

RETRIEVAL OF SOIL MOISTURE FROM AMSR DATA

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The Advanced Microwave Scanning Radiometer (AMSR) is a follow-on to the SMMR, SSM/I, and TMI spaceborne microwave radiometers. It is the first instrument since the SMMR to include C-band channels. Since the ability to penetrate vegetation, and to sense deeper in the soil, increases with wavelength, the AMSR is expected to have better soil moisture sensing capabilities than either the SSM/I or the TMI. The spatial resolution of AMSR will be a factor of two better than the SMMR. While not optimal for soil moisture sensing, the AMSR should provide useful soil moisture information over low-vegetated areas of the globe, and will serve as a valuable precursor to future proposed L-band soil moisture sensors.

In this paper we present results from models and experiments indicating the capabilities and problems of soil moisture sensing at the AMSR frequencies. Vegetation cover, snow cover, frozen ground, topography, water bodies, and general surface heterogeneity must be accounted for in determining the retrievability of soil moisture. Registration of the satellite sensor footprints to an Earth-fixed grid is advantageous when using ancillary data sets (e.g. soil texture and topography). Preliminary tests of soil moisture retrieval algorithms are discussed. Experiments using surface measurements, airborne sensors, and current satellite data are planned for further development of the retrieval algorithms, and for validation of the derived soil moisture products post-launch. The validation activities will also take advantage of measurement networks provided by international programs such as the GEWEX Coordinated Enhanced Observing Period (CEOP) experiments.