

DORIS Zenith Tropospheric Delays available from the IGN Analysis Center

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SUMMARY

- Overview of DORIS tropospheric results
- Spatial/temporal interpolation issues
- Some results
- Conclusions

Recent studies at IGN

Reference	stations	period	comparisons	results
Snajdrova et al., J Geod., 2006	VLBI / CONT 3	CONT05 2 weeks	VLBI GPS ECMWW WVR	ZTD
Bock et al., Adv. Space Res., 2010	GPS 30	1 year (2007)	GPS	ZTD
Teke et al., J. Geod., 2011	VLBI / CONT 3	CONT08 2 weeks	VLBI GPS ECMWW WVR	ZTD gradients
Willis et al., IAG Symp., 2012	GPS 30	1 year (2007)	GPS	gradients
Willis et al., IAG Symp., in press	GPS 30	1 year (2010)	GPS	ZTD gradients
Willis et al., Adv. Space Res., submitted	GAVB 1	3 years	GPS ECMWF	ZTD gradients

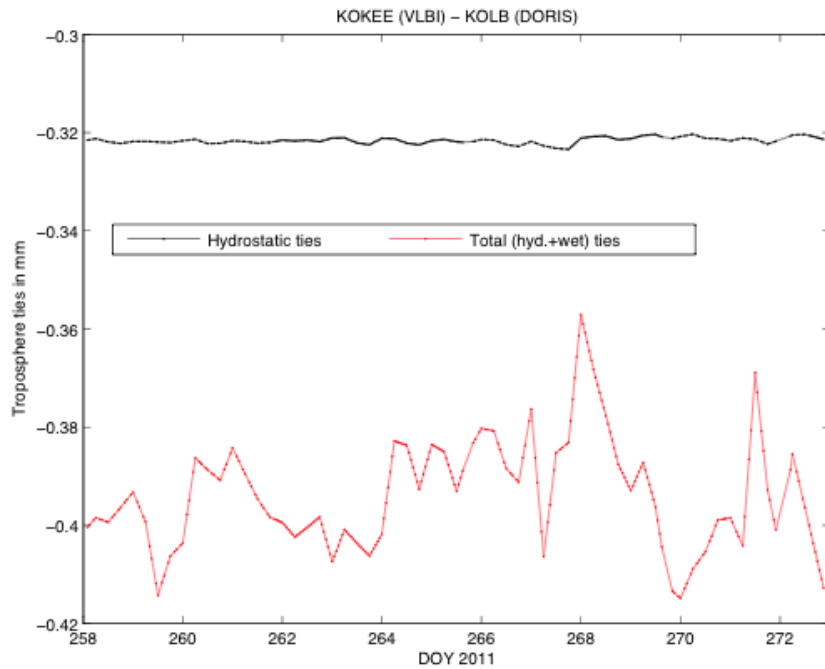
Spatial/temporal interpolation

- Temporal : need to interpolate GPS (or other) and to compare at DORIS data points (related to satellite passes)
- Spatial : need to correct for dry and wet delays (from antenna reference point to antenna reference point)

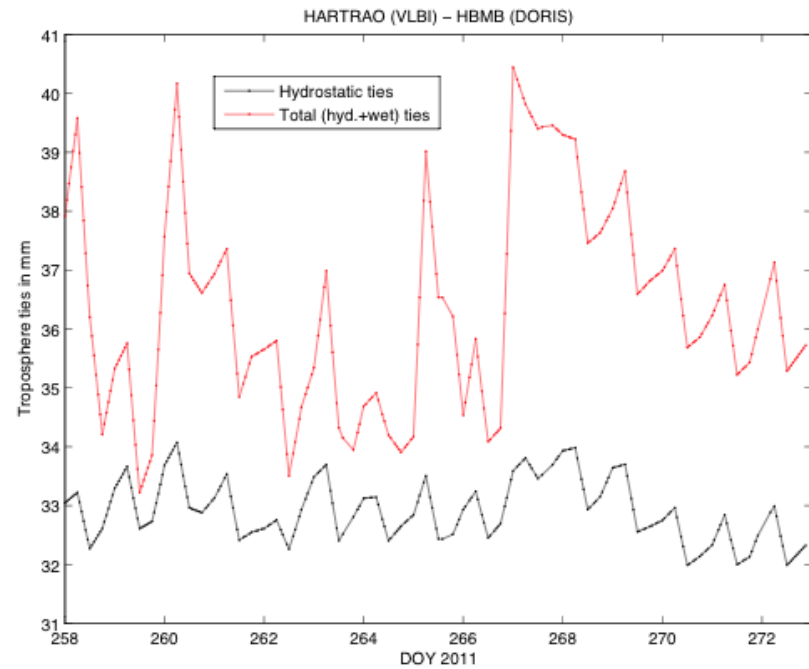
NB: especially important for VLBI (2-3 km away)

