GDR Status

CNES, NASA,
NOAA, EUMETSAT

OSTST meeting

From all 4 MSEs

GDR Status

- **Jason-1 GDR_C since 2006, no new reprocessing planned. We shall at least deliver POE GDR_D to all users**
- **ESA is working on the reprocessing of ENVISAT and on the ERS1&2 in a standard closed to JA1&2 GDR_C**

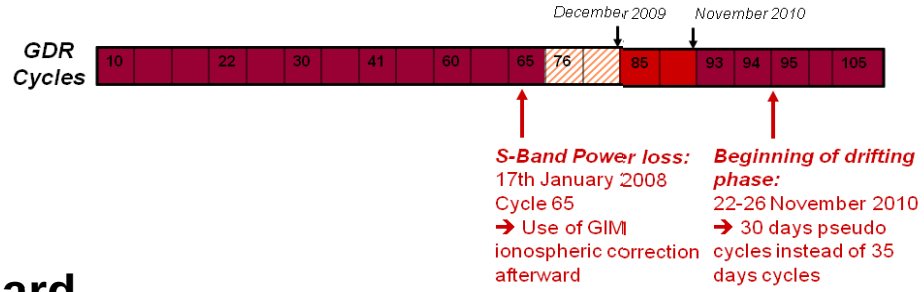
  - ✓ ~70% of the reprocessing have been performed
  - ✓ All GDR, SGDR data + Cyclic reports available at:

    ftp://diss-nas-fp.eo.esa.int

    directory : altimetry_dataset_v2.1

2 cycles validated per week
End expected early 2012

Envisat GDR V2.1 reprocessed dataset



- **SARAL/Altika will use GDR_D standard**
- **CryoSat data products can be processed in the same GDR_D standard and several groups have proved the high quality of the data**

Jason-2 GDR_D

- **The Jason-2 GDR_D standard has been implemented just before summer. Most of the delay is related to additional analysis on MLE3 sigma0 behaviors and definition of the product contents.**
- **In addition to the GDR_C evolutions we have also included:**
  - Absolute bias correction
  - Datation bias correction
  - Use of GOT 4.8 version instead of GOT 4.7
  - A new atmospheric correction algorithm provided by JPL
  - The MLE3 key parameters have been included in both GDRs and SGDRs datasets, following what has been implemented for MLE4
  - New LUT (altimeter instrumental corrections tables) have been generated and delivered after an anomaly discovered in the generation software, even if the impact was very small.
  - SSB tables were computed on a dedicated mockup during summer to anticipate the JA2 GDR_D products as much as possible
  - Cycles 1-8 were processed mid September for a first assessment of the software by 4 project partners.

Jason-2 GDR_D

- **Evolution on the product spec:**

S-GDR	GDR	SSHA
agc_20hz_c		
agc_20hz_ku		
agc_corr_20hz_c		
agc_corr_20hz_ku		
amplitude_20hz_ku_mle3		
epoch_20hz_ku_mle3		
		ice_flag
iono_corr_alt_ku_mle3	iono_corr_alt_ku_mle3	iono_corr_alt_ku_mle3
modeled_instr_corr_range_ku_mle3		
modeled_instr_corr_sig0_ku_mle3		
modeled_instr_corr_swh_ku_mle3		
mqe_20hz_ku_mle3	mqe_20hz_ku_mle3	
net_instr_corr_range_ku_mle3	net_instr_corr_range_ku_mle3	
net_instr_corr_sig0_ku_mle3	net_instr_corr_sig0_ku_mle3	
net_instr_corr_swh_ku_mle3	net_instr_corr_swh_ku_mle3	
number_of_iterations_ku_mle3	number_of_iterations_ku_mle3	
qual_alt_1hz_range_ku_mle3	qual_alt_1hz_range_ku_mle3	
qual_alt_1hz_sig0_ku_mle3	qual_alt_1hz_sig0_ku_mle3	
qual_alt_1hz_swh_ku_mle3	qual_alt_1hz_swh_ku_mle3	
qual_inst_corr_1hz_range_ku_mle3	qual_inst_corr_1hz_range_ku_mle3	
qual_inst_corr_1hz_sig0_ku_mle3	qual_inst_corr_1hz_sig0_ku_mle3	
qual_inst_corr_1hz_swh_ku_mle3	qual_inst_corr_1hz_swh_ku_mle3	

