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Global Navigation Satellite System (GNSS) Radio Occultation (RO) observation has been proven to be one of very important elements in the global data observing system because its data provide vertical profile information of temperature by assimilating into the NWP system. The Japan Meteorological Agency (JMA) has assimilated RO data in its global and limited area (mesoscale) NWP systems. The bending angle data are used in the global NWP system. In the mesoscale NWP system, the refractivity is selected for the assimilation because of its limited model-top (22km). The Radio Occultation Processing Package (ROPP) is used for assimilating RO data in the both NWP systems. Results of our experiments show that RO data have a large positive impact on temperature analysis and forecast in the upper troposphere and the stratosphere in the global NWP system. Although available data are very limited in the mesoscale NWP system, it is confirmed that the RO data degraded mean of the short-range forecast departures with respect to radiosonde temperature measurements above 500 hPa.

JMA implemented some updates into its operational system in July 2017. The ROPP version 8 was installed replacing version 6. The new bending angle observation operator in the version 8 is used in the global assimilation. Another major update in the global assimilation is a change of threshold value of the gross error check for bending angle in the tropics. The number of tropical bending angle observations passed through the gross error check was smaller than at other areas due to the poor first guess. Result of the experiment showed that the new threshold doubled the number of passed data and improved temperature analysis in the tropics and typhoon track forecasts. There is no change in the mesoscale assimilation except the update of ROPP.
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