

The low-latitude Plasma Irregularities After Sunrise From Multiple Observations in Both Hemispheres During the Recovery Phase of a Storm

Weihoa Luo, Chao Xiong, Jisheng Xu, Zhengping Zhu and Shanshan Chang

In this supplement, the observations in the morning sector from the Defense Meteorological Satellite Program (DMSP) F13 and F15, the first Satellite of the Republic of China (ROCSAT-1), and also the ground-based Total Electron Content (TEC) during 16–20 August 2003 would be shown.

Figure S1 displays the variations of ion density from DMSP F13 along the satellite trajectories at 160°E longitude region during 16–20 August 2003.

Figure S2 displays the variations of ion density from DMSP F15 along the satellite trajectories at 160°E longitude region during 16–20 August 2003.

From Figures S1–2, we note that the density fluctuations were not detected by DMSP F13 and F15 in morning sector during 16–20 August 2003, except on 18 August.

Figure S3 displays the variations of ion density from ROCSAT-1 along the satellite trajectories at 160°E longitude region during 16–20 August 2003. Figure S4 shows the ROCSAT-1 tracks in low-latitude regions in morning sector.

From Figure S3, we denote that the density fluctuations after sunrise were not recorded by ROCSAT-1 in low-latitude regions during 16–20 August 2003, except on 18 August.

Figure S4 shows the ROCSAT-1 tracks in low-latitude regions during 16–20 August, passing over the low-latitude regions. The sunrise is represented by the symbol .

When ROCSAT-1 passed over the low-latitude regions, the satellite was in sunlight, the observations from ROCSAT-1 in the morning sector were after sunrise.

Figure S5 displays the variations of vertical TEC at CNMR station (northern hemisphere) during 16–19 August for satellites PRN 4 and PRN 24, respectively. Figure S6 displays the variations of vertical TEC at LAEL station (southern hemisphere) during 16–19 August for satellites PRN 4 and PRN 7, respectively.

As shown in Figures S5–6, on 18 August, near local sunrise, TEC in both hemispheres displayed the obvious fluctuations, while no similar TEC disturbances were detected on other days.

From Figures S1–6, we can note that the density or TEC fluctuations similar with the observations on 18 August were not detected before and after the storm started. It can be concluded that the occurrence of daytime irregularities was related with the storm.

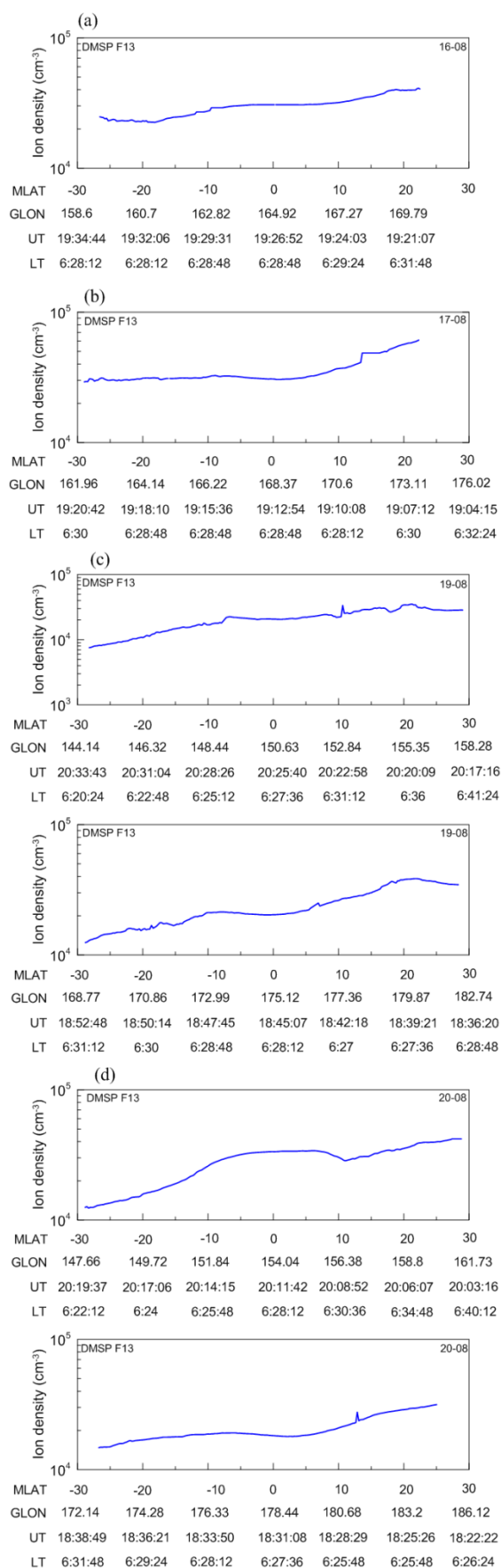


Figure S1. During 16–20 August 2003, the variations of ion density from DMSP F13 along the satellite trajectories at 160°E longitude region.