Jason-2 GDR_D

- **Evolution on the product spec:**

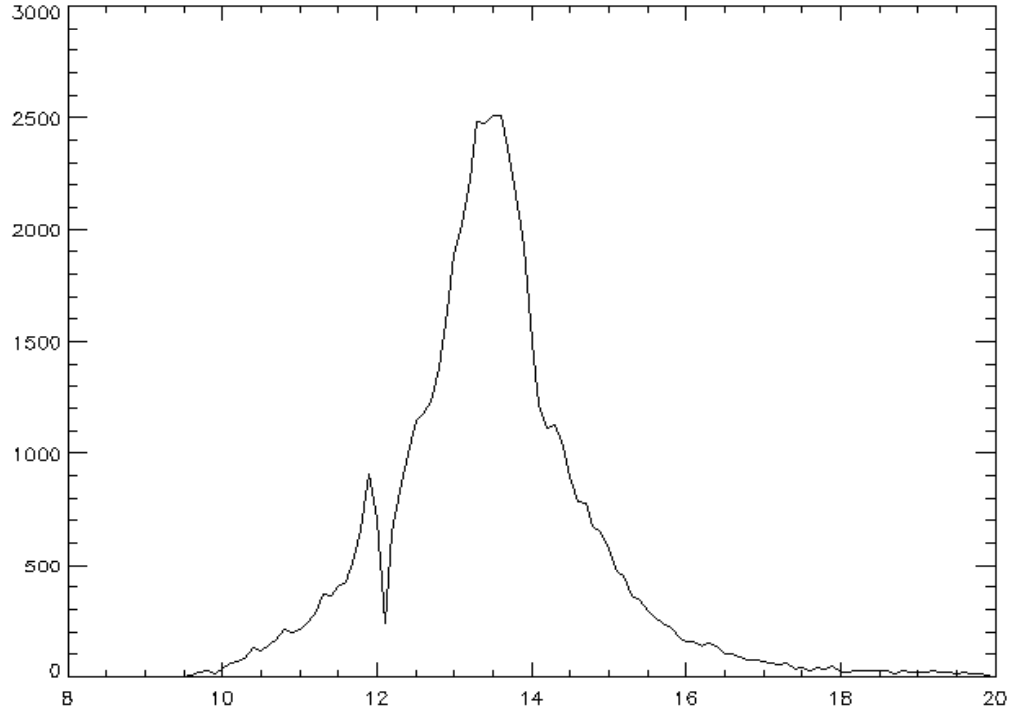
rad_averaging_flag	rad_averaging_flag	
rad_distance_to_land	rad_distance_to_land	
rad_land_frac_187	rad_land_frac_187	
rad_land_frac_238	rad_land_frac_238	
rad_land_frac_340	rad_land_frac_340	
rad_rain_flag	rad_rain_flag	rad_rain_flag
rad_sea_ice_flag	rad_sea_ice_flag	rad_sea_ice_flag
range_20hz_ku_mle3	range_20hz_ku_mle3	
range_ku_mle3	range_ku_mle3	range_ku_mle3
range_numval_ku_mle3	range_numval_ku_mle3	
range_rms_ku_mle3	range_rms_ku_mle3	
range_used_20hz_ku_mle3	range_used_20hz_ku_mle3	
sea_state_bias_ku_mle3	sea_state_bias_ku_mle3	sea_state_bias_ku_mle3
sig0_20hz_ku_mle3	sig0_20hz_ku_mle3	
sig0_ku_mle3	sig0_ku_mle3	sig0_ku_mle3
sig0_numval_ku_mle3	sig0_numval_ku_mle3	
sig0_rms_ku_mle3	sig0_rms_ku_mle3	
sig0_used_20hz_ku_mle3	sig0_used_20hz_ku_mle3	
ssha_mle3	ssha_mle3	ssha_mle3
		surface_type
swh_20hz_ku_mle3	swh_20hz_ku_mle3	
swh_ku_mle3	swh_ku_mle3	swh_ku_mle3
swh_numval_ku_mle3	swh_numval_ku_mle3	
swh_rms_ku_mle3	swh_rms_ku_mle3	
swh_used_20hz_ku_mle3	swh_used_20hz_ku_mle3	

- **Evolution on the product spec:**

ta_187		
ta_238		
ta_340		
tb_187_smoothed	tb_187_smoothed	
tb_238_smoothed	tb_238_smoothed	
tb_340_smoothed	tb_340_smoothed	
width_leading_edge_20hz_ku_mle3		
wind_speed_alt_mle3	wind_speed_alt_mle3	wind_speed_alt_mle3

Jason-2 GDR_D : SSB

- **Conclusion from the OSTST SSB tiger group: during its analysis the group noticed a weird behavior of the MLE3 sigma0. He has so recommended:**
  - GDR-C continue to use the Jason-2 wind speed (with appropriate biases) and SSB products developed using the MLE4 Ku-band sigma0 data. This will maintain heritage with Jason-2 to date and with Jason-1 for the time being.
  - Add all MLE3 parameters (including wind and SSB correction) in the GDR products



Jason-2 absolute bias

- **Using in-situ calibration sites and the 2 Topex/JA1 and JA1/JA2 tandem phases the JA2 absolute bias value is of the order of 19 cms :**
  - **19.5 mm** for the **in-situ sites**
  - **186 mm** for the **Topex/Jason2 relative bias**

