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The European Space Agency's (ESA's) Water Mission, the SMOS (Soil Moisture and Ocean Salinity) mission, was launched in November 2009. The payload for the mission was the 2D L-band radiometer [1]. Since then global maps of brightness temperatures (T_B) at L-band have been available. Angular characteristics of T_B for horizontal and vertical polarization are used for the simultaneous retrieval of surface soil moisture (SM) and vegetation optical depth (TAU). Ground based radiometers such as the ELBARA-II radiometer [2] at the Valencia Anchor Station (VAS) are playing a key role in Calibration/Validation activities for this mission [3].

The Valencia Anchor Station is situated in the Utiel-Requena area 80km west of Valencia, Spain. Over 60% of land use is dedicated to vine cultivation and the rest is mainly natural Mediterranean vegetation (30% pine trees and shrubs) and orchards [4]. The radiometer itself is placed on a 16 m tower overlooking the "tempranillo" vines. On top of the antenna, an infrared camera is mounted and directly in the antenna footprint there are 7 ThetaProbe soil moisture sensors. In the vicinity of the tower there is a DAVIS meteorological station. The first part of this study was to compare radiometric data provided by ELBARA-II with brightness temperatures seen by SMOS. In the second part a simplified approach to SM retrieval was tested against algorithm used in SMOS data processing.