Correcting with tropospheric tie

→ Need to correct as reference points are different for hydrostatic + wet



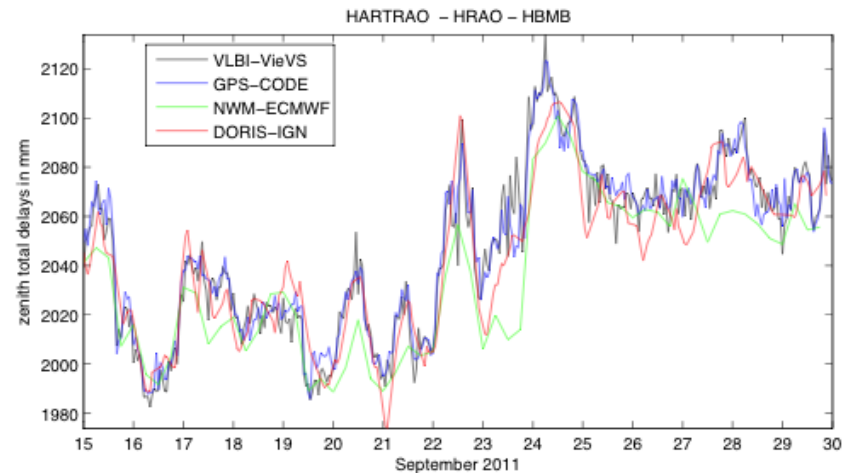
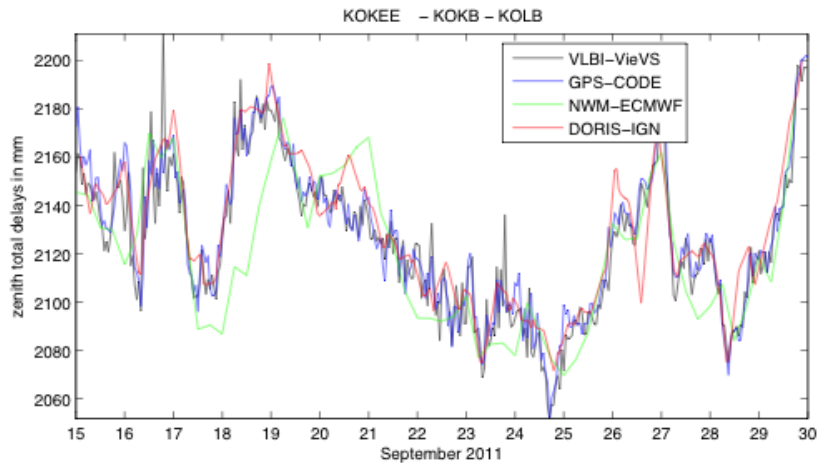
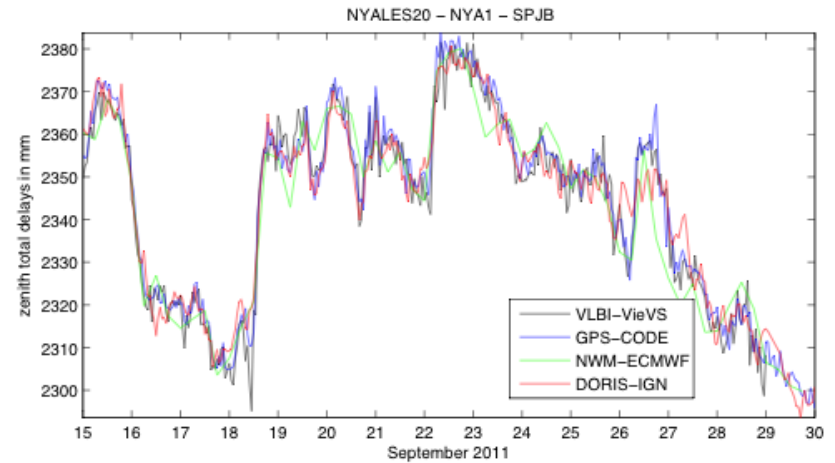
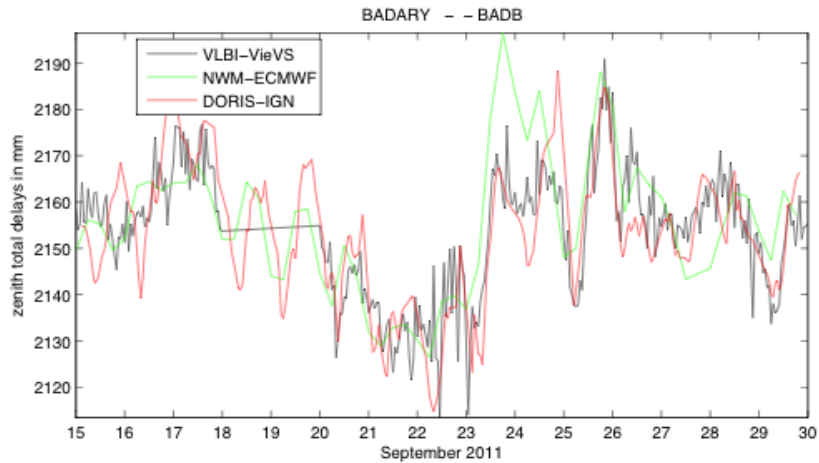
Kokee Park



