

In situ Measurements of Plasma Irregularities during nighttime over an Equatorial Station Trivandrum

H. S. S. SINHA¹, R. PANDEY² AND R. N. MISRA¹

¹*Physical Research Laboratory, Ahmedabad, India*

²*MLS University, Udaipur, India*

A RH 300 MKII rocket carrying a Langmuir probe (LP) was launched on 15 January 2007 at 2213 Hrs LT from an equatorial station Trivandrum (8.3°N, 76.9°E, 0°47' dip) to study the nature of ionospheric irregularities produced by plasma instabilities. The rocket attained the apogee of 127.4 km. In order to handle the large dynamic range of scale sizes of the electron density irregularities, the current collected by the LP was processed onboard in three different channels with frequency responses of 0-100 Hz, 20-150 Hz, 70-1000 Hz and a set of eight narrow band filters in the frequency band of 66 Hz to 5 KHz. With such onboard processing, it was possible to study electron density fluctuations in the scale size range of a few km down to about 10 cm. Strong vertical gradients in electron density, both positive and negative, were observed in 90 km - 127 km. Electron density irregularities with scale sizes from a few km to about 20 cm were observed in different altitude regions. Spectral characteristics of these irregularities, their association with density gradients and electrojet region will be presented and possible causes of their generation will be discussed.