

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)
Recent Advances in Equatorial, Low- and Mid-Latitude Mesosphere, Thermosphere and Ionosphere Studies (C1.1)

OCCURRENCE OF F-REGION IONOSPHERIC IRREGULARITIES DURING A SOLAR MINIMUM PERIOD (CYCLE 23)

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Equatorial F-region plasma irregularities have been observed through the use of multiinstruments (optical, ionosondes, radars, rockets, and satellites) since late 1930s to understand equatorial spread-F (ESF). ESF is generated in the F-layer bottomside just after sunset and the irregularities are nearly aligned along the Earth's magnetic field lines. The height of the nighttime F layer is an important parameter controlling the generation of ESF, and it is strongly dependent on the pre-reversal enhancement (PRE) of the equatorial vertical plasma drift velocity, just after sunset, which is driven by the zonal electric field. It is well accepted that the fundamental mechanism for generation of ionospheric large- and medium-scale irregularities is the Rayleigh-Taylor instability. However, some unsolved questions remain, such as the seeding conditions for spread-F generation. The seeding sources of ESF are the least understood aspect of this phenomena and observational evidence is currently limited. In this investigation we have used two ionosonde located in Brazil at Palmas (1012' S; 4821' W; dip latitude 773' S) and São José dos Campos (237' S; 4552' W; dip latitude 1961' S), near equatorial and low latitudes, respectively, during the period January 2008 to December 2008. In this work

we present and discuss observations of the occurrence, formation, and evolution of spread-F over the Brazilian sector under sunspot minimum conditions. Also, we discuss the influence of MSTIDs (Medium Scale Traveling Ionospheric Disturbances) on the generation of spread-F. We suggest that MSTIDs may be linked to spread-F occurrence at low latitudes during the last solar minimum.