

Verification of Global Satellite Mapping of precipitation (GSMaP) for providing its error information

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Precipitation is one of the most essential parameters in the Earth system. Due to address water issues like water shortage or floods, JAXA has developed and provided Global Satellite Mapping of Precipitation (GSMaP), which is hourly global precipitation dataset. It is under the Global Precipitation Measurement (GPM) mission and contributes.

GSMaP allows us to capture the hourly horizontal distribution of precipitation with good latency after observation. The spatial resolution is 0.1 x 0.1 degrees latitude/longitude. It has been used for various kinds of utilization purposes.

In terms of accuracy, GSMaP algorithms were updated in several times, and GSMaP has been getting more accurate day by day, however, it is known that the inhomogeneous of accuracy is existed depending on algorithm characteristics. It has been needed to provide information about the uncertainty and accuracy of GSMaP by users.

In this study, verification result of GSMaP near-realtime product version 6 (GSMaP_NRT) is reported. The radar/raingauge analysed precipitation data by Japan Meteorological Agency, which is an hourly rainfall analysis generated from ground-based precipitation radars corrected by automated rain gauges, are used as the reference data. Since the purpose of this study is for providing generalized error information, root mean square errors (RMSE) is statistically calculated for each precipitation level and each reliability flag during May-June-July-August-September-October in 2015-2018. Some initial results showed that the RMSE qualitatively represented the error for each precipitation level and reliability flag. The RMSE ratio to the average precipitation rate got larger as the precipitation rate became smaller while it became stable around 60 -80 % when precipitation rate was more than 10 mm/h. We report the validation results in detail, such as land/ocean difference or sampling dependence, and focus on the effectiveness of it.

Keywords: precipitation, GPM, GSMaP, validation