

Seasonal and local time variations of E-region field-aligned irregularities observed with 30.8-MHz radar in Indonesia

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A VHF backscatter radar with operating frequency 30.8 MHz has been operated at Kototabang, Indonesia, since February 2006. We analyzed E-region field-aligned irregularities (FAIs) observed by this radar through a year of 2007, and found that the E-region FAI observed at Kototabang can be classified into two groups. One is "descending FAI". Altitude of the FAI echo region descends with time from 102 km to 98 km altitude during 0700-1000 and 1900-0000 LT in June solstice season. The other is "low-altitude FAI", which is observed in an altitude range from 88 to 94 km mainly during nighttime. The observed Doppler velocity show distinct local time and altitude dependence. The seasonally-averaged zonal velocity above (below) approximately 94 km altitude is westward (eastward) during daytime and eastward (westward) during nighttime. Meridional/vertical velocity perpendicular to the geomagnetic fields is upward during daytime and downward during nighttime. The direction of the FAI velocity above approximately 94 km altitude is consistent with that of the background ExB plasma drifts reported previously.

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