



Global-scale Assessment and Combination of SMAP with ASCAT (Active) and AMSR2 (Passive) Soil Moisture Products

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Global soil moisture (SM) products retrieved from active and passive microwave remote sensing are providing an effective way to monitor near real-time SM content with near-daily temporal resolution. In the present study, we validated the Advanced Scatterometer (ASCAT), Advanced Microwave Scanning Radiometer 2 (AMSR2), and Soil Moisture Active Passive (SMAP) products in northeast Asia from March 31, 2015 to December 31, 2016, by using the International Soil Moisture Network (ISMN) in-situ SM datasets during the growing and non-growing seasons considering their overpass time. The analysis was done for relative SM datasets to investigate the impact of seasonal cycle on satellite-based SM products. In addition, the daily ASCAT and AMSR2 products and half-orbit SMAP products were combined, one by one, based on the maximized-R method with Global Land Data Assimilation System (GLDAS) SM as a reference SM value. The performances of individual and combined products were evaluated by different statistical metrics against the ISMN dataset. Considering the relative SM in the growing and non-growing seasons, the combination of ASCAT and AMSR2, ASCAT and SMAP, and AMSR2 and SMAP showed improved accuracy compared to the individual satellite products.