

THE SUNRISE IN THE IONOSPHERIC D-LAYER AND
THE TOTAL ATMOSPHERIC OZONE CONTENT

by

R.A. Medrano-B, I.S. Batista,

M.A. Abdu and L.R. Piazza

Instituto de Pesquisas Espaciais - INPE

São José dos Campos - SP, Brazil

ABSTRACT

The onset time of VLF phase change indicates the start of the electron production in the D-layer of the ionosphere. On the other hand the atmospheric ozone layer shields the solar UV radiation which is known to be an important ionization source in the formation of the D-layer. In this paper the onset time of VLF phase changes at sunrise in conjunction with total ozone content in the atmosphere is studied. The VLF signal is transmitted from Golfo Nuevo, Argentina (43°S , 65°W) and received at Atibaia, SP (23°S , 46°W). The ozone data correspond to observations performed through two Dobson spectrophotometers installed in Cachoeira Paulista, SP (22°S , 45°W) and Natal, RN (4°S , 36°W). The data used correspond to the interval 1977-1980. In the analysis calculations of the sunrise times at D-layer heights, for various ozone shielding heights, have been performed and subtracted from the onset times of phase changes to allow only for fluctuation. These fluctuations have been compared to those of the ozone data and interesting correlation with Cachoeira Paulista data were found and none with data from Natal. Implications of the results are discussed.