Current Status of Japan's Activity for GPM/DPR and Global Rainfall Map algorithm development

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The Global Precipitation Measurement (GPM) mission is composed of two categories of satellites; 1) a Tropical Rainfall Measuring Mission (TRMM)-like non-sun-synchronous orbit satellite (GPM Core Observatory); and 2) constellation of satellites carrying microwave radiometer instruments. The GPM Core Observatory carries the Dual-frequency Precipitation Radar (DPR), which is being developed by the Japan Aerospace Exploration Agency (JAXA) and the National Institute of Information and Communications Technology (NICT), and microwave radiometer provided by the National Aeronautics and Space Administration (NASA). GPM Core Observatory will be launched in February 2014, and development of algorithms is underway.

DPR Level 1 algorithm, which provides DPR L1B product including received power, will be developed by the JAXA. The first version was submitted in March 2011. Development of the second version of DPR L1B algorithm (Version 2) will complete in March 2012. Version 2 algorithm includes all basic functions, preliminary database, HDF5 I/F, and minimum error handling. Pre-launch code will be developed by the end of October 2012.

DPR Level 2 algorithm has been developing by the DPR Algorithm Team led by Japan, which is under the NASA-JAXA Joint Algorithm Team. The first version of GPM/DPR Level-2 Algorithm Theoretical Basis Document was completed on November 2010. The second version, "Baseline code", was completed in January 2012. Baseline code includes main module, and eight basic sub-modules (Preparation module, Vertical Profile module, Classification module, SRT module, DSD module, Solver module, Input module, and Output module.) The Level-2 algorithms will provide KuPR only products, KaPR only products, and Dual-frequency Precipitation products, with estimated precipitation rate, radar reflectivity, and precipitation information such as drop size distribution and bright band height. It is important to develop algorithm applicable to both TRMM/PR and KuPR in order to produce long-term continuous data set. Pre-launch code will be developed by autumn 2012.

Global Rainfall Map algorithm has been developed by the Global Rainfall Map Algorithm Development Team in Japan. The algorithm succeeded heritages of the Global Satellite Mapping for Precipitation (GSMaP) project between 2002 and 2007, and near-real-time version operating at JAXA since 2007. "Baseline code" used current operational GSMaP code (V5.222,) and development completed in January 2012. Pre-launch code will be developed by autumn 2012, including update of database for rain type classification and rain/no-rain classification, and introduction of rain-gauge correction.