S05-4

Status of the GeoKompsat-2A AMI rainfall rate algorithm

Dong-Bin Shin, Damwon So, and Hyo-Jin Park

Dept. of Atmospheric Science, Yonsei University

A rainfall rate algorithm has been developed for the Advanced Meteorological Imager (AMI) onboard the GeoKompsat-2A (GK-2A), the second Korea's geostationary satellite. The AMI rainfall rate algorithm uses the a-priori information including the microwave rainfall data from the low-earth orbiting satellites and infrared (IR) brightness temperatures from geostationary satellites. The algorithm may better perform with a variety of a-priori information describing all possible precipitating systems. In addition, separation of physically different precipitating systems likely to improve the accuracy of retrieval process. However, it has been well known that such the separation can be hardly achieved based on the measurements of cloud top temperatures. This algorithm tries to utilize the radiative characteristics observed differently for different wavelengths in IR spectral regions. The characteristics include the different emissivity as a function of wavelength and cloud thickness. Using the brightness temperature difference (BTD) between IR channels the algorithm determines the thresholds of the BTDs discriminating two types of precipitating clouds: shallow and not shallow types. In general, shallow precipitating clouds have the temperature similar to the surface temperature so that the temperature is not well connected with the surface rainfall. As such, the separation of two types of precipitating clouds may help the accuracy of rainfall estimates for each type of clouds. In addition to the separation of cloud types in the databases, the algorithm also uses databases classified by latitudinal bands. The bands are separated with four latitudinal zones. The separation of database based on latitudes may have an effect of distinguishing the cloud types that can occur regionally. The a-priori databases are thus classified with 8 different categories.

Once the a-priori databases are constructed, the algorithm inverts the AMI IR brightness temperatures to the surface rainfall rate based on a Bayesian approach. The Bayesian approach has advantages on using multi-channel brightness temperatures simultaneously and utilizing the probability of rainfall reserved in the a-priori databases. As a proxy for the

AMI this algorithm first tests the SEVIRI and then AHI data. The sample retrieval results and the status and plan of the algorithm development will be introduced.