

Simultaneous Imaging Observations of Post-Midnight Field-Aligned Irregularities and 630-Nm Airglow Intensity in Indonesia

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VHF and UHF radars near the geomagnetic equator have been used for observations of intense coherent echoes caused by the Bragg scatter from field-aligned irregularities (FAIs) generated within equatorial plasma bubbles. The plasma bubbles are well-known to occur frequently at evening terminator in equinoxes, especially during high solar activity conditions. On the other hand, recent observations show that the FAIs frequently occur at post-midnight around June solstice in low solar activity conditions. Previous studies suggest that the post-midnight FAIs are accompanied by plasma bubble or Medium-Scale Traveling Ionospheric Disturbances (MSTIDs). In this study, using Equatorial Atmosphere Radar (EAR) and all-sky airglow imager, installed at Kototabang (0.20°S, 100.32°E; dip latitude 10.36°S), Indonesia, we carry out simultaneous observations of two-dimensional structure of FAI and 630-nm airglow intensity. On the night of July 9, 2010, post-midnight FAIs were observed with the EAR. Simultaneously, 630-nm airglow depletions elongating in meridional direction were observed in the airglow images, indicating the observed post-midnight FAIs were accompanied by plasma bubbles. On the other hand, on the night of July 13, 2010, while the post-midnight FAIs were observed with the EAR, 630-nm airglow perturbations having a wavefront elongating from NE to SW and propagating northwestward were observed in the 630-nm airglow images. For this event, the post-midnight FAIs could be associated with MSTID. In the presentation, we will discuss mechanisms for generating the post-midnight FAIs at magnetically low-latitudes.