Contribution ID: **1300** Type: **Oral (Non-Student) / orale (non-étudiant)**

Plasma motion in the equatorial ionospheric F2-layer

Tuesday 14 June 2016 09:15 (15 minutes)

Oyedemi S. Oyekola
Etobicoke, ON M8V 3C8 Canada
Email: ooyekola@gmail.com

Abstract. The structure of evening and nighttime F-region vertical drift component of is vital for understanding the physics of the development of the occurrence of equatorial irregularities. In addition, postsunset ionospheric height has also been attributed as one of the most important factors for the occurrence of equatorial irregularities. We report vertical plasma drift velocities derived from the base (h'F) and the peak height (hmF2) of F-layer using 1-year of data obtained at Ibadan (Geog Long 3.9oE) during International Geophysical Year (1957-58) period for geomagnetic quiet-time and high solar activity conditions. We compared our results with International Reference Ionosphere 2012 model (IRI-2012). The results of this investigation include: (a) overall local- time characteristics of vertical drift between 1800 LT and 0600 LT are in good agreement for equinoxes, December, and June; (b) annual vertical drift derived from time variation of h'F and hmF2 and the corresponding annual variation of h'F and hmF2 variation indicate low correlation (R = 0.30), while IRI-2012 model vertical drift and IRI-2012 model of hmF2 show fairly good correlation (R = 0.67); (c) regression analysis between time variation of h'F and Scherliess / Fejer model demonstrate correlation coefficient of approximately 0.74 (equinox), 0.85 (December), 0.57 (June) and 0.74 (all-year), while that of time variation of hmF2 and IRI-2012 vertical velocities show 0.95 (equinox), 0.74 (December), 0.43 (June), and 0.74 (all-year); (d) plasma motion derived from the time rate of change of h'F and those of hmF2 are correlated at 0.94, 0.88, 0.63, and 0.90 for equinoxes, December, June, and all-year, respectively; (e) the evening prereversal vertical drifts enhancement rage between ˜20 - 45 m/s, ˜18 - 46 m/s, ˜20 –50 m/s for time variation of h'F, hmF2, and Scherliess / Fejer model, respectively; (f) the corresponding peak altitudes vary between 430 - 540 km (h'F), 560 –740 km (hmF2), and 570 –620 km (IRI-2012 model).

Primary author: Dr OYEKOLA, Oyedemi (Private)

Presenter: Dr OYEKOLA, Oyedemi (Private)

Session Classification: T1-4 Ground-based and In Situ Observations I (DASP) / Observations sur terre et in situ I (DPAE)

Track Classification: Atmospheric and Space Physics / Physique atmosphérique et de l'espace (DASP-DPAE)