

Inter-comparison of GCOM-W/AMSR2 cloud liquid water products and its long-term variation

*Yasutaka Murakami¹, Masahiro Kazumori¹

1. Japan Meteorological Agency

Cloud liquid water information from satellite-based microwave observation is a vital data not only for observing diurnal variations but also for observing seasonal variations. It also plays important roles in numerical weather prediction modeling as not only for a verification data in developing cloud related processes, but also for a reference data for quality control of the satellite data utilized in NWP system. Cloud liquid water contents retrieved from satellite-based microwave radiometer is prone to uncertainties. Verification of satellite retrieved cloud liquid water content is difficult due to its limited direct observation data and large spatial and time variation. It is, therefore, common to deploy indirect verification method, evaluating the frequency distribution of cloud liquid water contents at clear sky condition where it should ideally be zero.

The Advanced Microwave Scanning Radiometer 2 (AMSR2) is a microwave radiometer on board the Global Change Observation Mission - Water (GCOM-W or “SHIZUKU”). AMSR2 and its predecessor Advanced Microwave Scanning Radiometer-EOS (AMSR-E) have been continuing the long-term, high-resolution observation of global water cycle in the afternoon orbit (known as the A-Train) for more than 15 years.

In this study, features of AMSR2 cloud liquid water products from four organizations (i.e. Japan Aerospace Exploration Agency (JAXA), National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA) and Remote Sensing Systems (RSS)) are characterized by conducting inter-comparison of these products. The initial study shows that all four products show similar cloud liquid water pattern. Among these four products, JAXA and RSS products have most similar data quality except at high cloud liquid water areas. There are also differences in some weather condition or regions. NASA product has large cloud liquid water in tropics compared to other three organizations. NOAA product has large cloud liquid water in polar regions compared to other three organizations. The details of the comparison by weather conditions as well as the result of statistical analysis with a long term data set will be presented in the conference.

Keywords: cloud liquid water, microwave radiometer