VLF TRANSMISSIONS PHENOMENA OBSERVED IN THE ANTARCTIC PENINSULA

by

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ABSTRACT

We present the results obtained on long distance very low frequency (VLF) radio propagation signals simultaneously received at the Brazilian Antarctic Station Comandante Ferraz (62°05'S; 58°30'W) and at Itapetinga Radio Observatory, São Paulo, Brazil (23°11'S; 46°33'W) during the period from February 1986 to March 1987, when all transmissions were tracked at all frequencies in the VLF range (OMEGA-COM). During this period, signals of frequency 13.6 kHz were continuously recorded for the propagation paths Argentina-São Paulo and Argentina-Ferraz (King George Island), the study of seasonal variation of the lower ionosphere as well as the determination of the reflection height (Δh) variation and the behaviour of the conductivity gradient (β), parameters necessary to the construction of diurnal D-region electron density models. At 10.2 kHz, it was found a nighttime reference height of 85 km and a diurnal reference height of 65 km, with a nocturnal conductivity gradient β_N = 0.8 km and diurnal β_D = 0.3 km^{-1}. At 13.6 kHz the corresponding reference heights were 87 km and 67 km, with β_N = 0.5 km^{-1} and β_D = 0.3 km^{-1}, respectively. The reception of these signals on different paths propagating in and outside the South Atlantic Geomagnetic Anomaly allows one to study the influence of this region on the effects analysed.