Hemispheric asymmetry of the ionospheric variation during major sudden stratospheric warming events

Donghe Zhang and Jing Liu
Peking Uni, Geophysics, Beijing, China (zhangdh@pku.edu.cn)

The hemispheric asymmetry of the ionospheric variation in the American sector (45°N−45°S, MLAT; 80°−60°W) is studied with total electron content (TEC) data during major sudden stratospheric warming events. The amplitude ($A_{M2}$) and relative strength ($RS_{M2}$) of the semi-diurnal lunar tidal component (M2) of TEC are analyzed. $RS_{M2}$ is the ratio between the energy of M2 and the energy of all the studied tidal components. The magnitudes of $A_{M2}$ and $RS_{M2}$ exhibit clear hemispheric and latitudinal variations. The $A_{M2}$ in the north of the magnetic equator tends to occur at lower magnetic latitudes than the $A_{M2}$ in the south of the magnetic equator. The $RS_{M2}$ exhibits similar features as the $A_{M2}$ but the difference is more distinct. We suggest that such hemispheric asymmetry of M2 parameters is related to the hemispheric asymmetry of the EIA and the latitudinal variation of the amplitude of the solar tidal components in winter.