Global Jason-2 Data Quality Assessment

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Overview

- More than 6 years of Jason-2 measurements are now available

- Validation activities have been performing for (O)(I)GDR products on **CNES and JPL** to check and evaluate the quality of Jason-2 measurements

- Objectives of altimetry validation activities over ocean are :
  - To check the data availability and validity
  - To analyze the physical content quality of product parameters
  - To estimate the system performances in terms of sea level calculation
  - To contribute to a better knowledge of the sea-level physical content
  - To check and contribute to the system improvement
  - To provide information for users and production centre

- This talk aims at presenting the status of the Jason-2 sea-level performances

Data availability

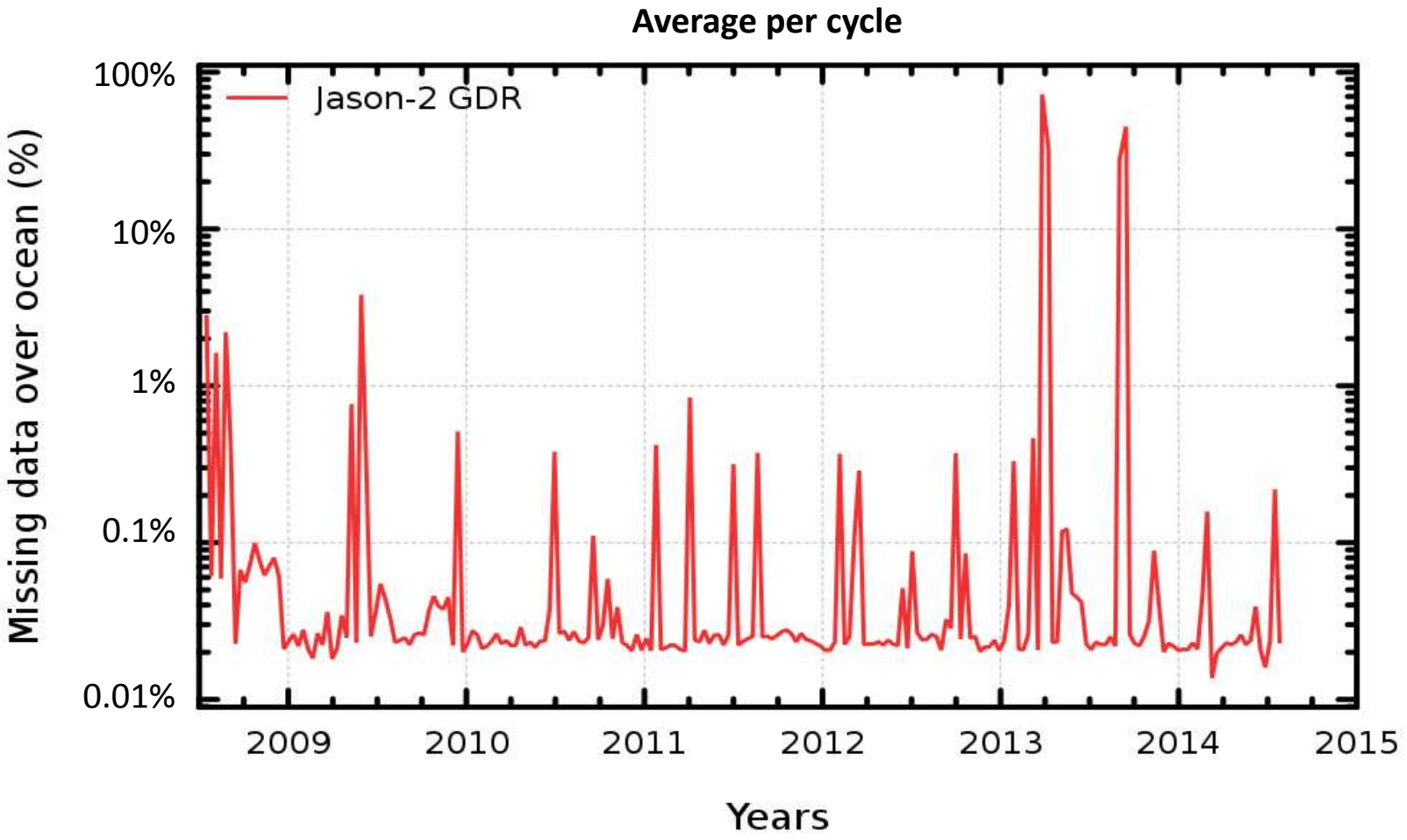
- Very good data availability over ocean : **99.1 % calibrations and incidents included**
- After removing calibrations and incidents : **99.93 % data are available over ocean**

