

## Validation of GPM DPR Surface Snowfall Product and the Global Distribution

V. Chandrasekar and Minda Le  
Colorado State University

Detection of falling snow is an important objective of the GPM mission, because it accounts for a significant fraction of precipitation in Earth's hydrological cycle, especially at the mid-high latitudes. Our group have developed various products for GPM DPR dual-frequency algorithm (level-2). One of them is a precipitation type index (PTI) based algorithm to identify surface snowfall. The algorithm is built upon vertical features of DPR dual-frequency reflectivity profiles. Le et al. (2017) describes the algorithm details. Extensive evaluations have been performed on this "flagSurfaceSnowfall" product currently in the Experimental Module of GPM DPR level-2 algorithm. Validation activities include those with NEXRAD radar network, NASA Polarimetric Radar (NPOL), and CSU-CHILL radar during concurrent precipitation events and GPM validation campaign Olympic Mountain Experiment (OLYMPEX). Other ground truth such as Precipitation Imaging Package (PIP) and ground report is also included in the validation. Based on 16 validation cases in the years 2014-18, the average match ratio between surface snowfall flag from space radar and ground radar is around 87.8%. Promising agreements are achieved with different validation sources. Global distribution map of the surface snowfall is generated based on years of observations. The distributions are cross compared with various global snow maps and demonstrates excellent performance.

### Reference

Le, M., V. Chandrasekar and S. Biswas, 2017: An Algorithm to Identify Surface Snowfall from GPM DPR Observations, in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 55, no. 7, pp. 4059-4071.