

Ionospheric observations by SEALION and the Equatorial Atmosphere Radar

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Equatorial spread F (ESF) is a well-known phenomenon in the equatorial ionospheric F region. As it causes severe scintillation in the amplitude and phase of radio signals, it is important to understand and forecast the occurrence of ESF from a space weather point of view. Ionospheric observation with the 47-MHz Equatorial Atmosphere Radar (EAR) in West Sumatra, Indonesia (0.20S, 100.32E, 10.36S dip latitude) has been conducted since 2001, and its unique observational data has been obtained for more than one solar cycle. The EAR is sensitive to 3-m scale ionospheric irregularities, which can be regarded as a tracer of ESF. Along with the EAR observations, Southeast Asia Low-latitude Ionospheric Network (SEALION) project by NICT started in 2003 for the purpose of monitoring and forecasting ESF. The SEALION consists of multiple ionosondes, GPS receivers and several other instruments in the Southeast Asian region. Since the developed ESF usually drifts eastward, monitoring ESF in this region can provide important space weather information for the Japanese longitude sector. We will summarize observational results with the SEALION and EAR, and discuss future potential of the ionospheric observation in the Southeast Asian region.

Keywords: SEALION, EAR, equatorial spread F, equatorial ionosphere