Safe Hold Mode

Calibrations

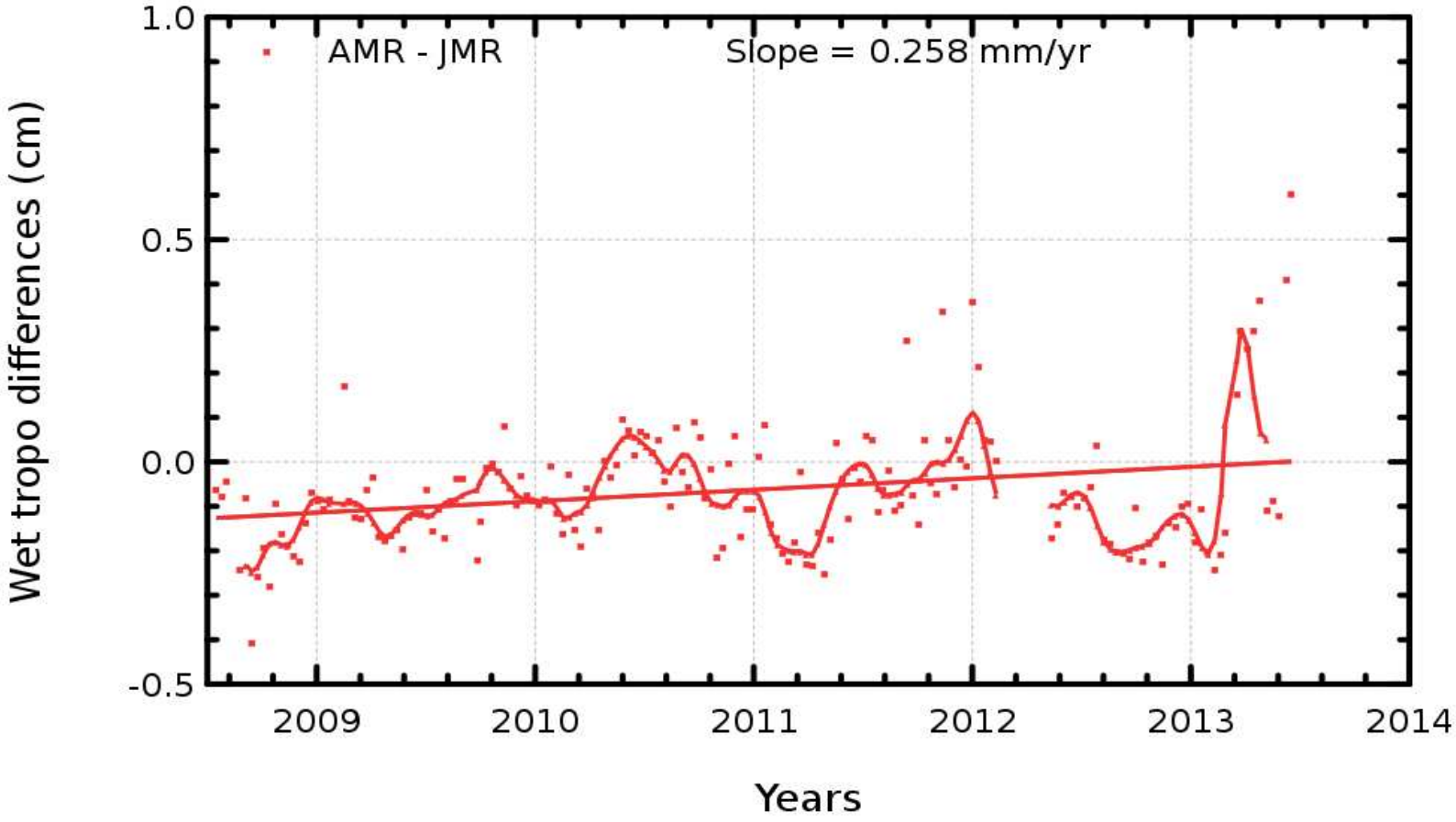
Software upload

Telemetry gaps



Product parameter monitoring

- All the parameters highlight a good behavior in terms of long-term stability
- For the radiometer wet tropo. correction, long-term errors are higher than for other parameters.

