The Soil Moisture and Ocean Salinity (SMOS) mission, launched on 2 November 2009, is the European Space Agency’s (ESA) second Earth Explorer Opportunity mission. The scientific objectives of the SMOS mission directly respond to the need for global observations of soil moisture and ocean salinity, two key variables used in predictive hydrological, oceanographic and atmospheric models. SMOS observations also provide information on the characterisation of ice and snow covered surfaces and the sea ice effect on ocean-atmosphere heat fluxes and dynamics, which affects large-scale processes of the Earth’s climate system.

This paper will provide an overview on the various aspects of the SMOS mission, such as

1. **The performance of the mission after more than 6 years in orbit:** The SMOS mission has been in routine operations since May 2010, following the successful completion of the 6-months commissioning phase. The paper will summarise the technical and scientific status of the mission, including the status of the RFI detection and mitigation and its effect on the data products. SMOS was the first satellite mission operating in the purely passive band 1400-1427 MHz. All emissions are prohibited in this protected band L-Band as adopted by the International Telecommunication Union (ITU) Radio-Regulations No. 5.340. Nevertheless strong interference sources have been detected worldwide but the situation is continuously improving. SMOS has so far provided very reliable instrument operations, data processing and dissemination to users. The paper will also provide a brief overview on the MIRAS instrument performance, including the instrument calibration and level 1 brightness temperature data processing. The recent developments in the level 1 processor have shown significant improvements in particular with respect to the orbital, seasonal and annual stability. In addition the spatial biases have been further reduced. The new version of the processor will make use of the full polarimetric information sensed by the instrument and provides more accurate measurements for the third and fourth Stokes parameters.

2. **An overview on the SMOS data products:** SMOS provides continuously level 1 (brightness temperature) and level 2 (soil moisture and ocean salinity) to its scientific user community since summer 2010. SMOS also provides brightness temperature and a neural network based soil moisture data product (from November 2015 onwards) via the WMO’s GTS and EUMETSAT’s EUMETCast data dissemination systems to other operational agencies. This direct link into the data collection points for operational agencies has increased the uptake of SMOS data in this community and has opened up new operational applications for SMOS data. Other data products are under development, responding to the requirements of the science community in particular in the area of hydrology, climate, land
use and ship routing, namely a frozen soil indicator, data products for freeze/thaw periods, sea ice thickness and vegetation water content.

3. Provide an update on the **overall validation approach and recent activities**: SMOS data products are continuously improved and approach the scientific mission objectives. Validation activities are essential to ensure high data quality. ESA in collaboration with national agencies and institutions maintains a frame for validation activities such as reference sites, ground based observations as well as campaigns. The paper will provide an update on recent activities, such as the ground based L-Band radiometer activities at DOME-C and over selected land sites.

4. Summarise the **collaboration with other space-borne L-band passive sensors**, such as NASA’s Aquarius and SMAP missions. International collaboration is ongoing both with L-Band mission counterparts (Aquarius and SMAP) but also other satellite and in-situ derived data sets for soil moisture and ocean salinity, including the working groups focusing on stratification and salinity inter-comparison/cross-calibration were established.

5. Provide the status of discussions on a potential **SMOS follow-on** mission.