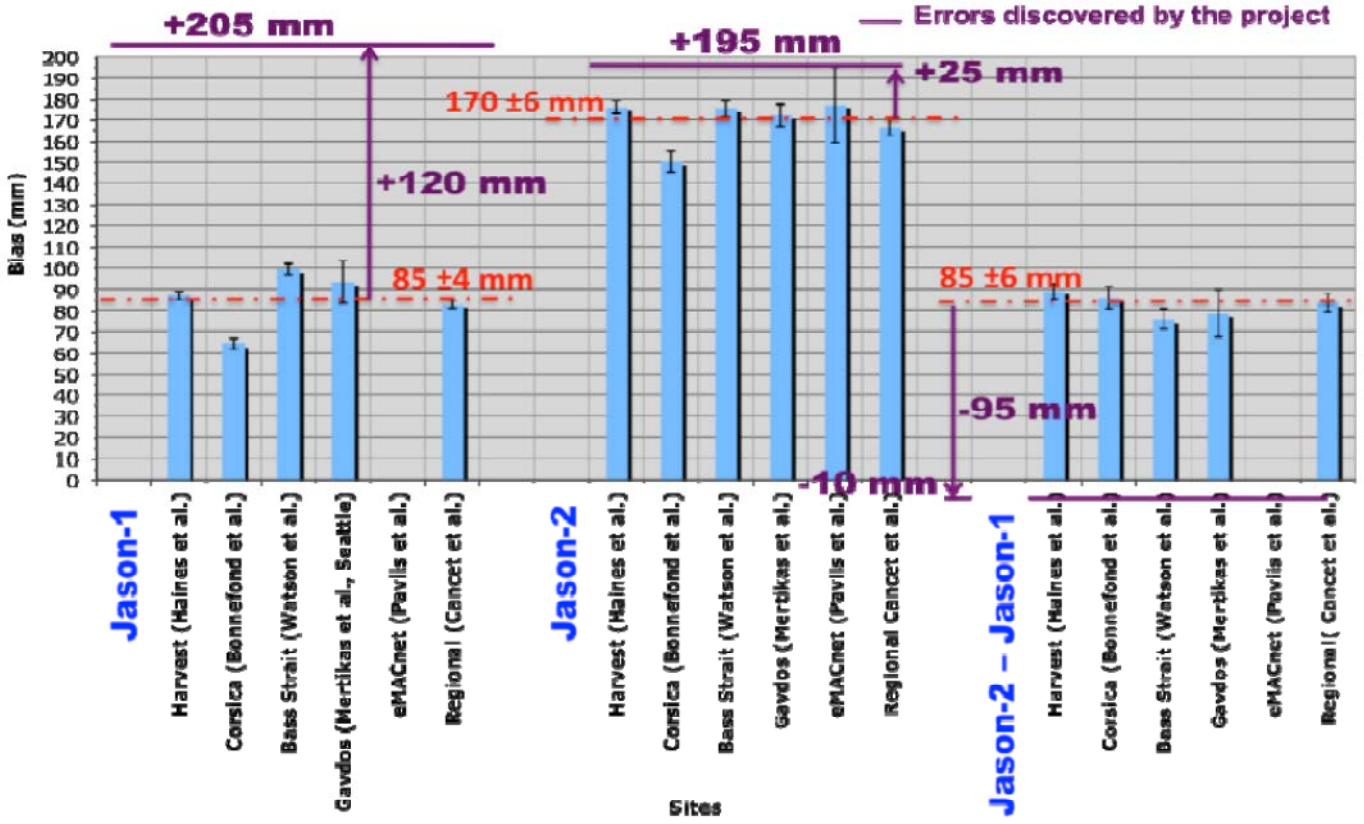
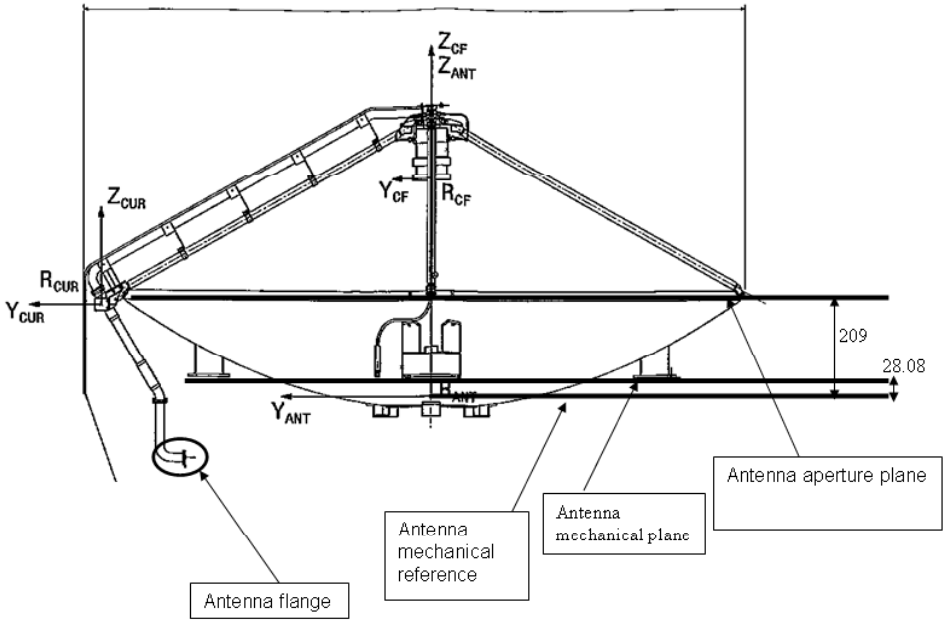


