

Long-term Observations of Large-scale Equatorial F-region Irregularities via OI 630 nm Imaging

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During the recent past, wide-angle imaging observations of the equatorial F-region nightglow emissions (e.g. OI 630 nm) have provided excellent results related to large-scale ionospheric plasma depletions, generally known as trans-equatorial plasma bubbles. An OI 630 nm emission all-sky imaging system is operational at Cachoeira Paulista (22.7° S, 45.0° W; 16° S dip latitude) since March 1987 and has provided the longest series of optical measurements of the large-scale ionospheric irregularities using wide-angle imaging. Several important results from this large data-base, including the seasonal occurrence characteristics and solar cycle effects, will be presented.

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Equatorial spread-F irregularities continue to be an important subject of investigations because of their strong influence on trans-ionospheric radio communications. During the recent past, wide-angle imaging observations of the F-region nightglow emissions (e.g. OI 630 nm) have provided excellent results related to large-scale ionospheric plasma depletions, generally known as trans-equatorial plasma bubbles. An OI 630 nm emission all-sky imaging system is operational at Cachoeira Paulista (22.7° S, 45.0° W; 16° S dip latitude) since March 1987 and has provided the longest series of optical measurements of the large-scale ionospheric irregularities using wide-angle imaging. Several important results from this large data-base, including the seasonal occurrence characteristics and solar cycle effects, will be presented.