Envisat / Jason-1 / Jason-2 cross calibration

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

Good performances of the three missions

- 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 slightly different from the J1/J2 presentation).

Geographically correlated difference: a good consistency

TOP: Average per box (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 box (4°x4°) of difference at cross-overs and smoothed 11x11 boxes.

SSH formula used for these results

\[
\text{SSH}_\text{Common} = \text{Orbit} - \text{Range} - \text{ECMWF Dry Tropo} \text{ (Gaussian grids)} - \text{MOG2D High Frequency} - \text{MAR\_GOT00 tide} - \text{Solid tide} - \text{Polar tide} - \text{SSB}
\]

\[
\text{SSH}_\text{J2} = \text{SSH}_\text{Common} - \text{AMR Wet Tropo} - \text{Filtered Bifrequency Ionospheric correction}
\]

\[
\text{SSH}_\text{J1} = \text{SSH}_\text{Common} - \text{JMR Wet Tropo} - \text{Filtered Bifrequency Ionospheric correction}
\]

\[
\text{SSH}_\text{EN} = \text{SSH}_\text{Common} - \text{USO correction} - \text{MWR Wet Tropo} - \text{GIM Ionospheric correction}
\]

Geographically correlated difference: a good consistency

- 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

Method: small precautions for a 10 day sampling for Envisat

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