

**New era of altimetry,
new challenges**

31 October >
4 November
2016

IDS workshop
SAR altimetry
workshop
OSTST meeting

La Rochelle - France

www.ostst-altimetry-2016.com

EUMETSAT
CNES
CENTRE NATIONAL
D'ETUDES SPATIALES

Quantify Errors and Uncertainties in Altimetry Data

Chairs: Remko Scharroo
Michaël Ablain

Overview

- ❑ **Objectives:** Establish the link between altimetry experts and applications (MSL, mesoscale, etc)
 - New insights about errors in the altimeter system
 - ⇒ From experts to applications
 - User needs and requirements in terms of errors, including formalism of errors
 - ⇒ From applications to experts

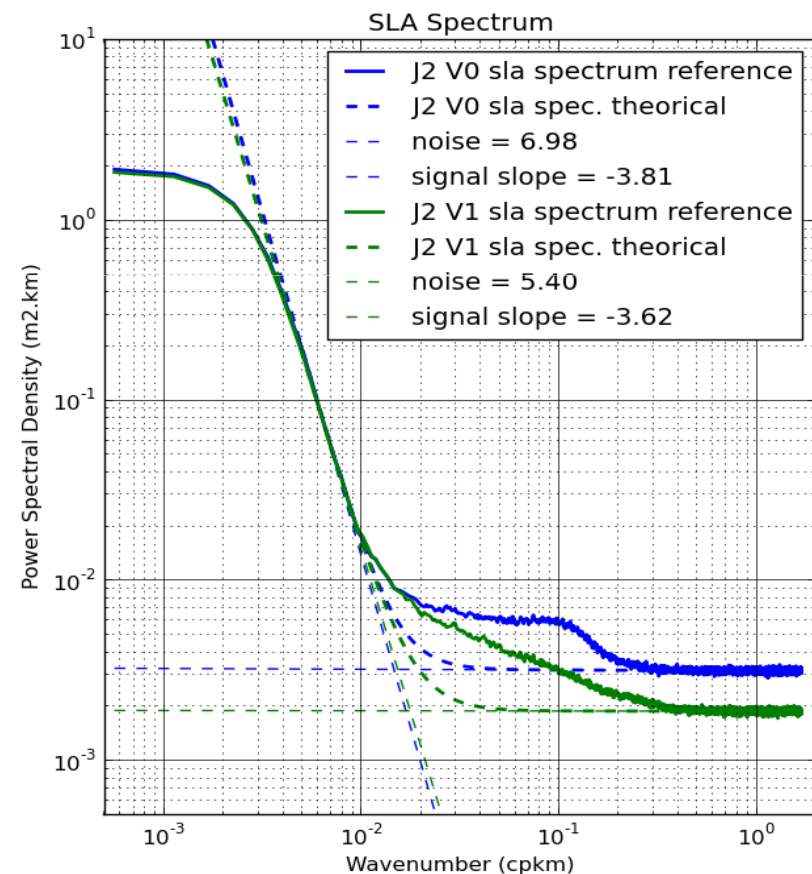
- ❑ This year, a focus on **short wavelength errors** has been performed with 5 talks dedicated and complementary to this subject

- ❑ 6 Posters (MSL errors, instrumental errors, error assimilation)

Description of altimetry errors

- ❑ **Issue #1** : Need to continue to improve LRM data to better observe small ocean scales (< 100 km): editing and new retracking are the main source of improvement expected. (M.Raynal et al).

