(1) SSALTO/CALVAL Jason-1 Performance assessment
Jason-1 / TOPEX/Poseidon cross-calibration

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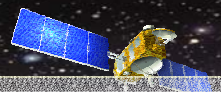


OBJECTIVES

Quality assessment of Jason-1 data.

Long-term monitoring of altimeter / radiometer parameters and geophysical corrections.

Assessment of algorithm performances and improvements.

Cross-calibration of Jason-1, TOPEX/Poseidon, ENVISAT measurements.

TOOLS

Missing measurements, data coverage.

Data editing.

Crossover analysis (performances evaluation, SSB, time tag bias, orbit error).

Repeat-track analysis, Statistical monitoring (biases and drifts determination).

Spectral analysis, ocean signals evaluation.

Most of these tools are routinely processed in the SSALTO/CMA Verification steps

ROUTINE PROCESSING

SSALTO/CALVAL activities and studies are routinely performed to assess the Jason-1 data quality (GDR data during the verification phase and GDR after).

Quality assessment reports are produced on a one cycle basis and associated to the IGDR/GDR dissemination.

Since the Jason-1 launch, SSALTO/CALVAL processing has been extensively used to carefully check the data and 26 cyclic reports have been produced on consolidated data.

IGDR Update

In order to compare the Jason-1 and TOPEX performances and to perform the cross-calibration between the two types of data, both IGDRs have been updated as follows:

T/P IGDR updates:

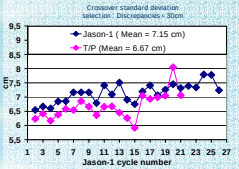
* CNES MOE orbit
* Jason-1 geophysical corrections (Got99 tide, Inverse Barometer, polar tide)
* TOPEX non-parametric SSB (Gaspar et al.). New Alt-B model also tested.
* 15 mm added to TOPEX range, –15 mm added to Poseidon range (idem GDR-M)
* Wallops TOPEX Range calibration

Jason-1 IGDR updates:

* First non-parametric Jason-1 SSB (Labroue 2002)
* Ku Sigma0 corrected for the right atmospheric effect

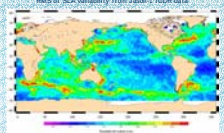
Jason-1 Performance Assessment

Crossover analysis



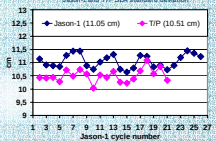
Jason-1 crossover variance at crossovers (DT<10 days) seems comparable to that of TOPEX (same period). However, higher values are found for Jason-1. Some Jason-1 geophysical corrections are not yet perfectly tuned (ionosphere, SSB). In addition, atmospheric corrections are based on predicted meteorological fields for Jason-1 IGDRs (analyzed for T/P). But the MOE Jason-1 orbit quality may contribute for the major part of the difference between Jason-1 and T/P (see dedicated section on poster (2)).

Repeat-track analysis



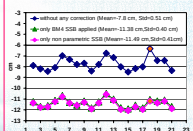
The Jason-1 SLA variability map has been computed over more than 8 months of data. It shows good Jason-1 performances for ocean studies.

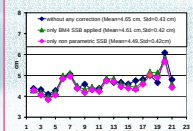
The cycle by cycle SLA standard deviation exhibits 60-day variations for both Jason-1 and T/P, probably linked to the MOE orbit calculation.



Jason-1 / TOPEX Cross-calibration

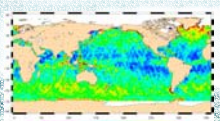
SSH cross-calibration





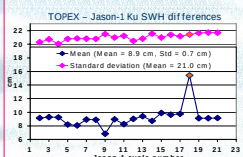
(T/P – Jason-1) SSH differences averaged over each cycle exhibit large variations with a 60-day cycle. These variations are mainly due to Jason-1 interim orbit (see poster 2).

DORIS USO drifts have been detected, particularly in the South Atlantic Anomaly, due to radiations. The impact on the orbit precision seems higher for Jason-1 than for TOPEX.

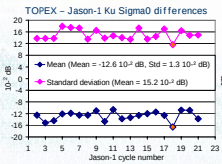


Standard deviation of (T/P – Jason-1) SSH differences

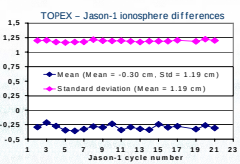
SWH



Sigma0

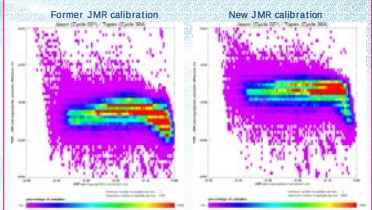


Ionosphere correction



SWH, Sigma0 and ionosphere correction from Jason-1 and TOPEX seem consistent, based on cycle mean differences (all Jason-1 IGDRs have now been produced with the same ground processing version). However, slight variations are observed along-track and are analyzed more specifically on poster (2).

JMR / TMR comparisons



TMR –JMR :
Mean = - 6.4 mm
Std = 8.4 mm

TMR –JMR :
Mean = 6.7 mm
(~0 with TMR drift correction)
Std = 1.9 mm

New calibration coefficients have been applied to the JMR (Ruf, 2002). Compared to the initial processing (left chart), the Jason-1 wet troposphere correction now better fits the TMR one (right chart). The (TMR-JMR) is now very close to zero.

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Jason-1 Science Working Team Meeting

New Orleans, October 2002

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