

Plasma Depletion Bays in the Equatorial Ionosphere Observed by TIMED and FORMOSAT3/COSMIC during 2007-2015

*FUYUAN CHANG¹, Jann-Yenq Liu¹

1. Graduate Institute of Space Science, National Central University, Taiwan

An interesting new feature of three Northern (one Southern) ionospheric plasma depletion bays over the magnetic equator is for the first time found in airglow emissions of 135.6 nm by TIMED/GUVI in May (January) of 2007. Electron density profiles derived from FORMOSAT3/COSMIC are further used to study diurnal, altitude, seasonal, longitudinal, and solar activity variations of the plasma depletion bays. Results show that the plasma depletion bays become the most prominent at 250-300 km altitude around the midnight during the low solar activity year. The three (one) bays appear between 60W-180E (80W-150W) during April-September, especially May (October-March). Model simulations suggest that the trans-equatorial neutral wind in the thermosphere should play an important role.

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