

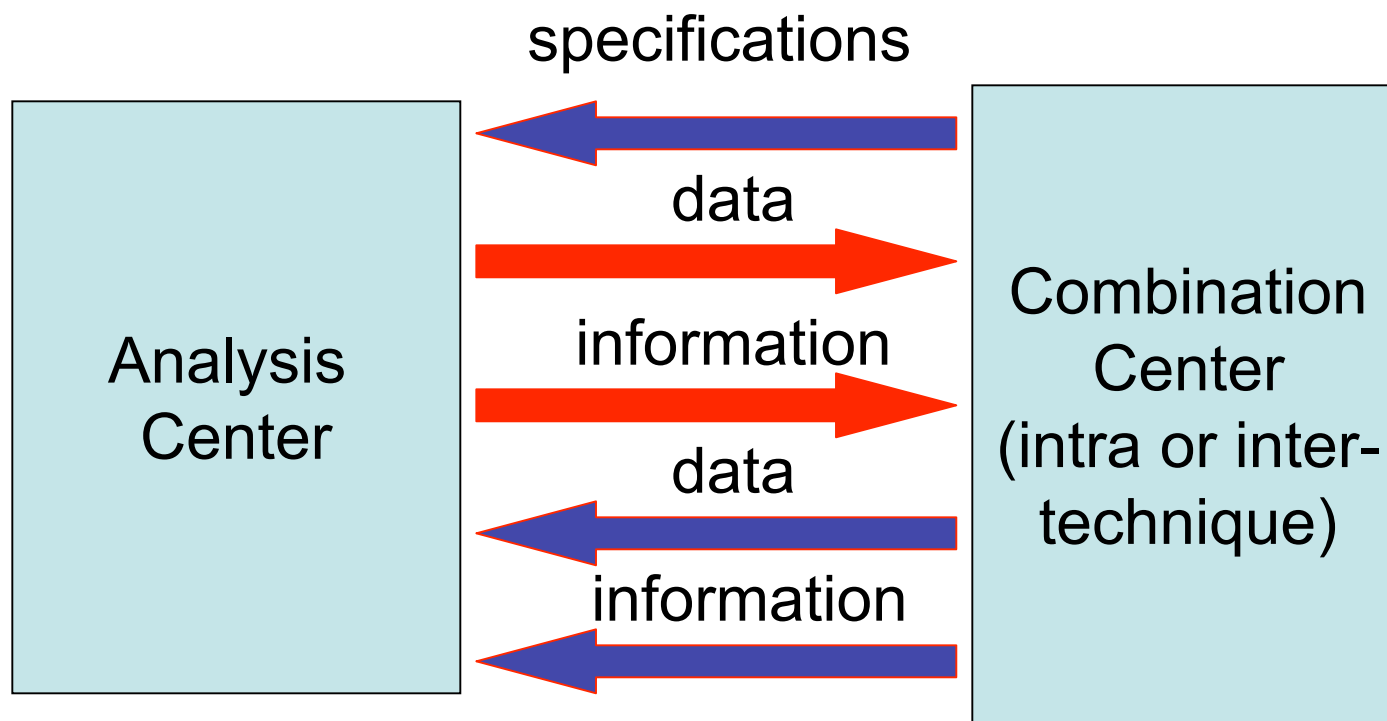
The point of view of an individual DORIS Analysis Center

