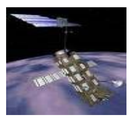


Envisat / Jason-1 /Jason-2 cross calibration

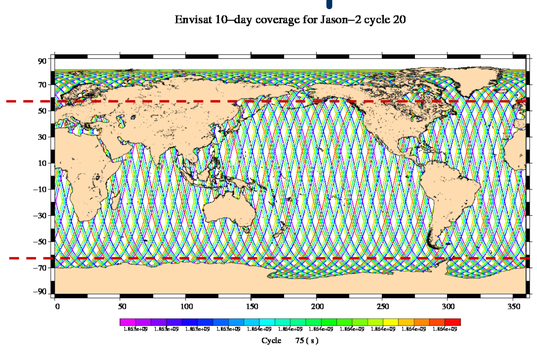
A. Ollivier, Y. Faugère, S.Philipps – **CLS**
N. Picot, E. Bronner - **CNES**
P. Féménias – **ESA.**

SSH formula used for these results

SSH_Common = Orbit –Range – ECMWF Dry Tropo (Gaussian grids) – MOG2D High Frequency – MAR_GOT00 tide – Solid tide – Polar tide-SSB

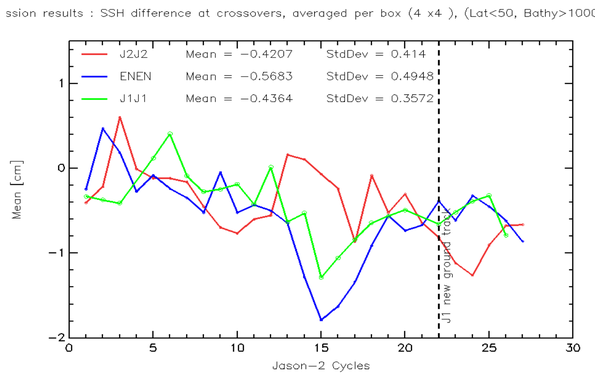
SSH_J2 = SSH_Common – AMR Wet Tropo - Filtered Bifrequency Ionospheric correction
SSH_J1 = SSH_Common – JMR Wet Tropo- Filtered Bifrequency Ionospheric correction
SSH_EN =SSH_Common – USO correction - MWR Wet Tropo- GIM Ionospheric correction

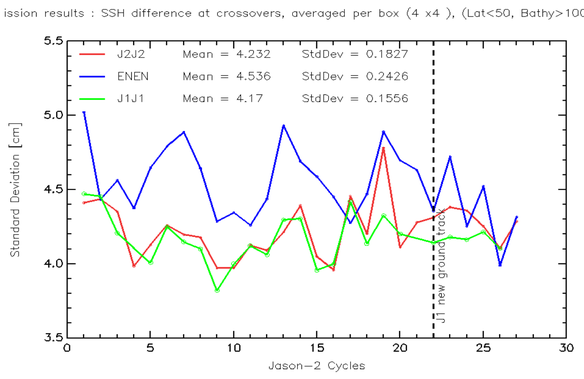
Method: small precautions for a 10 day sampling for Envisat



- Statistics are computed on a J2 cyclic basis (10 days)
- An average per boxes is performed, prior to the statistics in order to allow us to have homogeneous sampling of the ocean for the 3 satellites (statistics slighly different from the J1/J2 presentation).

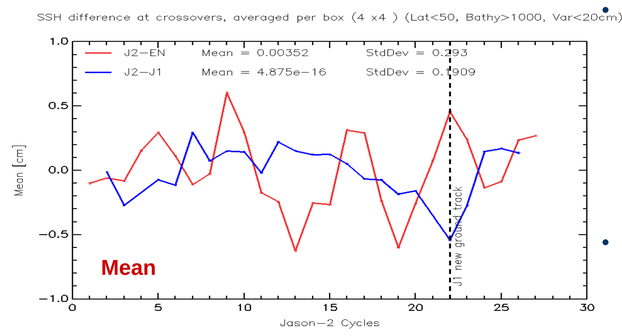
Good performances of the three missions

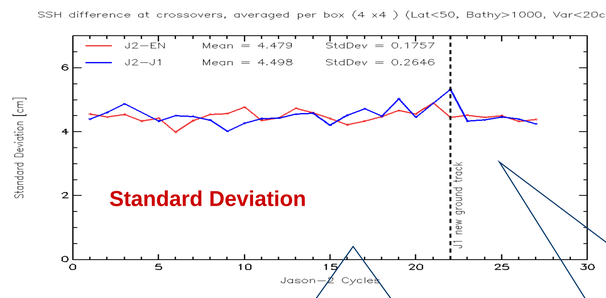




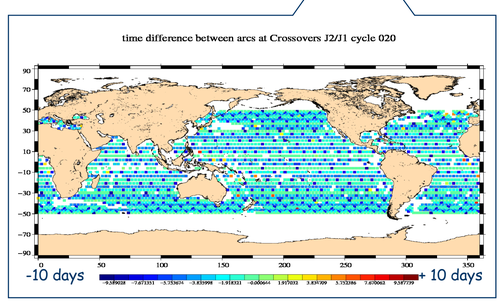
- Average (left) and Standard deviation (right) of monomission SSH crossover difference cycle per cycle (GDR) show:
  - ➔Slightly better performances for Jason-2 (4.2cm), Jason-1 (4.7cm) and Envisat (5cm).
  - ➔Good consistency for the three missions

