

Global occurrence distributions and rates of lightning and TLEs and their LT dependences

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Transient Luminous Events (TLEs) are the instantaneous discharge phenomena excited by intense cloud-to-ground (CG) discharges. Using the optical data obtained by the FORMOSAT-2/ISUAL data, global occurrence distributions and rates of TLEs were estimated. However, due to the sun-synchronous polar orbit of the FORMOSAT-2 satellite, the local time (LT) dependences of the global occurrence rates of TLEs has not been estimated. In this study, we analyzed optical data obtained by the JEM-GLIMS (Global Lightning and Sprite Measurements on JEM-EF) instruments onboard the ISS (International Space Station) for the period from December 2012 to November 2014. Since the orbital inclination of the ISS is 51°, we can estimate more accurate global occurrence distributions and rates of lightning and TLEs and their LT dependences. From our data analyses, it is found that the estimated occurrence distributions of lightning and TLEs are mainly centered over the Africa, Southeast Asia, and Central America. It is also found that the LT dependences of lightning and TLEs occurrence rates showed small peak at 20LT and gradual increase from 00LT to 03LT. At the presentation, we will show the results derived from our data analyses more in detail and will discuss the possible reasons for the estimated LT dependences of lightning and TLEs occurrence rates.

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