

Temporal change of the precise EIA asymmetry in Thailand-Indonesia sector observed by a beacon receiver network

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To reveal a temporal change of the equatorial ionization anomaly (EIA) asymmetry, a multipoint satellite-ground beacon experiment was conducted along the meridional plane of the Thailand-Indonesia sector. The observation includes one station near the magnetic equator and four stations at the off-equator latitudes. GRBR-TECs from 97 polar-orbit satellite passes in March 2012 were analyzed in this study. Successive passes captured the rapid evolution of the EIA asymmetry especially during the geomagnetic disturbances. The penetrating electric field during geomagnetic disturbed days is not the cause of an asymmetry. Such rapid evolution of the EIA asymmetry was not seen during the nighttime when meridional wind mainly controlled the asymmetric structures. The EIA asymmetry had a quasi 3-day variation at 21 LT, which probably suggests the forcing from the lower atmosphere. Precise capturing of the crests' locations and the asymmetry evolution enhances an understanding of the temporal change of the EIA asymmetry in local scale. It leads to a future local modeling of the TEC prediction in Southeast Asia.

Keywords: EIA, asymmetry, geomagnetic disturbances, penetrating electric field, rapid evolution