

Intercomparison of Dynamical Fields in the Middle Atmosphere Revealed in Global Reanalyses

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Various global atmospheric reanalysis data are used for studies of large-scale atmospheric phenomena. In this study, we compare dynamical fields revealed in various reanalyses, i.e., ERA-Interim, JRA-55, MERRA, MERRA-2, along with JRA-55c which is a reanalysis assimilating conventional meteorological observations only. Here, we use monthly averaged zonal-mean zonal wind and temperature data up to 0.1 hPa for all the reanalyses. We also use Aura Microwave Limb Sounder (MLS) observations for comparison. It is found that differences of the zonal wind among the reanalyses increase with height. The differences are the largest in the tropical region and meridionally symmetric with respect to the equator. On the other hand, the temperature field is also found to show a feature of increasing differences with height, but their latitudinal dependence is small. The discrepancy of the latitudinal dependence between the two is mainly due to relatively small constrains of the thermal wind balance near the equator. In the presentation, temporal changes of the differences will be also discussed.

Key words: middle atmosphere, reanalysis, Aura MLS, intercomparison