Geophysical Research Abstracts
Vol. 21, EGU2019-10481, 2019
EGU General Assembly 2019

Enhancing Data Assimilation of GPM Observations: Past 6 Years and Future Plans

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In precipitation science, satellite data have been providing precious, fundamental information, while numerical models have been playing an equally important role. Data assimilation integrates the numerical models and real-world data and brings synergy. We have been working on assimilating the GPM data into the Nonhydrostatic ICosahedral Atmospheric Model (NICAM) using the Local Ensemble Transform Kalman Filter (LETKF). Our 3-year project titled “Enhancing Data Assimilation of GPM Observations”, funded by JAXA, started in April 2016 and is ending its period in March 2019. The project follows the success of the previous 3-year effort on “Ensemble-based Data Assimilation of TRMM/GPM Precipitation Measurements”, where we developed a global data assimilation system NICAM-LETKF from scratch. This presentation will provide a summary of the past 6-year effort with more emphasis on the recent achievements, including model parameter estimation with data assimilation of JAXA’s multi-satellite precipitation analysis data known as the GSMaP (Global Satellite Mapping of Precipitation), data assimilation of GPM/DPR reflectivity, and comparison between GPM/ice-flag product and NICAM simulation and its implications to the NICAM’s snow-density parameter. Based on the achievements, we will present our plans for the next 3-year project for improving precipitation forecast through data assimilation of GPM observations.