

Terrestrial Reference Frame investigations in
preparation of GRASP
GPS and DORIS PPP results and preliminary
comparisons with geodetic local ties

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OUTLINE

- Main goal (preparing GRASP)
- Method description
- Preliminary results
- Conclusion and future work

Main goal

- Main assumptions
 - GRASP would include all 4 techniques
 - GRASP Satellite orbit should be at mm-level
 - PPP solutions from GRASP could be done for GPS and DORIS, providing results in a unique TRF
- Goal:
 - test this possibility using current Jason-2 satellite

Method description

- Data used:
 - GPS PPP solutions = standard JPL PPP solutions available at <http://sideshow.jpl.nasa.gov/post/series.html>
 - DORIS PPP solutions = new results using JPL Jason-2 orbits (from GPS) + DORIS data in PPP mode (daily solution, 1 satellite)
 - Geodetic local ties = as provided by IGN/SIMB

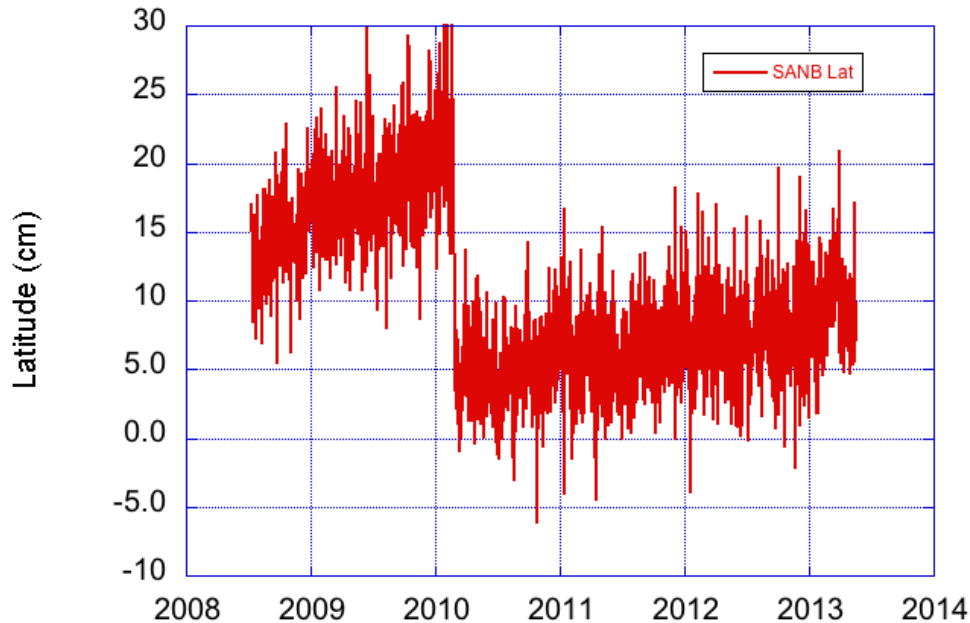
Comment:

GPS and DORIS results refer to center of phase
geodetic local ties refer to monumentation

Results

16/09/2015 13:24

DORIS PPP
(Jason2 orbit)



DORIS Jason2/PPP results

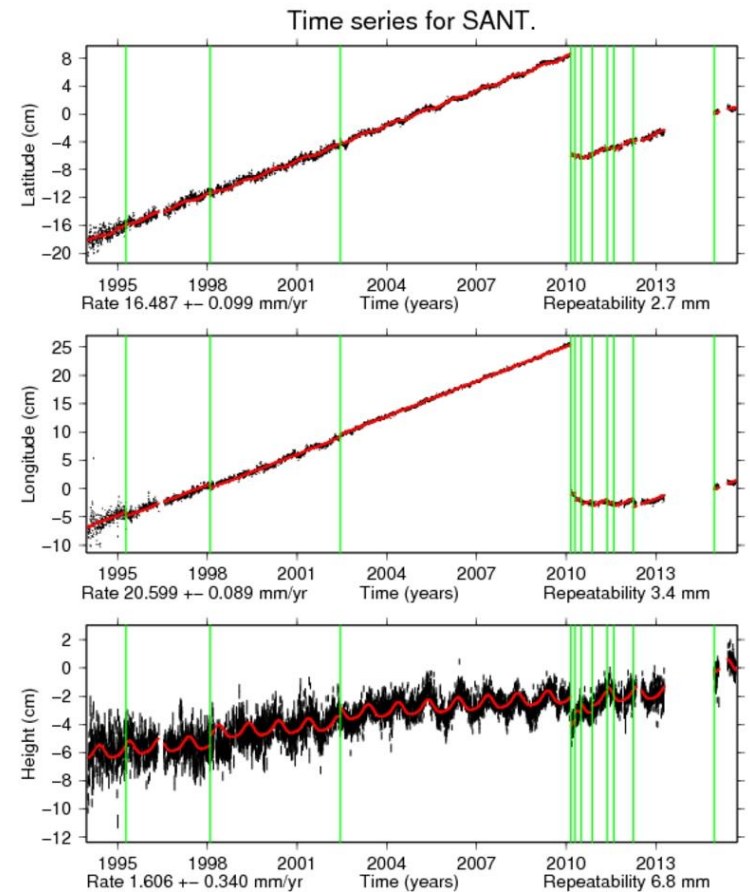
Why selecting Santiago?

