

Morphological study of the field-aligned E-layer irregularities observed During SEEK II campaign

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We report on the field-aligned irregularities observed in the sporadic E (Es) layer with the Frequency-Agile Radar in Tanegashima (FAR, 30.4°N, 131.0°E, geomagnetic latitude 20°N). The radar was operated for 12 days during 7/29~8/9 in 2002 for both daytime and nighttime observations. The observations were used to study the percentage of occurrence of the E region echoes for both daytime and nighttime. They are characterized as four types of echoes, namely, NPQ echoes, PQP echoes, continuous echoes, and other type of FAI echoes based on the echo occurrence characteristics. The statistical characteristics of the occurrence are mainly between 1800 and 0400 LT and the altitude of observations lies between 80 and 110 km. The occurrences are often the types of NPQ echoes and other type echoes statistically. The results are compared with that of the ionosonde located near the FAR in Yamagawa. By comparing the observations of the ionosonde, we find that only the appearance periods of the QP echoes with negative range rate slope may characterize a time delay with those of the enhancement of the gradient of the electron observed by the ionosonde. The altitude of the FAI bottom-side observed by the FAR are well correlated with the h'Es by the ionosonde in Yamagawa.