CNES POD Reprocessing plans

CNES POD Team

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)

From Couhert et al., OSTST 2010
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