

THE SLOOP PROJECT: PREPARING THE NEW GENERATION OF ALTIMETRY PRODUCTS FOR OPEN OCEAN

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Project presentation

Since the launch of the first altimeters the accuracy of the altimetry data has continuously increased thanks to the improvement of both the technology of the instruments and the on-ground processing. These improvements allowed the apparition of various applications. About a thousand teams (in 2007) now use the altimetry products around the world for geodesy, oceanic circulation, model, wind/waves applications ...

One of the main contributors to the success of altimetry, the French Space Agency (CNES), decided this year to fund a new project in order to prepare the new generation of altimetry products for open ocean. The project, started in September 2008 and will end in 2010. The first phase is the analysis of the users needs and the subsequent redefinition of the product content in terms of content, resolution and data distribution. In a second phase, all the potential improvements of the altimetry processing chains will be analysed.

This project is a good opportunity to have a consistent approach for the general improvement of the current altimetry processing. It is also a good opportunity to reinforce the collaboration between the altimetry product development teams and the final users, which is essential to have optimal products, suitable for all kind of applications.

Consortium

A consortium composed of CLS, Noveltis and expert support laboratories will be in charge of this project on behalf of CNES.

The experts associated with this project are: LEGOS laboratory, AER, TéSA laboratory (ENSEEIHT), I FREMER, LOCEAN, University of New Hampshire, I MEDEA, METEO-FRANCE, Mercator Ocean, SHOM, GRGS laboratory

Reanalysis of the user needs

üA serie of non linear operation of editing/filtering is currently applied on the 20Hz measurements to compute the altimetric range ▷What resolution and filtering level do you need?

ü The current GDR products allows us to have a good management of the product version but some limitation exists, notably during the reprocessing phases

▶ How data distribution may be improved?

 $\begin{tabular}{ll} \ddot{u} \mbox{ Product content:} \\ \mbox{\triangleright Which additional information/parameter do you need?} \end{tabular}$

Please help us understand your needs by answering our survey (see also poster "Altimetry data, what do you want" in Qutreach session)

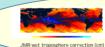
Analysis of all potential improvements of the altimetry components

This includes the development of new retracking algorithms, the update of geophysical corrections based on recent models and algorithms, and the computation of new reference surfaces (Mean Sea Surface, Mean Dynamic topography). A specific study will also be dedicated on the quantification of the errors of altimetry measurements.

Development of retracking algorithm



ü review and assessment of all known retracking techniques on open ocean (MLE3/4 on wave forms associated with the Singular Value Decomposition method, Least Square Estimator, Neural network, Bayesian estimator ...) and choice of the best candidate üDevelopment and tuning of a retracking specific for rain cells and Sigma0 Bloom



Development of Radiometer wet troposphere correction

üDevelopment of neural algorithm for 3-frequency microwave radiometer

Development of Sea State Bias correction

ü develop new solution based on the use of outputs from the WaveWatch3 (WW3) sea state model and combining classification of sea states and suitable SSB per class



Refining the dual frequency
ionospheric correction

üAnalysis of the High Frequency content and improvement of
the filtering method

Analysis of the error budget of altimetry

üRe-Analysis of the possible editing strategies

üDefinition and analysis of the error covariance matrix

Future Open Ocean altimetry products

Computation of a new Mean Dynamic Topography

üWith improved data (geoid model, altimetry) üWith longer time series (insitu data) üWith improved methodoloav



Computation of a new Mean Sea Surface

üWith all the past and flying mission üWith improved methodology



Assessment of available new geophysical correction

üModel tropospheric correction (dry and wet): analysis and assessment available models

ÜOceanic tides: Quality assessment of recently released models, analysis of the contribution of the non linear M4 and the internal waves





ÜDynamic atmospheric correction:
Quality assessment of existing models and
quantification of the potential interest of using
a baroclinic model
Exploring new strategy for
S1 and S2 filtering



Analysis of the synergy between altimetric and geodesic missions

ü toward new products based on GOCE static and GRACE time depending gravity fields.





