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Validation of SMOS and ASCAT data over France with ISBA-A-gs model and the SMOSMANIA network

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The SMOS (Soil Moisture and Ocean Salinity) satellite based on an aperture synthesis L-band radiometry was successfully launched in November 2009. Over land, the aim of SMOS mission is to provide global surface soil moisture (SSM) maps with an accuracy better than 0.04 $m^3.m^{-3}$. SSM estimates are also provided by the Advanced Scatterometer, ASCAT (C-band). Currently, over France, SMOS data at level 1 (brightness temperature) and level 2 (SSM) and the ASCAT soil moisture product are available for the full year 2010. This work focuses on the validation of SMOS and ASCAT data over France for the year 2010. SMOS and ASCAT SSM products are compared with the SSM simulated using the ISBA-A-gs model over France. Also, ASCAT and SMOS SSM products are compared with in situ measurements from the SMOSMANIA network, comprising 21 stations located in southern France. All the stations measure soil moisture profiles and the observation closest to the surface is made at a depth of 5cm. Finally, an attempt is made to derive SSM from regressed empirical logarithmic equations using a combination of SMOS brightness temperatures at different angles and polarizations.