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Estimation of atmospheric vertical profiles using FY-4B/GIIRS

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The hyperspectral infrared sounder is well known to play an important role in now-casting, data assimilation on NWP, and climate change monitoring. The sounder has thousands of channels with a high vertical resolution, so it could estimate more accurate atmospheric information. The National Meteorological Satellite Center, Korea Meteorological Administration (NMSC/KMA) has developed an algorithm to retrieve the atmospheric profiles for Geostationary Interferometric Infrared Sounder (GIIRS) onboard FengYun-4A/B (FY-4A/B) for monitoring atmospheric instability and water vapor information. To develop the algorithm for GIIRS of FY-4A/B, channel selection, and systematic bias correction were performed. The channel was chosen to consider the vertical distribution of the weighting function, except for the channel with strong trace gas absorption and channels with large observation error among 1682 channels of GIIRS/FY-4B. The retrieved temperature and humidity profiles with GIIRS/FY-4B for the summer of 2022 were compared with radiosonde and the profiles of the GK2A AMI. The validated results of GIIRS/FY-4 were similar to the GK2A even though more channels were used. So, it is needed various sensitivity tests to get more accurate temperature and humidity profiles using hyperspectral infrared sounder such as the number of channels and wavelength selection used by the algorithm. The detailed results and plans are presented at the conference.

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