STSM REPORT

- **Purpose of the STSM**

The purpose of this STSM was to create and establish a working feasible connection with CISC and allow the acquisition of SMOS satellite data. To enable a future interface for independent data processing in our lab, I have worked on developing a protocol to retrieve additional information from Soil Moisture and Ocean Salinity (SMOS) satellite without masking out data by alarmed flags. The concept is to save as much data as possible by converting L0 to L1 and L2 products. Thus, the suggested source of data will be geolocalised antenna data (L1C) rather than gridded data (L2 to L4) .

- **Description of the work carried out during the STSM**

The magnitude and complexity of data processing involved in SMOS is very significant, so trying to replicate the full processing chain would exceed the framework of any reasonable study. Thus, the first stage of this stay was to start by working with the existing processed data streams, as recommended by the team at CISC. Thus, L3 and L4 salinity was used as the main data source extracted from the current processed data since the beginning of the mission. Once this task was completed, and the data has been acquired, it was submitted to my home institute for further examination and collaboration in the current

study. I began to familiarize myself with the products produced by the team, existing code, documentation, working method, protocols. Much effort has been put to study how the data is acquired, corrected and produced in order to integrate our desired implementation with the existing code and processing method. The logic behind this work process was that altering the code/protocol only in the required locations so that we can achieve an optimal result in the very little time that we had to do it.

After that, a request was sent to Argans in order to have the coded of the current L2 Operational Processor for processing the data at lower leves, using the corrections and processing which is required to isolate the brightness temperature signal which is due to geophysical processes. Due to size and amount of code it has not yet been altered, it would require a lot more time in order to complete this task even when considering only altering the protocol at the desired place and not rewriting the whole code from scrap. Furthermore once the code will be altering in the desired manner the SMOS raw data need to be accesses. For this purpose a request for direct access to the SMOS L1C Brightness Temperature product was sent and is now pending approval.

- **Description of the main results obtained**

  The CISC products were received and will be integrated in the current research. Sea Surface Salinity from 2010-2013 both Fused and 9 day maps were gathered, and access to different forms of the processed

data is now established. Work on modifying the code and processing procedure has initiated. But due to the volume of code and mathematical complexity of the proceeding being done it will take some more time before we will be able to freely modify the code for our intentions and comfort.

- **Future collaboration with the host institution (if applicable);**

Since there is still work to be done (about a year in volume) there are many opportunities for future work and collaboration while working toward enabling independent processing of raw SMOS data.

- **Foreseen publications/articles resulting from the STSM (if applicable)**

These data will be further submitted to an ongoing research at the same COST action Evaluation of ocean synthesis. A research covering the topic of floods in South East France, and their relations to the Gulf Of Lyon sea surface temperature changes, during a certain and well defined atmospheric pressure synoptic situation.

Combining the two studies it will be possible to validate the MEDRYS12, PSY4 products, developed by Mercator Ocean, using the point data as a reference for validation.