Observations of medium-scale traveling ionospheric disturbances using FORMOSAT-2 / ISUAL 630.0 nm airglow

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We reports observation results of space based imaging of medium-scale travelling ionospheric disturbances (MSTID) in 630.0 nm emission by Imager of Sprites and Upper Atmospheric Lightnings (ISUAL), onboard FORMOSAT-2 satellite. The limb integrated measurements, after removing background, reveal multiple bands of intensity perturbation when projected to a horizontal plane corresponding to the altitude of peak emission, with distinct southwest to northeast orientation in the southern hemisphere. The ISUAL observations in the year 2007 are further used to investigate the MSTID features as well as occurrence characteristics in the southern hemisphere, most of which are over the ocean where no ground based observations are available. The preliminary statistics shows more MSTID occurrence in solstices with peak in June-July months. Majority of the MSTID perturbations have wavelength in the range 150-300 km, and are aligned at about 30°-50° from the east-west plane. The orientation of the wave fronts indicate that Es-layer instability might be important in the MSTID generation.

Keywords: MSTID, FORMOSAT-2/ISUAL, airglow

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