

CNES initiative for altimeter processing in coastal zone : PISTACH

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CNES initiative

- **Current level2 data set (O/I/GDR) distributed to users are not appropriate to coastal studies (see later).**

- **Those limitations are related to :**
 - ◆ **Instruments technology :**
 - Insufficient data mapping related to the altimeter and/or radiometer
 - Tracking limitations (impacting mainly inland water data on Jason-1)
 - ◆ **Processing chains : we use the same standards to process the data whatever the surface is. Those processing chains have been developed (and validated involving OSTST group among others...) for deep ocean conditions**
 - Standard 1Hz data sampling at level2 (while altimeter provide 10 or 20Hz data)
 - Same retracking algorithm (brown model, MLE, ..)
 - Same radiometer data processing
 - Same geophysical corrections (tides, dynamic atmospheric correction, atmospheric models, ...)
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- **Thanks to the DIODE coupling mode, Jason-2 altimeter, then AltiKa (and with the advantage of Ka band technology), will gather more data close to land.**

CNES initiative

- **More and more applications (and user requests) for coastal applications. And coastal products are part of Jason-2 scientific objectives → we need to improve Jason-2 products close to land.**
- **Using experience from ALTICORE, ALBICOCCA, MERSEA, ECOOP, ..., a CNES ITT was issued in July 07 (all Jason-2 partners being informed of this initiative : NASA/JPL, NOAA and EumetSat) and this ITT being analysed by ESA team :**
 - ◆ **CLS proposal was selected.**
 - ◆ **Work started November 2007.**
 - ◆ **This involves several groups either data users or experts: LEGOS, IFREMER, CEMAGREF, LMTG, ... all on France side**
- **In parallel, ESA has issued a similar ITT to European countries (excluding France): goal is to compare CNES results with ESA results.**

Both studies are followed by ESA and CNES in a close partnership, key progress meeting will be co-organized to share results.