Pascal Willis^(1,2) and Yoaz Bar-Sever⁽²⁾

(1) Institut Geographique National, France

(2) Jet Propulsion Laboratory, California Institute of Technology, USA

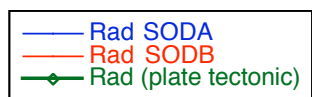
SUMMARY



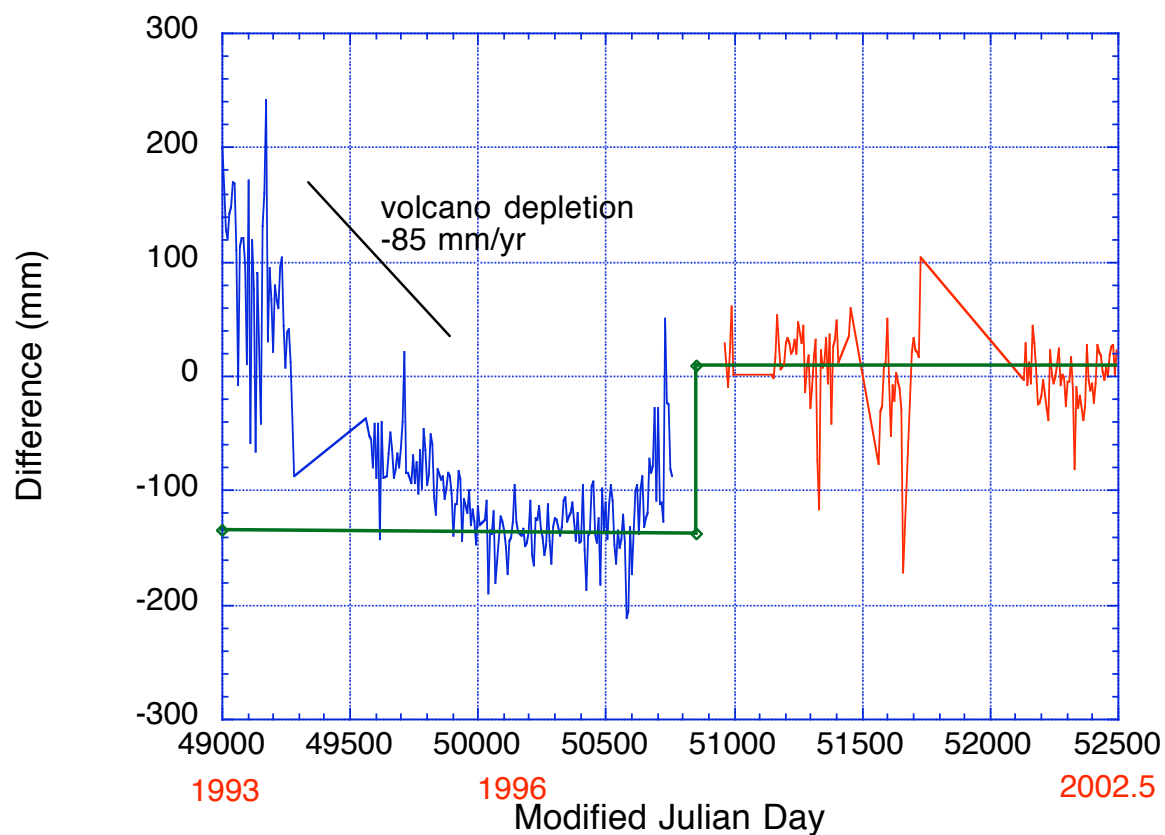
Specifications for Analysis Centers

- Which parameters should be estimated
 - (EOP rates or not, how frequently?...)
- Proper weighting (a priori weighting + a posteriori re-weighting)
- How to handle ?
 - stations discontinuity
 - Non linearity of station coordinates
- Improved series vs. homogeneous computations ?
 - better results vs. time series discontinuities

Socorro height due to volcano depletion
Willis and Sillard, DORIS Day, 1998
Cazenave et al., GRL, 26(14), 1999.