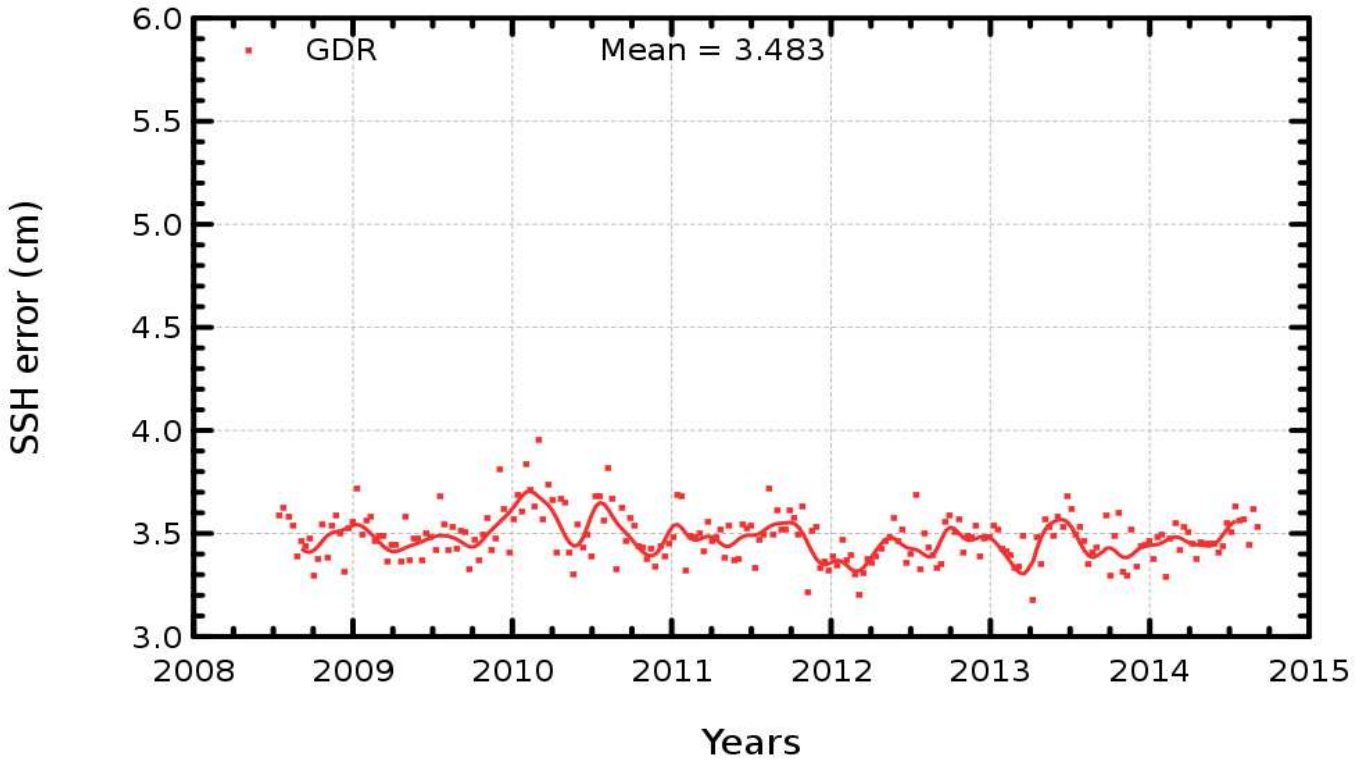


Sea-level performances

- SSH error for Jason-2 is deduced from crossovers analyses using radiometer data
  - for time scales < 10 days without taking into account altimeter noise
  - selecting |latitudes| < 50°, bathy<-1000m, oceanic variability < 20 cm
  - assuming error is equivalent on ascending and descending passes

