

Topex, Jason-1/2/3 and SARAL GDR Status

**CNES, NASA,
NOAA, EUMETSAT**



OSTST meeting

From all 4 MSEs



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Mission Product Status



- **Jason-1 GDR_E** : 3 years of data available since a couple of week.
- **Jason-2 GDR_D** since March 2013. Jason-3 will use the same standard. No evolutions envisaged before end of JA3 CalVal phase. JA3 will be also available as prototype products (PEACHI)
- **SARAL with GDR-D** (Patch 2) since mid 2013 – new version planned in 2016 TBC (GDR-E) including a full reprocessing of GDR products. Also available as prototype products (PEACHI)



- Sentinel-3 will be available with a standard close to GDR-E, including SAR mode based on SAMOSA retracking
- Cryosat-2 GOP available with a standard close to GDR-E, SAR mode based on SAMOSA retracking will be implemented in 2016. Also available as prototype products (CNES, ...)
- ENVISAT reprocessing planned in 2016, with a standard close to GDR-E
- We stress the importance of a strong collaboration between agencies to define homogeneous products standards





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JA1 GDR Reprocessing Status



- As announced last year, Jason-1 processing Toolbox (no retracking) has been developed by CNES&JPL and implemented to support the reprocessing of all mission data.
- Documentation has been updated accordingly
- 3 years of data has been made available on PODAAC and AVISO servers

Parameter	Description
Format	NetCDF instead of binary. Closely follows Jason-2 products.
Time tag	Difference between time of emitted and received echo.
Orbit	Version E POD standards
Range	+63.9 mm in Ku- and C-band to account for internal path delay.
Radiometer	Re-calibrated data with near-land algorithm applied.
Sea State Bias	Updated for Ku- and C-band (computed from GDR-C data).
Ionosphere	From updated range and sea state bias.
Met. Models.	ECMWF Re-Analysis (ERA) in addition to ECMWF operational. (Dry and wet troposphere, Inverse Barometer, High Frequency Fluctuations, wind speed)
Ocean Tides	Modern FES(2014) and GOT (4.8) models.
Other Models	New for MSS, MDT, Geoid

- **Jason-1 GDR-E products are significant improvement over GDR-C.**
 - Improved SSHA cross-over variance.
 - Improved consistency with Jason-2 GDR-D products.
- **Known issues:**
 - Tide model is based on GOT4.8 for all tidal components, except S2 from GOT4.10.
 - Error in range instrument corrections.
 - Ku-band: Should have been +60.74 mm instead of +63.9 mm.
 - C-band: Should have been -3.16 mm instead of +63.9 mm. (12 mm iono bias).
 - Relative SSH bias with Jason-2 GDR-D should be +33 mm instead of +42 mm.
 - Mostly explained by relative sea state bias of -24 mm.
- **We recommend fixing the above issues, to compute a SSB solution based on GDR-E and to take into account additional PI feedbacks (if any) if provided by mid Nov 2015. The whole mission should be provided with this updated software. J1 project managers have already been tasked for fulfilling the recommendation.**



- Thanks in particular to Ka and SAR modes new data sets, a very large number of proposals could be envisaged for future Jason standard. GDR-E/F could include Either in official data products and/or in a dedicated prototype.
- **Altimeter Instrument processing :**
 - DCore and/or 2 pass retracker
 - Numerical retracking (Peachi JA3) accounting for real antenna aperture
 - Add the new retracking solution which provides continuity over sea-ice (J.C. Poisson)
 - Waveform classification (J.C. Poisson)
 - Accounting for the CNG steps to improve sigma0 and wind stability
 - Accounting for SST impacts on sigma0 values (Ka band)
 - SSB 3 parameters (Peachi SRL and JA3)
 - New SSB table on JA2 (inline with JA1 ..) and updated ionospheric correction (CLS JA1 poster), define the best way to fix the mean of the SSB tables (JPL 'Zero significance' method)
 - Compute the SSB from SWH and sigma0 instead of SWH and wind
 - 1Hz averaging (which degrades the data quality - W. Smith)
 - Filtering, editing including rain flag.



- **Radiometer Instrument processing :**
 - Fix the anomaly on the AMR land flag
- **POD:**
 - Just follow the improvements
 - And provide tools to update past products with new POE standards



- **Geophysical correction :**

- New tides solutions (FES2014 – GOT v4.10xx)
- New MSS (DTU15 and CNES&CLS_2015)
- New geoid model (same as JA1)
- Distance to the coast (or work on the surface flag)
- Add the DAC in OGDR products
- Compute the wet and dry wet tropo correction from 3D fields (for inland water and ice).
- New pole tide solution (S. DeSai and co) – also to be applied on Jason-1 GDR-E ?
- Add one Internal tide model ?