CLS PISTACH project

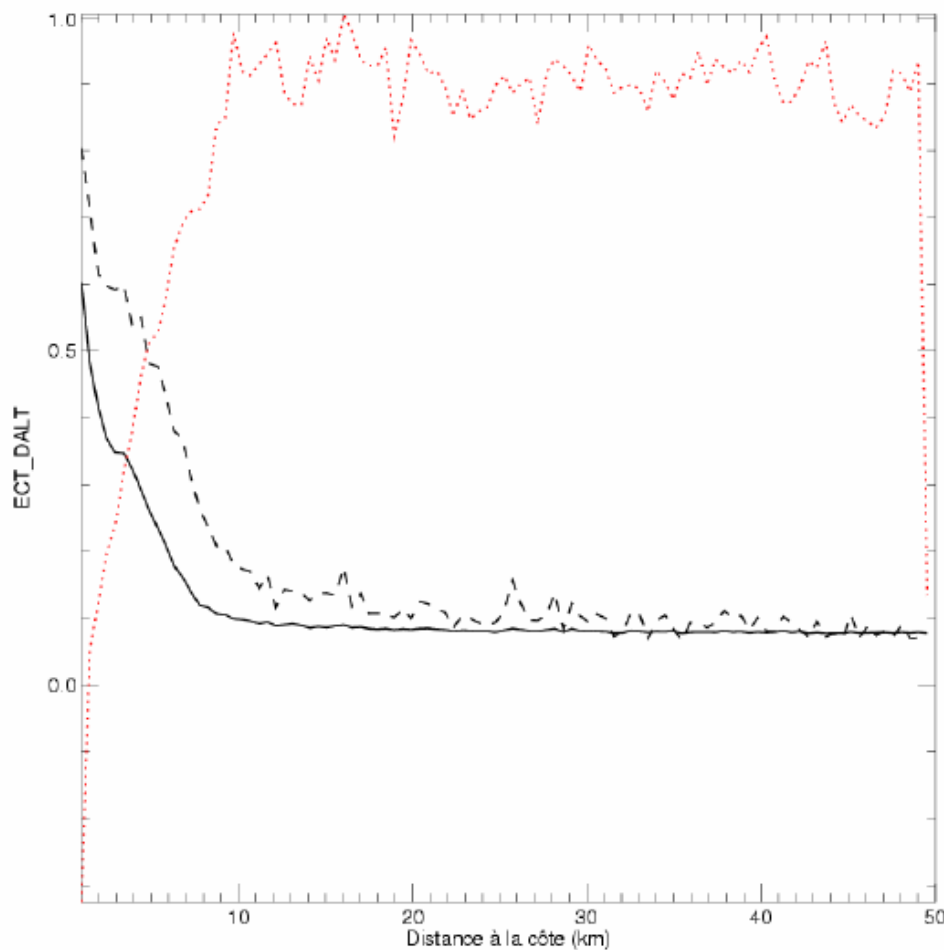
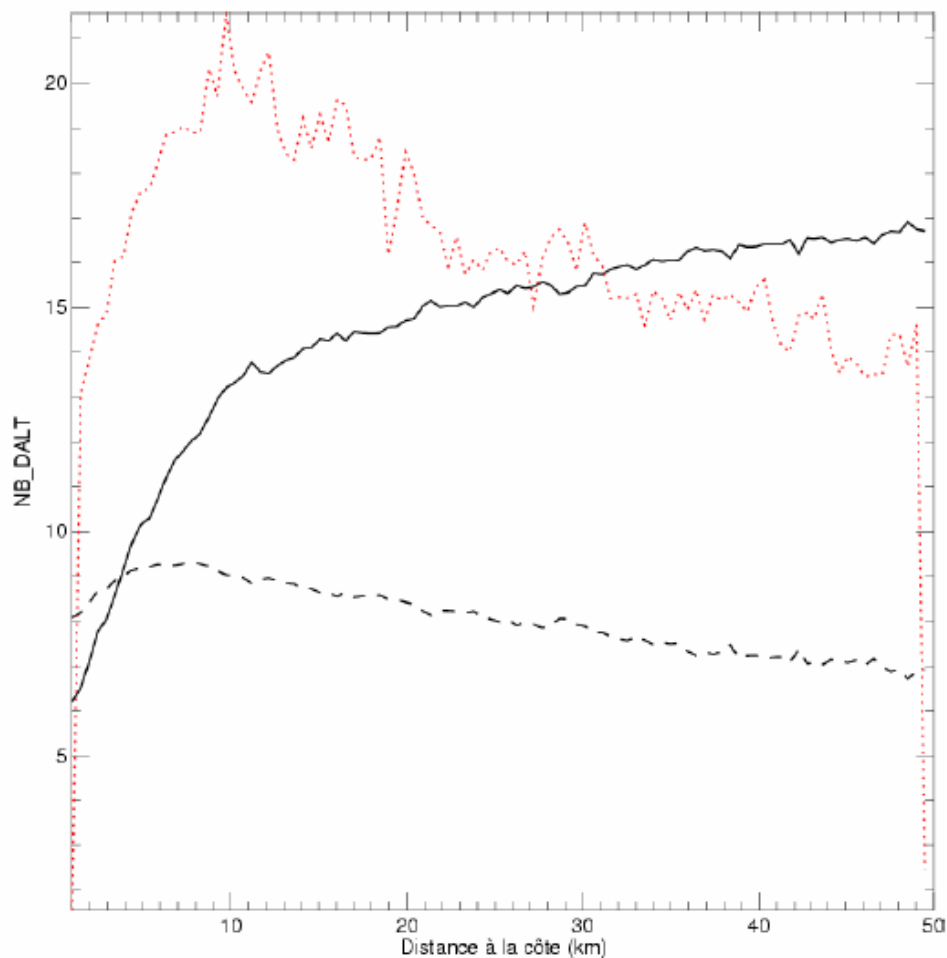
■ PISTACH major objective :

- ◆ Develop new standards for coastal applications
- ◆ Generate level2 products during Jason-2 CalVal phase, disseminated those products to PI groups (OSTST PI community and others), validate, adapt and present results during 2009 OSTST meeting
- ◆ As for ocean processing our objective is to have OSTST approval for implemented methods

■ Notice that PISTACH is also covering inland water processing (not developed here and not part of OSTST)

■ PISTACH stand for : '*Prototype Innovant de Système de Traitement pour l'Altimétrie Côtière et l'Hydrologie*' (ie Coastal and Inland water Innovative Altimetry Processing Prototype')

