

Ionospheric response to the October 2003 geomagnetic superstorm in the South American-Atlantic sector

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The major geomagnetic storm that started at 0611GMT on 29 th October 2003 in response to the solar event that occurred on the day before has affected the earth ionosphere at a broad range of latitudes and longitudes Drastic and peculiar effects were observed at the equatorial and low latitude ionospheric F region a few hours following the storm onset and also in the following days In this work we analyze ionograms from a chain of Digisonde stations in the South American-Atlantic 280 o - 345 o E longitude sector in order to study the ionospheric response to the intense solar event Less that two hours after the storm onset an unusual early morning enhancement of the equatorial ionization anomaly was observed at the three ionospheric stations located at or close to the equatorial anomaly crest Tucuman TU 26 9 o S 294 6 o E dip -26 24 o Cachoeira Paulista CP 22 5 o S 315 o E dip -32 9 o and Ascension Island AI 7 95 o S 345 6 o E dip -37 8 o The anomaly intensification was more pronounced at TU and CP where the F layer peak electron density increased from $1.1 \times 10^5 \text{ el cm}^{-3}$ to $2.8 \times 10^6 \text{ el cm}^{-3}$ than at AI The most striking fact about this intensification is that it occurred just before sunrise at TU and around sunrise at CP when the conditions for the fountain effect are not set yet Another striking effect of the magnetic storm was the spectacular uplift of the F layer around sunset on 30 th October at the equatorial station S a o Lu i s SL 2 6 o

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