

Toward improvement in estimate of precipitation in higher resolution with surface gauge, radar and satellite observations in Vietnam

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Hourly-rainfall in the Global Satellite Mapping of Precipitation (GSMaP) was validated with gauge data in northern Vietnam. Near-real-time products showed comparable performance with standard products. We will also present a plan to adjust surface radar data with the Global Precipitation Measurement (GPM) satellite observation.

1. Introduction

The Red River is an important river running through Hanoi, the capital of Vietnam. It sometimes makes floods and its upstream is surrounded by sub-100-km-scale mountain ranges. Therefore, satellite-borne-radar rainfall observation plays a crucial role in flood forecasts in this region. The GSMaP dataset is one of such observations based mainly on the microwave observation by the Tropical Rainfall Measuring Mission and the GPM satellites (Aonashi et al. 2009; Ushio et al. 2009).

2. Data

We compared hourly rainfall at eight gauge stations of the Vietnam Meteorological Hydrological Administration and the GSMaP data at the closest grid points to the gauges from April to October. The used GSMaP products were the MVK version 7 (MVKv7), 6 (MVKv6), NRT version 6 (NRTv6) for 2014, and the RNL version 6 (RNLv6) and the NRTv6 for 2010.

3. Results

In 2014, the MVKv7 and NRTv6 showed comparable values with the gauge rainfall as a whole, whereas the MVKv6 showed lower values than the gauge. In 2010, both the NRTv6 and RNLv6 showed lower values than the gauge. The GSMaP had larger (smaller) rainfall than the gauge data, in lighter (heavier) gauge rainfall cases. Probability of detection (POD) was higher for accumulated intervals shorter than 12 hours and longer than 48 hours for 95-percentile rainfall. The higher POD for the shorter-interval accumulated rainfall indicated the possibility to improve heavy rainfall reproducibility, although the main reason seems that the accumulated 95-percentile rainfall was smaller for the shorter intervals than for the longer intervals.