Current level2 limitations (among other) : Altimeter parameters

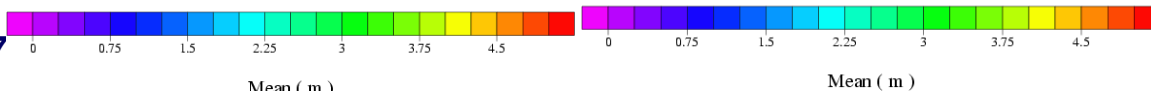
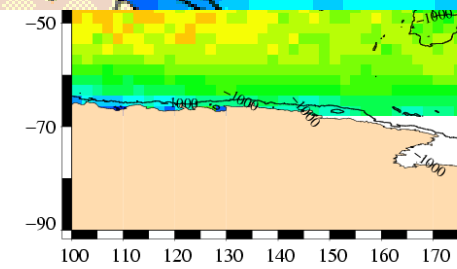
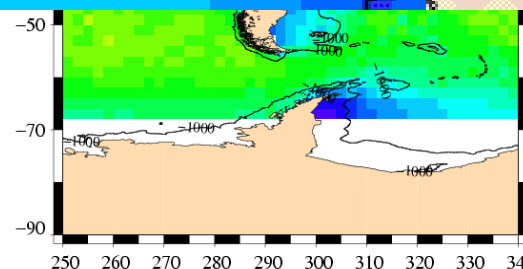
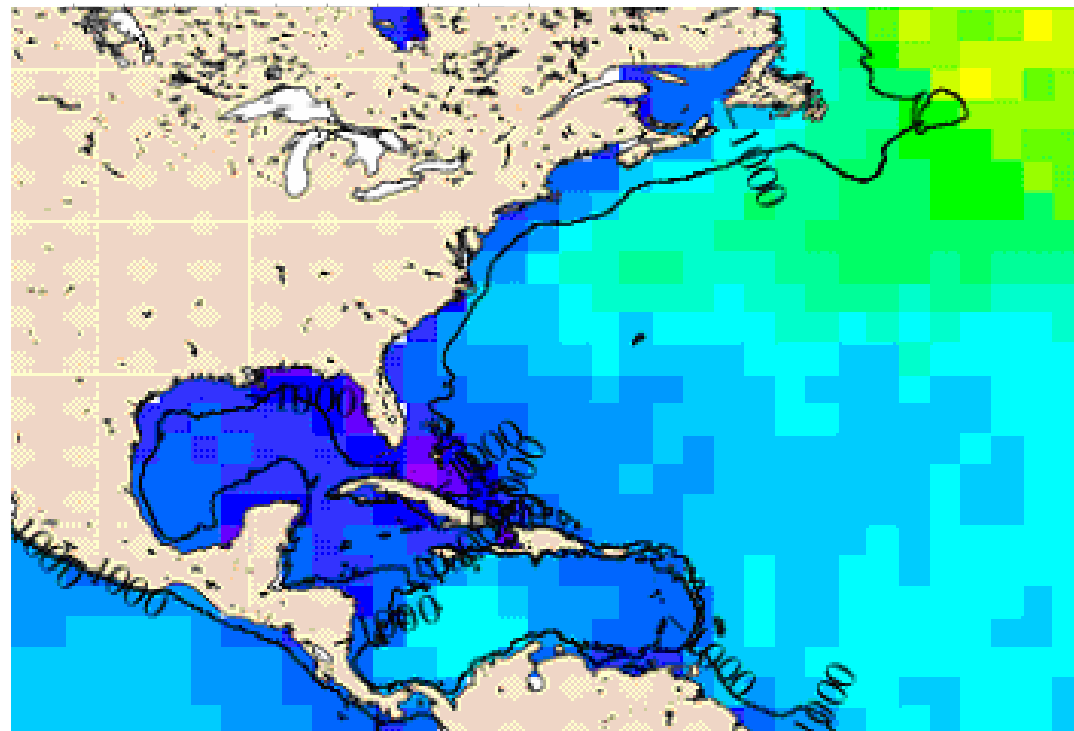


Current level2 limitations (among other) : Sea State Bias

- Current SSB solutions are global, based on empirical fits on SWH and wind parameters, using open ocean data only (bathymetry < -1000 m)
- New studies (Tran et al - Vandemark et al) have demonstrated the importance of sea surface conditions :
 - ◆ Sea State is influenced by : currents, tides, wind speed direction and strength, ...

