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Assimilation of hyperspectral infrared sounder radiances in the JMA's meso-scale NWP system

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Assimilation of hyper spectral infrared sounder (HSS) radiances observed by satellite is beneficial for improving temperature and water vapor profiles in numerical weather prediction (NWP). JMA has been assimilating HSS radiances in the global NWP system. We are now working on assimilation of HSS radiances in the meso-scale NWP system.

At the beginning, observation error settings and quality control (QC) processes such as cloud detection follow the processes implemented in the global system. The assimilation channels are selected from the channels of the global system, taking into account the height of the model-top which is lower than the global system. Higher peaking channels are omitted based on the accuracy of the brightness temperature calculation. Brightness temperature biases are removed by variational bias correction (VarBC) scheme with simple predictor variables such as surface temperature and satellite zenith angle and constant.

Data assimilation experiments were conducted for summer and winter season. The results showed that tropospheric temperature and water vapor forecasts have slightly improved. Precipitation forecasts have also improved. The most recent results will be presented in the conference.