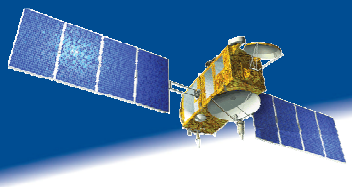
GDR-C STANDARDS FOR JASON-1 ORBITS

L. Cerri[1], P. Perrachon[1], S. Houry[1], F. Mercier[1], J.P. Berthias[1]

[1]*CNES, Toulouse, France*



The Jason-1 precise orbits (POE) included in the GDR products have been recently reprocessed over the entire mission time-span using the GDR-C standards. This same configuration is currently applied to Jason-2 and Envisat. The poster illustrates the properties of the new Jason-1 orbit and summarizes the main differences with respect to the previous standards (GDR-B).

New Reference Frame (ITRF2005)

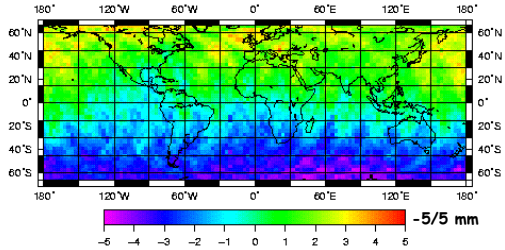
Reference frame : from a hybrid ITRF2000 configuration to ITRF2005 based orbits

This change is responsible for most of the geographically correlated radial difference mean and rate (Z shift)

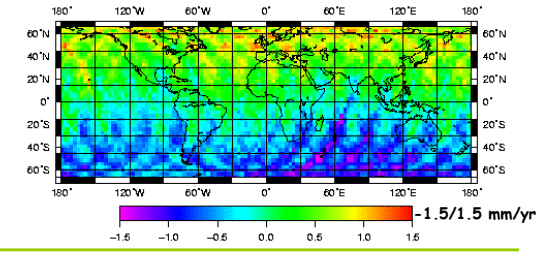
Improve the continuity of the Doris+SLR+GPS solution for both Jason-1 and Jason-2

GDR-B orbit was close to GPS-only orbits. In order to improve the consistency of GDR-C J1 and J2 orbits, the weight of SLR has been increased over the whole series, and for Doris only after cycles > 91 (SAA model applied over the entire series).

Mean radial difference GDRC-GDRB, cycles 001 - 232

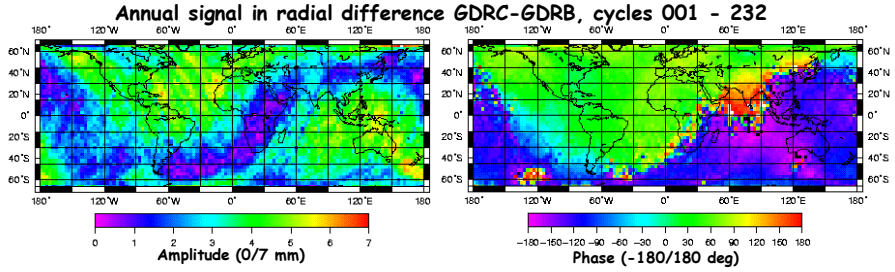


Radial difference rate GDRC-GDRB, cycles 001 - 232



Time Varying Gravity

Annual signal in radial difference GDRC-GDRB, cycles 001 - 232

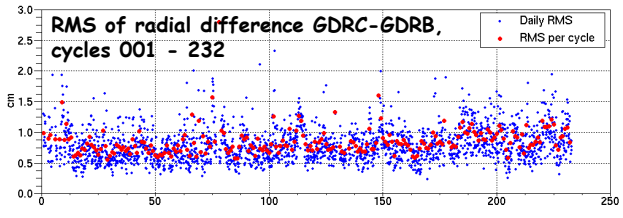


Static field EIGEN-CG03C → EIGEN-GL04S

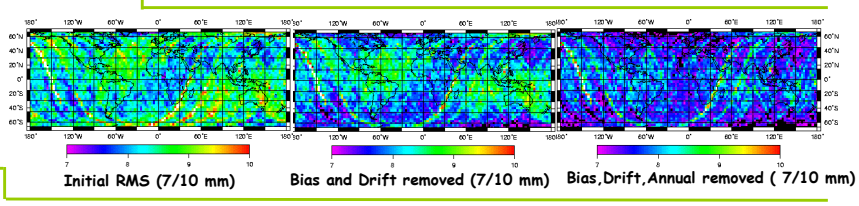
+ Annual/Semiannual variations from EIGEN-GL04S-ANNUAL

