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SMOS Soil moisture Cal val activities

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SMOS, successfully launched on November 2, 2009, uses an L Band radiometer with aperture synthesis to achieve a good spatial resolution.. It was developed and made under the leadership of the European Space Agency (ESA) as an Earth Explorer Opportunity mission. It is a joint program with the Centre National d'Etudes Spatiales (CNES) in France and the Centro para el

Desarrollo Tecnológico Industrial (CDTI) in Spain. SMOS carries a single payload, an L band 2D interferometric radiometer in the 1400-1427 MHz protected band. This wavelength penetrates well through the vegetation and with the atmosphere being almost transparent, it enables us to infer both soil moisture and vegetation water content. SMOS achieves an unprecedented spatial resolution of 50 km at L-band maximum (43 km on average) with multi angular-dual polarized (or fully polarized) brightness temperatures over the globe and with a revisit time smaller than 3 days.

SMOS is now acquiring data and has undergone the commissioning phase. The data quality exceeds what was expected, showing very good sensitivity and stability. The data is however very much impaired by man made emission in the protected band, leading to degraded measurements in several areas including parts of Europe and China. Many different international teams are now performing cal val activities in various parts of the world, with notably large field campaigns either on the long time scale or over specific targets to address the specific issues. These campaigns take place in various parts of the world and in different environments, from the Antarctic plateau to the deserts, from rain forests to deep oceans.

SMOS is a new sensor, making new measurements and paving the way for new applications. It requires a detailed analysis of the data so as to validate both the approach and the quality of the retrievals, and allow for monitoring and the evolution of the sensor. To achieve such goals it is very important to link efficiently ground measurement to satellite measurements through field campaigns and related airborne acquisitions. Comparison with models and other satellite products are necessary. It is in this framework that CESBIO has been involved with many groups to assess the data over many areas in close collaboration.

This paper aims at summarising briefly the results (presented in detail in other presentations) to give a general overview and a general first taste of SMOS' performance, together with the identified gaps and next steps to be taken.

This presentation could be the general introduction to Cal Val activities.