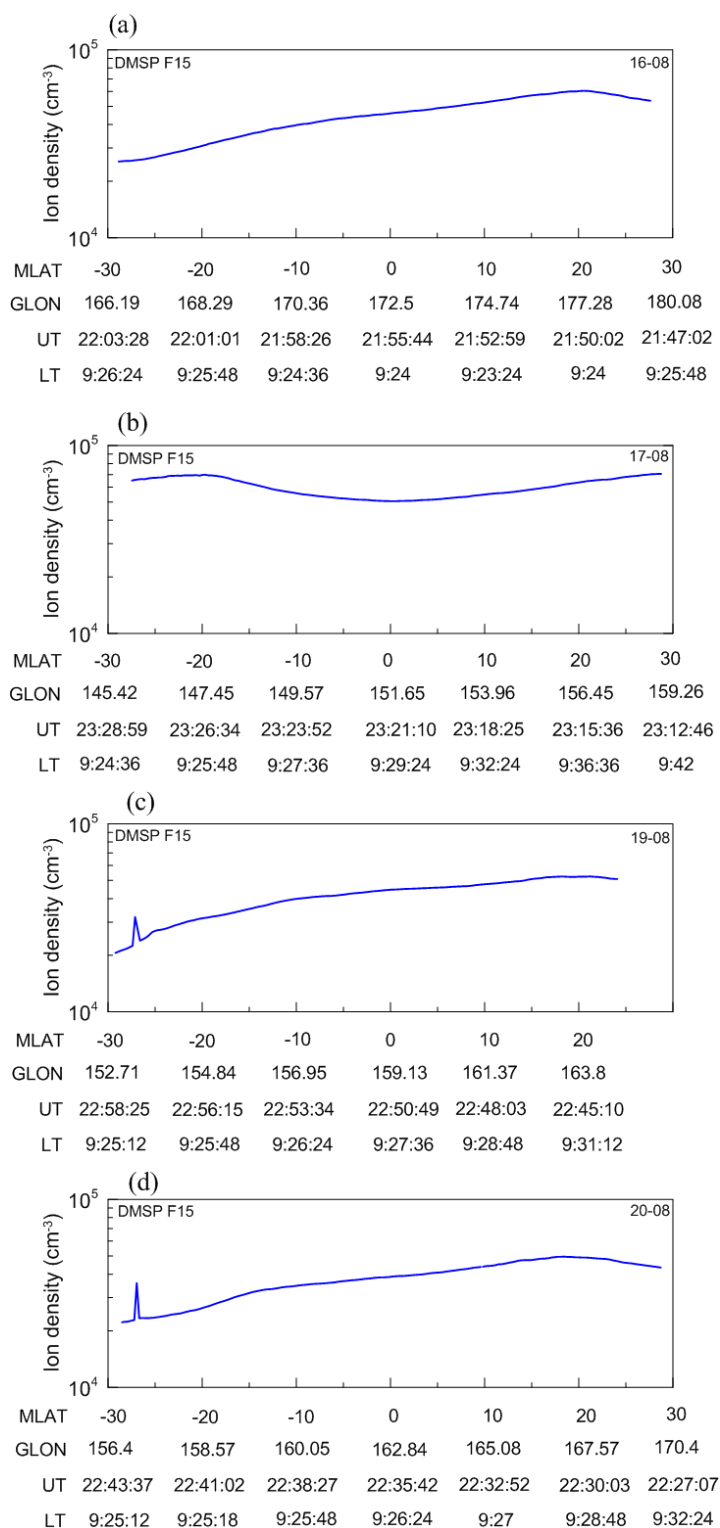


Figure S2. During 16–20 August 2003, the variations of ion density from DMSP F15 along the satellite trajectories at 160°E longitude region.