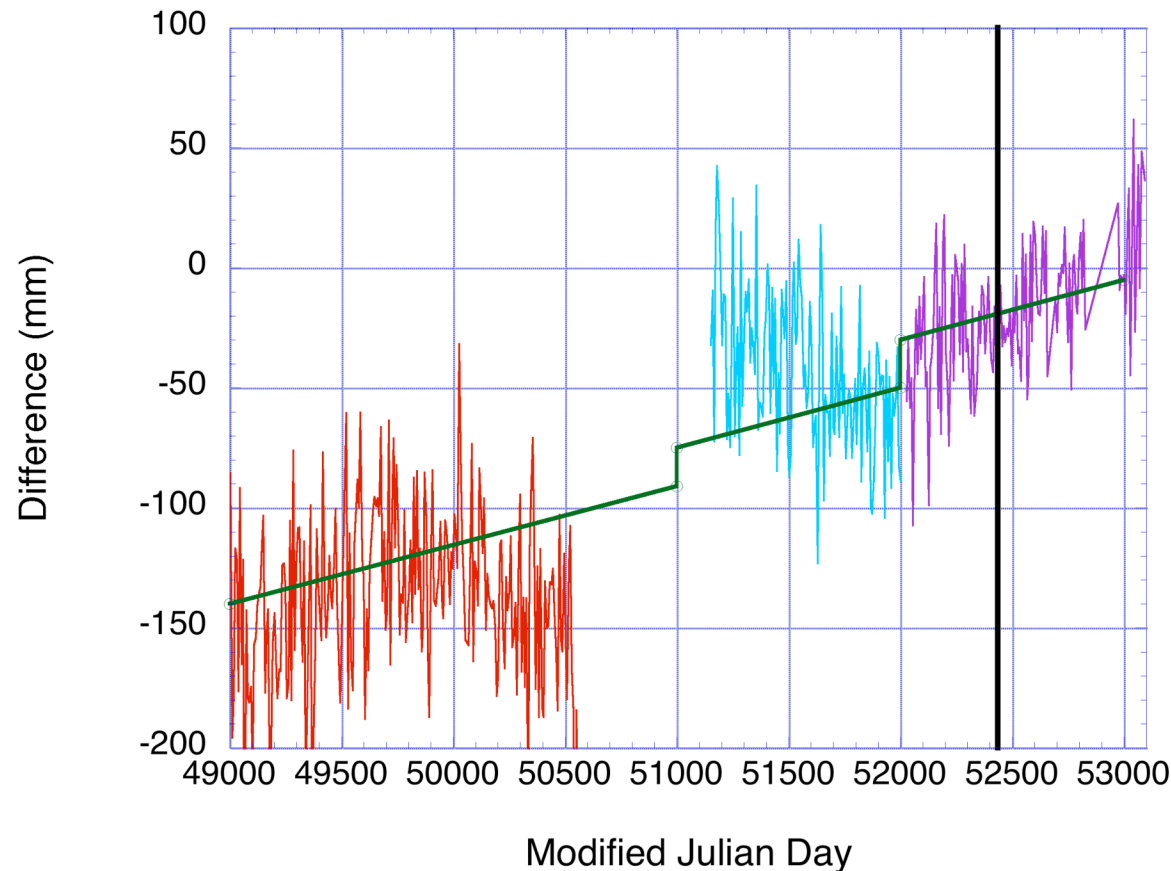
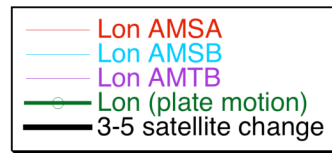