Hartebeestoech

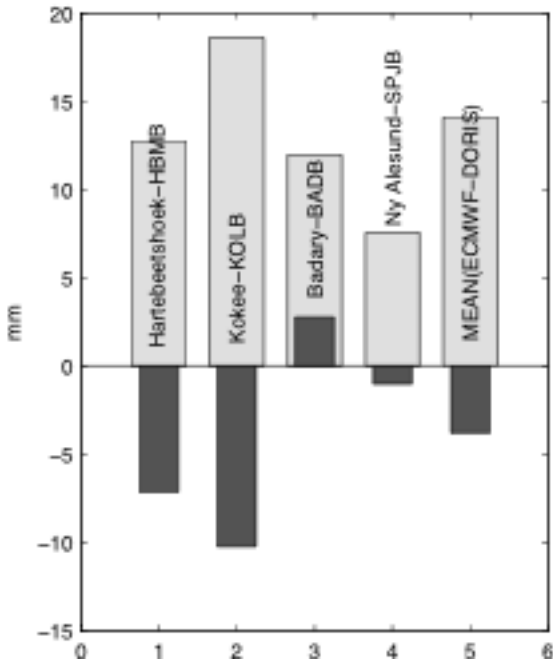
From Teke et al., in prep.

Examples of CONT11 results

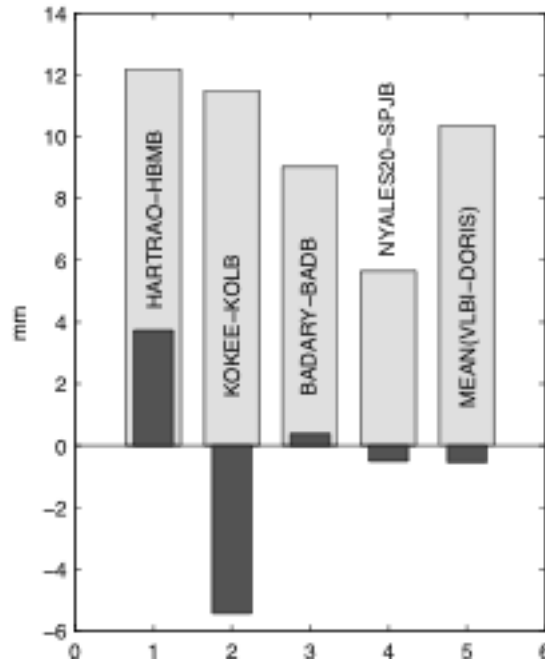


From Teke et al., in prep.

