

PALS (Passive Active L-Band System) Soil Moisture Measurements in SMAPVEX15 (SMAP Validation Experiment 2015)

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The National Aeronautics and Space Administration Soil Moisture Active Passive (SMAP) mission was launched in January 2015. The objective of the mission is global mapping of soil moisture and freeze/thaw state. For soil moisture algorithm validation, the SMAP project conducted the SMAP Validation Experiment 2015 (SMAPVEX15) around the Walnut Gulch Experimental Watershed (WGEW) in Tombstone, Arizona on August 1-19, 2015. The main goals of SMAPVEX15 are to understand the effects and contribution of heterogeneity on the soil moisture retrievals, evaluate the impact of known Radio Frequency Interference (RFI) sources on retrieval, and assess the accuracy of disaggregated SMAP brightness temperature product. The key airborne microwave instruments featured in the campaign was PALS (Passive Active L-band System). PALS has an L-band radiometer and radar sharing one microstrip patch antenna in conical scanning configuration. The PALS instrument, mounted on a DC-3 aircraft, mapped the selected test site near the time of SMAP overpasses. WGEW was selected as the experiment site due to the North American Monsoon rainfall patterns in August and existing dense networks of precipitation gages and soil moisture sensors. PALS measured diverse soil moisture conditions during the experiment, which were verified by ground observations. In particular, heterogeneous and variable distribution of soil moisture was detected. In this talk we will present the soil moisture retrieval results from PALS and validation of those results with in situ measurements.

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