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GPM 主衛星搭載二周波降水レーダの初期結果
Early results of Dual-frequency Precipitation Radar on Global Precipitation Measurement Core Observatory

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The Global Precipitation Measurement (GPM) Mission consists of a Tropical Rainfall Measuring Mission (TRMM)-like non-sun-synchronous orbiting satellite (GPM Core Observatory) and a constellation of satellites carrying microwave radiometer instruments. The GPM Core Observatory, which was launched on 28 February 2014 (JST), carries the Dual-frequency Precipitation Radar (DPR) developed by the Japan Aerospace Exploration Agency (JAXA) and the National Institute of Information and Communications Technology (NICT). The DPR consists of two radars; Ku-band (13.6 GHz) precipitation radar (KuPR) and Ka-band (35.55 GHz) radar (KaPR). The DPR is expected to advance precipitation science by expanding the coverage of observations to higher latitudes than those obtained by the TRMM Precipitation Radar (PR), by measuring snow and light rain via high-sensitivity observations from the KaPR, and by providing drop size distribution (DSD) information based on the differential scattering properties of the two frequencies. For operational productions of precipitation datasets, it is necessary to develop computationally efficient, fast-processing DPR Level-2 (L2) algorithms that can provide estimated precipitation rates, radar reflectivity factors, and precipitation information, such as the DSD and precipitation type. The L2 algorithms have been developed by the DPR Algorithm Development Team under the NASA-JAXA Joint Algorithm Team.

The DPR data have been evaluated in terms of consistency with TRMM/PR data, and comparison with ground instruments. All GPM standard products have been released to the public since September 2014 after achievement of release criteria of the products. The release criteria of the DPR precipitation products is less than 50% differences of averaged surface precipitation rates between the GPM/DPR and the TRMM/PR are over the ocean. In addition, success criteria of the DPR product is defined as less than 10% difference in annual rainfall amounts compared with ground-based measurements. In this work, the current DPR evaluations using TRMM/PR data and ground rain gauge data over the Japan will be presented.

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