

Ionospheric climatology over Brazil: Zonal plasma velocities from experimental observations and theoretical validations

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Abstract

We present model calculations and experimental estimations of the zonal drift velocities over Brazil. The latter ones are derived from plasma bubbles signatures the OI6300 Å airglow images from the conjugate stations Boa Vista - BV (Geogr. 2.8N, 60.7W, dip angle: 22.0N ) and Campo Grande - CG (Geogr. 20.5S, 54.7W, dip angle: 22.32S) during the Conjugate Points Experiment COPEX carried out in Brazil between October and November 2002. Simultaneous velocities as derived by VHF and GPS techniques are also presented and compared. The theoretical ambient plasma zonal velocities were calculated using the formulations by Haerendel et al. (1992) and Eccles (1998) for which the input parameters were based on the available empirical models for zonal electric field (Scherliess and Fejer, 1999), horizontal winds (HWM-1993), neutral constituents (MSIS-1990) and ionospheric parameters (IRI-2001). The model results show reasonable correlation coefficients between observed and predicted values. However relatively large discrepancies of magnitudes are found between them.

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