

**PLASMA BUBBLE CHARACTERISTICS AS OBSERVED BY A ROCKET-BORNE
LANGMUIR PROBE AND A HIGH FREQUENCY CAPACITANCE PROBE**

by

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ABSTRACT

On 11th December 1985, at 2030 Hrs. LST, a SONDA III rocket carrying among other experiments on board, a swept potential Langmuir Probe and a High Frequency Capacitance Probe, was launched from the Centro de Lançamento da Barreira do Inferno (CLBI) in Natal-RN, Brazil. The principal objective of the experiments was to study in detail the characteristic features of ionospheric plasma depletions known as plasma bubbles, associated with the phenomenon of low latitude Spread-F. The rocket reached an apogee of about 524 km and in fact passed through at least a couple of large plasma bubbles centered in the altitude regions of about 370 Km and 420 Km, with vertical scale sizes in the range of 30-40 kms. The general eastward (azimuth 74.4°) trajectory of the rocket enabled the approximate estimation of the minimum east-west scale size of the plasma bubbles. The Langmuir Probe made continuous measurement of the height variations in the electron density, electron temperature and the spectral distribution of plasma density irregularities. The absolute determination of the electron density and its height profile could be made from the High Frequency Capacitance probe measurements. Physical characteristics of the plasma parameters like electron temperature and the nature of electron density irregularities inside the plasma bubbles were seen to be different from those outside the bubbles. Physical implications of these differences in our present day knowledge of the plasma bubbles, are discussed here.