



CENTRE NATIONAL D'ÉTUDES SPATIALES

CNES POD Reprocessing plans

CNES POD Team

DORIS AWG Meeting, Paris, France, 23-24 May 2011

POD Standards upgrade - History and Motivation

■ Oct. 2005: GDR-B standards

- ◆ Jason1+Envisat
- ◆ Grace-derived Eigen3-c0 static field , ITRF2000, IERS2003 conventions

■ July 2008: GDR-C standards

- ◆ Jason1+Jason2+Envisat+Cryosat
- ◆ Improved gravity modeling (Eigen4, annual, semi-annual, and atmospheric pressure variations), ITRF2005, calibrated SRP model

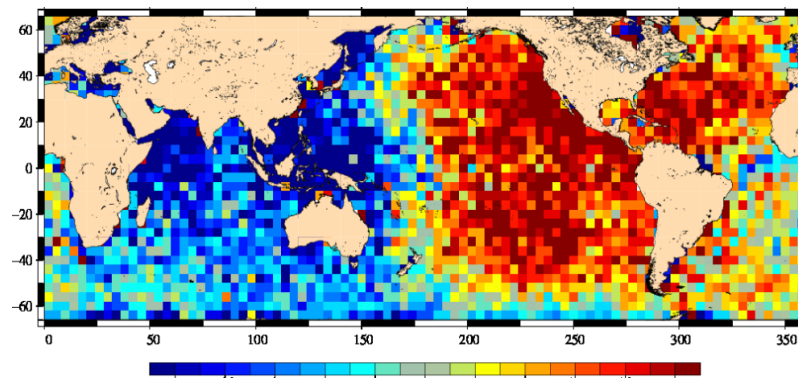
■ 2011 (TBD): GDR-D standards (currently being defined)

- ◆ Jason GDR-C orbits are still at 1-cm level, the issue is long-term stability
- ◆ Jason1+Jason2+Envisat+Cryosat+HY2A
- ◆ Latest release of Grace-derived mean gravity field
(including periodic terms and drifts)
- ◆ ITRF2008 (released and tested in 2010)
- ◆ Models from IERS 2010 conventions

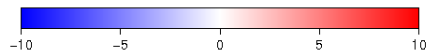
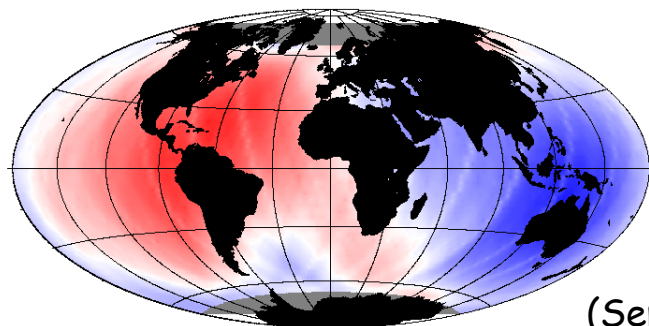
Long-term variations in the gravity field

- East/West hemispheric differences between Envisat and Jason SSH could be significantly attenuated using the new mean gravity field

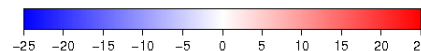
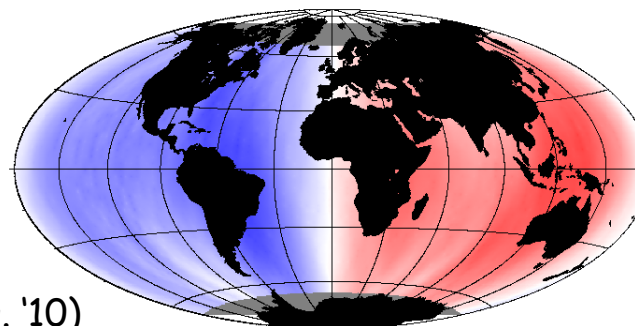
Faugere et al., OSTST 2010: Mean difference (Envisat – Jason-1) SSH at crossover (cm) per longitude in 2010



Mean radial difference Jason1
Grace10day - GDRC W + 7 mm , E -7 mm



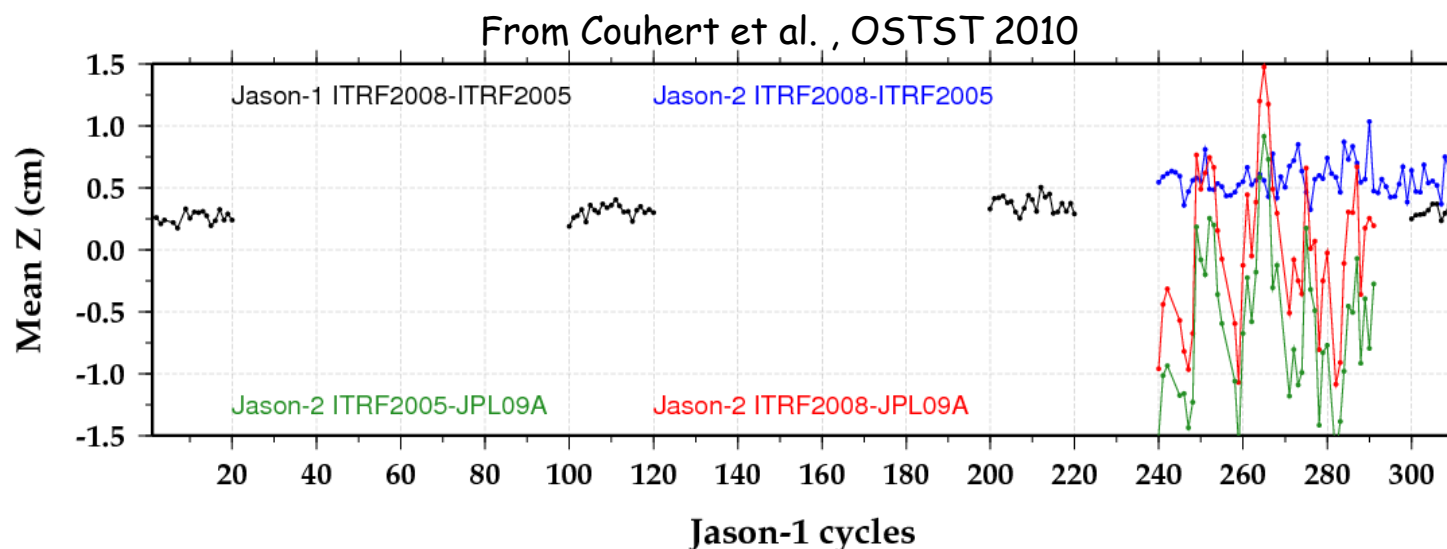
Mean radial difference Envisat
Grace10day - GDRC W -15 mm , E +15 mm