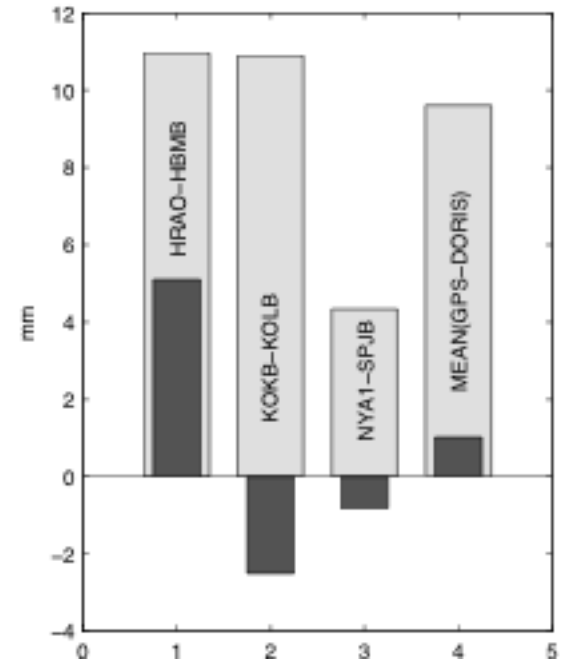
CONT11 results



DORIS vs. ECMWF



DORIS vs. VLBI

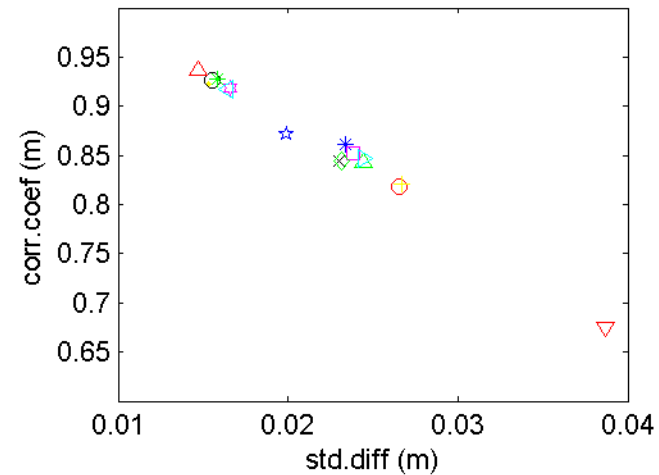
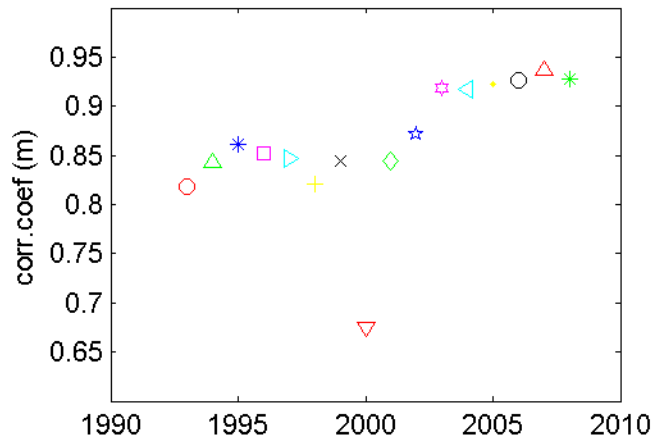
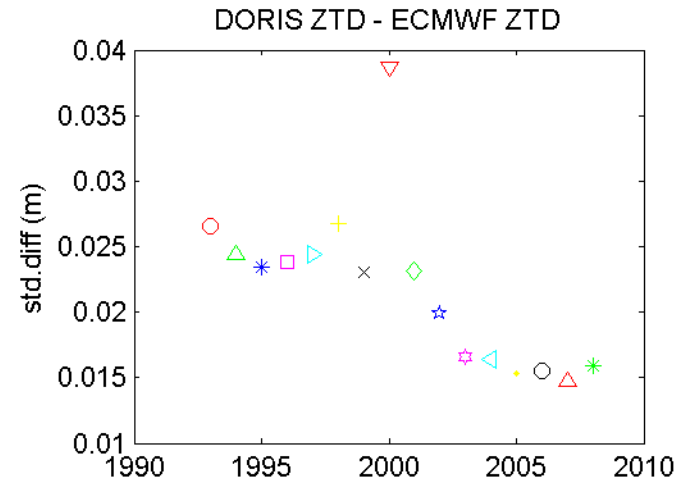