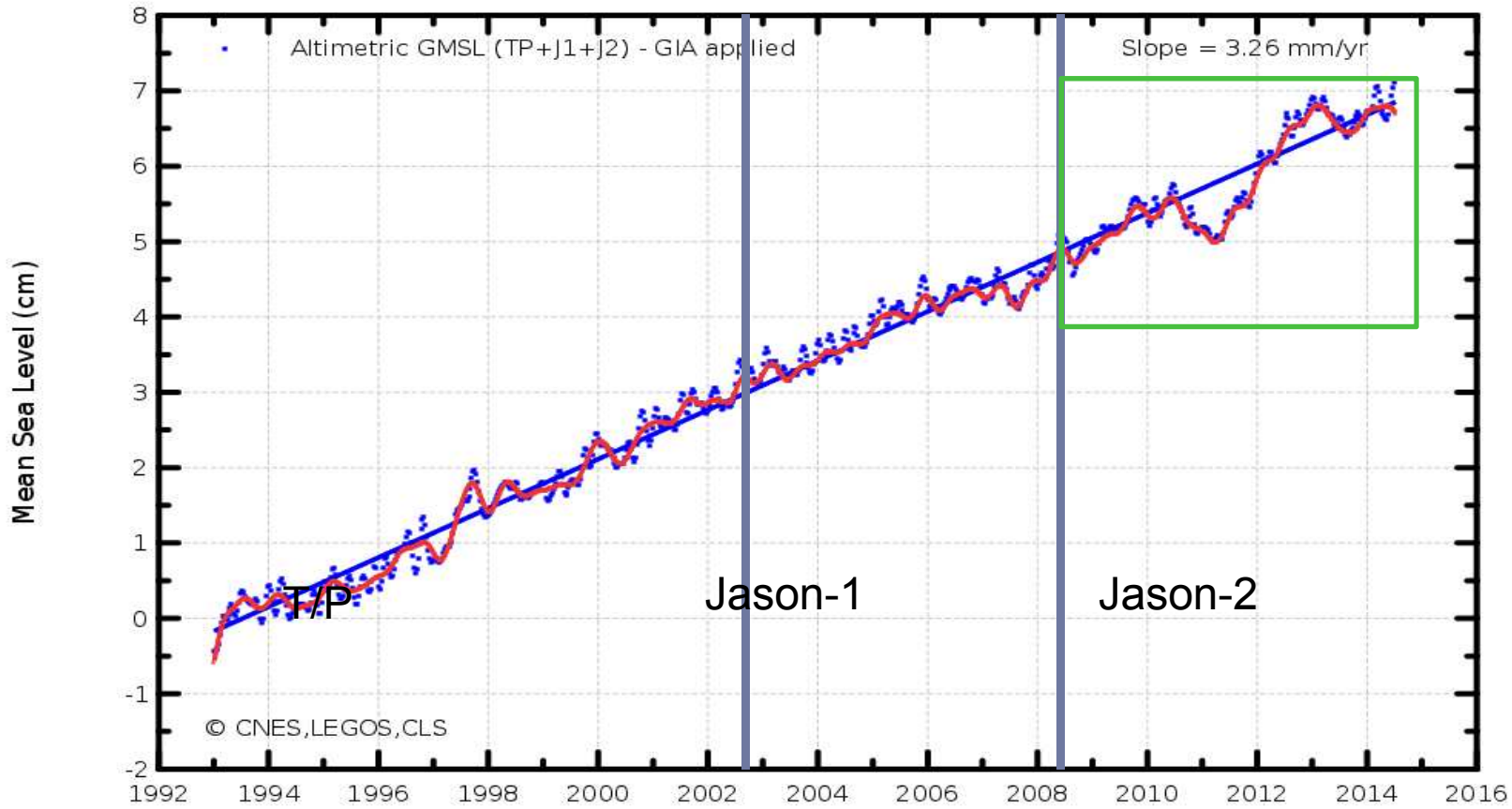
Products	Jason-2
GDR	3.48 cm

Products	Jason-1
GDR	3.60 cm
IGDR	4.09 cm
OGDR	8.66 cm



Mean Sea Level evolution and stability

