

Ionospheric height variations observed by ionosondes along magnetic meridian and plasma bubble onsets

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Since October 2004, an ionosonde chain along the magnetic meridian has already been operated in Southeast Asia, which are in Kototabang (0.2S, 100.3E), Indonesia, Chumphon (10.7N, 99.4E), Thailand, and Chiang Mai (18.8N, 98.9E), Thailand.

To study the cause of the day-to-day variability of plasma bubble occurrences, variations in virtual heights of the bottom side of the F-region ($h'F$) at 2.5 MHz were analyzed for the period from October 2004 to April 2005.

When equatorial spread F (ESF) or plasma bubbles are generated, $h'F$ was enhanced at the three stations. However, even when $h'F$ at the equatorial station, Chumphon, was largely enhanced, plasma bubbles were not generated when $h'F$ was not enhanced at either low-latitude station, Chiang Mai or Kototabang.

This result indicates that the conductivity in the low-latitude F region is an important factor for plasma bubble onsets, in addition to the equatorial height rises.

Our result supports the suggestion by Maruyama [1984] that strong trans-equatorial thermospheric winds, that lower the ionospheric height in one hemisphere, can explain longitudinal/seasonal variations of plasma bubble occurrences.