



Sunrise enhancement of equatorial vertical plasma drift

Libo Liu, Ruilong Zhang, and Huijun Le

Inst. of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (liul@mail.iggcas.ac.cn)

Sunrise enhancement in vertical plasma drift over equatorial regions is not discernible in the statistical picture compared with the significant enhancement during dusk hours. In this report, it is the first time to investigate the occurrence of the dawn enhancement in the equatorial ionospheric vertical plasma drift from ROCSAT-1 observations during geomagnetic quiet times. The dawn enhancements occur most frequently in June solstice and least frequently in December solstice. The statistical survey shows that the occurrence depends on the magnetic declination. The enhancement has the strongest amplitude in regions near 320° longitude and peaks during June solstice. The dawn enhancement reaches its peak after the sunrise in conjugated E regions. Furthermore, it is found that the dawn enhancement is closely related to the difference between the sunrise times in the conjugated E regions (sunrise time lag). The dawn enhancement occurs easily in regions with a large sunrise time lag. Moreover, we will report the effects of the sunrise enhancement of vertical plasma drift on the equatorial ionosphere as indicated from the observations and model simulations.

We thank National Central University of Taiwan providing the ROCSAT-1 data. The A_p and $F107$ indices are obtained from the National Geophysical Data Center (<http://spidr.ngdc.noaa.gov/spidr/>). This research is supported by National Natural Science Foundation of China (41231065), the Chinese Academy of Sciences project (KZZD-EW-01-3), National Key Basic Research Program of China (2012CB825604) and National Natural Science Foundation of China (41321003).