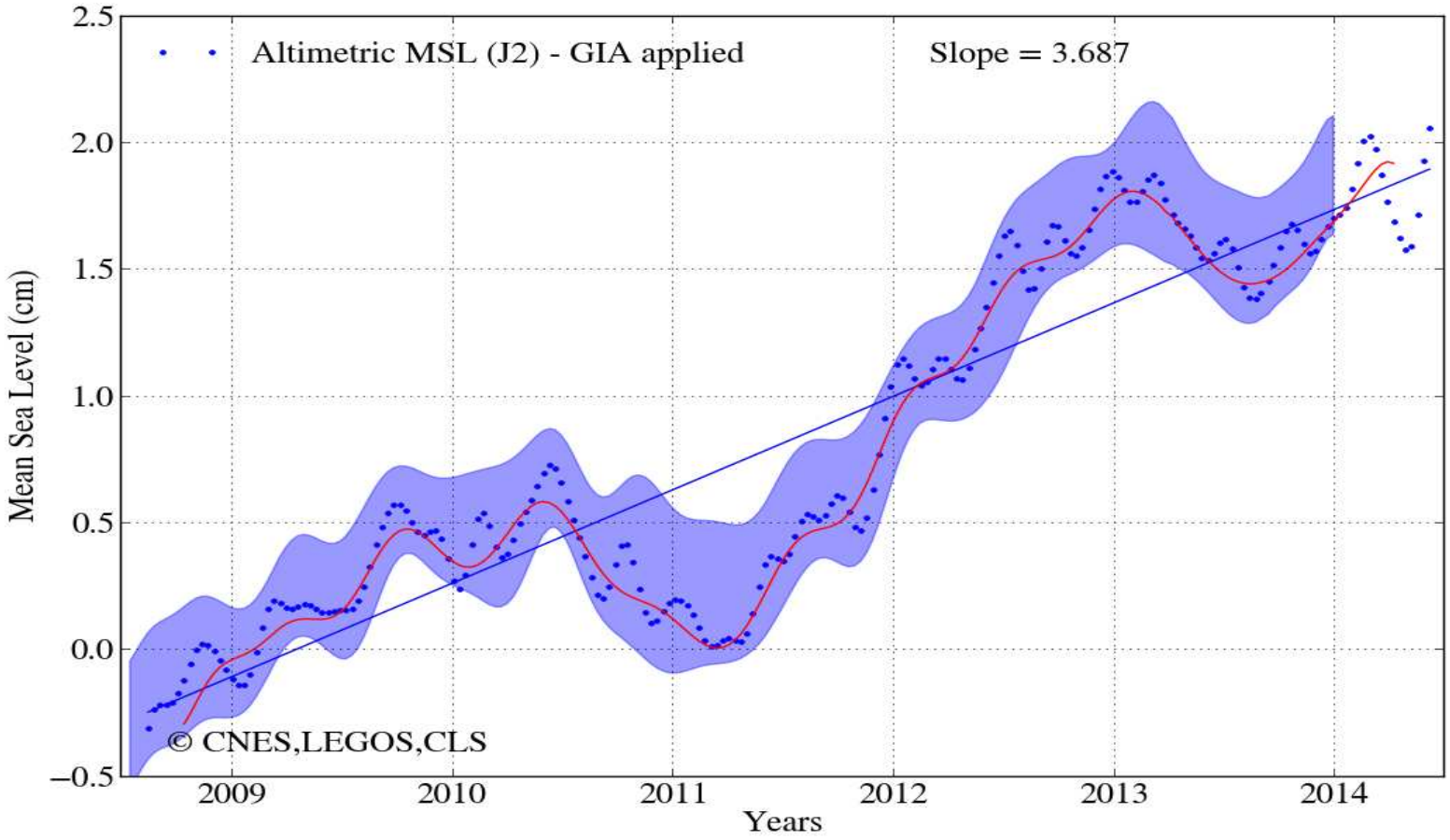
- MSL Jason-2 is used as the reference in altimeter products from 2008 onwards
- GMSL trend derived from Jason-2 data is 3.69 mm/yr