Figure 9.1.11. Absolute bias values for Jason-1 and Jason-2 from the different calibration sites. Red lines and associated numbers correspond to the average of all individual sites values. Purple lines and associated numbers correspond to the absolute biases if corrected from the error recently discovered by the project.

Jason-2 absolute bias

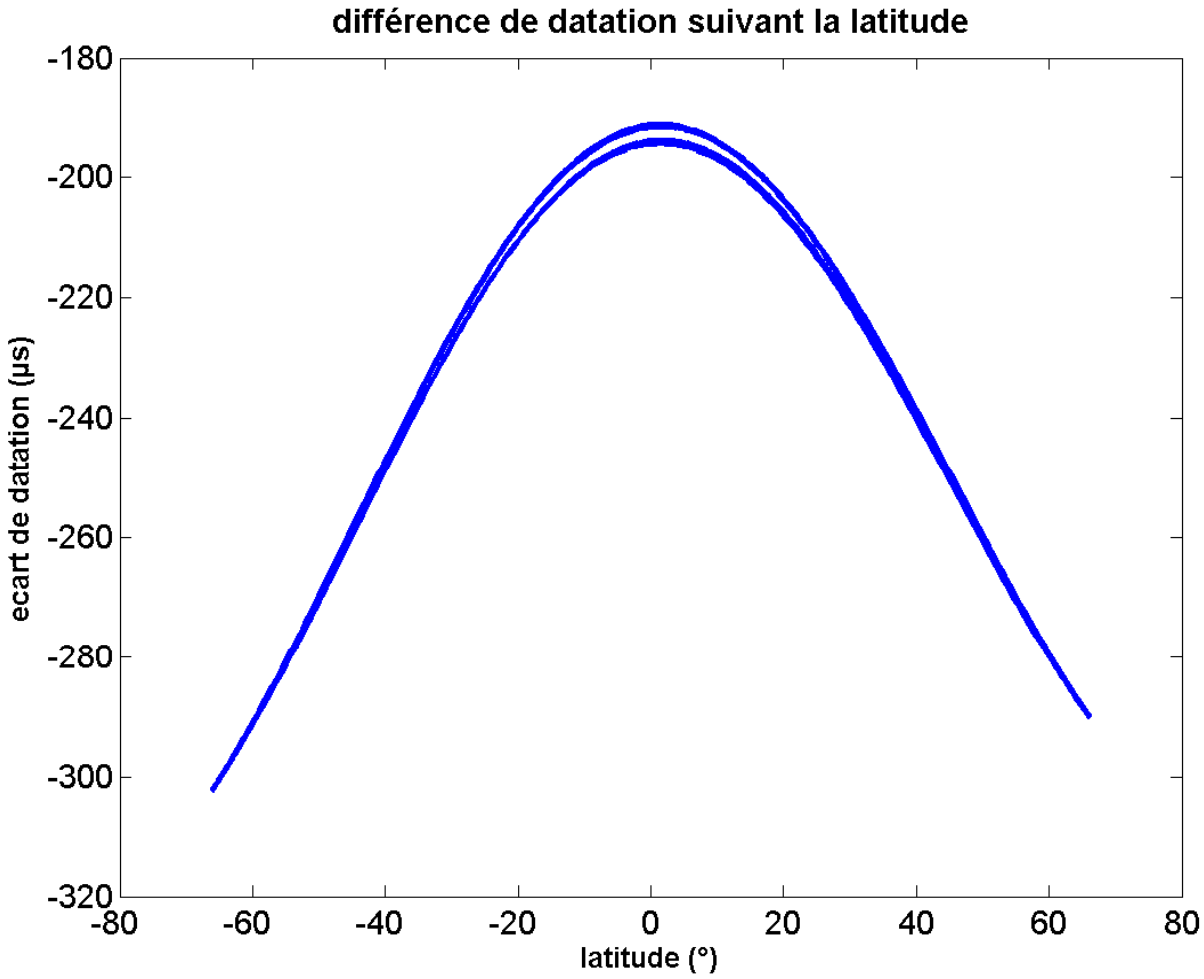
- **An anomaly was discovered end 2011 by CNES in the ground characterisation files :**
  - the altimeter internal path delay was determined by THALES ALENIA SPACE as part of the Poseidon-3 development contract managed by CNES. The reference plane corresponding to the **antenna aperture plane** was used to perform this determination.
  - However, the reference pla **plane** was used as the refe determination. On the nadi