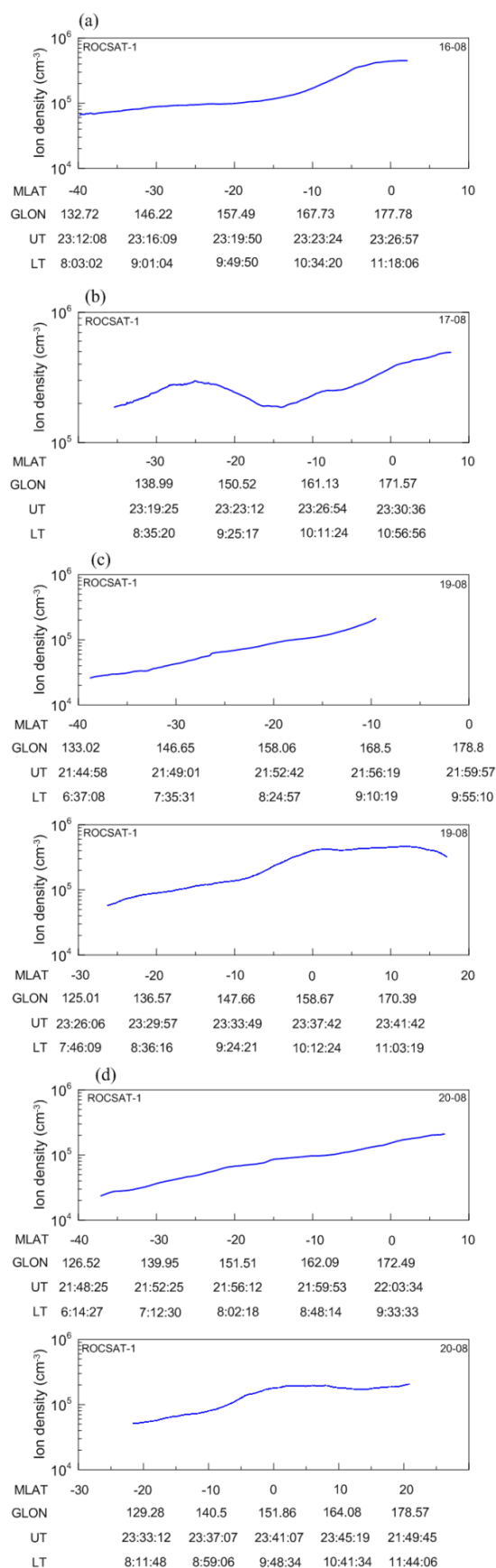


Figure S3. During 16–20 August 2003, the variations of ion density from ROCSAT-1 along the satellite trajectories in local daytime sector at 160°E longitude region.

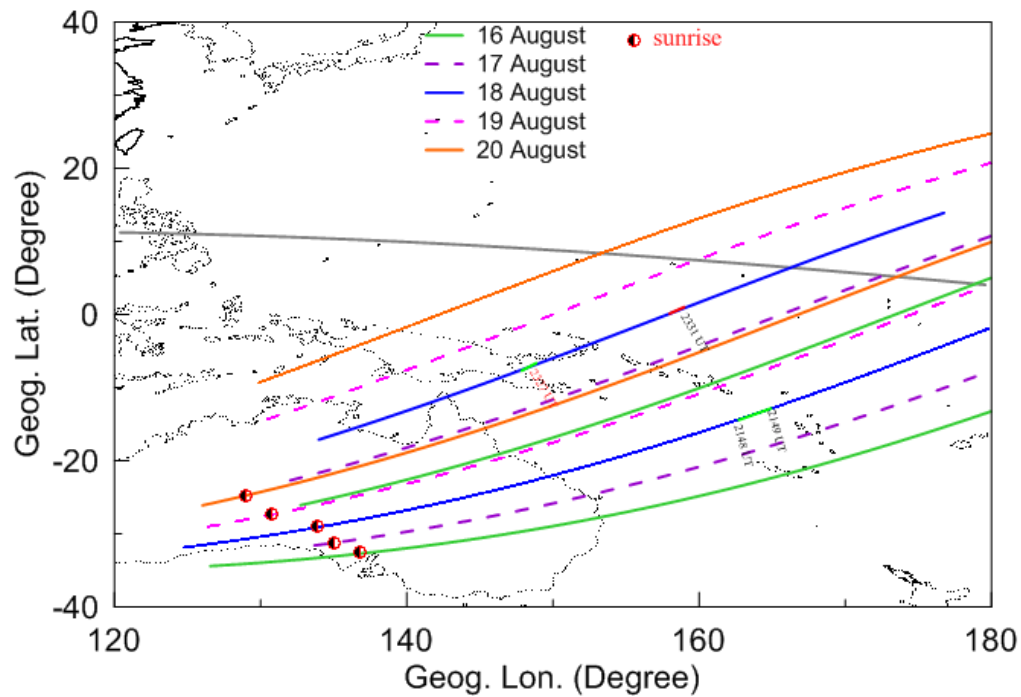


Figure S4. During 16–20 August 2003, the ROCSAT-1 tracks in morning sectors. The symbol  represents the sunrise. The short red and green lines on the satellite trajectories represent the plasma blob and bubble encountered by the satellite, respectively.

