

Comparison between high frequency satellite rainfall estimation and APHRODITE-2 ground rain gauge observation

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APHRODITE project collects daily precipitation observation data from ground rain gauges in each country, and then performs appropriate quality control and converts it into gridded data. APHRODITE holds long-term data from the 1960s to the present and focuses on analyzes such as changes in characteristics of extreme rainfall due to long-term climate change. However, ground-based daily rain observations has a problem which end of the day (EOD) in each country is different from each other. To estimate the EOD in each country, we developed a Rain Potential Map (RPM) which is a product that can estimate global rain probability using geostationary meteorological satellites (GEO) (Hirose et al., 2016, JMSJ). In this study, we used the RPM, GSMaP and CMORPH which are global satellite rain estimation data based on microwave satellite and GEO observations.

Since the above satellite rainfall observation data can estimate global precipitation every hour, it is possible to create daily average data in which the average section is shifted by one hour. By correlating the satellite daily precipitation observation time series with the APHRODITE daily precipitation observation time series, the EOD value in each country was estimated from the time when the correlation coefficient is largest. We confirmed that the reliability of this method is high by a verification analysis in the field where true value of EOD is already known. Moreover, we made pseudo hourly rain time series of APHRODITE by inserting APHDOITE daily rain time series to satellite hourly rain time series. By this method, we will try to make a new APHRODITE data that is corrected for the EOD difference between each country.

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