

Recent updates of the Global Satellite Mapping of Precipitation (GSMaP)

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The Global Satellite Mapping of Precipitation (GSMaP) provides high-resolution, high-frequency global precipitation maps derived primarily from multi-satellite passive microwave (PMW) radiometer observations, complemented by information from geostationary infrared (IR) sensors (Kubota et al., 2020, 2026). The standard GSMaP products have a horizontal resolution of 0.1° and a temporal resolution of 1 hour.

An updated version of the GSMaP product is scheduled for release in 2026. Main features of the new version (Product version: V06, algorithm version: v9) are, 1) extensions to the pole-to-pole coverage, 2) implementation of new satellites/sensors, 3) utilization of AI/Machine learning techniques. In the PMW algorithm, new satellites/sensors will be implemented, such as GOSAT-GW/AMSR3, WSF-M/WMI, AWS/MWR, and so on. AI/Machine learning techniques will be used in a bias correction method over the land, improvement of rainfall detections. Snowfall estimation will be improved based upon the Bayesian method. In the normalization module for PMW retrievals, a basic idea is based upon Yamamoto and Kubota (2022), and will be implemented with a new normalization method by Yoshida et al (2026). In the PMW-IR Combined algorithm, a basic idea is using morphing and Kalman filter (Ushio et al. 2009). In addition, histogram matching method by Hirose et al. (2022) was implemented in the current version. In the new version, the following are planned to be implemented. Retrievals extended to the pole-to-pole using the numerical model. Using Machine Learning-based Cloud Classification. In the Gauge-adjustment algorithm, a basic idea is adjustment using the NOAA CPC Global Unified Gauge-Based Analysis of Daily Precipitation (Mega et al. 2019). Artificial patterns will be mitigated in the new version, diurnal Cycle Correction is now studied by Konduru et al. (2026).