

E-F REGION FIELD ALIGNED IRREGULARITIES OBSERVED WITH EQUATORIAL ATMOSPHERIC RADAR AND IONOSONDE

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The irregular plasma density and velocity fluctuations often occur in the Earth's ionosphere regions. When radio signals propagate through that region, they cause a fade in received signal power known as scintillation. The generation of these plasma irregularities is one of the important manifestations of space weather. Recently, research of the mechanism and the morphology of plasma irregularities has progressed. In this study, we analyzed E and F region field aligned irregularities (FAI) observed by a VHF backscatter radar with operating frequency 47 MHz have been operated at Kototabang (0.20°S, 100.32°E; dip lat 10.36°S), Indonesia. Seasonal variation of E and F region field aligned irregularities observation compared with sporadic E (E_s) and equatorial spread F (ESF) occurrences observed by ionosonde. The ionosonde provide various E and F region parameters such as the critical frequency of F₂ layer (f_oF_2), the critical frequency of sporadic E layer (f_oE_s), and the maximum height of F₂ layer (hmF₂). We analyzed for equinox (March, April, September, and October), June solstice (May-August), and December solstice (November-February) of data observations during 2011-2012. We also discussed correlation between sporadic E (E_s) and equatorial spread F (ESF) occurrences to understand morphological of coupling between E and F region of the Earth's ionosphere.

Keywords: plasma irregularities, ionosphere, E-F region, coupling