S6-07

Impact of clear-sky radiances at CO2 band in the JMA's global data assimilation system

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Clear-sky radiance (CSR) data derived from Himawari-8, GOES-16/-17, Meteosat Second Generation (MSG)-2/-4 are currently used in the JMA's operational global data assimilation system. CSRs at water vapor (WV) bands of 6.2, 6.9 and 7.3 μm are assimilated in order to obtain information about WV amount at the mid and upper troposphere for analysis of the system. We tried CSRs at CO2 band of 13.3 or 13.4 um assimilation in order to extract the information about temperature at the low troposphere. One of the reasons for discarding CSRs other than WV bands is inaccuracy of surface parameters used for radiative transfer (RT) calculation in the system. Land surface temperatures (LSTs) retrieved from CSRs at window band of 10.8 um was used in RT calculation for CO2 and WV band CSRs instead of first-guess (FG) LST. The validation using GCOM-C LST product showed that accuracy of retrieved LST is higher than FG LST. The result of assimilation experiments showed that use of CO2 band CSRs with the LST retrieval successfully improved analysis accuracies and forecasts scores of not only temperature but also relative humidity and wind speed. The improvement was found especially at the mid and low troposphere in the summer hemisphere and the tropics. The details of the result will be shown in the presentation.