209-28.08 mm=**180.92 mm.**



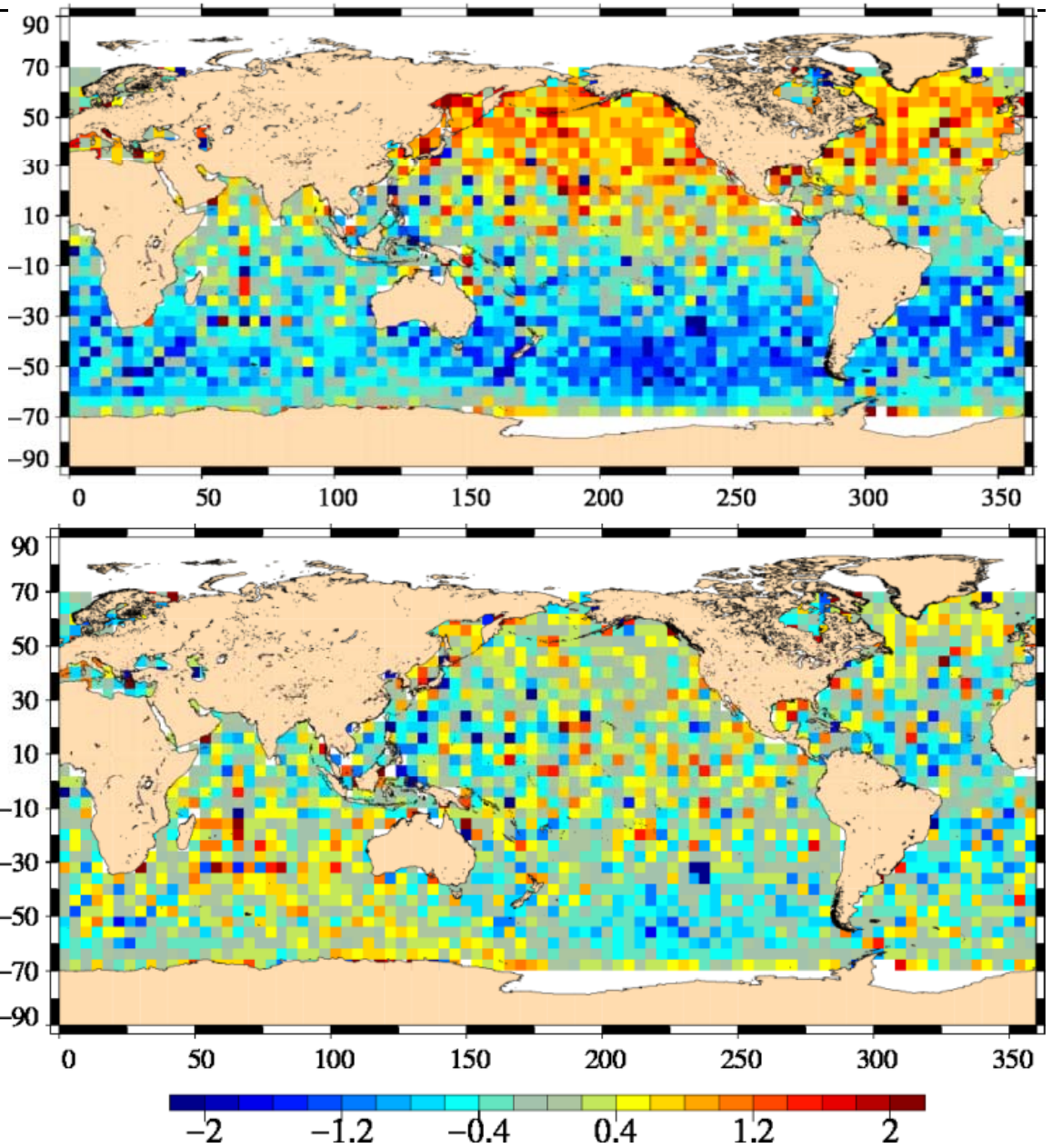
Jason-2 datation bias

- **An anomaly was discovered end 2011 by CNES in the ground processing software. This explain the ~ 250 micros seconds datation bias.**
  - in the telemetry emitted echo an
  - This is obvious l a few words : th receive the pow repetition interv information with interval. This tim compensate **mc**

