Rocket observations of night time equatorial F-region plasma irregularities from Brazil

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Sounding rockets carrying plasma diagnostic experiments were launched from the Brazilian rocket launching stations in Natal (5.9˚S, 35.2˚W Geog. Lat.) and Alcantara (2.31˚S, 44.4˚W Geog. Lat.) to measure the height profiles of electron density, electron temperature and the ambient electric field. High frequency Capacitance probes were used to measure the height profiles of the electron density and Langmuir probes were used to measure the electron density, temperature and the spatial structures of plasma irregularities. On one occasion an electric field double probe was used to measure the electric field fluctuations associated with the F-region plasma irregularities. A brief study of the characteristic features of small-scale electron density and electric field fluctuations under different ionospheric conditions is presented here. In the presence of large-scale plasma bubbles in the F-region, electron density fluctuations are accompanied by abnormal electron temperature variations. In the nighttime F-region without large scale plasma bubbles, though electron density irregularities are observed, the electron temperature and electric field variations donot exhibit abnormal features. A comparative study of the k-spectra of the electron density and electric field fluctuations is made with the specific objective of identifying the origin of the irregularities in these parameters.