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The Status of NASA's Global Precipitation Measurement (GPM) Mission 26 Months After Launch

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Water is essential to our planet Earth. Knowing when, where and how precipitation falls is crucial for understanding the linkages between the Earth's water and energy cycles and is extraordinarily important for sustaining life on our planet during climate change. The Global Precipitation Measurement (GPM) Core Observatory spacecraft launched February 27, 2014, is the anchor to the GPM international satellite mission to unify and advance precipitation measurements from a constellation of research and operational sensors to provide "next-generation" precipitation products [1-2]. GPM is currently a partnership between NASA and the Japan Aerospace Exploration Agency (JAXA).

The unique 65o non-Sun-synchronous orbit at an altitude of 407 km for the GPM Core Observatory allows for highly sophisticated observations of precipitation in the mid-latitudes where a majority of the population lives. Indeed, the GOM Core Observatory serves as the cornerstone, as a physics observatory and a calibration reference to improve precipitation measurements by a constellation of 8 or more dedicated and operational, U.S. and international passive microwave sensors.

GPM's requirements are to measure rain rates from 0.2 to 110 mm/hr and to detect and estimate falling snow. GPM has several retrieval product levels ranging from raw instrument data to Core and partner swath precipitation estimates to gridded and accumulated products and finally to multi-satellite merged products. The latter merged product, called IMERG, is available with a 5-hour latency with temporal resolution of 30 minutes and spatial resolution of 0.1o x 0.1o (∼10km x 10km) grid box. Some products have a 1-hour latency for societal applications such as floods, landslides, hurricanes, blizzards, and typhoons and all have late-latency high-quality science products.

The GPM mission is well on its way to providing essential data on precipitation (rain and snow) from micro to local to global scales via providing precipitation particle size distributions internal to the cloud, 5-15 km estimates of regional precipitation and merged global precipitation. Once TRMM data is recalibrated to the high quality standards of GPM (and as GPM continues to operate), TRMM and GPM together, with partner data) can provide a 25-30+ year record of global precipitation. Scientists and hazard decision makers all over the world value GPM's data. Status and successes in terms of spacecraft, instruments, retrieval products, validation, and impacts for science and society will be presented.