

## AIRGLOW STUDY OF IONOSPHERIC PLASMA IRREGULARITIES

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An instrument for all-sky spectrophotometric imaging was developed for airglow measurements. A 630.0 nm airglow imaging system has been developed for ground-based studies of the optical signatures of tropical plasma irregularities in the F-region. The system was designed for narrowband interference filters (10 angstrom full width at half power) with all-sky ( $180^\circ$ ) lenses and records images photographically by using a standard Nikon D300 camera. A field test of the apparatus was conducted on Cachoeira Paulista close to the southern crest of the equatorial ionization anomaly ( $22.7^\circ\text{S}$ ,  $45.0^\circ\text{W}$ , dip angle =  $-28^\circ$ ) from March 20 to March 29, 2009. The optical signature of plasma irregularities are airglow depletion bands in the OI 630 nm emission like plasma bubbles or MSTIDs. The production of the OI 630.0 nm emission depends on the molecular oxygen density [O<sub>2</sub>] and on the oxygen ion density [O<sup>+</sup>]. The oxygen ion density [O<sup>+</sup>] is approximately equal to the electron density in the F-region. The height of the F-layer peak electron density is around 350–400 km, while the molecular oxygen density [O<sub>2</sub>] increases with decreasing height. Thus, the OI 630 nm emission peak occurs in the bottomside of the F region around 220–300 km. The initial results to come from these observations show the presence of airglow depletions in the OI 630 nm. In this work, the characteristics and resolution of the all-sky developed is present and discuss.

Plasma irregularities, airglow

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