

Abstract Since the beginning of Jason 2 mission, the phase correction map computed by the JPL was used for the CNES GPS orbits determination. This map was for the first Jason 2 GPS antenna. A specific extension of the IGS GPS phase maps has been used for each GPS satellite model to achieve a correct phase processing (OSTST 2009, Seattle). For the Jason 2 reprocessing, we build maps for the first antenna, and also for the second antenna, which is now in use since September 2014. These maps are estimated using the igs08 antex data file available at IGS, which contains now the extension estimated at IGS for LEO processing. The maps definition is 2*2 degrees. The maps can be delivered to the users in antex format. These two maps remove efficiently the dependencies of the phase errors in azimuth and elevation, the phase residuals are now around 5 mm rms. The parameterization of the orbits used for the maps construction, and the processing method are detailed

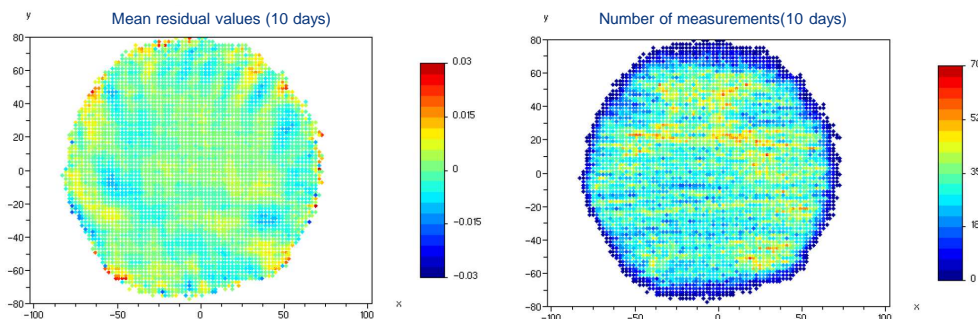
Methods

Representation in azimuthal projection, ϕ zenith angle, θ azimuth
 Use of square cells in this representation

- good homogeneity of the details
- similar number of measurements for each cell

$$x = \left(\frac{\pi}{2} - \phi\right) \cos\theta$$

$$y = \left(\frac{\pi}{2} - \phi\right) \sin\theta$$



Map estimation algorithms

- one day arcs, standard dynamic parameterization, 30 s measurements with estimation of x,y,z reference point offset (in satellite reference frame)

	x	y	z
Ant 1 initial	2.3858	0.2170	-0.5218
adjusted	2.3906	0.2171	-0.5252
Ant 2 initial	2.3858	-0.2170	-0.5218
adjusted	2.3906	-0.2171	-0.5252

- use of the iono-free phase residuals, and passes description
- 100 days (one complete β cycle)
- map estimation simultaneously with ambiguities and clock

$$\text{minimize } J(p_m, p_c) = \left\| [A_m \ A_c] \begin{bmatrix} p_m \\ p_c \end{bmatrix} - B \right\|^2$$

p_m : ambiguities and clock
 p_c : map

- convergence is achieved in two iterations

Conclusion

New maps have been estimated for the two Jason 2 antennas, the corresponding reference points have also been adjusted. The POD dynamic phase residuals are below 5 mm rms, for both antennas phase measurements.

An improved construction method has been used : simultaneous identification of the map, ambiguities and clock, using 100 days 30 s residuals. The reference points are adjusted in the orbit determination process to generate the reference residuals.

The maps can be delivered in antex format. The same processing will be applied for Jason 3 and Sentinel 3, which will be launched in December 2015

Final maps

