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ESA's Soil Moisture and Ocean Salinity Mission - Mission overview and first results

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The European Space Agency's (ESA) Soil Moisture and Ocean Salinity (SMOS) mission was successfully launched on 2 November 2009. SMOS will play a key role in the monitoring of climate change on a global scale. It is the first ever satellite designed both to map sea surface salinity and to monitor soil moisture on a global scale. It features a unique interferometric radiometer that will enable passive surveying of the water cycle between oceans, the atmosphere and land.

ESA initiated a number of scientific projects exploiting the global data set and focussing on the following aspects:
o The International Soil Moisture Network was initiated together with the Global Energy and Water Cycle Experiment (GEWEX) in cooperation with the Group of Earth Observation (GEO) and the Committee on Earth Observations (CEOS). Data hosting, maintenance and web-based distribution will initially be performed by the Vienna University of Technology (TU Wien, http://www.ipf.tuwien.ac.at/insitu/).
o As part of the continuous SMOS data quality control procedures, the European Centre for Medium-range Weather Forecasts (ECMWF) is monitoring global top of atmosphere brightness temperatures. In the context of Numerical Weather Prediction, monitoring is defined as the systematic comparison between the observations and the corresponding model fields. Monitoring is a mandatory step prior to data assimilation to detect and quantify systematic differences between the observations and the model. Monitoring can also reveal instruments drifts and failures.
o Soil moisture and ocean salinity are the two key geophysical variables retrieved from the SMOS brightness temperature observations and both parameters are generated operationally by the level-2 processor. However, L-band brightness temperatures are also sensitive to sea ice thickness variations. Within the framework of the "L-band radiometry for sea ice applications" study it was demonstrated through radiative transfer modelling that it may be possible to detect thin sea ice with thickness values up to $\sim$ 1 m.

This presentation will include results from the above mentioned activities. It will also provide an overview on the SMOS mission, its current status and available data products.