Maule Earthquake on 27-FEB-2010

Distance = 50 m

Local tie precision = 1mm

GPS PPP results (JPL)

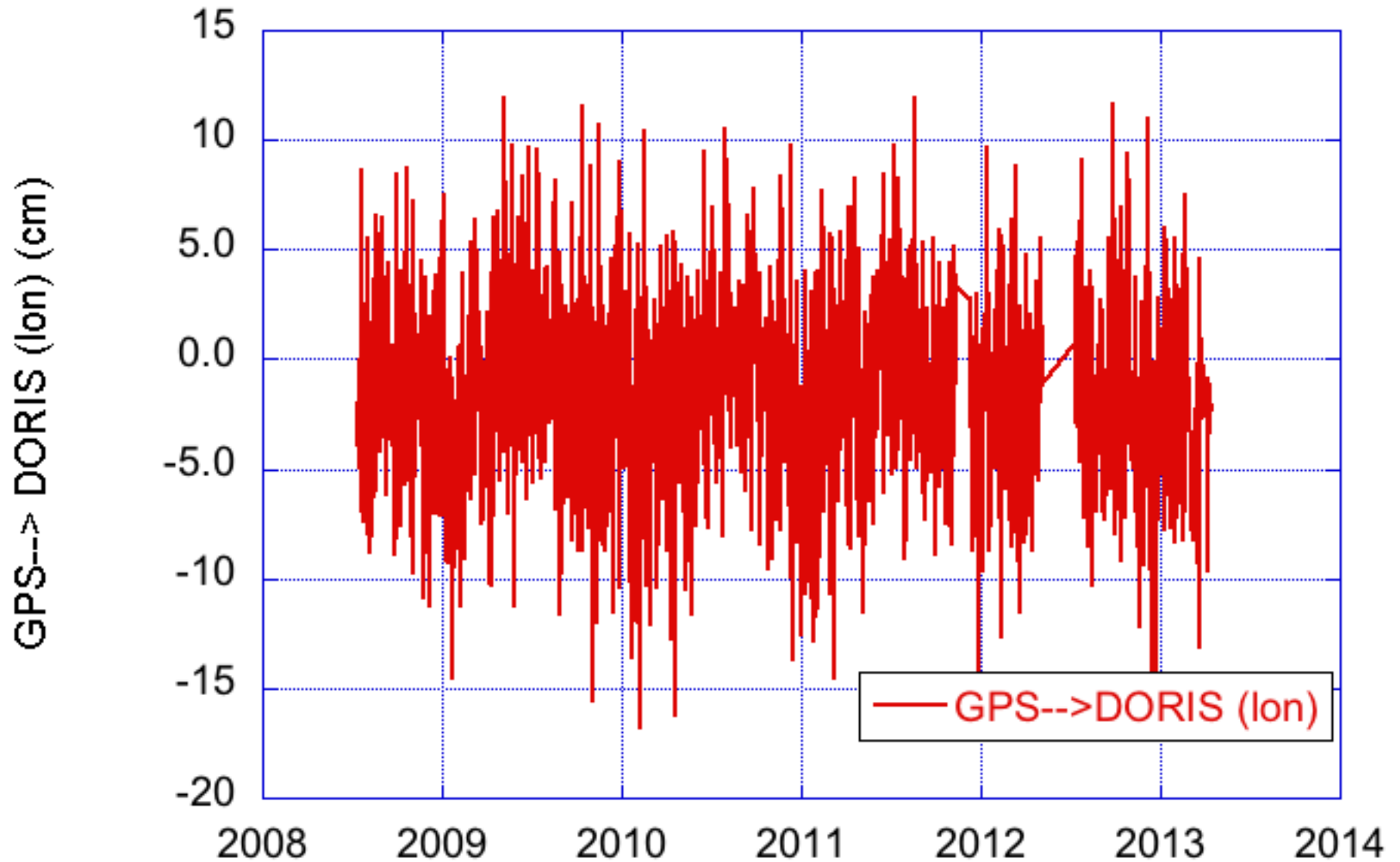


