

Simultaneous observations of F-region field-aligned irregularity and total electron content after midnight at equatorial region

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We investigated the 2-Dimension structures of Field-Aligned Irregularity (FAI) echoes at post-midnight to find out the generation possibility of FAI that appeared after midnight. These data were observed with the Equatorial Atmosphere Radar (EAR) at Kototabang (0.20°S, 100.32°E; dip lat. 10.4°S), Indonesia. We examined 14 post-midnight field-aligned Irregularities (FAIs) which appeared within the Equatorial Atmospheric Radar's field of view around midnight in June solstices from May 2010 to June 2013. The total electron content (TEC) are obtained from GPS receivers of the Sugar and IGS networks and MyRTKnet in Malaysia. The detrended TEC and rate of TEC index (ROTI) maps are made. Detrended TEC was made by subtracting 1-hour running average for the original TEC data for each satellite-receiver pair in order to obtain perturbation components of TEC. ROTI represents amplitude of the plasma density variations, especially irregularities with scale size of 3 km. Those maps cover the Southeast Asia region, covering a wide field-of-view compared to the EAR. We made simultaneous 2-dimensinal observations of total electron content and F-region field-aligned irregularity to the time when the FAI are first observed by the EAR. This study is to investigate whether the post-midnight FAIs are accompanied by the plasma bubble or MSTID. Among 14 days that FAIs appeared within the EAR's FOV on post-midnight time, we found 11 days in which TEC depletion performed around the time when the post-midnight FAIs first appeared. More detail will be discussed in the presentation.