# Study on generation of low-latitude ionosphere E-region irregularities with the Equatorial Atmosphere Radar

# Takamichi Kawamura[1]; Shoichiro Fukao[2]; Amit K. Patra[2]; Mamoru Yamamoto[2]; Tatsuhiro Yokoyama[2]

[1] RISH, Kyoto Univ; [2] RISH, Kyoto Univ.

In the equatorial ionospheric F region, equatorial spread F(ESF)that contains field-aligned irreguralities (FAI) frequently occurs in the nighttime. Since the bottomside of the equatorial F -region couples to the low-latitude E region through the geomagnetic field, the low-latitude E region has a significant effect on the equatorial and low-latitude ionosphere. However, the low-latitude E region FAI has not been studied well, for lack of observations.

In this study, the generation of the low-latitude E region irregularities based on the data from and discussed with the 47 MHz Equatorial Atmosphere Radar (EAR) and ionosondes. The EAR is located at West Sumatra, Indonesia (0.2S, 100.32E; 10.36S geomagnetic latitude). Observations were conducted March to April 2004 and October 2004.

Large echo intensity corresponded to the time and altitude of sporadic E (Es) layer appearance. Es layer appearance also intensified the FAI echo from E region. The characteristic of the FAI echoes below 100 km altitudes differ from that above 100 km on echoes intensity, doppler velocity and spectrum width. During the growth phase of F-region FAI, E-region FAI echo disappeared after sunset, Es layer was existing. While, when Es layer disappeared, E-region FAI echo existed. That is, it suggests that F-region FAI affects E-region FAI echo disappearance.