<http://sideshow.jpl.nasa.gov/post/links/SANT.html>

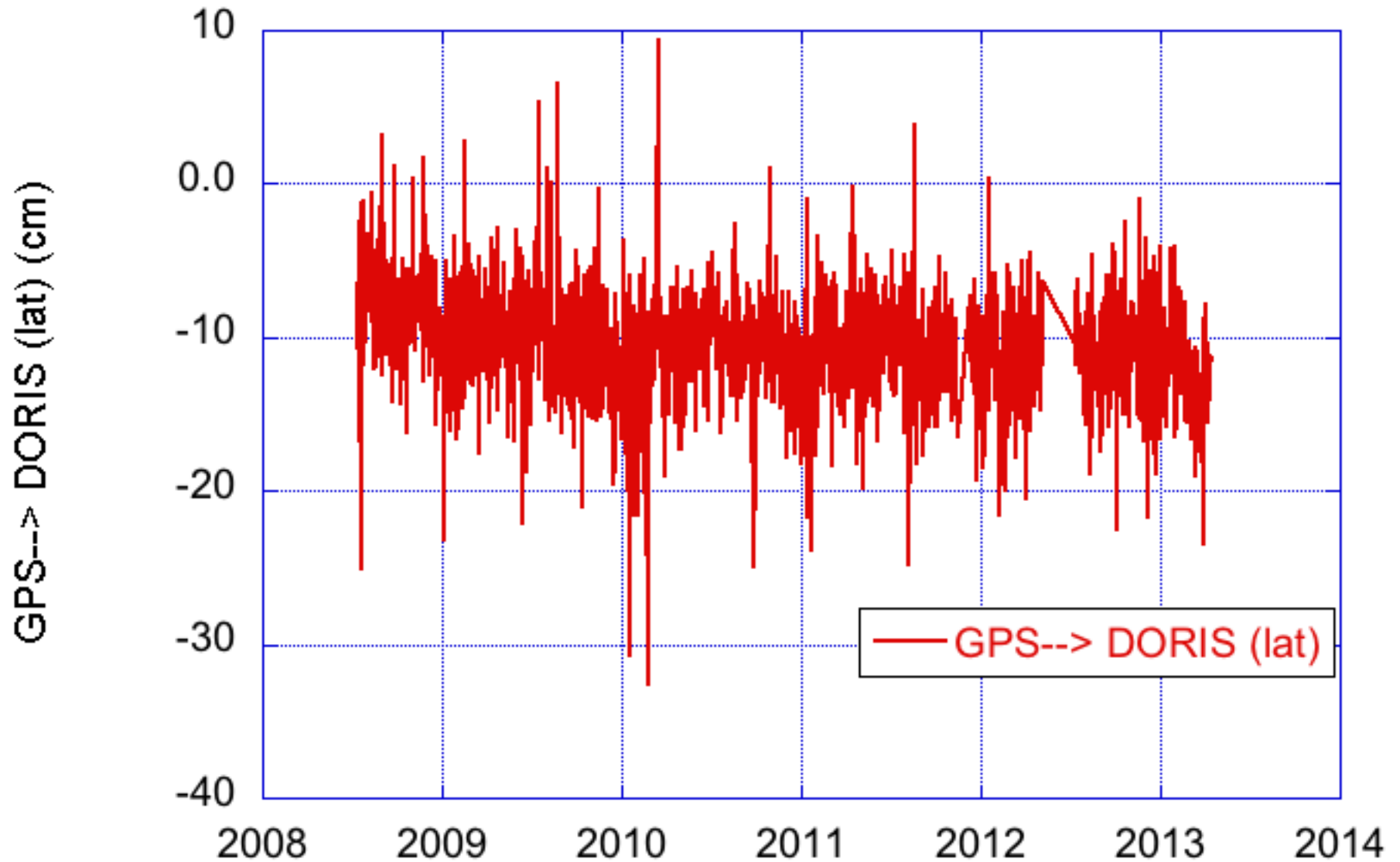
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Santiago