Mean Sea Level evolution and stability

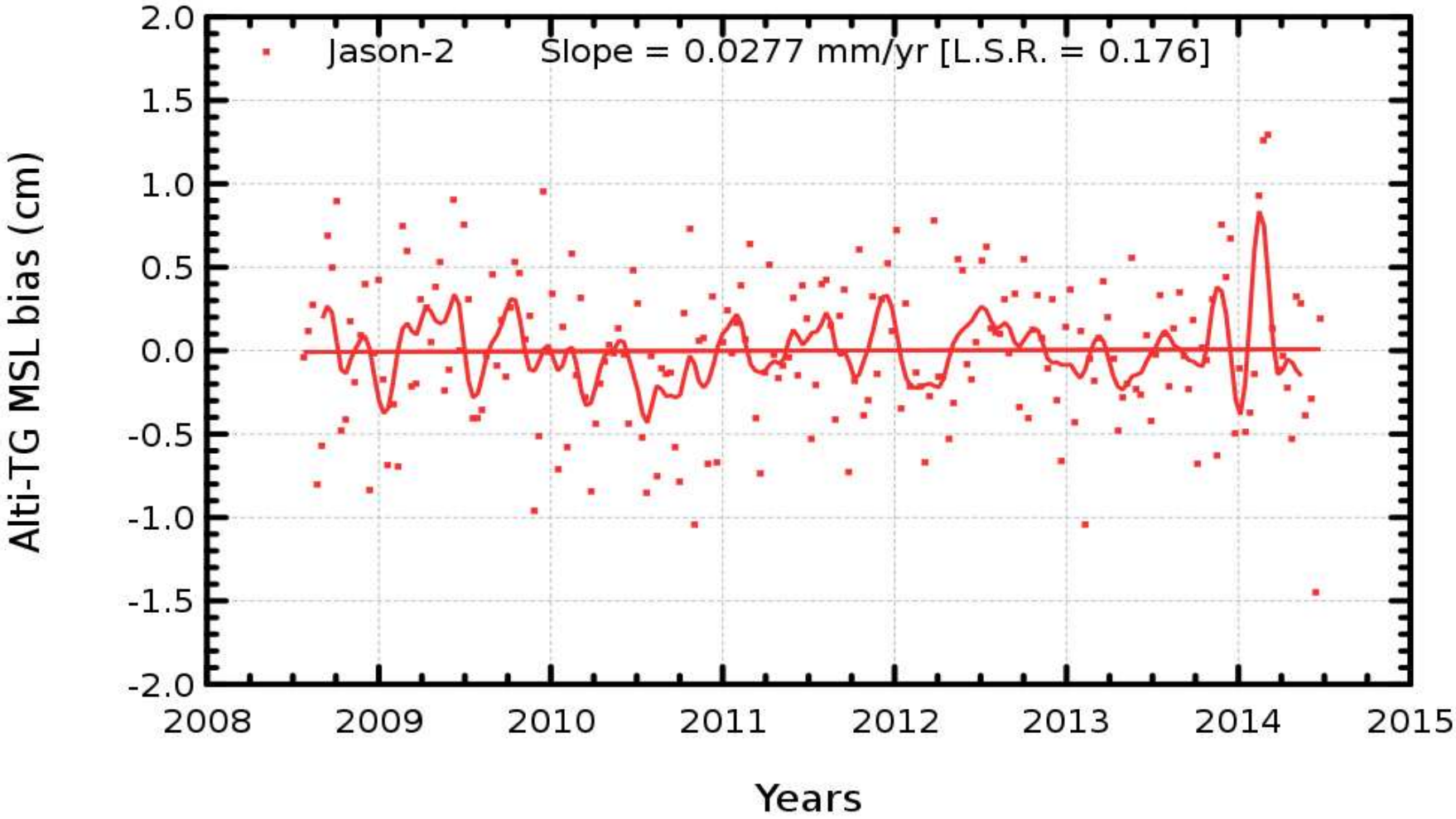
- A Jason-2 GMSL envelop error has been calculated combining different SSH corrections and editing thresholds : **see Zawadzki and Ablain 's poster (n° 152)**

