

SA41A-06 - Statistical analysis of the equatorial plasma irregularities retrieved from Swarm 2013--2019 observations



Thursday, 12 December 2019



09:18 - 09:32



Moscone South - 203-204, L2

Abstract

In this study, we present a statistical analysis of equatorial plasma irregularities (EPIs) by using in situ plasma density measurements of the Swarm constellation from December 2013 to April 2019. The EPI occurrence patterns with respect to longitude, season, local time, latitude, solar activity, and geomagnetic activity level are investigated, respectively. The main results are as follows: (1) The EPI occurrence rate has strong longitudinal preference: the South American (African) sector has higher values around the December (June) solstice, while the occurrence rate over the Atlantic and other sectors usually reaches the maximum values during equinoxes. (2) The postsunset/postmidnight EPI occurrence rate exhibit different seasonal dependence: the postsunset EPIs have the maximum occurrence rate over the American/Atlantic sectors during the December solstice and equinoxes, and the postmidnight EPIs have the maximum occurrence rate over the African sector during the June solstice. (3) The local time distribution of EPIs varies significantly: During the December solstice and equinoxes, the occurrence rate peaks in the evening sector around 20--21 LT and becomes much lower after midnight. During the June solstice, the occurrence rate often slowly increases after sunset and reaches a peak after midnight around 03--04 LT. (4) The latitudinal distribution of EPIs exhibits a double-peak structure around $\pm 10^\circ$ modified dip latitude with a larger peak in the summer hemisphere. (5) The postsunset (postmidnight) EPIs have a positive (negative) correlation with solar activity. (6) The EPI occurrence rate increases with increasing geomagnetic activity level. Possible mechanism responsible for those observed phenomena are also discussed.

Authors

[Ercha Aa](#)

Chinese Academy of Sciences

[Shasha Zou](#)

University of Michigan

[Siqing Liu](#)

Chinese Academy of Sciences

View Related

[SA41A - Advances in Equatorial Thermosphere and Ionosphere Studies I](#)



[SPA-Aeronomy](#)



Similar

[Seasonal Variations of O/N₂ Volume Density Ratio Retrieved from CHIM Duvide Limb](#)