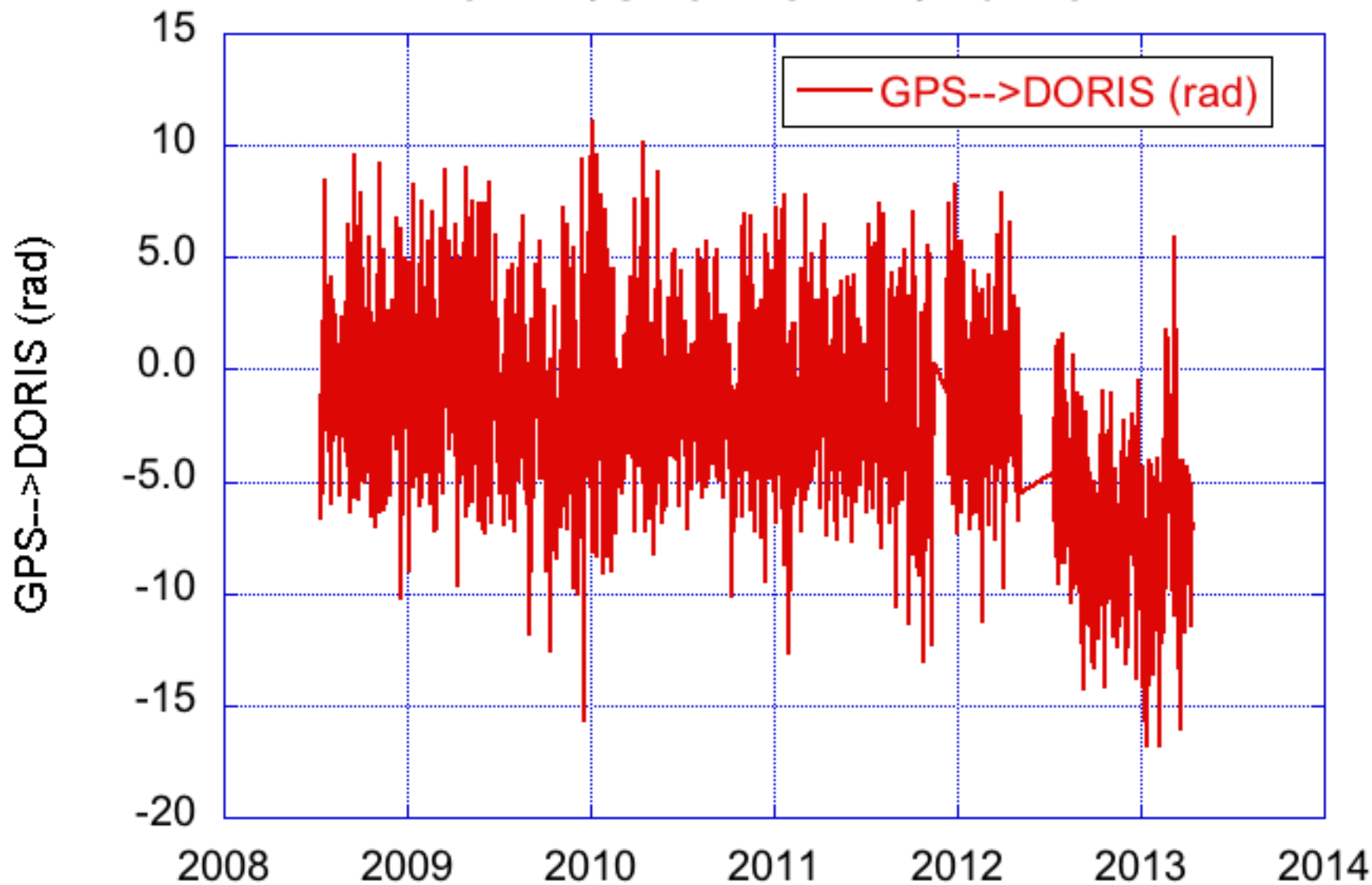
SANT/GPS-->SANB/DORIS



Santiago SANT/GPS-->SANB/DORIS



Santiago SANT/GPS-->SANB/DORIS



Santiago

	Mean (cm)	Std (cm)
longitude	-1.5	4.4
latitude	-10.5 ???	3.7
up	-2.1 (first data only)	4.3 (first data only)

Conclusion and future work

- Conclusions
 - Test done only for SANB/SANT (Santiago de Chili)
 - GPS/DORIS vector not affected by Earthquake
(velocity could be held fixed through Earthquake in IDS and ITRF solutions)
 - Mean = 2 or 10??? cm, std = 4 cm (1 day, 1 satellite)
(equivalent to 7 mm for 5 satellites @ 1 week)
- Future work
 - Do similar tests for weekly or monthly solutions
 - 1 week 15 mm ???
 - 1 month = 7 mm??? GRASP results should be better
 - 3 month = 4 mm ???
 - Do extensive tests (more DORIS stations) using all available local ties