

Development of IASI Preprocessing at KIAPS and Preliminary Results

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The preprocessing system of Infrared Atmospheric Sounding Interferometer (IASI) radiances developed at Korea Institute of Atmospheric Prediction Systems (KIAPS) is introduced and its preliminary results are described here. Brightness temperature (TB) observed for one month in November, 2012 is extracted from IASI Level1D BUFR data using ECMWF BUFR decoder. The background TB is simulated by RTTOV 10.2 using UM 6-hour forecast data.

After gross error checking and simple cloud screening, the bias correction of background departures (i.e. difference between the observed TB and corresponding background TB). The background departure helps us to understand the characteristics of IASI data and bias correction. Small bias is observed for the background departure over the channels for high altitude temperature sounding and water vapor sounding channels. On the other hand, large bias is observed for the background departure for atmospheric window channels. The scatter plots of the observed TB and the background TB show that the large bias for window channels is partly due to cloud contamination. We are currently testing the various cloud screening methods of other organizations and the test results will be presented. .

We have also checked the bias of less cloudy contaminated channels via the off-line bias correction method for IASI used in [1]. There are three types of background departure errors (i.e. scan errors, air-mass errors, and random errors). The scan bias is simply computed as the average of the background departure for each viewing angle and each latitude bin. Satellite viewing angles for 120 IASI scan positions are checked and the histograms of the bias are utilized over each latitudinal bin to find a scan bias error pattern. The air-mass bias is then computed by multiple linear regression analysis of scan-bias-corrected background departures and predictors. We are currently testing the various predictors (i.e. thickness of some part of the atmosphere, total precipitable water, surface temperature, etc.) to find the predictors most suitable for the KIAPS preprocessing system.

References

[1] B. A. Harris and G. Kelly. "A satellite radiance bias correction scheme for data assimilation", *Q. J. R. Meteorol. Soc.*, vol. 127, pp. 1453-1468, 2001.