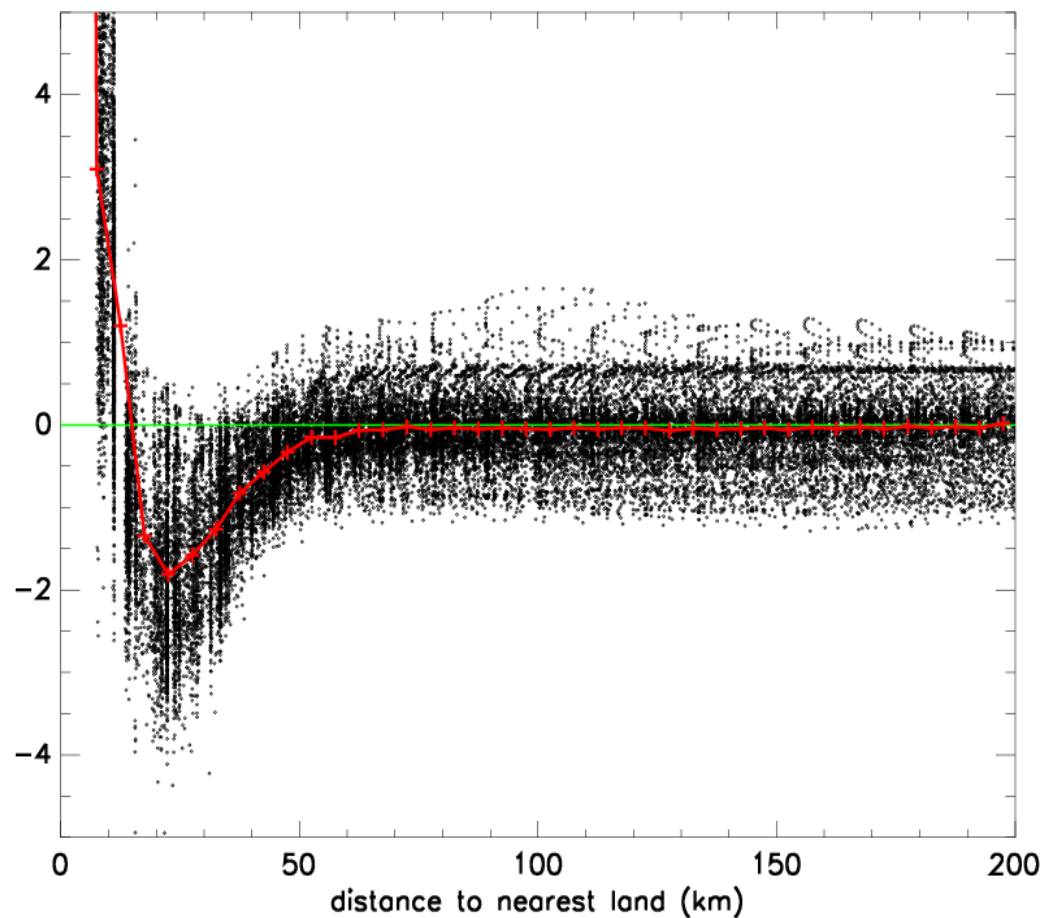
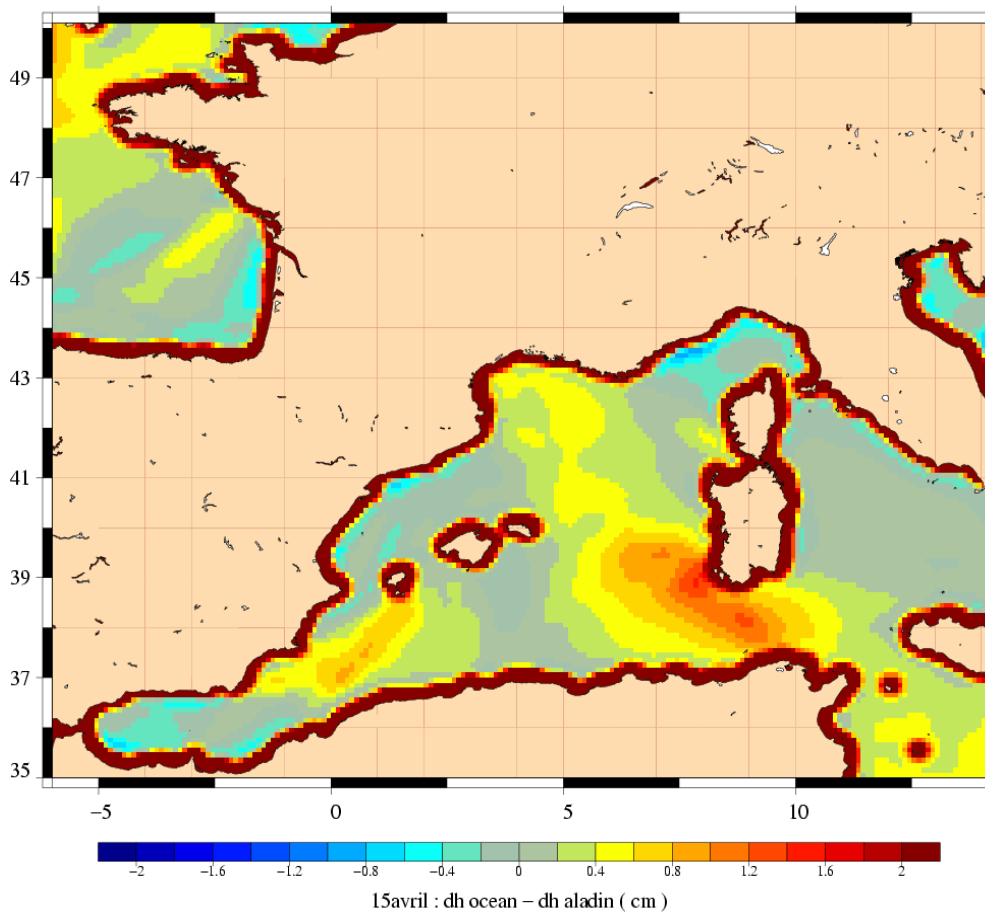
=> All these parameters are highly variable over continental shelves

