

Title : Rocket observations of electron temperature and energy distribution in the lower F-region prior to the onset of equatorial plasma bubbles

Session: S5: Low and mid latitude Aeronomy and Electrodynamics

Preferred type of presentation: Poster

Abstract:

Height profiles of the ionospheric electron density and temperature were made from Brazil on different occasions under different ionospheric conditions. During one of the launches the rocket passed through well-developed plasma bubbles on both upleg and downleg. During the second launch the ionospheric F-region did not show the presence of prominent plasma bubbles. During the third launch the rocket on its upleg passed through an F-region without plasma bubbles while on its downleg it passed through an F-region that showed a large number of well-developed plasma bubbles. Electron temperatures were estimated by applying sweep potentials to Langmuir probes. During the first and second launches the electron temperatures estimated were comparable to those given by models. But during the third launch the electron temperatures estimated showed abnormally high values of more than 3000 deg. K in the lower F- region only on the rocket upleg. The maximum electron temperature observed above the F-peak was only about 700 deg. K. The region below the base of the F-region seems to be associated with very large electron temperatures just before the development of plasma bubbles. An attempt is made here to get the electron energy distribution function (EEDF) from the second derivative of the current-voltage characteristic curves.

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