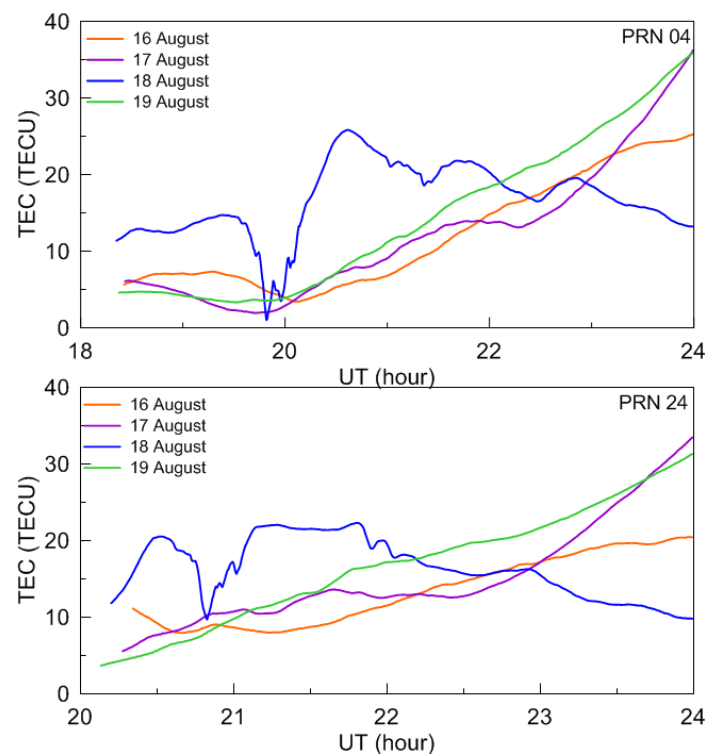


Figure S5. During 16–19 August 2003, at CNMR station, variations of vertical TEC for satellite PRN4 (top panel) and PRN24 (bottom panel).

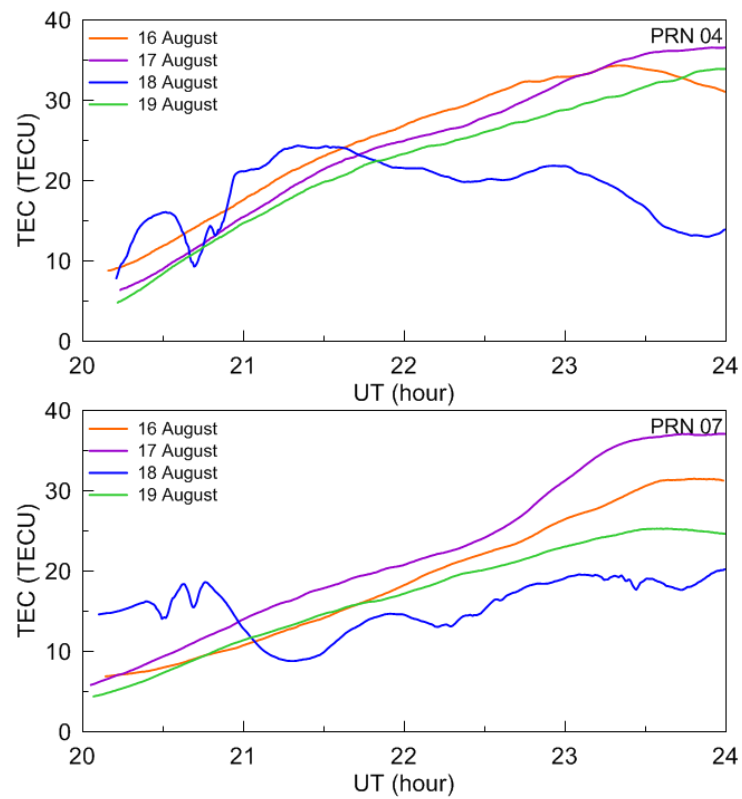


Figure S6. During 16–19 August 2003, at LAEL station, variations of vertical TEC for satellite PRN4 (top panel) and PRN7 (bottom panel).