Preliminary result of GeoKompsat-2A/AMI land surface temperature retrieval algorithm using Himawari-8/AHI data

Youn-Young Choi, Myoung-Seok Suh, and Gwan-Young Park
Korea, Republic Of (sms416@kongju.ac.kr)

In this study, we developed the prototype of GeoKompsat-2A/AMI land surface temperature retrieval algorithm using proxy data of Himawari-8/AHI data. In order to develop the LST retrieval algorithm, we simulated spectral radiance at the top of atmosphere (TOA) using MODTRAN4.0 based on the satellite viewing angle, atmospheric profile, emissivity, and diurnal temperature range of LST and air temperature of GeoKompsat-2A/AMI observing area. The TOA radiances are transferred into brightness temperature of each channel using the spectral response function of Himawari/AHI IR channels and inverse Planck function. Using the pseudo-match up database from the RTM simulations, the LST retrieval equations were derived according to the day/night and atmospheric conditions (wet/normal/dry). The LST estimated by the developed algorithm showed a strong correlation (0.995) with the prescribed LST and relatively small bias (0.007 K) and root mean square error (RMSE: 1.145 K). However, the LST retrieval algorithm showed a large RMSE when the brightness temperature difference is greater than 5K and the lapse rate condition is superadiabatic. We are plan to improve the LST retrieval algorithm through the reclassification of LST retrieval equation based on the evaluation results. And the LST algorithm was able to reasonably retrieve the LST from Himawari-8/AHI data compared to the MODIS LST version 5. The preliminary validation results showed that the LST retrieved from Himawari/AHI data was slightly warmer (+1.9 K) than that of the collocated MODIS LST. In this presentation, we will show the detailed results of LST retrieval algorithm including validation results according to the day/night and other impacting factors.