+ Atmospheric gravity (IB) from NCEP pressure fields

TVG causes annual signals whose amplitudes can reach ~6mm (~2mm is the contribution of atmospheric gravity only)

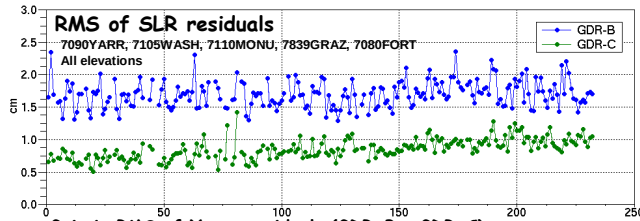


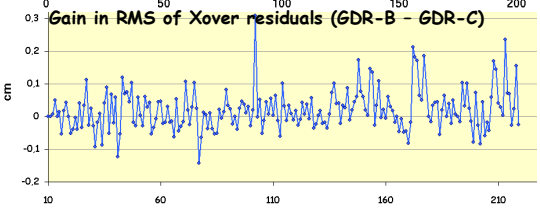
Mean RMS per cycle is below 1 cm.



The change in the reference frame and the introduction of TVG explain the largest part of the geographically correlated difference between GDR-C and GDR-B orbits.

Performance



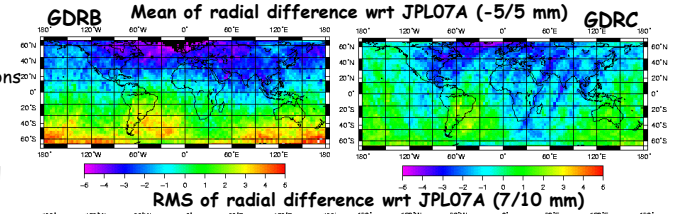


The RMS of SLR residuals per cycle for the best stations of the network is now below 1 cm (all elevations).

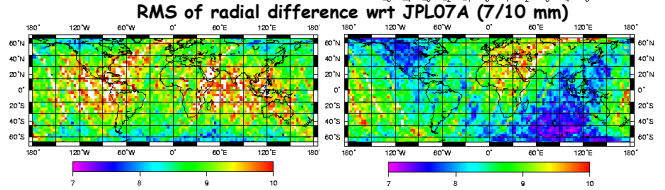
Some of the global difference of GDR orbits wrt JPL07A are reduced, but some patterns still remain

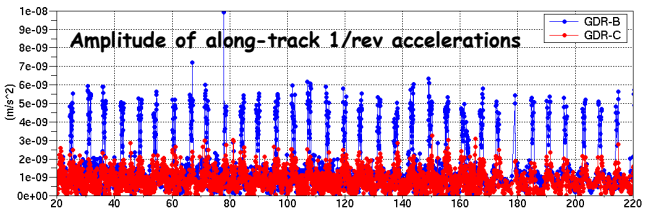
Average Xover residuals are slightly improved; this effect is more significant on later cycles (SAA effect is now modeled, important when GPS tracking is reduced)

Mean of radial difference wrt JPL07A (-5/5 mm)



RMS of radial difference wrt JPL07A (7/10 mm)



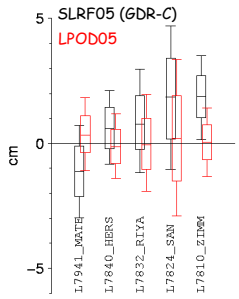


For next reprocessing

A new ITRF will soon be released. In the meantime the LPOD2005 solution has been made available, showing important improvements on many stations.

A completely consistent solution for the GPS constellation (ephemeris, clocks, emitter/receiver phase maps) will be available

Adoption of some models should be reviewed (example Haurwitz and Cowley atmospheric tides)



Improve TVG Modeling: current GDR-C orbits do not include drifts of the EIGEN-GL04S-ANNUAL field. Further work is needed to investigate how long term TVG effects can be accounted for on Jason operational POD

Radial difference rate 50x50 drifts - no drifts (J2,J3,J4 only)