

Zonal ionospheric plasma drifts in Brazilian sector during period of extreme solar activity minimum

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Transequatorial *F* region plasma bubbles are large-scale ionospheric depleted regions that develop in the bottomside of equatorial *F* region due to plasma instability processes. All-sky imaging observations of the OI 630.0 nm nightglow emissions were carried out at São José dos Campos – SJC (23.21°S, 45.86°W; dip latitude 17.6°S) and Palmas – PAL (10.28°S, 48.33°W; dip latitude 6.7°S), Brazil, during the years 2008 and 2010, a period of minimum extreme solar activity. In this work we present and discuss the height-resolved nocturnal *F* region zonal drift velocities obtained from plasma bubbles observed in imaging observations of OI 630.0 nm emissions result from excitation mechanisms by dissociative recombination of O₂. We have investigated the nighttime zonal plasma drift variations using fixed emission peak altitudes, used by earlier investigators, as well as emission peak altitudes based on simultaneous ionospheric sounding observations for both observatories. The average maximum and minimum zonal plasma drift velocities inferred for OI 630.0 nm emission, using emission peak altitudes based on simultaneous ionospheric observations, (SJC: 116 ± 7 and 57 ± 15 m/s; PAL: 119 ± 6 and 58 ± 10 m/s) are lower and with less scatter than that using fixed emission peak altitudes (SJC: 119 ± 6 and 58 ± 10 m/s; PAL: 111 ± 5 and 85 ± 10 m/s). Also, the nocturnal variations of the zonal plasma drift velocities obtained with peak altitudes based on simultaneous ionospheric observations show better agreement than for the case with fixed emission peak altitudes ($h = 280$ km).