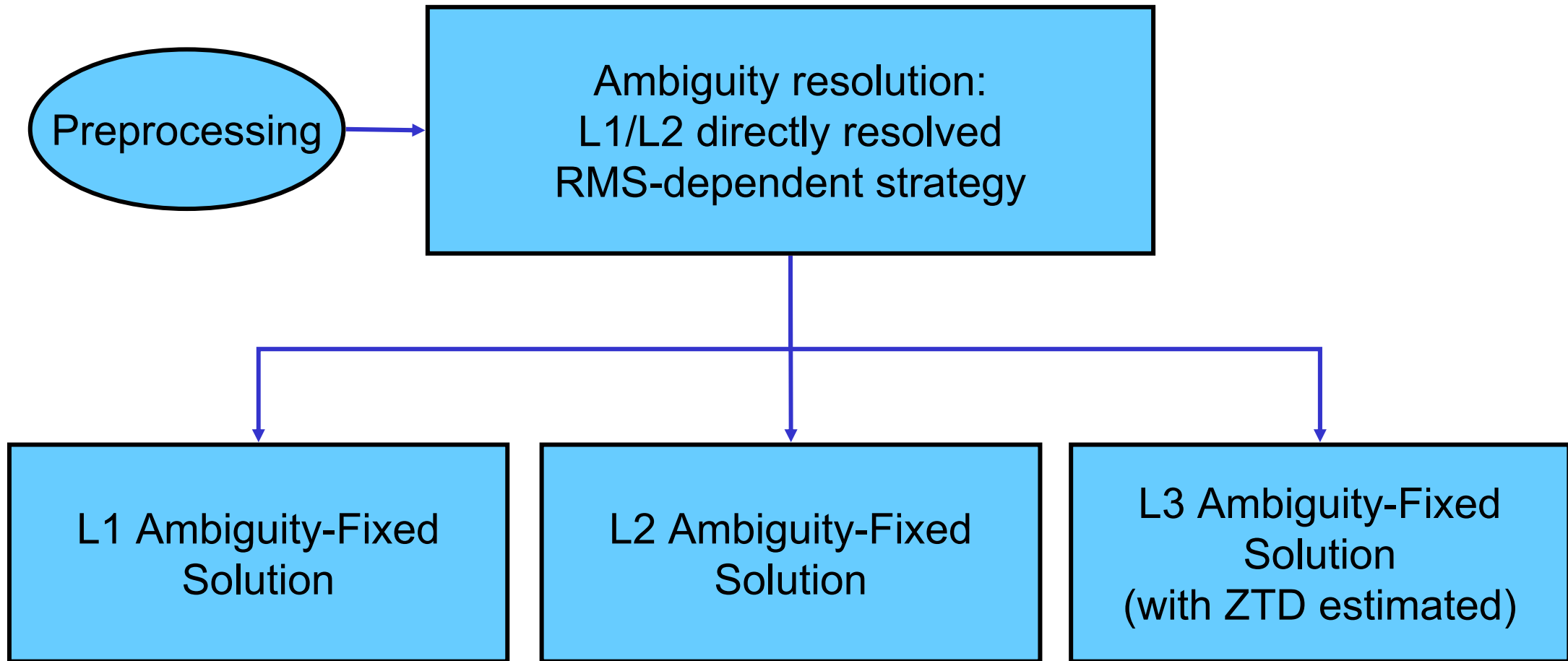
Receiver: ASHTECH Z18 → JPS LEGACY

Antenna: ASH 701073.1 → TPSCR3_GGD

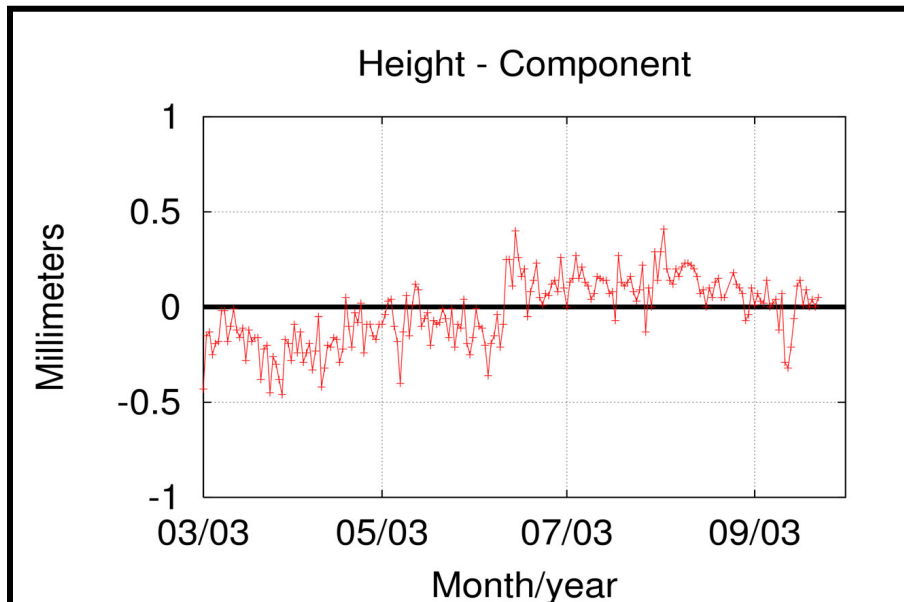