DORIS vs. GPS

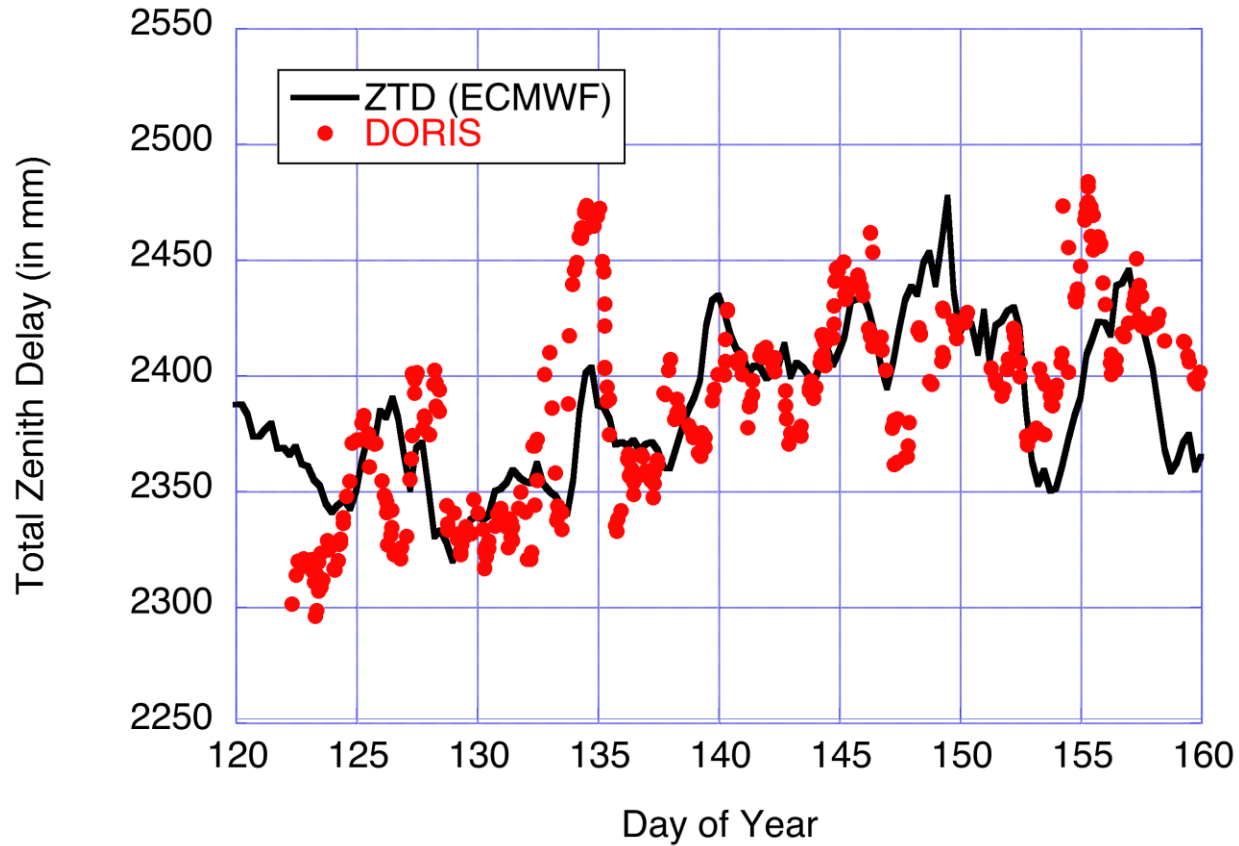
NB: light grey = standard deviation of differences, dark grey = mean bias

