



Biophysical parameters analysis over the Valencia Anchor Station in the framework of SMOS Vegetation Optical Depth Validation Activities (2010-2013)

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The SMOS (Soil Moisture and Ocean Salinity) Mission was successfully launched on 2nd November 2009 as the second ESA Earth Explorer Opportunity Mission within the framework of ESA's Living Planet Programme. Referring to continental surfaces, one of the main objectives of SMOS is to improve the knowledge of the Earth's Water Cycle through the global observation of soil moisture and the study of the effect of vegetation.

The Valencia Anchor Station (VAS) is a relatively homogeneous area of 50 x 50 km² composed mainly by vineyards (65%) and other Mediterranean vegetation cover types (30%). It is placed in the natural region of the Utiel - Requena Plateau, about 80 km west of the city of Valencia. The VAS was selected by ESA and the SMOS Science Group in October 2006 as one of the core validation sites for SMOS land data and products, and it is currently a long term validation site of SMOS level 2 and 3 products. In addition, it is being considered in the framework of the forthcoming NASA SMAP (Soil Moisture Active and Passive) and ESA SENTINEL-3 OLCI (Ocean & Land Colour Instrument) validation activities.

The study establishes an analysis of the biophysical parameter vegetation optical depth (TAU) taken from the SMOS satellite level 3 products and from the microwave L-band ESA radiometer ELBARA-II situated at the MELBEX-III site (Mediterranean Ecosystem L-Band Characterization Experiment) at the Valencia Anchor Station. The vegetation optical depth parameter depends on vegetation water content (VWC), biomass, vegetation dynamics and transmissivity of the plant. Consequently, the objective of this study is to assess, in the Valencia Anchor Station area, the relationship of TAU SMOS and TAU ELBARA-II with other vegetation indices related with different vegetation characteristics.

On the one hand, TAU is correlated with the Normalized Difference Vegetation Index (NDVI) and the Enhanced Vegetation Index (EVI) obtained from MODIS and, on the other hand, with the Leaf Area Index (LAI) obtained from LSA SAF Project (Satellite Application Facility on Land Surface Analysis) during the years 2010 – 2012 and from in situ measurements taken in 2013 with the LAI Licor – 2000 Plant Canopy Analyzer. Moreover, TAU will also be analysed with respect to VWC measurements to be obtained from in situ linear displacements transducers (precision dendrometers) being now installed at the vineyard crops at MELBEX – III site.