S42-14

Tropopause folds measured by Fengyun-4: Preliminary validation and their relation to hazard weather events

Yi-Xuan Shou, *National Satellite Meteorological Center*
Feng Lu, *National Satellite Meteorological Center*
Sixian Wang, *Chinese Academy of Meteorological Sciences*

Tropopause folds an important mid-latitude atmosphere phenomenon within the upper troposphere and lower stratosphere are intimately linked to upper level frontogenesis and jet stream dynamics. They are often considered as the key processes for the stratosphere-to-troposphere transports and some hazard weather events. In this study a statistical-physical combined method is used to establish a tropopause folding retrieval model based on Fengyun-4 geostationary satellite observations. By comparison with the tropopause foldings detected from GEOS-5/MERRA-2 reanalysis data using the 3-D labeling algorithm based on the 3-D distributions of PV (potential vorticity) and θ (potential temperature) in the stratosphere and troposphere, the tropopause folds identified based on Fengyun-4 observations have the HR (hitting rate) of ~0.8. Both of the two datasets show a similar seasonal cycles with the maxima frequency in winter. By evaluated with the aircraft in situ EDR (eddy dissipation rate) observations, the probability of detection turbulence by tropopause folds is about 0.7 which illustrate the potential correlation of tropopause folding with the clear-air turbulence at upper-level troposphere.