=> the EM bias behavior will certainly be different from one region to another.



Current level2 limitations (among other) : Radiometer correction

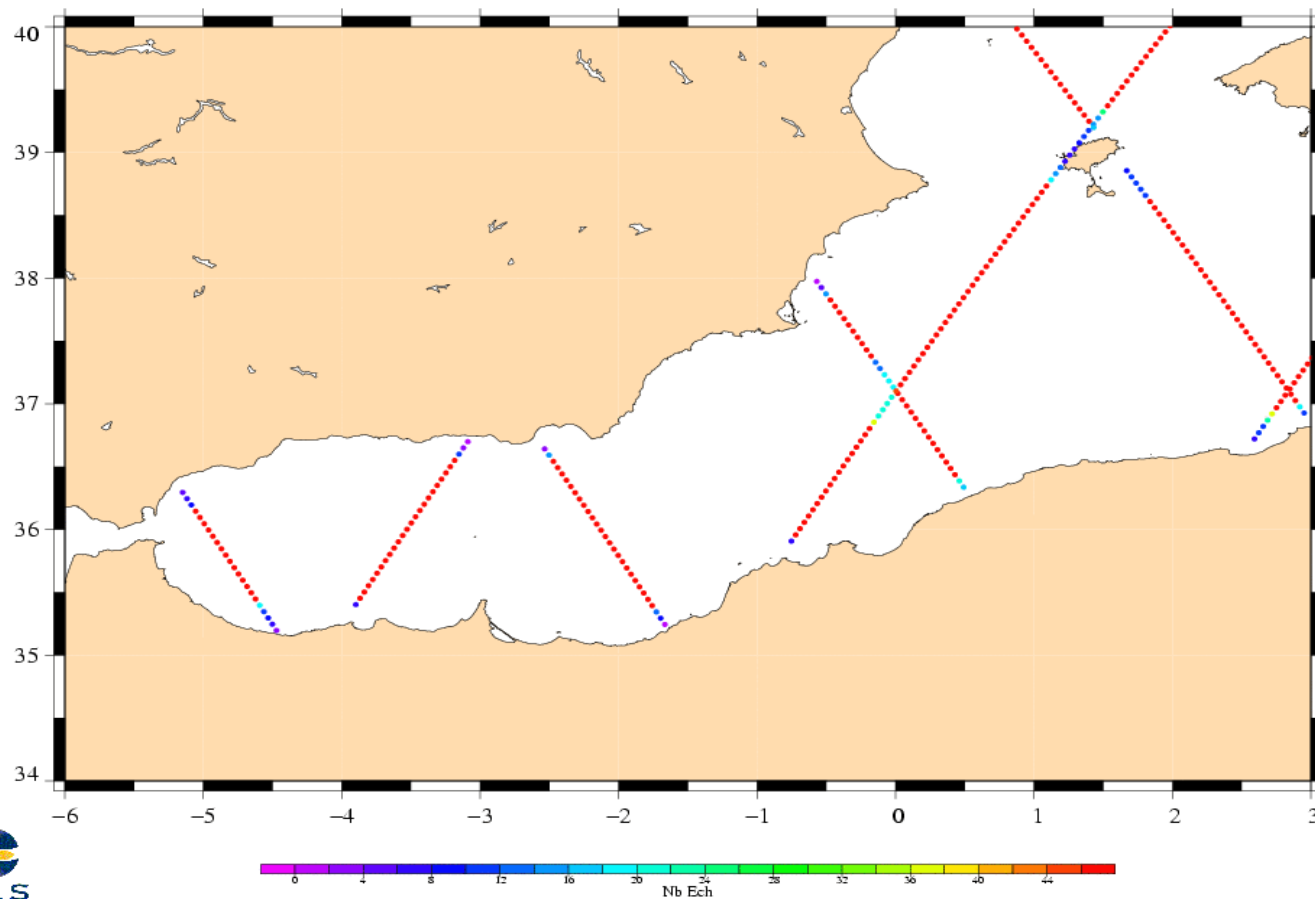
■ Radiometer correction :