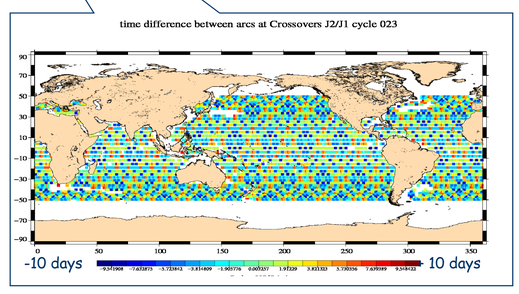
Envisat even more relevant for Jason-2 calibration since Jason-1 orbit change





- Average at crossover of dual SSH crossover difference cycle per cycle shows:
  - ➔ Good agreement of the three missions
- Standard deviation of dual SSH crossover difference cycle per cycle shows:
  - ➔ Comparison Jason-2/ Envisat are as consistent as Jason-2/ Jason-1 even though both missions are different in terms of orbit and instruments!





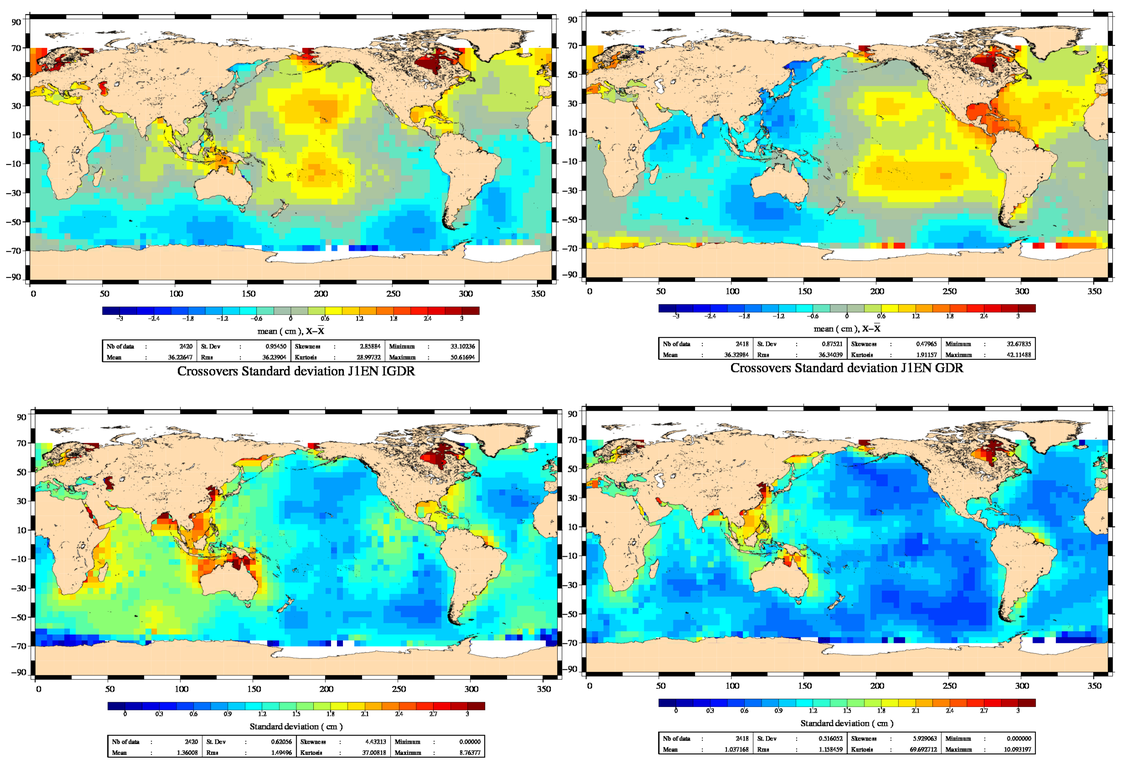
Delta time between two tracks taken into account for the cross-over analysis.
Left: during tandem period, cross-overs are temporaly close.
Right: afterwards, the time delay between two tracks are more largely spread out between – and + 10days