**DORIS Weekly altitude
Socorro Island**

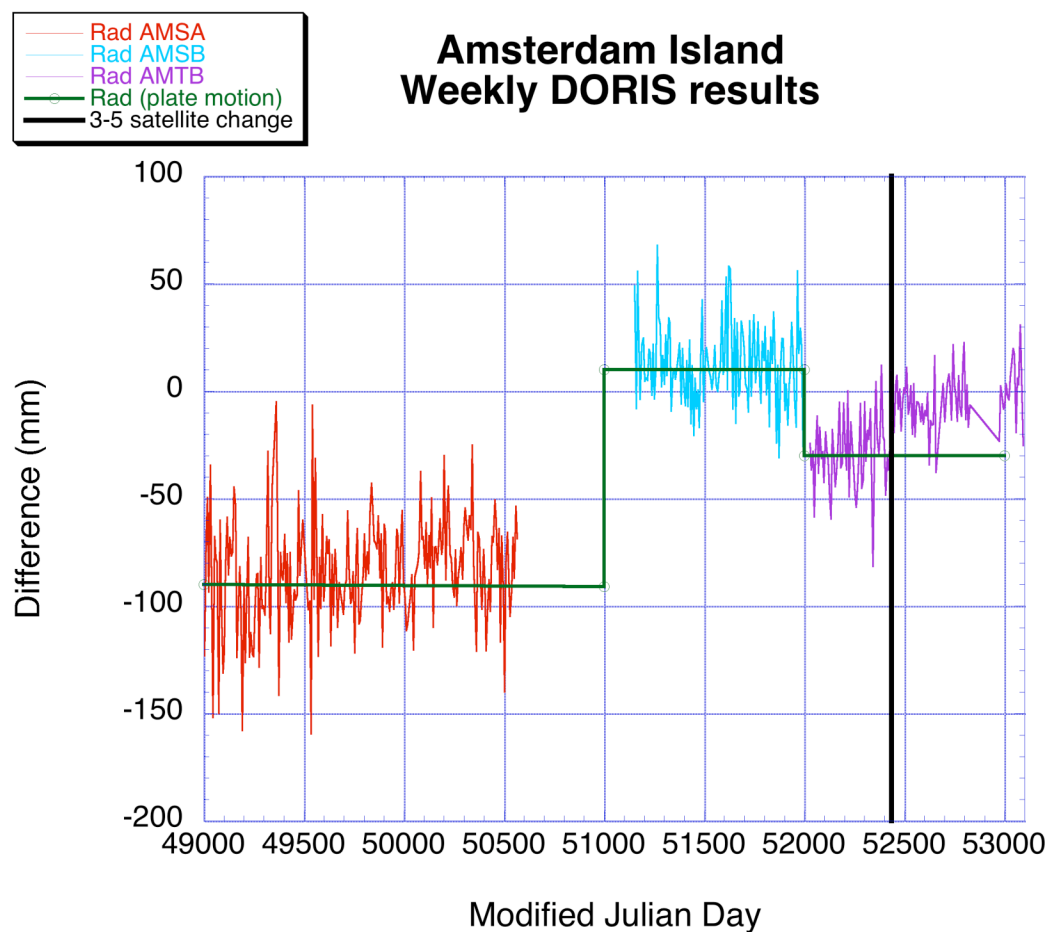


Willis and Bar-Sever, IDS Workshop, 2003
Fagard, DORIS Mails #0114, #0128

Antenna tilt AMSA
Antenna tilt AMSB



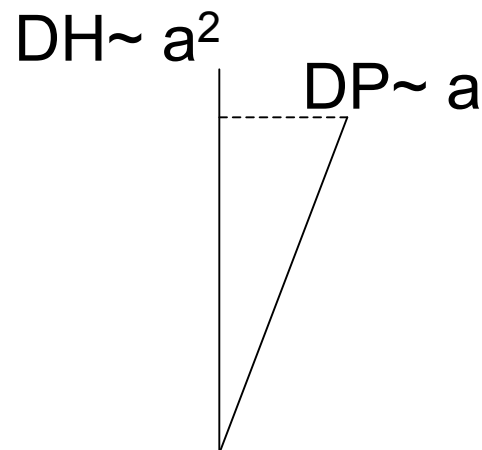
Willis and Bar-Sever, IDS Workshop, 2003 Fagard, DORIS Mails #0114, #0128



Antenna tilt AMSA
Antenna tilt AMSB

Discontinuity in AMTB?

Linked with new satellites
Availability = Analysis problem?