  ⇒ Impact on the long-term trend is **+/- 0.4 mm/yr**



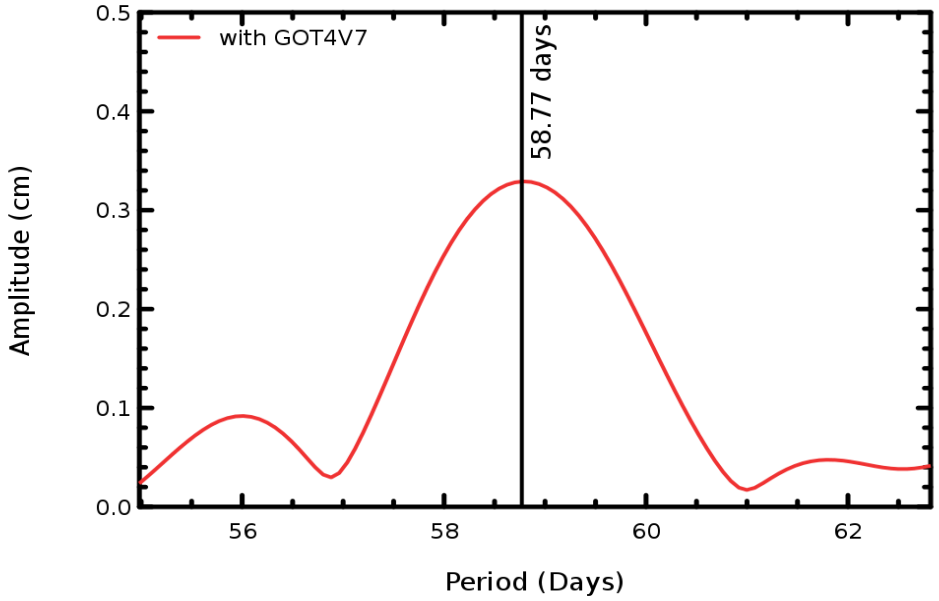
Mean Sea Level evolution and stability

- No drift detected by comparison with tide gauges : **see Prandi's poster (n°40)**

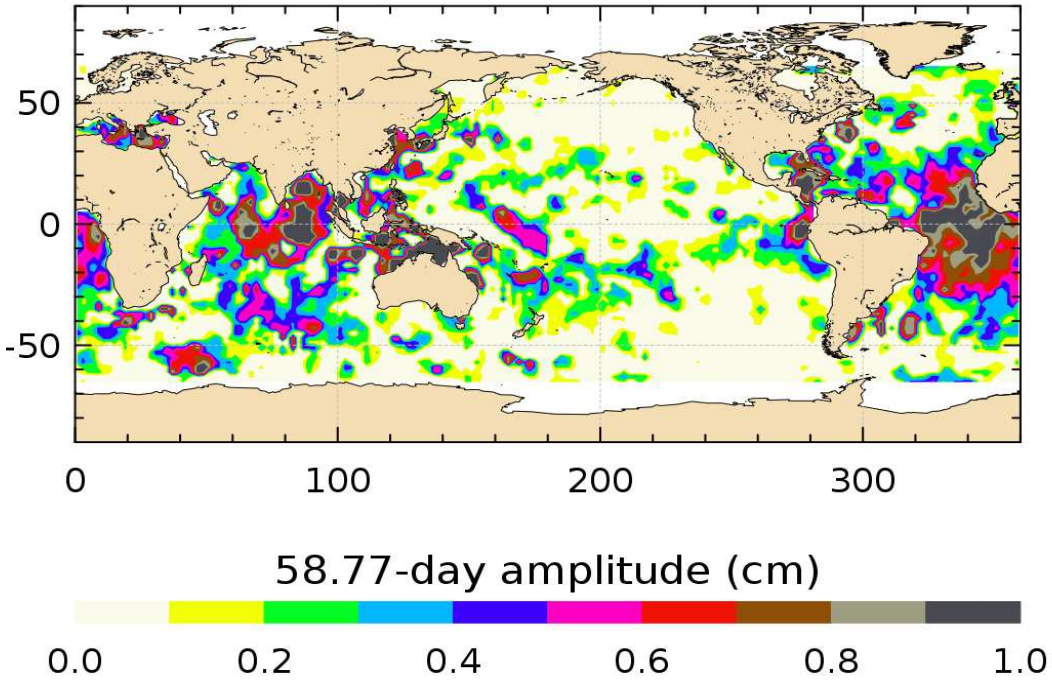


Recent improvements of the Jason-2 sea level

- Semi-diurnal errors aliased at 58.77 days were detected in Jason-2 sea level :
  - They have recently been reduced for Jason-2 using new tide models: GOT4V10
  - Similar work is on-going using the future FES2014 tide solution
  - See **Carrere's talk** and **Zawadzki's poster (n° 22)** for more details