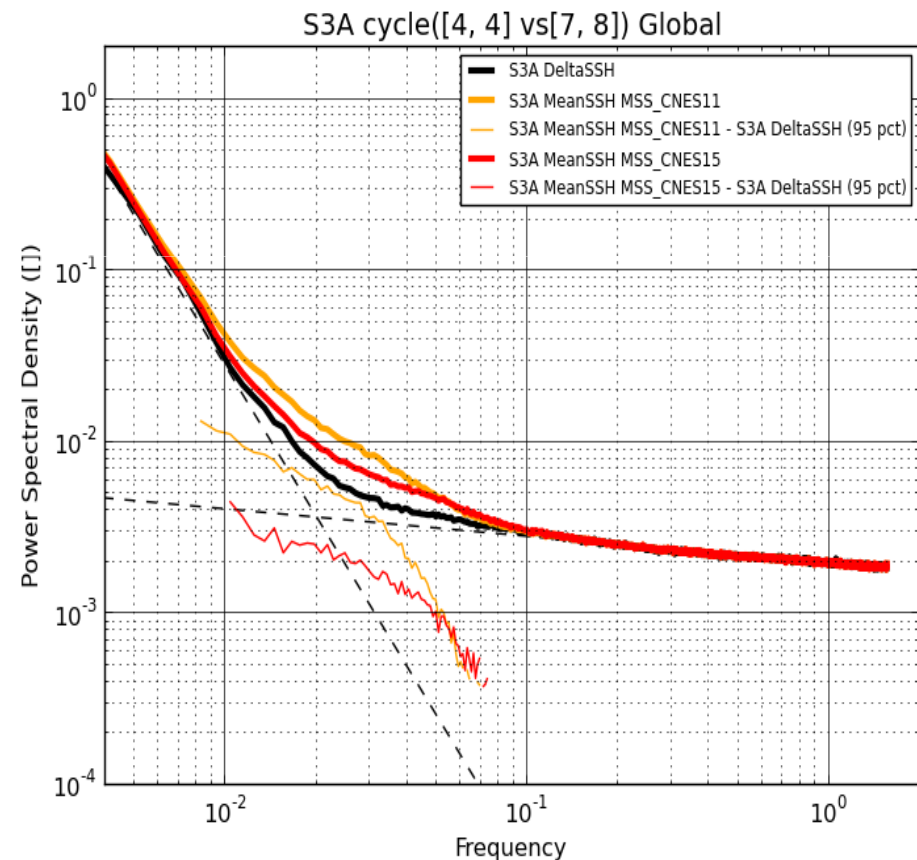
Improvement of Jason-2 LRM data at small ocean scales applying adapted editing algorithm and Zaron's empirical method to reduce the correlated noise between altimeter range and SWH (M.Raynal et al.)



Description of altimetry errors

- **Issue #2:** Ability of Sentinel-3 data to observe small ocean scales (between 30 and 100 km) is very promising after removing MSS errors on the new ground track.
(M.Raynal et al., M.I. Pujol et al.)

Sentinel-3A SLA spectrum is reduced after removing the MSS error comparing 2 consecutive cycles N and N-1 (M.I. Pujol et al.)



Description of altimetry errors

- **Issue #3:** MSS errors at high resolution will be reduced:
 - using geodetic missions
 - improving the mean profile along track resolution based on high rate altimeter measurements
 - improving the correction of the ocean variability (especially along geodetic tracks)
 - using geodetic missions over an extended period
 - improving the reduction of the LRM measurement errors (M.I. Pujol et al.)

Swell

- **Issue #4** : Impact of swells and wind-waves on the altimeter-derived estimates in SAR mode has been clearly identified at small scale (in terms of dispersion over 7 km) (T. Moreau et al.)
 - Not yet clear what the mean effect is on 1-Hz data

New formalism to describe errors

- ❑ **Issue #5:** Spectral analyses based on Fourier transform are often used to describe sea-level errors at small ocean scale, however they present some limitations: parameterization, sensitivity, large variance (C. Mailhes et al.)
- ❑ **Issue #6:** Other method based on Auto-Regressive Spectral Analysis could be preferred to better described altimetry errors (C. Mailhes et al.)
- ❑ **Issue #7:** A new method has been proposed for accounting error correlations in order to accurately assimilate future SWOT observations (E. Cosme et al.)