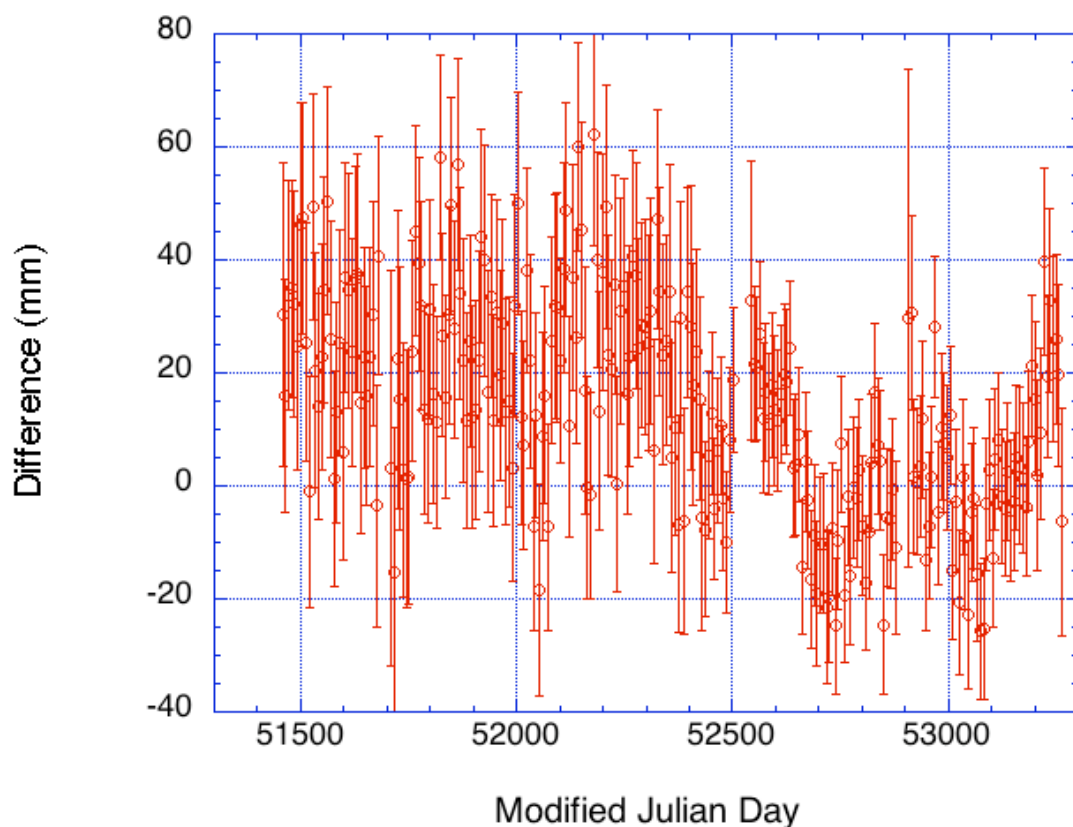
Discontinuity in STJB vertical?

yes P. Willis, 2004 (-17 mm)

no M. Feissel-Vernier and K. Le Bail, IDS Workshop, 2004
(conclusion was normal short-term irregularity)

○ Rad STJB

DORIS Weekly solutions St John (Altitude)