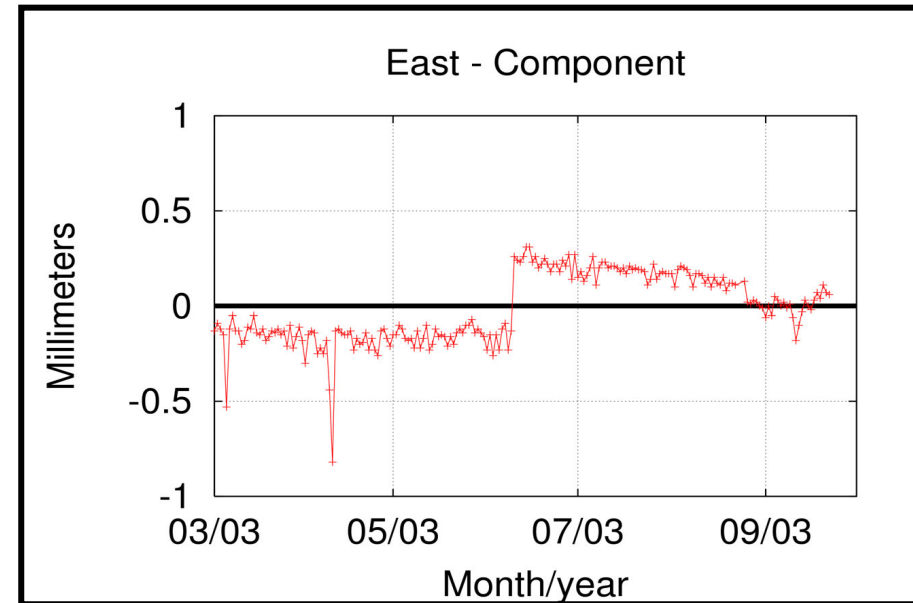
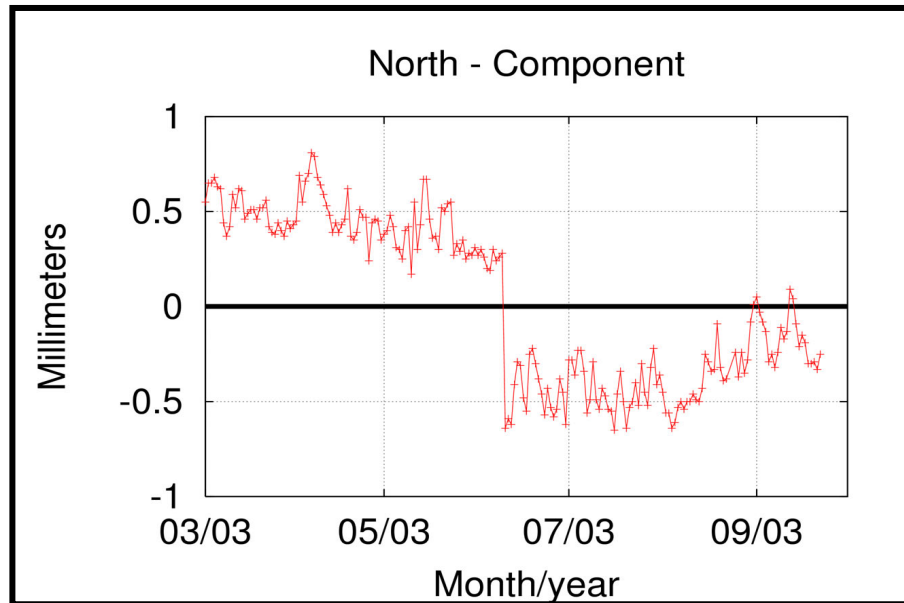
Processing Strategy - Solution Types