ZTD vs. number of DORIS satellites

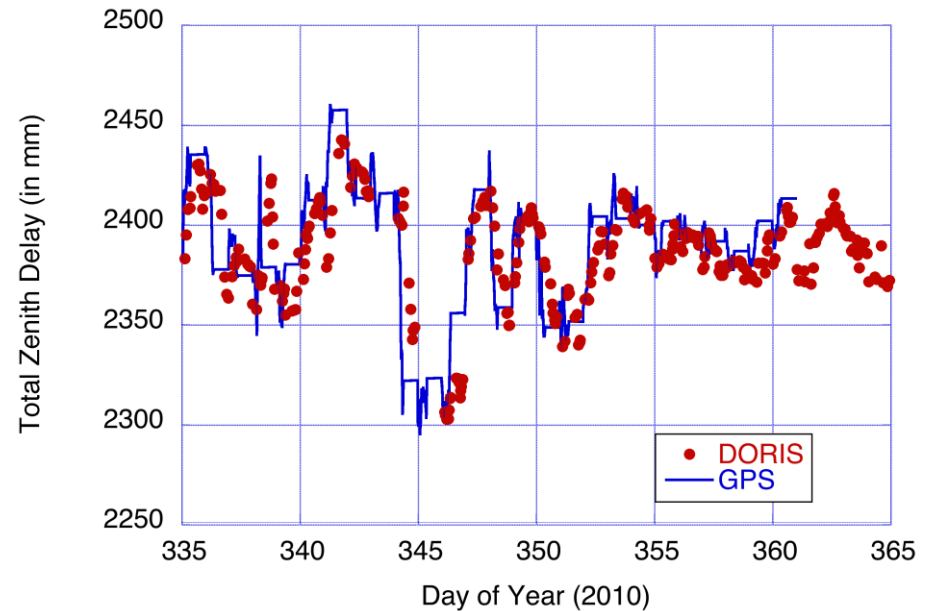
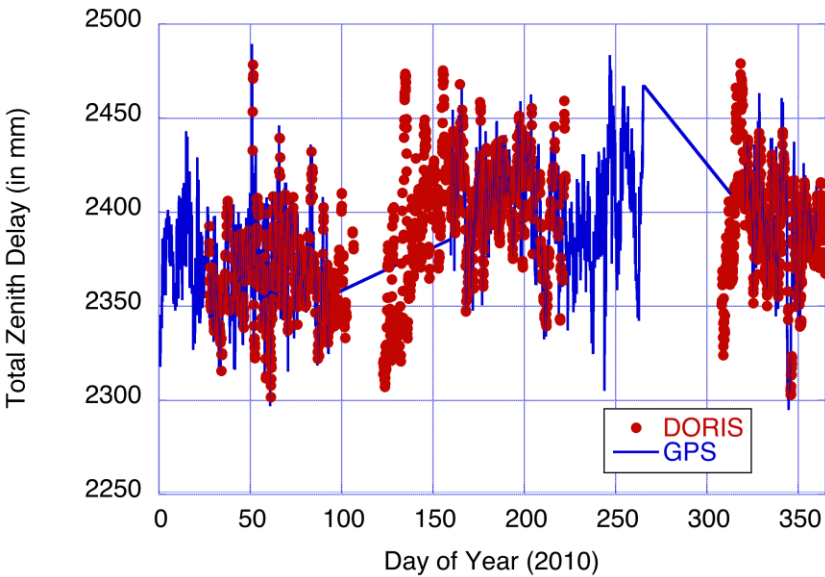
Bock et al., in prep



Comparisons at GAVB (ECMWF)



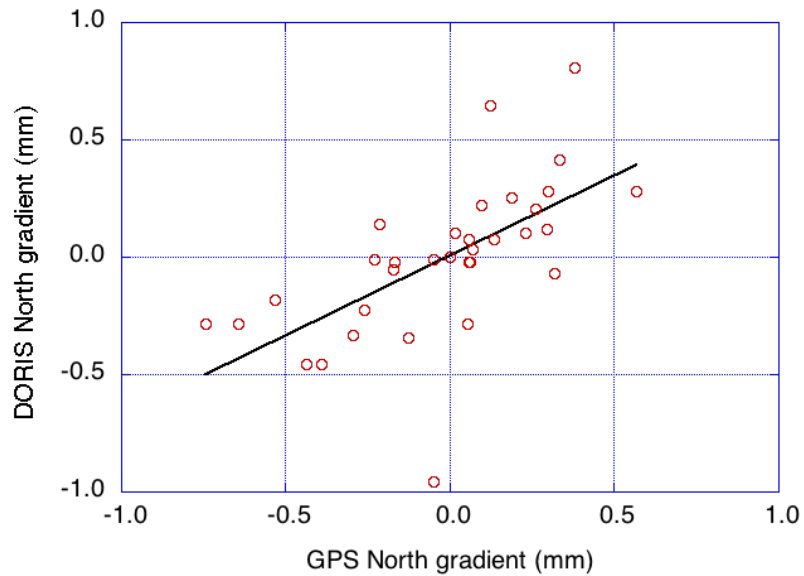
ZTD comparisons at GAVD (with GPS)