Estimated vertical velocity

no break = -7.4 mm/yr

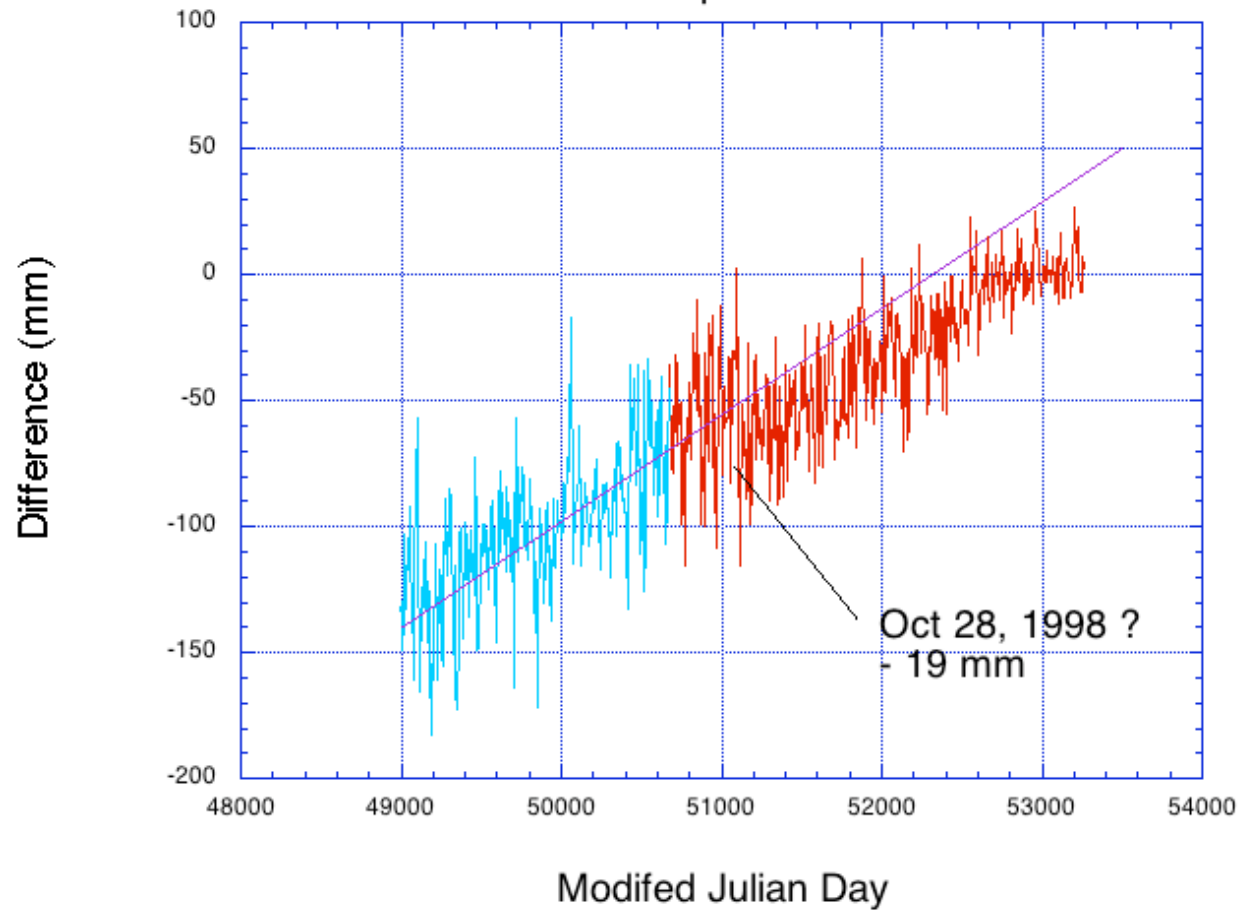
With break = 0.1 mm/yr

Data gap = Sep 2002
Station reprogrammed
(electric storm)



DORIS/Toulouse

No break estimated velocity = + 12.0 mm/yr
Break in 1998/11/1 estimated velocity = + 14.2 mm/yr
 plate tectonic value = + 15.7 mm/yr





What is used vs.



What is not used



Analysis Center  Combination Center

- Data
 - Weekly sinex solutions (free-network)
 - Weekly sinex solutions (ITRF2000)
 - stcd files (differences of coordinates in ITRF2000)
- Information
 - Weekly reports (DORIS observations, residuals)
 - Information on ids analysis forum
(<http://listes.cls.fr/www/info/ids.analysis.forum>)



What is done vs.



What could be done



Analysis Center Combination Center

- Data
 - Weekly sinex solutions (free-network)
 - Weekly sinex solutions (ITRF2000)
 - stcd files (differences of coordinates in ITRF2000)
- Information
 - Weekly reports
 - Feed-back to Analysis Center
 - Proper citation of work in Journals
 - Proper way to present results depending on the technique

Different ways to present results (EOP)

Satellites	Weeks	Period	XPOLE (RMS)	YPOLE (RMS)
2	171	1993.0 – 1994.1 1996.8 – 1999.0	1.9	1.5
3	321	1994.1 - 1996.8 1999.0 - 2002.4	1.7	1.2
5	99	2002.4 - 2004.3	1.4	0.9