(Sept. '09 - Aug. '10)

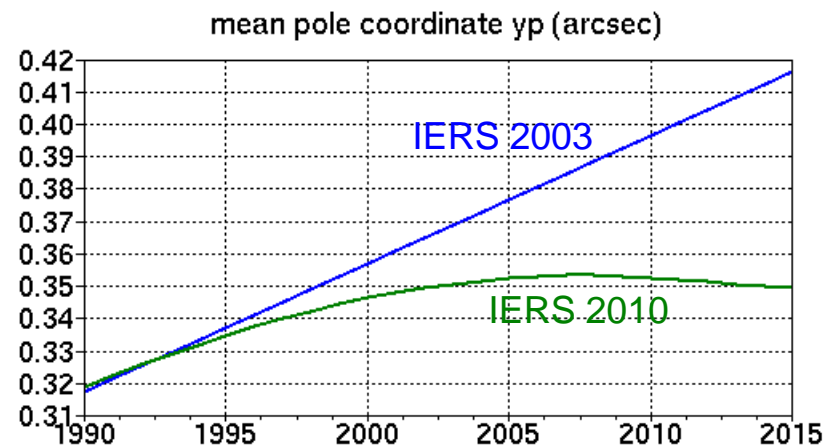
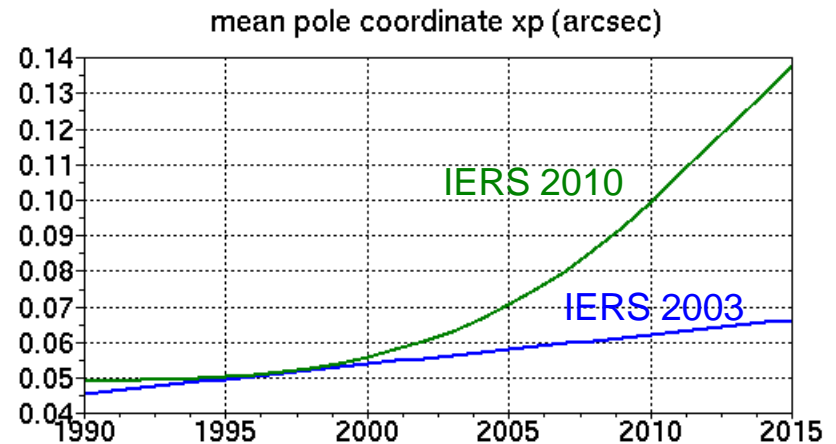
ITRF2008

- Released and tested by various teams in 2010 - the DORIS complement DPOD2008 will include the most recent beacons (P. Willis et al.)
 - ◆ Z-shift (north/south bias) of less than 5 mm on Doris+SLR orbits
 - ◆ Negligible drift with respect to ITRF2005 orbits
 - ◆ Brings DORIS+SLR orbits closer to GPS-only orbits (tied to the independent realization IGS05)



Other updates (having minor impact)

- Several models will be updated in order to comply with the latest IERS 2010 conventions
 - ◆ New mean pole model (pole tide)
 - ◆ GPT/GMF tropospheric correction for Doris measurements
 - ◆ Updates in station displacement due to solid earth tides
 - ◆ Sub-diurnal corrections for polar motion and UT1
 - ◆ IAU2000/2006 precession/nutation
- Atmospheric tide model
 - ◆ Haurwitz/Cowley (1973) model to be updated with Biancale/Bode model (2006)



Orbits reprocessing – Tentative schedule

- End of July :
 - ◆ GDR-D standards are finalized and implemented in CNES POD software
 - ◆ operational orbits remain in GDR-C standards
 - ◆ a GDR-D orbit solution is produced in parallel for all missions
 - ◆ GDR-D reprocessing will start roughly at the same time, priority is given to Jason1, Jason2, Envisat orbits over the period 2007 – 2011, although new standards are applicable to all 5 altimeter missions (J1,EN1,J2,CS2, and HY2A)
- October: results obtained using the available GDR-D orbits are presented at next OSTST - a change towards the GDR-D standards will be proposed to the science community
- Dec. 2011: Operational orbits switch to GDR-D, reprocessed GDR-D orbits are made available , GDR-C standard is abandoned
- End of GDR-D orbit reprocessing (all missions) expected by end of march 2012