

EARTH OBSERVATION SYMPOSIUM (B1)
International Cooperation in Earth Observation Missions (1)

Author: Mr. BERMUDO Francisco
Centre National d'Etudes Spatiales (CNES), France, francois.bermudo@cnes.fr

SMOS AN INTERNATIONAL COOPERATION FOR A L BAND INTERFEROMETRIC
RADIOMETER MISSION

Abstract

The SMOS (Soil Moisture and Ocean Salinity) mission is a joint ESA/CNES/CDTI Earth Observation program selected in the framework of the Earth Explorer Opportunity Missions with launch planned in summer 2009. An overview of the SMOS mission will be addressed by this paper with attention put on the CNES specific undertakings in the frame of this cooperation. The first results of the in-orbit commissioning phase will also be presented. The objective of the SMOS mission is to provide maps of soil moisture (SM) and Ocean Salinity (OS) of specified accuracy, sensitivity, spatial resolution and coverage.. Both Soil Moisture and Ocean Salinity are key variables in weather forecasting, climate monitoring, extreme events forecasting. The SMOS mission will be implemented by a system consisting of a satellite, a launch service and a ground segment. The SMOS Satellite injected into a Low Earth Polar sun synchronous Orbit with a typical altitude of 755 kilometers will acquire passive radiometric information in the L-band with high sensitivity, high accuracy and moderate spatial resolution. The SMOS spacecraft will consist on a platform, based on the CNES/THALES generic platform adapted to the mission specificities. The SMOS Payload Module, procured by ESA will consist in a EADS/CASA L-Band 2D interferometric imaging radiometer with a Y-shaped 3 arms synthetic aperture antenna. The launch vehicle in charge of injecting the SMOS satellite into its Low Earth Polar Orbit is the ROCKOT-Breeze KM operated from the Plesetsk Cosmodrome in Russia. The SMOS Satellite Operations Ground Segment, in charge of operating, controlling and monitoring the satellite, is located in Toulouse and will be operated by CNES. The SMOS Data Processing Ground Segment in charge of acquiring, processing, archiving and dispatching the SMOS Levels 1 and 2 products, will be located in the ESA – Villafranca centre. A Centre Aval de Traitement des Données SMOS in charge of processing, calibrating, archiving and dispatching the SMOS scientific data at levels 3 and 4 (geographic maps and special products) will be developed by CNES . The SMOS instrument data products after calibration and corrections performed on ground shall be maps of brightness temperature at different polarizations for all specified land areas and for the oceans. Subsequently from these data geophysical information of concern to the mission, namely fields of Soil Moisture and Ocean Salinity will be extracted.