

Effects of the lower atmosphere on generation of the traveling atmospheric disturbances in the thermosphere

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Disturbances generated in the auroral oval such as the large-scale traveling atmospheric/ionospheric disturbances (LS-TADs/TIDs) have been investigated by both observation and simulation studies. Although the observed LS-TADs/TIDs had variety in their propagation velocities and spatial extents, the causes of the variety are still unknown. Furthermore, the LS-TIDs are occasionally observed even when a geomagnetically quiet period. In order to investigate the LS-TADs, we have performed numerical simulations using a whole atmosphere general circulation model (GCM) developed by Miyoshi and Fujiwara [2003]. This GCM successfully simulates time-dependent thermospheric disturbances, e.g., generation and propagation of the LS-TADs in both the geomagnetically quiet and disturbed periods. We have found relatively small-scale structures in the thermospheric disturbances, suggesting effects of the lower atmosphere on generation of them. In this study, we will investigate and discuss the effects of the lower atmosphere on generation of these disturbances in the upper thermosphere.