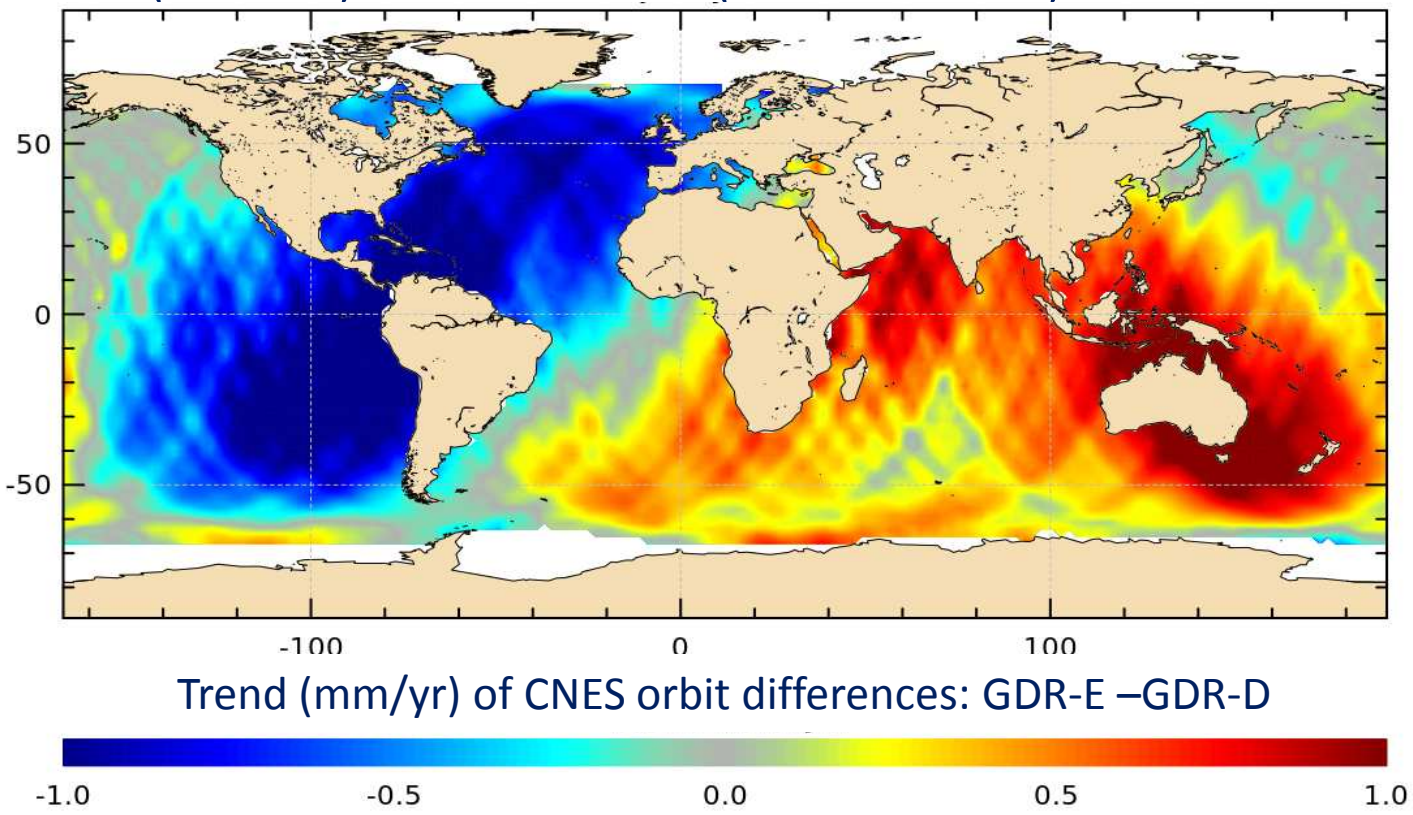


With GOT4V7



Recent improvements of the Jason-2 sea level

- A new CNES orbit solution was evaluated (POE-E) :
  - Significant impact on regional MSL trends, mainly due to the gravity field upgrade and new geocenter position.
  - Refer to **Ollivier's talk (POD splinter)** for more details
  - GFSC orbit (std2014) is also available (**Lemoine's talk**)



Trend (mm/yr) of CNES orbit differences: GDR-E –GDR-D

Conclusions

- Jason-2 measurements quality are excellent, in terms of :
  - Ocean data availability (**99.1 %**)
  - Sea Level performances (close to **3.5 cm** for temporal scales < 10 days)
  - Global Long term sea level stability (**< 0.4 mm/yr : close to User Requirements**)
- Some topics worth additional investigation:
  - Long-term stability of wet troposphere correction: discrepancies with models or other radiometer corrections are close to 0.3 mm/yr
  - SSH geographical biases (with other missions): sensitive to the orbit choice
  - Semi-diurnal signal error (aliased at 58.77 days): dependent on tide models
- Thanks to the very good quality of Jason-2 measurements:
  - Jason-2 is the mission of reference for climate studies
  - Recent SARAL/Altika data have been assessing with relevance (Prandi's talk)
- Jason validation activities are of great importance to prepare the seamless transition between Jason-2 and Jason-3 in 2015.

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