

OPTICAL STUDIES OF LOW-LATITUDE IONOSPHERE IN
BRAZIL - A REVIEW

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Airglow observations started at INPE in 1970. Since that date, considerable progress has been made and numerous photometers and an interferometer have been designed and constructed at this Institute. Several photometers are operated on a routine basis at Cachoeira Paulista, SP, and Fortaleza, CE, for ground-based airglow studies. The observations include measurements of the F-region (OI 6300 A and 7774 A) and mesospheric (OH(9-4) 7750 A, O atm. (0-1) 8645 A, NaD 5890 A and OI 5577 A) nightglow emissions. A 15 cm OI 6300 A Fabry-Perot interferometer to measure the thermospheric winds and temperatures is in operation at São José dos Campos, SP. INPE has recently embarked on a program of rocket sounding of the upper atmosphere in conjunction with the Institute of Space Activities (IAE) of the Brazilian Air Force. A SONDA III rocket vehicle developed by IAE was successfully used to launch two photometers at Natal, RN, on October 31, 1986 to make the first simultaneous measurement of the OI 6300 A and 5577 A F-region profiles in the equatorial ionosphere. Earlier, on December 11, 1985, two photometers were launched on-board a SONDA III rocket to measure the OI 5577 A and O atm. (0-0) 7619 A nightglow emission profiles originating in the mesospheric region. Further experiments are planned for the near future. In a cooperative bilateral project with the University of Texas at Dallas a photometer is operated at Cachoeira Paulista to observe the N 3914 A and 4278 A and H 4861 A nightglow emissions excited by energetic particle precipitations at low latitudes during magnetic disturbances. In another bilateral research project with Boston University, a low light level airglow

imaging system is operated at Cachoeira Paulista for studying the F-region morphology and motion of airglow structures. In this review, a summary of the research programs and some recent results of the low-latitude ionospheric studies will be presented.