

The Performance and Validation of GPM's Falling Snow Retrieval Algorithms

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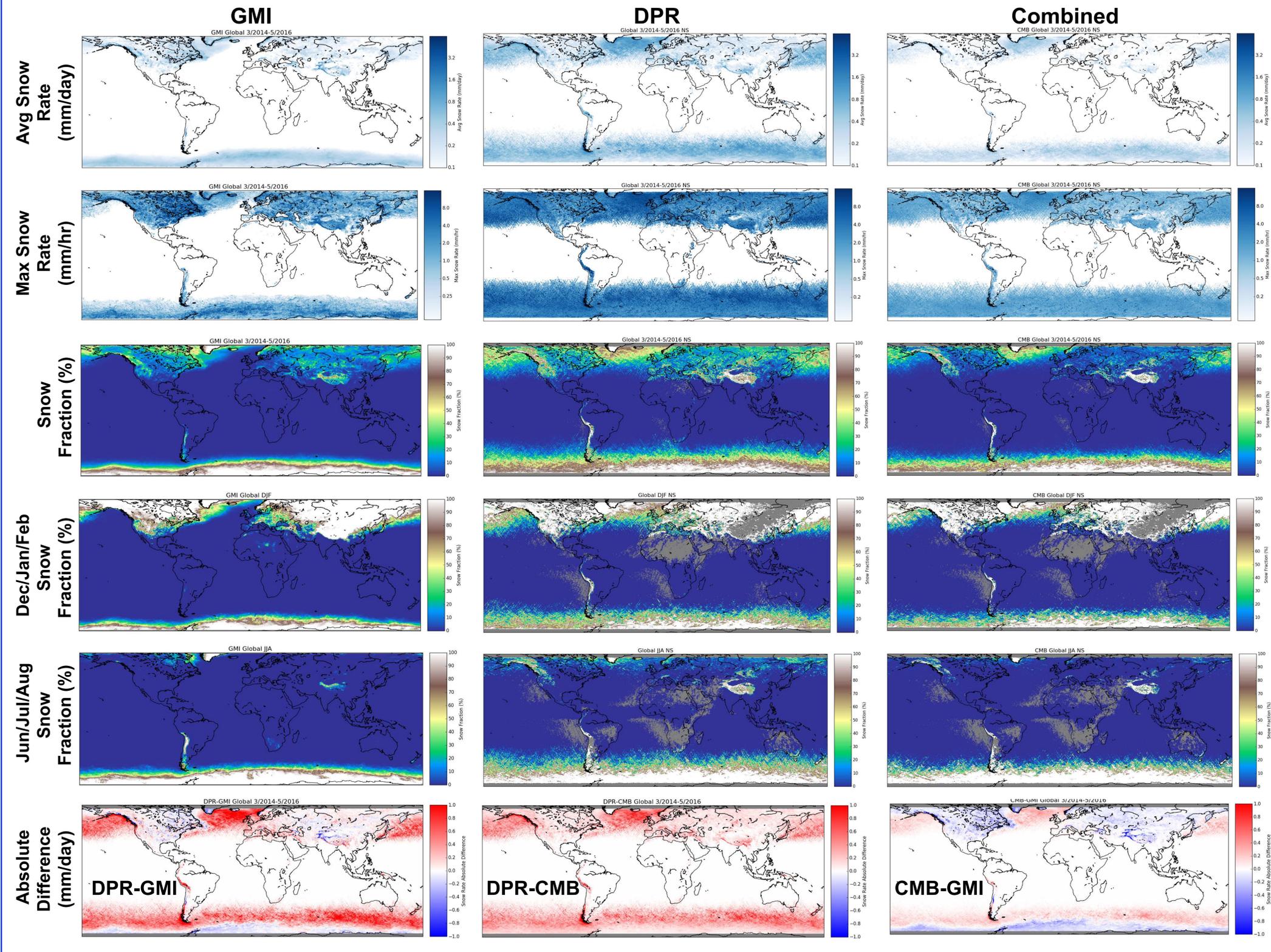
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Introduction:

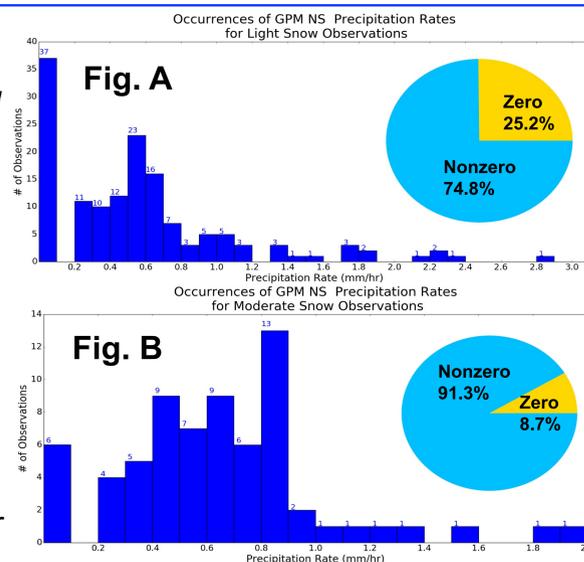
Precipitation falling in the form of snow is vitally important for society and the Earth's climate, geology, agriculture, and ecosystem. Falling snow can exert tremendous socio-economic impacts and disrupt transportation systems. In some parts of the world, snow is the dominant precipitation type and relied upon year round for freshwater. The Global Precipitation Measurement (GPM) mission (launched 2014 in a partnership between NASA and JAXA) was specifically designed to remotely sense (estimate) both liquid rain and falling snow. This poster describes the **preliminary results and performance evaluations of estimating falling snow** using the GPM Microwave Imager (GMI) and the Dual-frequency Precipitation Radar (DPR) on board GPM. These plots use Version 04 of the algorithms. All snow estimates are in liquid equivalent units.

Global Falling Snow Estimates from GMI, DPR, and Combined (March 2014-April 2016)



Falling Snow Detection

One of GPM's Mission Level 1 Science Requirements is proving that GPM detects falling snow events. Ground observation data (AWOS, ASOS, METAR) was obtained for 30 GPM falling snow cases from the Iowa Environmental Mesonet (IEM) database and compared with the GPM DPR (NS=Normal Scan) variables precipRateNearSurface and phaseNearSurface when the METAR observation reported intensities of light snow, moderate snow, or heavy snow, with intensity classified by measured visibility at the METAR site. **Fig A:** For METAR light snow, number of DPR NS estimated precipitation rates (liquid equivalent) for various bins. **Fig. A Inset:** Percentage of GPM zero and nonzero precipitation rates for METAR light snow obs. **Fig B and Inset:** Same as Fig. A for moderate snow obs. **Fig C:** The total number of occurrences of the phase of precipitation for light snow observations as detected by GPM NS.



Future Work

Our next steps include: (1) analyzing the causes in differences between the GMI, DPR, and Combined snow estimates, (2) comparing GPM's snow estimates with ground observations (e.g., MRMS in the US), (3) comparing GPM results with CloudSat snow estimates, (4) include more months of data, and (5) further analyze using additional techniques and then document GPM's Falling Snow Detection performance for meeting Level 1 Science Requirements.

Acknowledgments

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