Geographically correlated difference: a good consistency

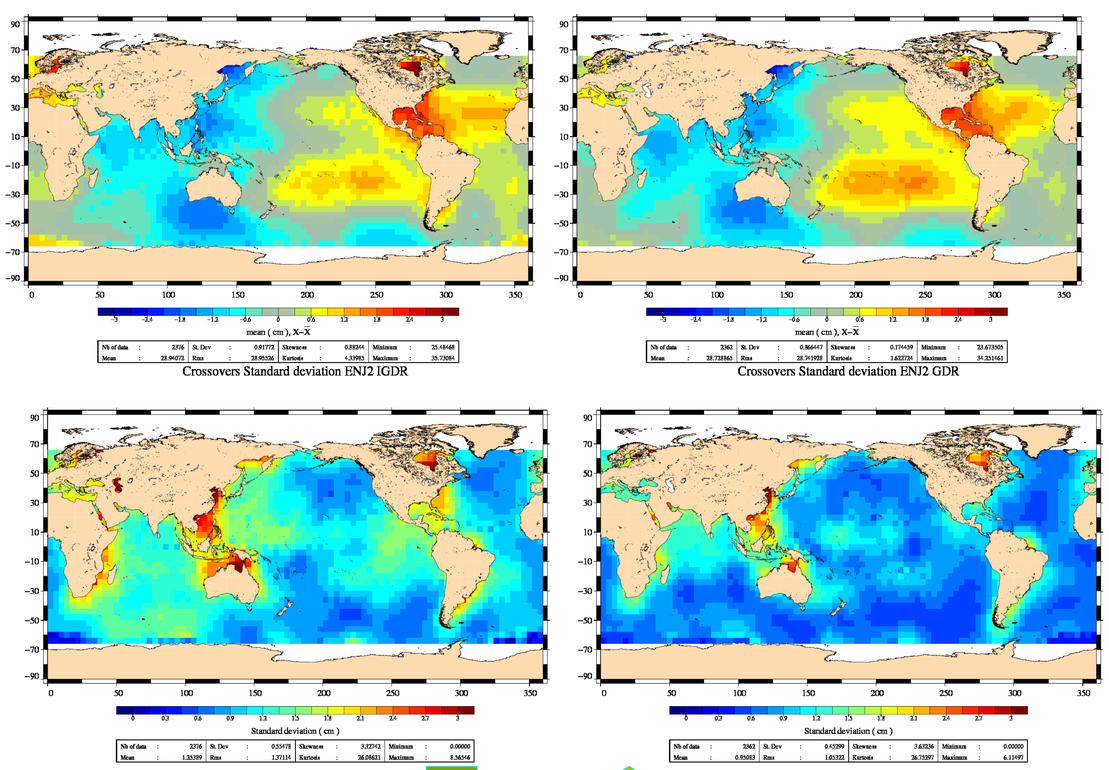
TOP: Average per boxe (4°x4°) of difference at cross-overs and smoothed 11x11 boxes over the 22 first Jason-2 cycles.

BOTTOM: Standard deviation of the average per boxe (4°x4°) of difference at cross-overs and smoothed 11x11 boxes.

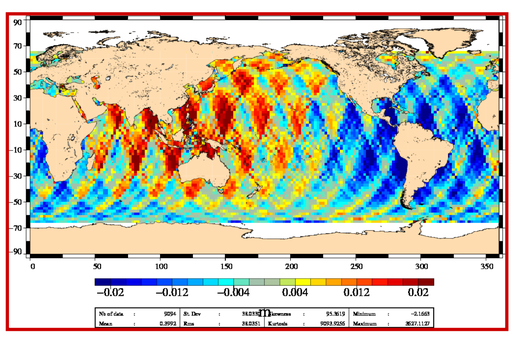
Near Real Time IGDR J1 / EN Delayed Time GDR



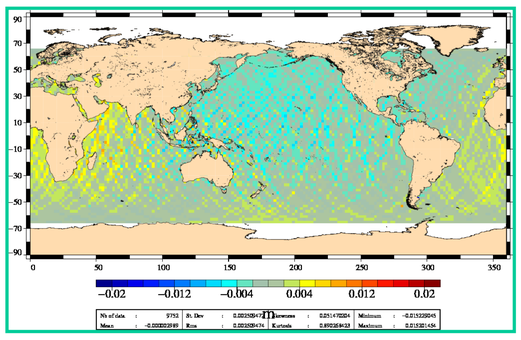
Near Real Time IGDR J2 / EN Delayed Time GDR



J1 POE – MOE over 220 days



J2 POE – MOE over 220 days



Strong improvement of the orbit POE used for GDR mainly due to J1 MOE->POE difference :
➔TOP: Geographical bias changed mostly due to J1 MOE (see POE-MOE difference on the figure opposite). This difference is reduced for recent cycles thanks to the SAA better taken into account (see J2 orbit quality poster and presentation, A.Ollivier et al.)
➔BOTTOM: Very good time consistency on J1/EN correlation between missions in GDR.

Very good correlation between J2/EN missions and even more concerning GDR products. The improvement is partly due to J2 POE orbit showing a better time stability than MOE.
➔TOP: East West Bias observed in both cases
➔BOTTOM: Slight improvement of the time consistency on J2/EN correlation between missions in GDR.

Further investigations concerning the remaining differences are detailled in Y.Faugere et al. poster

Concerning Envisat, the MOE and POE are very similar and only few impact is noticed between both orbits. Further information on the orbits can be seen on A.Ollivier et al. poster and presentation.

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OSTST meeting

Seattle, June 2009

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