- **Geophysical correction :**

- New correction to account for loading effects over inland waters ?

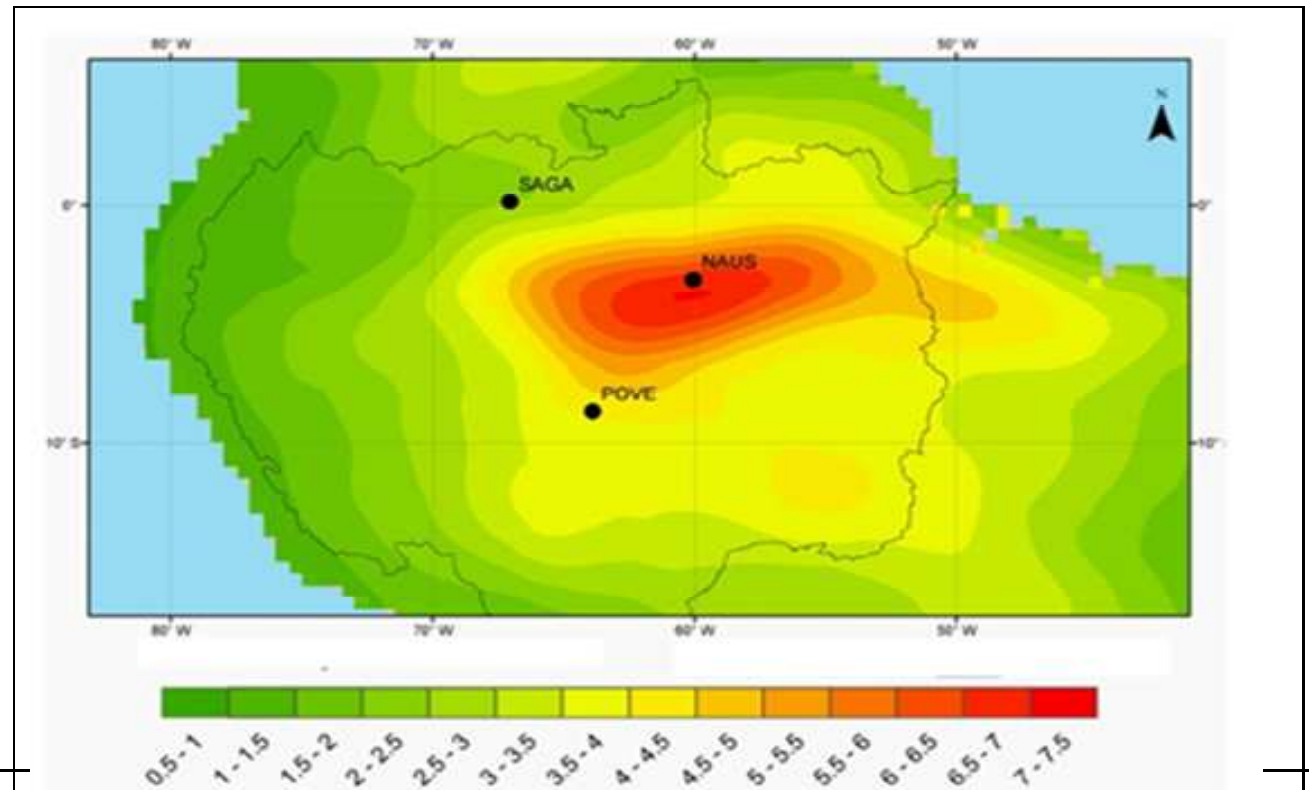


Figure 15: Amplitude moyenne de la déflexion crustale dans le bassin Amazonien induite par la charge hydrologique (cm)



- Proposes evolutions summarized below :

Category	Algorithms available	PEACHI Prototype / SARAL 'GDR-E'
Altimeter processing	Antenna Gain Pattern	PEACHI / SARAL 'GDR-E'
	DCORE retracker	PEACHI
Wind speed	2D wind speed	PEACHI / SARAL 'GDR-E'
Sea State Bias	2D Sea State Bias	PEACHI / SARAL 'GDR-E'
	3D Sea State Bias	PEACHI
Continental Ice	Snow Classification	PEACHI / SARAL 'GDR-E'
Sea Ice	Sea Ice Flag	PEACHI / SARAL 'GDR-E'
	Radar freeboard estimation	PEACHI
Radiometer algorithms	Updated Wet Tropospheric Correction	PEACHI / SARAL 'GDR-E'
Tide Models	FES2014	PEACHI / SARAL 'GDR-E'

- Mis Pointing values derived from platform STRs
- Artic Tide solution developed by Nolvétis and co
- 3D wet and dry tropospheric corrections