Estimation of observation model parameters using ground data for the Gauge-adjusted Global Satellite Mapping of Precipitation (GSMaP_Gauge)

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Global Satellite Mapping of Precipitation (GSMaP) is a developing project of algorithm global precipitation map based on space-borne microwave radiometers (MWR). In the Global Precipitation Measurement project, the integrated products of the high-resolution mapping of precipitation obtained from microwave measurements made by a constellation satellite and infrared radiometers in geostationary orbit are developed and supplied to the public (GSMaP MVK). However, high-resolution products such as GSMaP_MVK sometimes underestimate the surface precipitation and introduce large error into hydrological modeling. A rain-gauge-adjusted algorithm for the GSMaP (GSMaP Gauge) is a fitting algorithm estimated precipitation from satellites observation to rain-gauge precipitation with precipitation and observation models. The GSMaP Gauge algorithm improve land surface precipitation estimated from space-borne MWR.
The GSMaP Gauge models are two equation. One is observation equation. The observation equation indicate to linear relation with noise between observation data and true precipitation linear relation. Other indicates time change of precipitation. The study show that the estimation method for observation model parameters from ground observation and GSMaP MVK. In Japan region, the estimated parameter reduce root mean square error and rain amount ratio of GSMaP Gauge precipitation from 1.1 to 0.80 and from 1.55 to 1.37, respectively. Also, correlation coefficient is up from 0.47 to 0.54. Therefore the estimation of the parameters for the observation equation of the GSMaP Gauge algorithm lead to better precipitation estimation.

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