

RESEARCH DEPARTMENT

MISSION REPORT



To: SMOS-AMMA cal-val participants

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From: P. de Rosnay, M. Grippa, Y. Kerr, F. Cabot, C. Gruhier, A. Albitar, P. Hiernaux, E. Jacqueline, S. Juglea, L. Kergoat, O. Merlin, A. Mialon, P. Richaume, F. Timouk

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Subject: SMOS-AMMA cal-val over the Gourma site meeting, 14 October 2008

Tuesday 14 October was held at CESBIO an informal meeting on the SMOS-AMMA cal-val activities over the Gourma (Sahel) meso-scale site. The SMOS-AMMA cal-val is coordinated through an ESA proposal (de Rosnay et al., ESA SMOS cal-val, proposal ID-3257) and a TOSCA/CNES funding (Grippa et al. 2008-2010). The aims of this meeting was (i) to clarify the hand over concerning the TOSCA/CNES proposal (from P. de Rosnay to M. Grippa), (ii) to define activities to be conducted for the SMOS-AMMA cal-val, (iii) to ensure an efficient feedbacks during the cal-val period between the AMMA team and the SMOS team toward the level 2 to level 4 ground segments .

Different persons from CESBIO-SMOS (Yann Kerr, François Cabot, Claire Gruhier - also in the AMMA team- Ahmad Albitar, Elsa Jacqueline, Silvia Juglea, Olivier Merlin, Arnaud Mialon, Philippe Richaume) and from CESBIO-AMMA (Manuela Grippa, Pierre Hiernaux, Laurent Kergoat, Franck Timouk), as well as Patricia de Rosnay (ECMWF) attended the meeting.

Yann Kerr gave an overview of the SMOS status. The satellite is ready and the launch date is between June and July 2009. The levels 3-4 ground segment will be at CESBIO. Yann Kerr described briefly the main SMOS cal-val sites. Arnaud Mialon, Silvia Juglea and Olivier Merlin presented in more details the SMOS cal-val sites of Valencia (Spain), the NAFE experiments and the SMOS cal-val over Australia. Patricia de Rosnay showed the main objectives of the SMOS cal-val activities over West Africa: (i) evaluation of the SMOS level 2 soil moisture products, (ii) validation of the SMOS retrieval algorithm, (iii) investigation of the root zone soil moisture with assimilation experiments and evaluation.

François Cabot presented the SMOS End to End Simulator (SEPSBIO) and Philippe Richaume presented the inversion procedure. Elsa Jacqueline, Ahmad Albitar presented the level 3 and level 4 SMOS products. Three presentations were provided concerning the Gourma meso-scale site measurements. Pierre Hiernaux presented a description of the soil and vegetation types, Franck Timouk presented the instrumental network deployed within the AMMA project, Patricia de Rosnay presented the Gourma soil moisture network to be used for the SMOS cal-val. She showed the main features of soil moisture vertical and temporal structure and its spatial variabilities observed at different scales in the Gourma region. Claire Gruhier presented her work on soil moisture products evaluation and Manuela Grippa presented for

Frédéric Baup the soil moisture maps produced from ENVISAT/ASAR over the Gourma mesoscale site.

The ALMIP-MEM intercomparison was presented by Patricia de Rosnay and Manuela Grippa presented the ALMIP Phase2 coordinated by Aaron Boone (CNRM/Météo France) to be conducted at mesoscale and at finer spatial resolution (not yet defined) than ALMIP. These modelling activities are highly relevant for the SMOS cal-val activities. ALMIP Phase2 forcing will be fed by the well documented data base provided over the Gourma mesoscale site (soil texture and vegetation types, hydrological units and catchment description, atmospheric forcing). Land surface model outputs from ALMIP Phase2 will suitable to be used as input for microwave emission models and SMOS simulators. They will be used by the SMOS ground segment at CESBIO to simulate L-band brightness temperatures as seen by SMOS. Comparison with SMOS data will allow to investigate uncertainties in the SMOS prototype algorithm.

Based on ALMIP-MEM, a preliminary experiment will be performed at L-band by Patricia de Rosnay with CMEM and by François Cabot with the SEPSBIO to compare, at the regional scale the CMEM and the SMOS level 2 algorithms. The ALMIP experiment 3 (using TRMM precipitation forcing) will be used for the year 2007 (outputs at 6am and 18am, according to the SMOS overpass) Patricia de Rosnay will provide the microwave model input to François Cabot by the end of October 2008.

Field measurements activities relevant for the SMOS cal-val in 2010 were reviewed. The SMOS cal-val mainly relies on the ground soil moisture measurements network. It is also crucial to ensure a robust soil moisture station calibration during that period and to continue up-scaling (transect) measurements in 2010. The possibility of using a radiometer to perform field measurements at L-band is envisaged for the summer 2010. Manuela Grippa will investigate this possibility.

To conclude, this SMOS-AMMA cal-val meeting was very positive. The coordination of the SMOS cal-val over West Africa is well organised between CESBIO (Manuela Grippa, TOSCA/CNES proposal) and ECMWF (Patricia de Rosnay, ESA proposal). Field measurements relevant for the SMOS cal-val were reviewed, as well as land surface modelling and microwave modelling activities. A Key component of an effective cal-val contribution is to ensure feedbacks between the cal-val team and the SMOS ground segment. A preliminary cal-val study in collaboration between CESBIO and ECMWF has been defined to compare the ESA level 2 algorithm and the L-band CMEM forward operator over West Africa.