Current level2 limitations (among other) : reference surface

■ Reference surfaces : Mean profile

ProfilMoyen_TP_7ans_RefSmo98v2



PISTACH work packages

■ PISTACH includes 3 major phases :

◆ Phase 1:

- user needs and structure of coastal products

◆ Phase 2:

- analysis and selection of fields to be taken into account in this product

◆ Phase 3:

- prototype implementation, validation and operations during Jason-2 CalVal phases

PISTACH Phase 1

- **Phase 1: user needs and structure of coastal products
November 07 to March 08 (to take into account Pls feedbacks and results from this meeting) :**
 - ◆ **Task 1.1: User expectation analysis :**
 - by analyzing various requests from groups like CASH, MERSEA, MFSSTEP, ...
 - ◆ **Task 1.2: Define the information required in a level 2 product, and propose a structure for such a generic product :**
 - (1Hz / 20 HZ, global / local geophysical corrections, global / local weather fields ...)
 - ◆ **Task 1.3: Analyze and quantify the possible processing improvement**
 - ◆ **Task 1.4: Quantify the methodology of a level 3 product (including potential use of other instruments or insitu data)**

PISTACH Phase 2

■ **Phase 2 : analysis and selection of new algorithms to be taken into account in this product - January 08 to June 08**

◆ **Task 2.1: geophysical corrections**

- models inventory and analysis (quantify their potential and their limitations due to geographical area covered, time availability, ...).
With particular attention to : tides models, atmospheric corrections, inverse barometer correction (DAC/Mog2DHR,...), and other fields (MSS, Geoids, iono correction, ...)

◆ **Task 2.2: Identify and analyze new retracking methods**

◆ **Task 2.3: Identify and analyze new wet and dry correction methods from models**

◆ **Task 2.4: Identify and analyze new wet correction methods derived from radiometer data**

◆ **Task 2.5: Identify and analyze new SSB methods**

◆ **Task 2.6: Identify and analyze data editing strategy**

◆ **Task 2.7: Identify and analyze data covariance error**

PISTACH Phase 3

- **Phase 3: prototype implementation, validation and operations during Jason-2 CalVal phases - March 08 to March 09**
 - ◆ **Task 3.1: Prototype development**
 - in order to generate a product according to the specifications laid down in previous phases
 - ◆ **Task 3.2: Prototype operations**
 - during the Jason-2 CalVal phases, accounting for PIs feedbacks

PISTACH extended phase

- **Way to implement and operate this prototype on past or current data (JA1, T/P) to be analyzed (this has already been raised by some potential users)**
- **We also need to analyze the possibility to process ENVISAT data and to define the strategy to compare PISTACH results with ESA results (dedicated OSTST meeting could be organised)**
- **New ITT ongoing for deep ocean : new tides models, retracking techniques, ... this has obvious links with the current project : users require sea surface (or wave, ...) continuity whatever the processing chain is.**