Tavernier et al., Adv. Space Res., submitted

DORIS EOP = 2 mas, Gambis, J. Geod., 78(4), in press

Different ways to present results (geodetic positioning)

Starting with the same DORIS free-network solutions

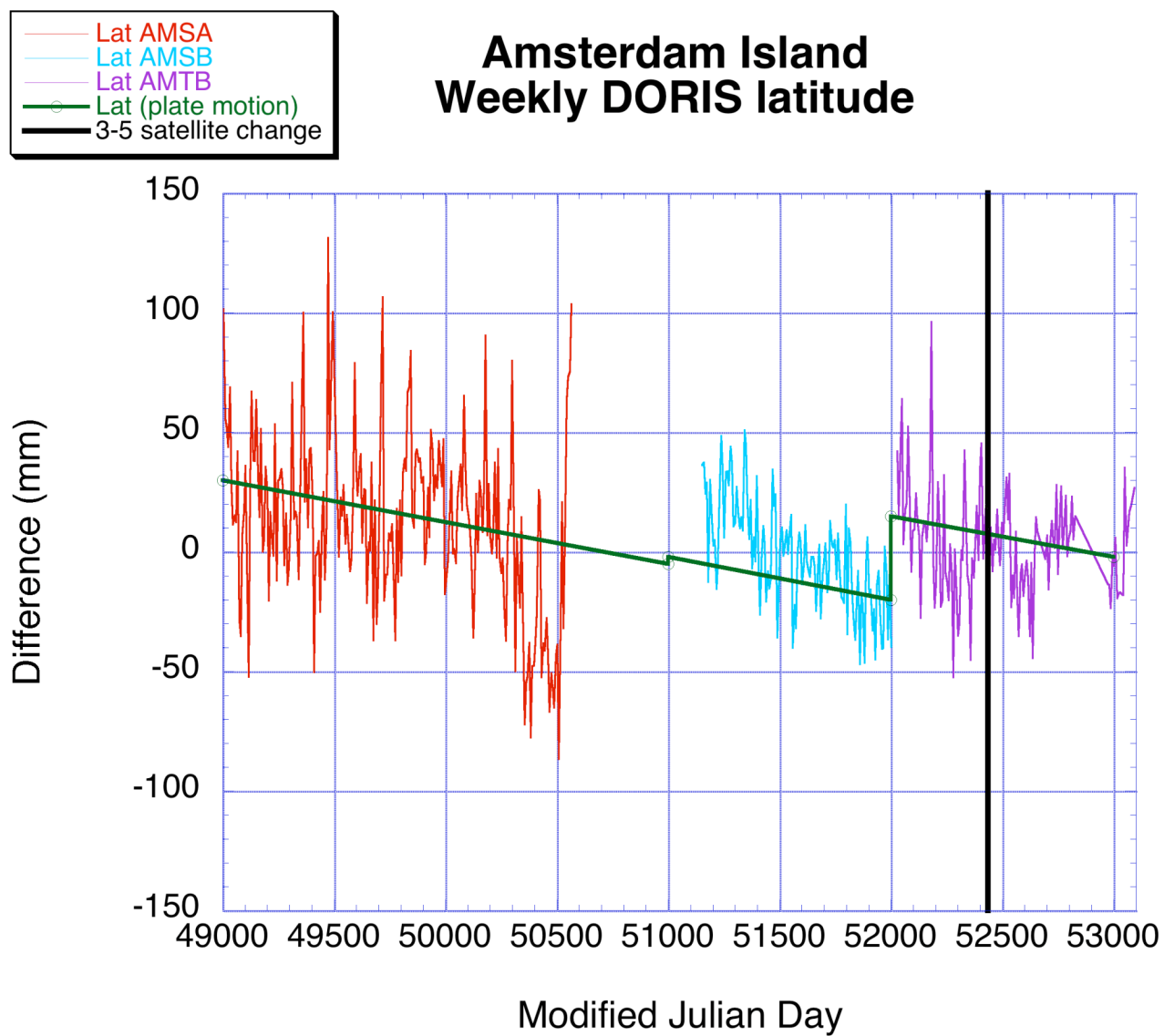
Estimating vertical velocities

WRMS from 2.5 mm/yr up to ???

