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Innovations in Version 5 IMERG

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The rapid turnover of versions in the Global Precipitation Measurement (GPM) mission data products, in particular the Integrated Multi-satellitE Retrievals for GPM (IMERG) merged precipitation product, has brought the products to Version 05, and these algorithms are now being used to compute the retrospective analysis for the final TRMM Version 8 datasets. The goal is to create a homogeneously processed data record covering the TRMM and GPM eras, and being extended into the future as new observations are recorded. Extensive intercalibration of the TRMM and GPM Core Observatory sensors was undertaken to allow the TRMM and GPM Core Observatory sensors to serve as the TRMM- and GPM-era calibrators respectively. The status of IMERG in both the TRMM and GPM eras will be summarized, together with examples of performance.

In particular, Version 05 IMERG introduced a quality index (QI). At the half-hourly time scale, QI is taken as the approx. Kalman Filter correlation that arises out of the morphing calculation. It depends (non-linearly) on the time offset to each passive microwave overpass used, plus infrared contribution (if any) in each grid box. The general appearance includes swaths set to one for passive microwave overpass data, thin strips of low QI where inter-swath gaps lack recent data, blockiness due to the background coefficients used in the Kalman Filter, and a clear delineation of low confidence in snow- and ice-covered regions where the microwave estimates are discarded, leaving infrared as the sole estimator. The monthly QI is based on the Equivalent Gauge (Huffman et al. 1997; units of gauges / 2.5°x2.5°), which inverts the equation for estimating monthly random error in each grid box. This computation largely tames the non-linearity due to dependence on rain amount, although some residual issues remain at high values.