

## Validation of GSMaP using ground snowfall observation data

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The Global Satellite Mapping of Precipitation (GSMaP) is a global rainfall map based on a blended Microwave-Infrared product and has been developed in Japan for the Global Precipitation Measurement (GPM) mission. GSMaP is the product of an hourly global rainfall map in 0.1-degree latitude/longitude grid and available 3-day after observation through the "JAXA Global Rainfall Watch" web site (<http://sharaku.eorc.jaxa.jp/GSMaP>).

The latest GSMaP version 04 (algorithm version 07) was released in January 2017 to the public. This product gives snowfall retrieval algorithm for the first time using passive microwave instruments that have higher frequency channels. This algorithm apply the rain/snow discriminant technique developed by Prof. Liu (Sim and Liu 2015, Liu and Seo 2013). The new input data of Multisensor Snow/Ice Cover Maps provided by NOAA/NESDIS make suppress the fake precipitation signals in high latitude area (Kubota et al., in preparation).

This research validates the snow retrieval on GSMaP with the AMeDAS dataset provided by Japan Meteorological Agency(JMA) . The uncertainties of ground observation for snow precipitation amount have been well known. It is often influenced significantly of local climate conditions and small differences in measurement.. JMA mainly uses three types of rain gauge, but those observational errors largely depend on the rain gauge type. Addition to this the effect of the wind is negligible especially for snow observation. WMO suggested the method of double fence intercomparison reference (DFIR), but even the DFIR requires the data correction when the wind speed at gauge height is over 6 m/sec.

Thus at first the categorical validation using GSMaP and AMeDAS data and its dependency for the condition such as altitude of the observational site and wind speed. Then the precipitation amount of GSMaP is compared with of on the ground which is corrected by the several methods which suit on the rain gauge types.

The objective of this research is to estimate the accuracy and correlation between the snowfall retrieval from satellite observation and ground measurement.

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