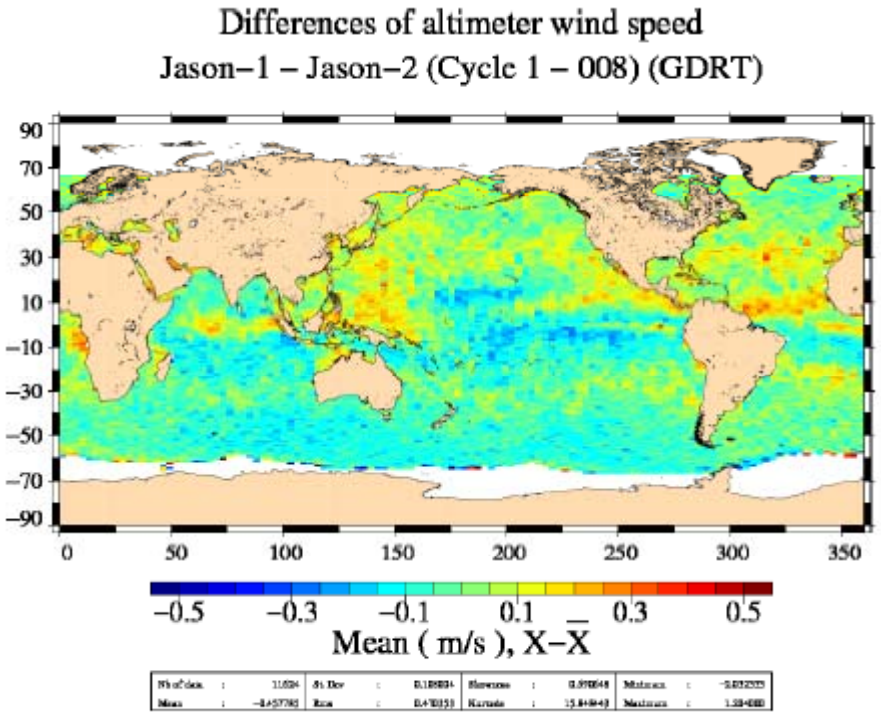


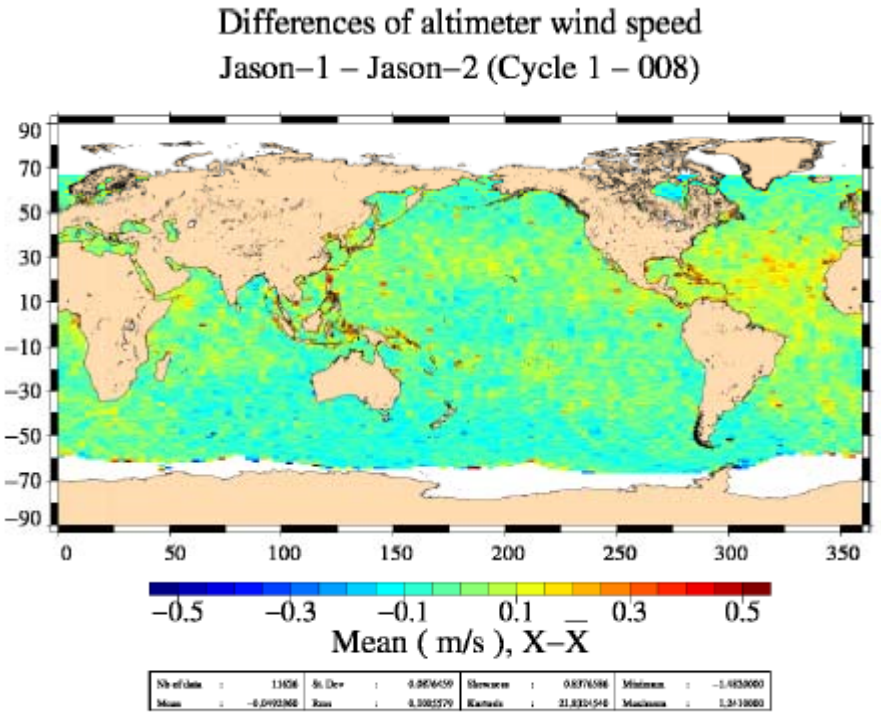
Jason-2 datation bias

- **Impact on the SSHA:**

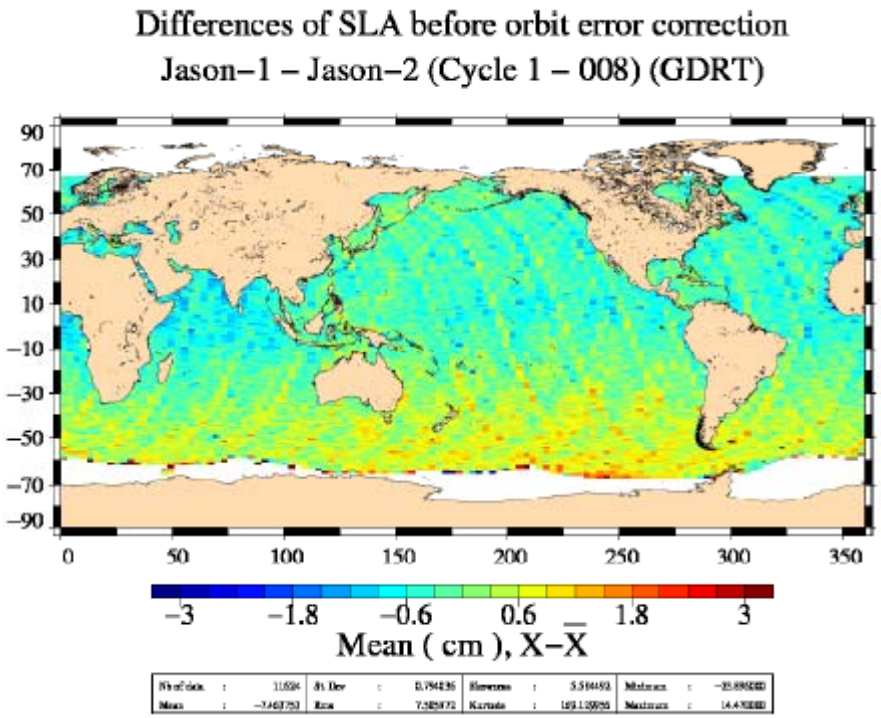


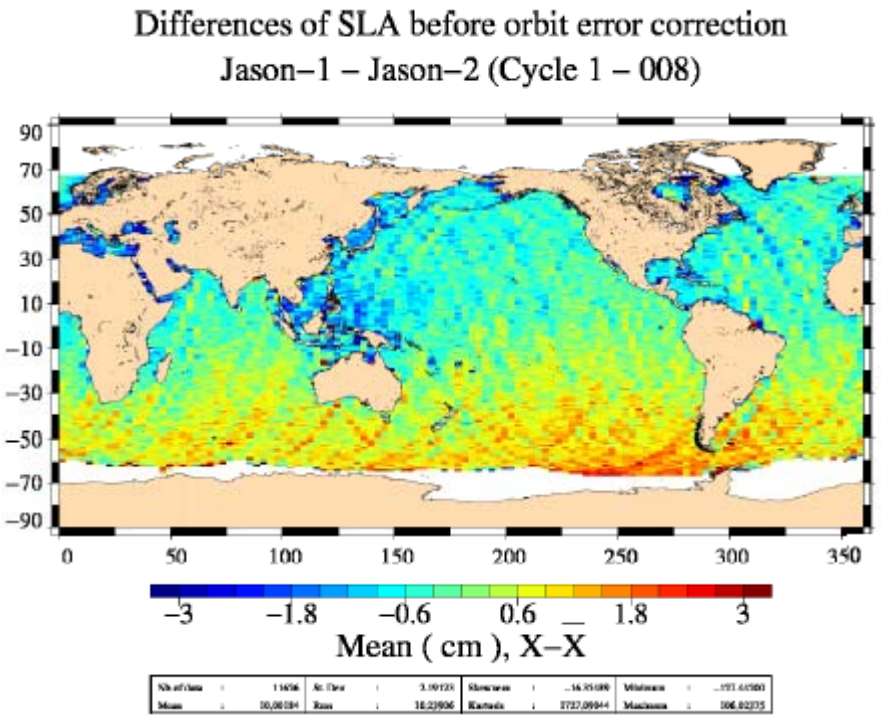
- **Wind differences:**





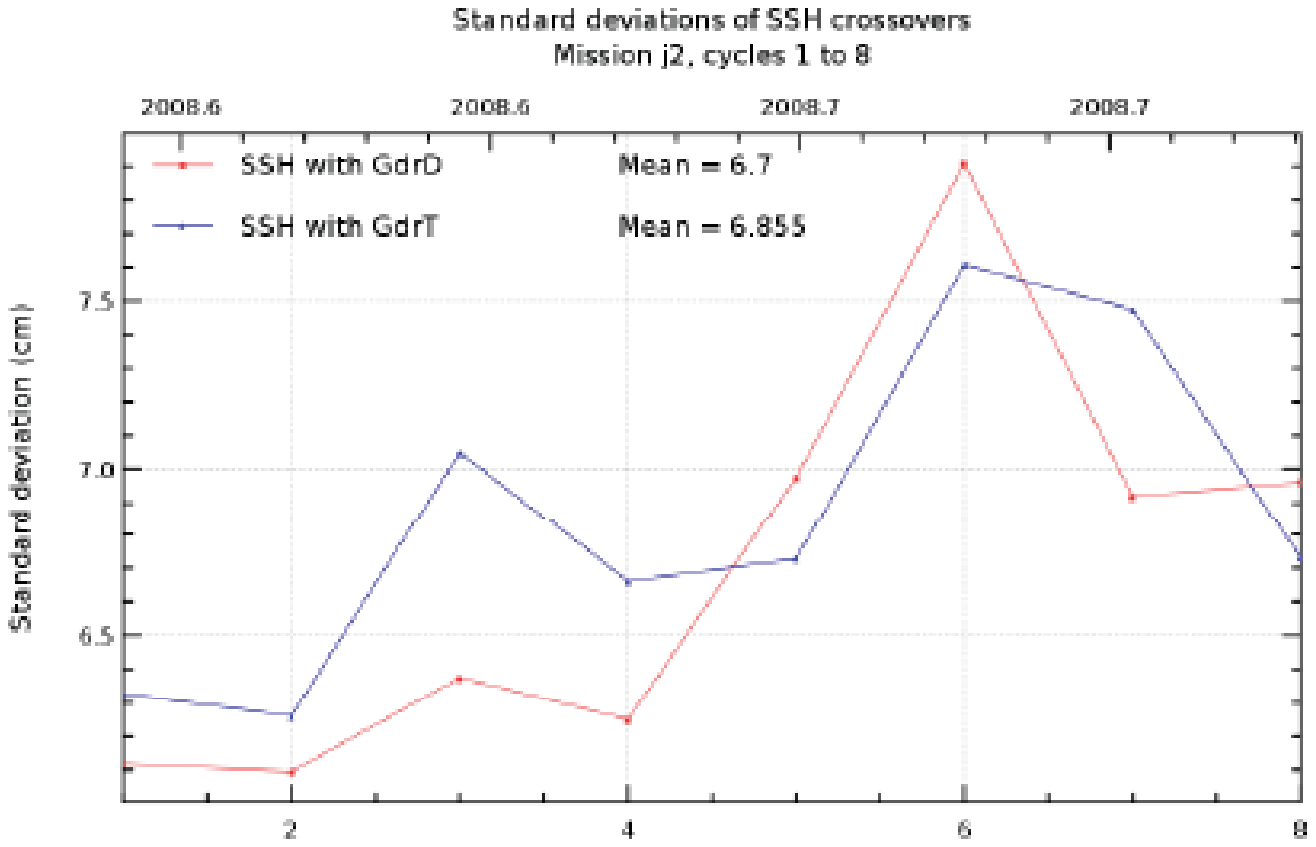
- **SLA differences:**





JA2 GDR_D results

- **Quality metrics**



Conclusion

- **All GDR_D evolutions have been implemented and validated thanks to the processing of 8 cycles on the ops configuration.**
- **Major improvements are included in this version including:**
  - AMR new algorithms and new characterization file
  - Correction of the Absolute bias and Datation bias issues
  - Additional MLE3 retracking added
  - We really need to put this in operations as soon as possible.
- **Remains to be done**