Baseline WTZZ - WTZR: 1.6 m

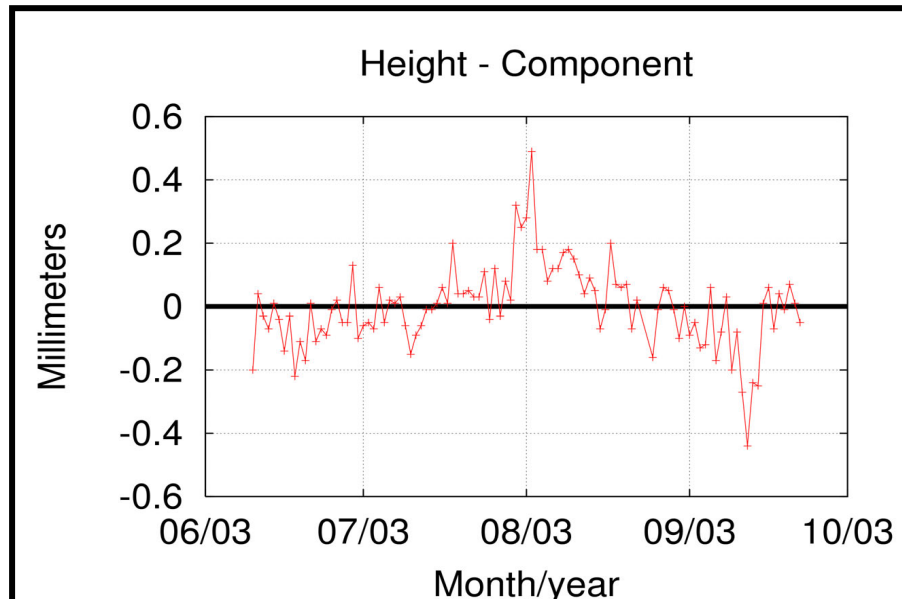
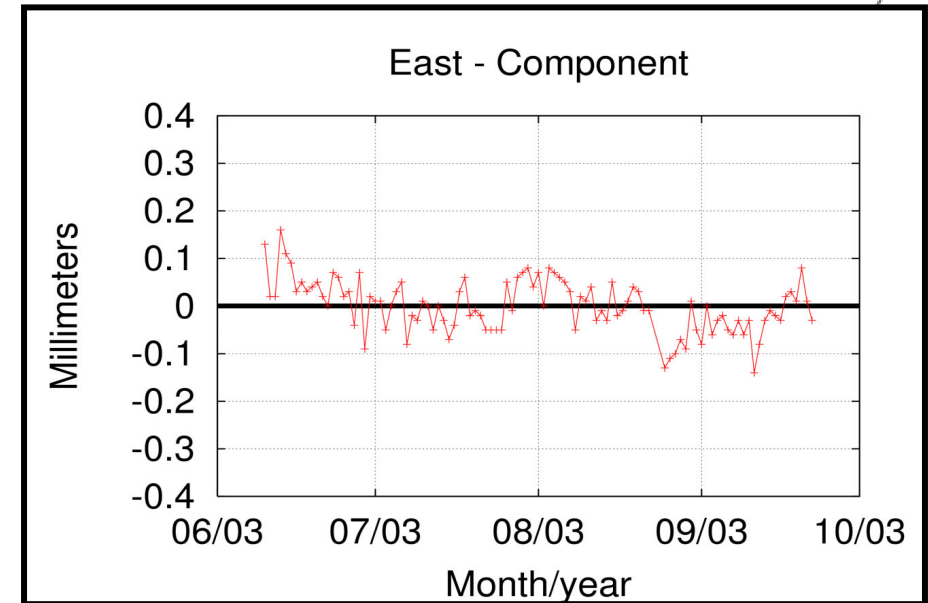
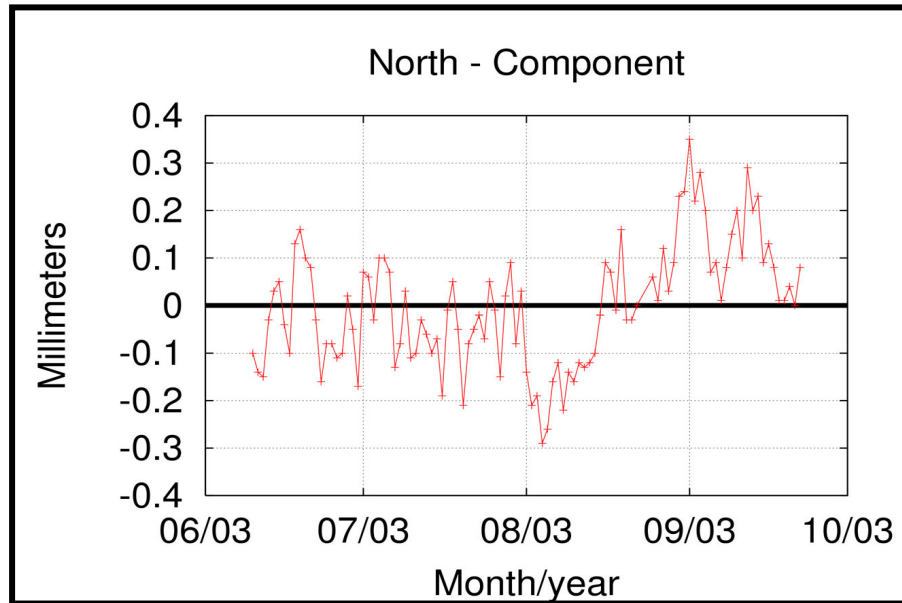


