

Advances in X- and Ku- Band Radar Algorithms for SWE Retrieval by Future Satellite Missions

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ABSTRACT

A leading measurement technique for a future SWE satellite mission is radar volume scattering at X and Ku bands (10 and 17 GHz). For example, the European CoReH2O concept was based around this, but unfortunately was not selected. Many key advances have been made since then, both in the theoretical domain as well as in the area of validation against field observations - for example, from SnowEx. Using those advances, there is a NASA mission concept being developed around this technique.

At the core of the current algorithm, and one of the key advances, is a dense media radiative transfer (DMRT) model in a simplified parameterized form. Other advances include subtraction of background scattering and partitioning by the scattering albedo. The retrieval solution is determined through a cost function minimization approach after accounting for surface scattering from the snow-soil interface, low vegetation, and the scattering albedo.

We will show validation results using both tower and airborne data and discuss the options for obtaining the necessary input parameters.

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