Quasi-realtime version of the Global Satellite Mapping of Precipitation (GSMaP_NOW) over the Himawari-8 region

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Japan Aerospace Exploration Agency (JAXA) started to distribute the "quasi-realtime" version of the Global Satellite Mapping of Precipitation (GSMaP_NOW) over the Japan Meteorological Agency (JMA) geostationary satellite "Himawari-8" region through the "JAXA Realtime Rainfall Watch" website (http://sharaku.eorc.jaxa.jp/GSMaP_NOW/) since Nov. 2015.

"Realtime availability" of satellite rainfall data is one of major requirements from users. As one of the Japanese products of the the Global Precipitation Measurement (GPM) mission, JAXA has provided the "near-real-time" GSMaP (GSMaP_NRT) product, which is hourly and 0.1-degree grid box global rainfall product combining observation data from microwave and infrared radiometers aboard multiple satellites, four hours after observation through the "JAXA Global Rainfall Watch" website (http://sharaku.eorc.jaxa.jp/GSMaP/). Data latency of "four hours" for GSMaP_NRT product was chosen considering balance of satellite data availability and user requirements. To produce GSMaP_NRT, we allocated three hours to collect satellite data and one hour to process data. Users and purposes of GSMaP_NRT data have been increased in number and variety since its release. It is used in, for example, rainfall monitoring, flood alert and warning, drought monitoring, crop yield forecast, and agricultural insurance.

Building on its experience in the GSMaP production, JAXA has developed the GSMaP realtime version (GSMaP_NOW) product to respond user requirements to shorten data latency of "four hour," and achieved this by providing current rainfall over the geostationary satellite Himawari-8 region. The GSMaP_NOW product uses passive microwave radiometer and geostationary satellite data that is available only within 0.5-hour after observation. At present, we uses data from GPM/GMI, GCOM-W/AMSR2 direct broadcasting near Japan, NOAA and MetOp's AMSU/MHS direct broadcasting, and Himawari-8/AHI to produce GSMaP at 0.5-hour before. In addition, extrapolation of rainfall area with 0.5-hour forward (toward future) by using cloud moving vector calculated from AHI enables us to produce "quasi-realtime" rainfall map over Asian regions. All processing are completed within 0.5-hour, and updated half-hourly.

GSMaP_NOW and other GSMaP products are validated by comparing with with JMA's gauge-calibrated radar analysis (Radar-AMeDAS) over the Japan in daily and 0.25-degree grid basis. Results showed that accuracy of GSMaP_NOW is almost equivalent or slightly worse than GSMaP_NRT for the period from October 2015 to December 2015.

This quasi-realtime capability will provide possibility to operational users to apply the GSMaP_NOW data in their rainfall monitoring more rapidly, flood alert in smaller basins. Extension of GSMaP_NOW from "Himawari" area to the other geostationary satellites' observation areas is also under consideration for future improvements.

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