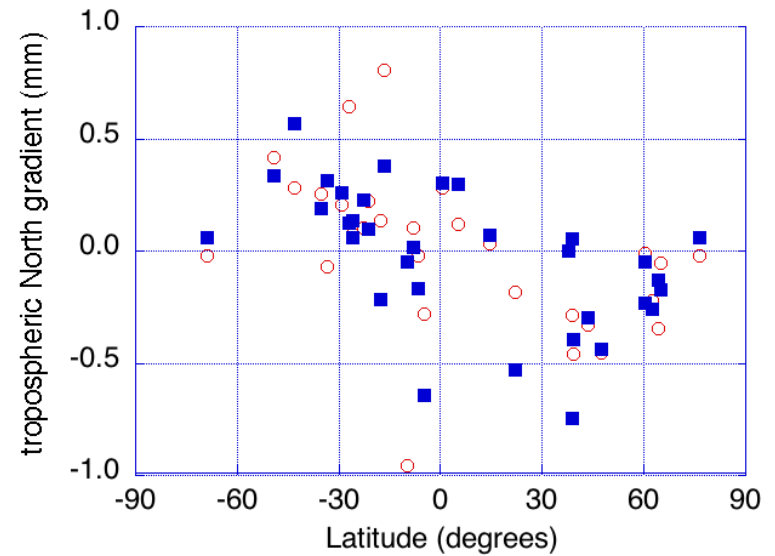
Zoom

From Willis et al., submitted

Horizontal gradients



GPS/DORIS correlation

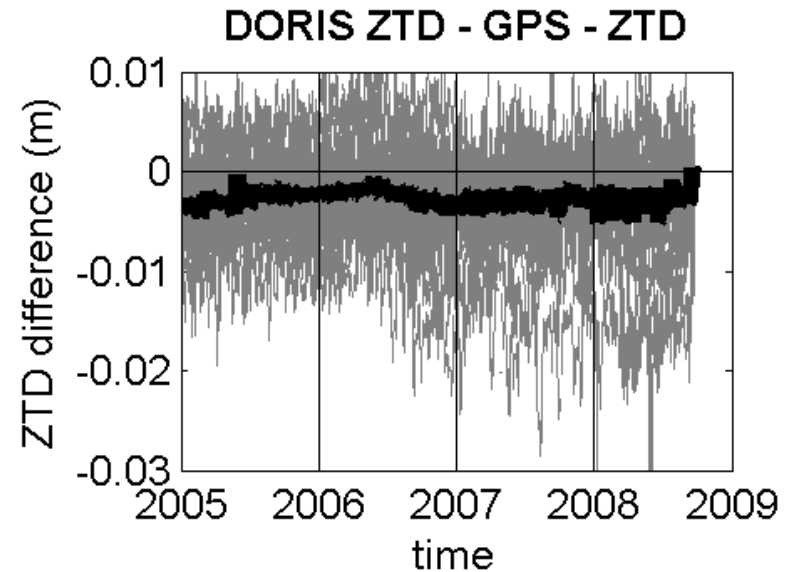
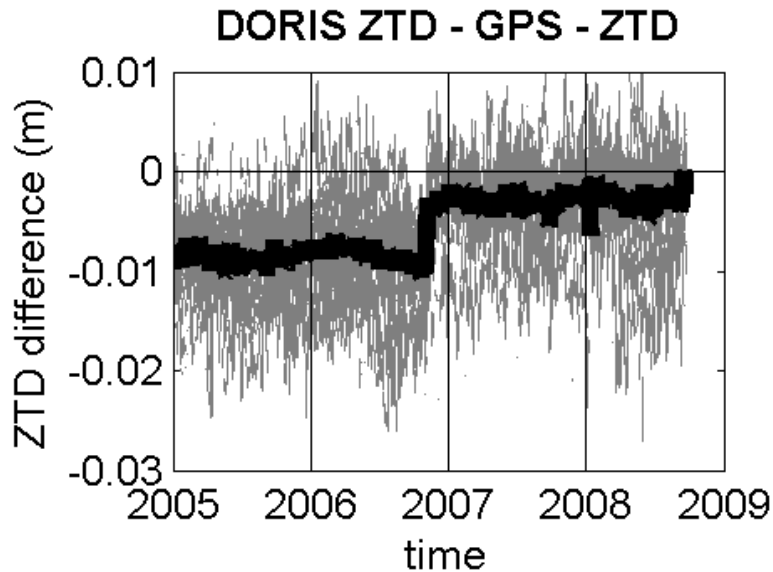


