Testing of Cloud Microphysics Scheme with Snow Events

W Tao (1), J Shi (1,2), T Matsui (1,2), A Hou (1), S Lang (1,3), R Cifelli (4), C Peters-Lidard (1), G Jackson (1), S Rutledge (4), and W Petersen (5)

(1) NASA/Goddard Space Flight Center, Greenbelt, Maryland, USA, (2) Goddard Earth Sciences and Technology Center, University of Maryland at Baltimore County, Baltimore, MD, USA, (3) Science Systems and Applications, Inc., Lanham, MD, USA, (4) Colorado State University, Fort Collins, CO, USA, (5) NASA/Marshall Space Flight Center, Huntsville, Alabama, USA

One of the grand challenges of the Global Precipitation Measurement (GPM) mission is to improve precipitation measurements in mid- and high-latitudes during cold seasons through the use of high-frequency passive microwave radiometry. For this, the Weather Research Forecast (WRF) model with the Goddard microphysics scheme is coupled with the Satellite Data Simulation Unit (WRF-SDSU) that has been developed to facilitate the over- snowfall retrieval algorithm by providing virtual cloud library and microwave brightness temperature (Tb) measurements consistent to the GPM Microwave Imager (GMI). This study tested the Goddard cloud microphysics scheme in WRF in snowstorm events (January 20-22, 2007) over the Canadian CloudSat/CALIPSO Validation Project (C3VP) site up in Ontario, Canada.

In this meeting, we will present the performance of the Goddard cloud microphysics scheme both with 2ice (ice and snow) and 3ice (ice, snow and graupel) as well as other WRF microphysics schemes. We will also examine the microphysical processes that generate the liquid and icephase. Results will be compared with the King Radar data. We will also use the WRF model outputs to drive the Goddard SDSU to calculate radiances and backscattering signals consistent to satellite direct observations. These simulated radiance are evaluated against the measurement from A-Train satellites.