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SMOS system performances based on end-to-end simulations

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The Soil Moisture and Ocean Salinity (SMOS) mission aims at observing two variables critical for a large scientific community, from biosphere dynamics to climate monitoring. The mission should also provide information on root zone soil moisture and vegetation and contribute to significant research in the field of the cryosphere.

The original design, 2D interferometric radiometer at L-band, and principle of measument makes SMOS a challenge at various technical levels. Moreover, stringent requirements on the estimated variables, make the complete processing of SMOS data even more challenging.

The satellite, at present in final integration and test phase is due for launch at the end of 2008, and the development of the ground processing system is on-going.

These important steps will complete the characterization of the various elements composing the payload and the satellite, as well as the various trade-offs and constraints that makes possible to evaluate performance assessment accurately.

This presentation will give an overview of the system performances evaluation, based on end-to-end simulations. From the description of the surface, through the generation of brightness temperatures at the input of the instrument, computation of correlation and visibilities, calibration, reconstruction and retrieval of land soil moisture.

Each contributor to the final performance is simulated with its current expected accuracy, so as to generate as representative as possible end products. The assesment of

these products will be done based on the initial surface description used as input to the simulator. When possible the impact of each major contributor will be emphasized.

Simulations results will be shown including complete half orbit products, and extensive time series over Europe.