Daytime Es layer structures revealed by the MU radar ultra-multi-channel imaging during the partial solar eclipse

Susumu Saito1*, Mamoru Yamamoto2, Huixin Liu2, Smitha V. Thampi2, Takashi Maruyama3

1Electronic Navigation Research Institute, 2RISH, Kyoto University, 3NICT

During the partial solar eclipse that occurred on 22 July 2009 near Shigaraki, Japan, the MU radar observed quasi-periodic radar echoes from the E region. Ultra-multi-channel imaging of the radar echoes with multi-beam experiment revealed spatial structures of the daytime Es layer. This is a rare observation that shows daytime Es layer structure in detail. Short-lived ripple-like structures with a wavelength of about 10 km were observed, suggesting modulation by breaking atmospheric gravity waves. Polarization effect associated with sudden disappearance of the conducting E region on QP echo generation is further examined.

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