

A REVIEW OF AIRGLOW OBSERVATIONS AT EQUATORIAL AND LOW-LATITUDES
IN THE BRAZILIAN SECTOR

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ABSTRACT

Regular observations of several nightglow emissions have been carried out at Cachoeira Paulista (22.7°S, 45.0°W; geomag. 11.9°S), Brazil, which is situated inside both the equatorial ionospheric and South Atlantic magnetic anomalies, since 1975. Also, in 1986, airglow observations have been started at Fortaleza (3.9°S, 38.4°W; geomag. 2.1°S), Brazil, situated near both the geographic and geomagnetic equators. The present observations include measurements of the F-region (OI 630 nm and 777.4 nm), mesospheric (OH(9,4) 775 nm, O₂ atm (0-1) 864.5 nm, NaD 589 nm and OI 557.7 nm), and energetic particle excited (N₂⁺ 391.4 nm and 427.8 nm, and Hβ 486.1 nm) nightglow emissions. Also, a Fabry-Perot interferometer to measure the thermospheric winds and temperatures is in operation. In this review, a summary of the research programs and some recent results will be presented. The interest in airglow measurements in the region of the South Atlantic magnetic anomaly dates back to the discovery of the radiation belts. The aeronomical effects of the charged particle precipitations in the anomaly continues to attract considerable attention. Recently, several Japanese scientific satellites (e.g. Taiyo and Hinotori) have obtained valuable ionospheric data in the South Atlantic magnetic anomaly region. A proposal is made to look into the possibilities of joint analysis of the existing ground-based airglow data in conjunction with the satellite data towards a better understanding of the aeronomical effects.