Dual-frequency Precipitation Radar (DPR) in the Global Precipitation Measurement (GPM) Mission

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ABSTRACT:

The Global Precipitation Measurement (GPM) mission is a joint multi-satellite mission between the U.S. (NASA) and Japan (JAXA/NICT). A dual-frequency-band radar system will be flown on the core' spacecraft among constellation of satellites. The core spacecraft serves as a high quality reference platform for training and calibrating the rain retrieval algorithms used with the passive microwave radiometers on the other constellation satellites. The dual-frequency radar (DPR) is being developed by JAXA and NICT and is expected to provide accurate estimates of rainfall rate as well as drop size distribution (DSD) parameters from the combination of Ku- and Ka-band radar returns. This paper outlines the GPM mission and the roles of the DPR in it. Differences between the DPR and the Precipitation Radar (PR) on the TRMM satellite are emphasized. In particular, new algorithm issues associated with the addition of the Ka-band radar are mentioned and a possible rain profiling algorithm for the DPR is presented.