



Integrated L-band Soil Moisture estimates using SMOS and SMAP observations

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Soil Moisture Active Passive (SMAP) mission and the Soil Moisture and Ocean Salinity (SMOS) missions provide brightness temperature and soil moisture estimates every 2-3 days. SMAP brightness temperature observations were compared with SMOS observations at 40 degree incidence angle. The brightness temperatures from the two missions are not consistent. SMAP observations show a warmer TB bias (about 1.27 K: V pol and 0.62 K: H pol) as compared to SMOS. SMAP and SMOS missions use different retrieval algorithms and ancillary datasets which result in further inconsistencies between their soil moisture products. A linear adjustment over land was made to recalibrate the brightness temperatures for the two polarizations to develop a consistent brightness temperature data record. The reprocessed constant-angle SMOS brightness temperatures were used in the SMAP soil moisture retrieval algorithm to develop a consistent multi-satellite product. The integrated product has an increased global revisit frequency (1 day) and period of record that is unattainable by either one of the satellites alone. The use of consistent brightness temperature and the same algorithm and ancillary data resulted in a SMOS soil moisture that is consistent with the SMAP product. The use of this methodology allows the development of a longer-term climatological dataset of both brightness temperature and soil moisture estimates that can be used in various water cycle applications. Results from the development and validation of the integrated soil moisture product will be presented.