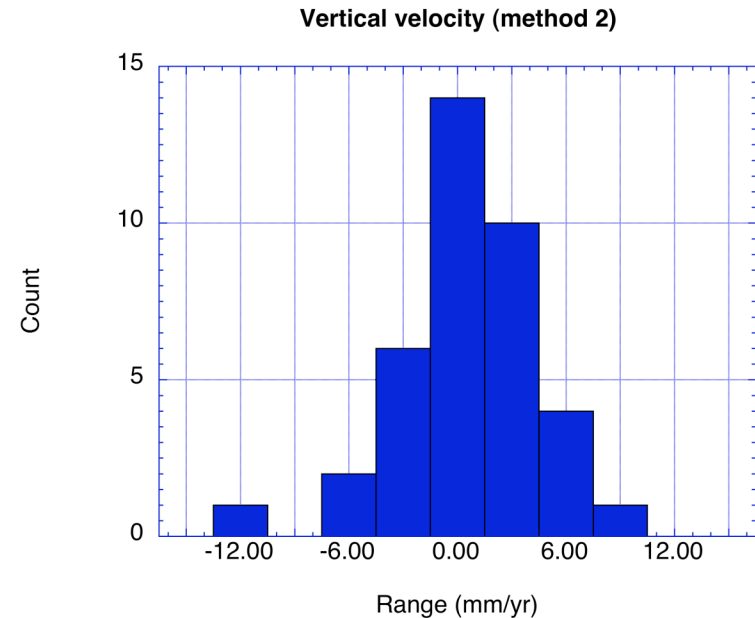
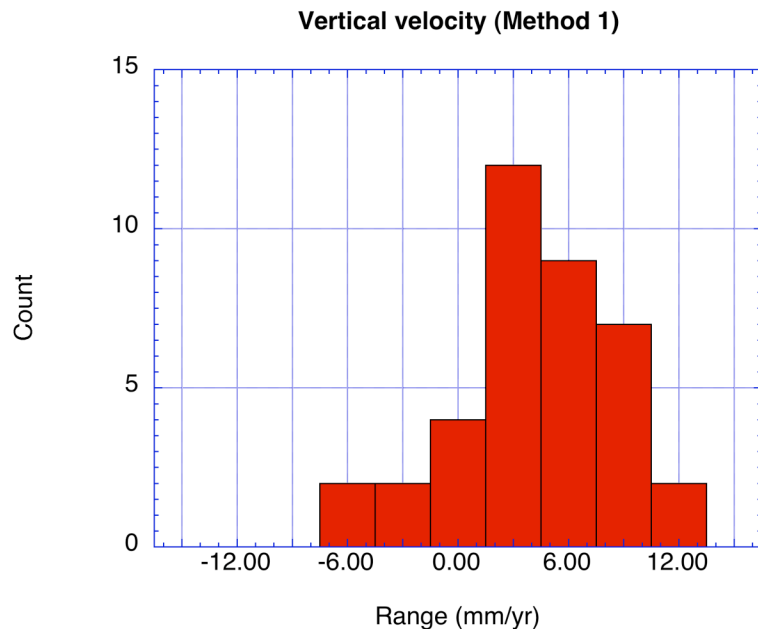
CONCLUSIONS

- There is still a lot of things we should agree on for the IERS CPP (**no specifications**)
- To get good results significant amount of work is required (**station discontinuities** and change in velocity rate)
- There is a need to better define interfaces between Analysis Centers and Combination Centers (**feed-back**, proper citation,...)

Additional slides



Different ways to present results (DORIS positioning)



Results obtained using different software and different methods
from the **same original DORIS weekly solutions**

DORIS vertical velocity?

Method 1 WRMS = **5.31 mm/yr**

Method 2 WRMS = **2.61 mm/yr**