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Creation of Normalized Time Series Data for Microwave Radiometer AMSR2 Loaded on GCOM-W1 Satellite Launched Soon

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The operation of the Advanced Microwave Scanning Radiometer for Earth-Observation System (AMSR-E) loaded on Aqua satellite stopped in October, 2011 after more than 9-years observation. But, JAXA plans to launch GCOM-W1 (Global Change Observation Mission 1st - Water) satellite carrying the successor of AMSR-E (AMSR2), and this satellite will be launched in 2012.

AMSR2 is a microwave radiometer to observe microwave signals at 6.9, 7.3, 10.65, 18.7, 23.8, 36.5 and 89.0 GHz emitted from the Earth almost twice a day because GCOM-W1 satellite is deployed into a sun-synchronous sub-recurrent orbit. Generally, measuring points of a spaceborne instrument differently distribute according to satellite tracks, eventually, observation times. The location and size of a receiver's footprint for one measurement also differ among frequencies. Therefore, as long as some kind of resampling method is applied, the data of different times and frequencies cannot be compared. As for a microwave radiometer, because the footprint size is large, and the main mission is to globally retrieve physical quantities, it has not been sufficiently considered what kind of resampling method is most suitable, which deteriorated the qualities of retrieved physical quantities.

In contrast, because brightness temperature data observed by AMSR2 are resampled by Backus-Gilbert method, footprint size and location among frequencies are unified. These data are provided as the standard product (L1R product). However, because resampling by Backus-Gilbert method requires high amount of calculation, the process to make the L1R product is simplified, and the data of different times and frequencies still cannot be compared at an arbitrary point.

We have developed a method to extract local and faint changes from AMSR-E data, and the idea of Backus-Gilbert method is important to use AMSR2 data for our purpose. So, we implemented Backus-Gilbert method without simplifying to our method to compare the data of different times at an arbitrary point. This paper presents the overview of AMSR2, the details of our method improved by Backus-Gilbert method.