

Investigation of the relationship between post-sunset equatorial spread-F, equatorial electro-jet, and equatorial anomaly

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<http://wdc.nict.go.jp/IONO/index.html>

Equatorial spread-F (ESF) consists of various scale sizes of irregularities from the order of cm to km, so that it causes crucial errors for various communication and navigation systems. Since ESF results from non-linear evolution of the gravitational Rayleigh-Taylor instability, it is important to clarify growth and seeding of the instability.

Recently, it is reported that ESF onsets and the diurnal strength of the equatorial electro-jet (EEJ) have a good correlation. On the other hand, the strength and symmetry of the equatorial anomaly (EIA) are also reported to have a good correlation with ESF onsets. Because we can observe both the diurnal EEJ and EIA much prior to ESF onsets, these relationships are worthy to be investigated in more detail for predictions of ESF onsets.

To investigate these relationships and to clarify the ionospheric condition of ESF onsets, we analyzed ionosonde and magnetometer data obtained in the same magnetic meridional plane in Southeast Asia. The ionosonde data analyzed in this study were obtained at Chiang Mai (geographic latitude 18.8N, geographic longitude 98.9E, and magnetic latitude 13.2N) in the northern magnetic low-latitude region, Chumphon (10.7N, 99.4E, and 3.2N) near the magnetic equator, and Kototabang (0.2S, 100.3E and 10.1S) in the southern magnetic low-latitude region, while the magnetometer data were obtained at Phuket (8.1N, 98.3E, and 0.1N) and Kototabang.

In this presentation, we discuss the preliminary analysis results.