Repeatability for WTZZ: L1-Solution



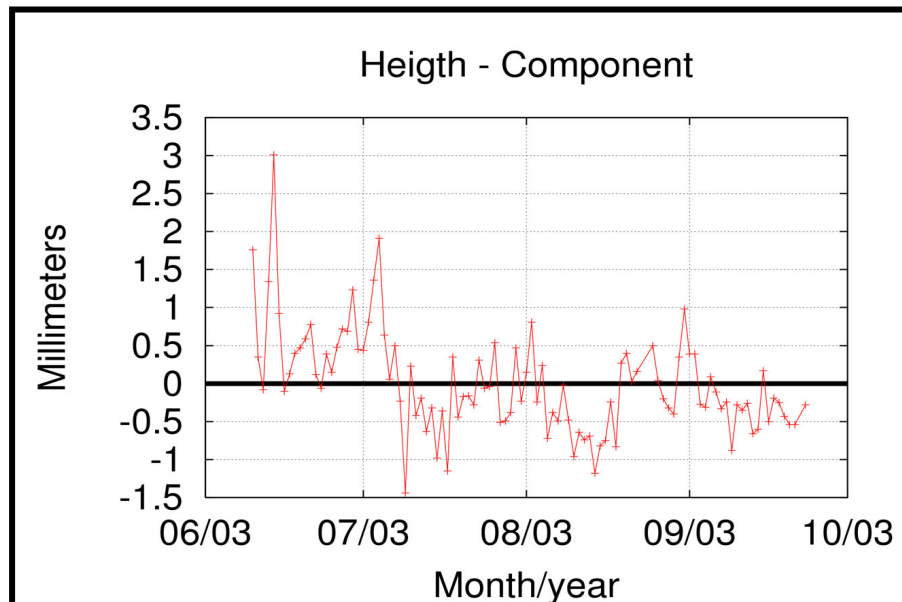
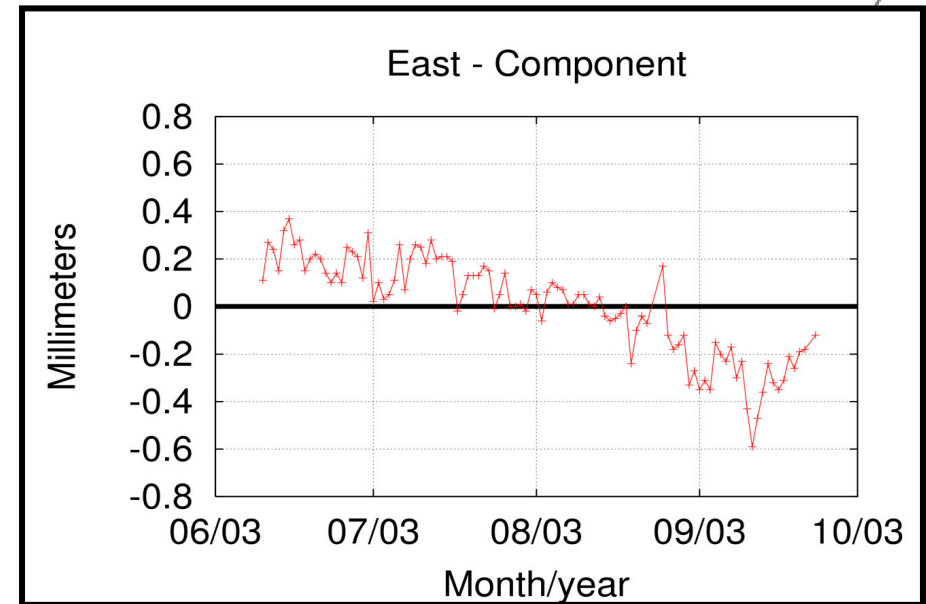
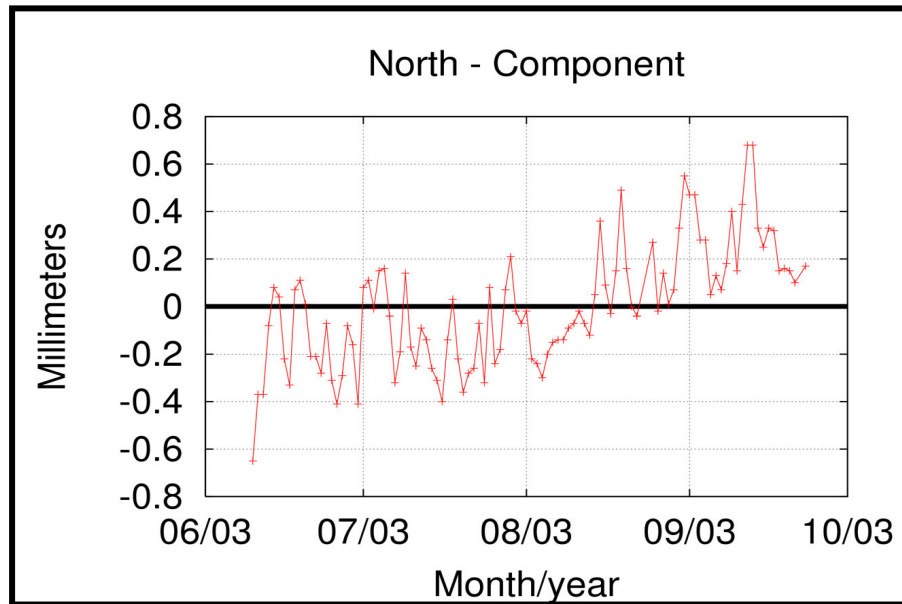
RMS	Ashtech Z 18	JPS LEGACY
North	0.14 mm	0.17 mm
East	0.09 mm	0.10 mm
Height	0.12 mm	0.12 mm
< June, 9th		> June, 9th

Repeatability for WTZZ: L2-Solution



RMS	JPS LEGACY
North	0.13 mm
East	0.05 mm
Height	0.13 mm

Repeatability for WTZZ: L3-Solution with ZTD



RMS	JPS LEGACY
North	0.25 mm
East	0.20 mm
Height	0.68 mm



GPS antenna changes can be monitored using an antenna array:

- Extremely short baselines (e.g. 1.6 m)
- Repeatability on the level of **0.1 - 0.2 mm** (L1 and L2 solutions)
- Ionosphere-free LC (L3) with troposphere delay estimation: **0.7 mm vertically** (scatter you may expect in a global solution)

Recommendation for GPS fundamental stations (new strategy):

- If you are running 2 or more receivers at the same site: use the data of all receivers to **monitor the receiver and antenna performance**
- GPS antennas at **different positions** (baselines of a few meters)
- Routine processing of the local GPS data to monitor receiver performance in detail

GPS equipment may be changed without losing the local tie between antennas