Latitude dependency

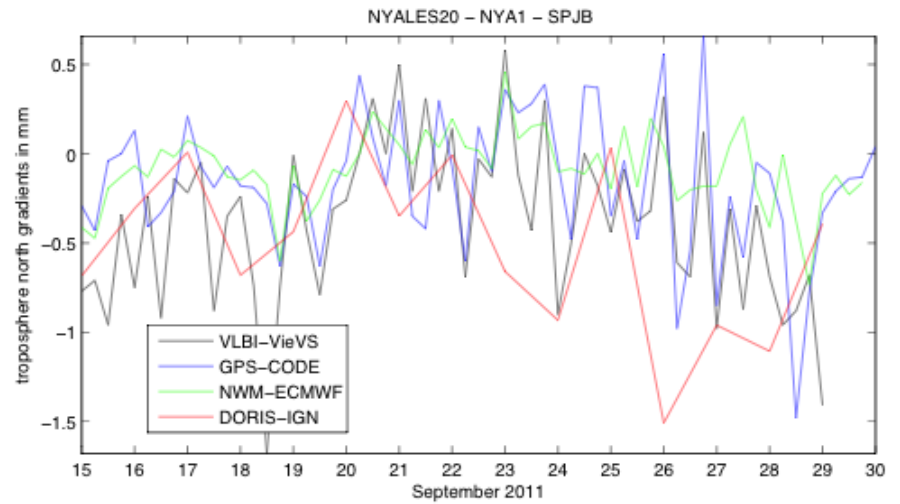
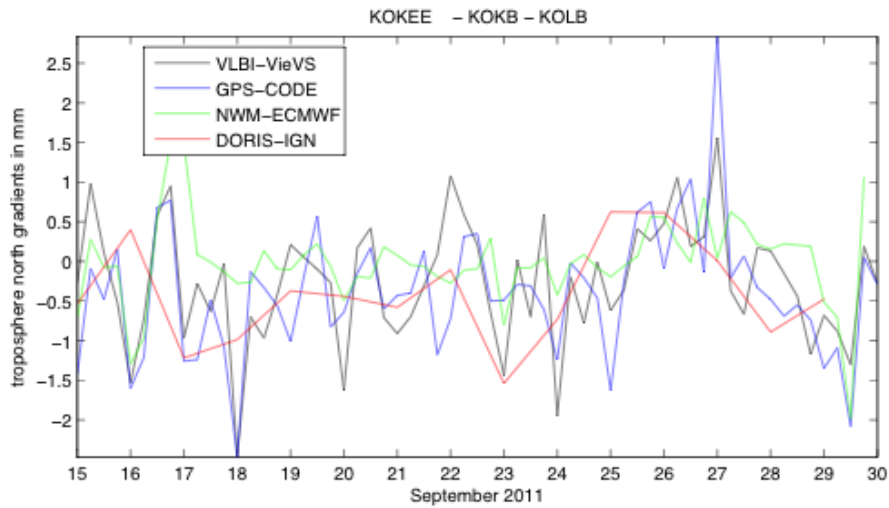
Using DORIS to calibrate GPS

Temporal evolution
of DORIS – GPS bias
(IGS trop-new) 2005 - 2008

Update with IGS/repro1
and trop_new



Tropospheric North gradients / CONT11



From Teke et al., in prep.

Conclusions

- ZTD : multiple comparisons were done
 - VLBI, GPS, ECMWF
 - Short time periods (CONT-type comparisons)
 - Long time periods (station-specific)
- Horizontal gradients
 - GPS inter-comparisons + recent CONT results

Possible use for climatological studies (long-term, post-processing mode):

Stable network, 2 types of antennas, unique reprocessing,...