Latitudinal and Longitudinal Variations of Ionospheric Storms by the Global Ionosphere Map of Total Electron Content

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In this study, we examine latitudinal and longitudinal variations of the total electron content (TEC) during the 2003 Halloween storm. The global ionosphere map (GIM) of TEC retrieved from Center for Orbit Determination in Europe is used to investigate the positive and negative storm signatures at various universal times (UT) and global fixed local times (GFLT). The positive and negative storm signatures are prominent at low and middle latitudes, respectively. The UT results show clear longitudinal phase shifts in both positive and negative storm signature. The positive (negative) storm signature reveals the period of 26 (24) hrs and the phase velocity of 14 (15) deg/hr in the longitudinal direction. On the other hand, the GFLT results show that the positive (negative) storm signature tend to appear at equatorial-equatorial iononization anomaly (low-middle) latitudes in daytime. Finally, a statistical analysis of the ionoospheric storm signature is carried out and cross compared with that of the 2003 Halloween storm.