  - Compute more precisely the relative sigma0 bias between JA1 and JA2 to compute the wind table and rain flag tables
  - Account for the POE GDR_D orbits
  - Assess the slight dependency between JA1 and JA2 SLA for low winds/waves states
- **Tentative schedule**
  - Implement the above proposed additional evolutions and start the processing early 2012.
  - Processing to be started with the JA1/JA2 tandem phase in order to derive relative bias estimates between both missions. This relative bias shall be widely published by all projects communication means (several users complain about the lack of available information on that topic).

Differences between JA1(Pos2) and JA2 (Pos3) range measurement

- **CalVal difference for Ku Band : 8.3 cm during tandem phase – same figure obtained by insitu sites**
- **2 major origins**
  - A wrong altimeter PRF is today used in ground segment (Truncate effect) **on both missions**
  - A wrong altimeter internal path delay value is used **on JA1** (derived from ground measurement)

Parameter	JASON1	JASON2	JAS-1/JAS-2 Difference
PRF truncate effect	-0.316 cm	-2.471 cm	-2.156 cm
Alti correction for Ku band	4.151466 m	4.268487142 m	11.70211423 cm

  - **Total difference for Ku band : 9.5 cm**
  - Remaining Difference in Ku Band ~ 1.2 cm
- **Conclusion :**
  - Poseidon2 and Poseidon3 are very close in term of hardware, the difference of range between JASON1 and JASON2 is artificial and explained ---->

Remaining difference in Ku band : ~ 1cm

  - Investigations are still in progress to explain:
    - The difference between Jason1/2 and Topex
    - To check the C band configuration values
  - **No artificial bias will be applied to align JA2 ionospheric correction to JA1**