Geophysical Research Abstracts
Vol. 12, EGU2010-9381, 2010
EGU General Assembly 2010

Ionospheric response to the total solar eclipse in India on 22 July, 2009

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The variations in total electron content (TEC) and amplitude of the fixed frequency VLF transmitter signals (f =19.8 kHz, NWC, Australia) are studied at Agra (Geographic lat. 27.20N, long. 780E), India during the total solar eclipse of 22 July, 2009 which was longest seen in India ever since 18 August, 1968. The equipments used for the study are a dual frequency GPS receiver (GSV 4004V). The data for a period of fifteen days ($\pm$7 days from the date of the event) are analysed and it is found that the TEC decreased by about 30% from normal days during the total solar eclipse. The period of the data analysis is characterised by a low level of geomagnetic activity, hence the decrease in TEC s is unlikely to be influenced by geomagnetic disturbances. The results are interpreted in terms of depression in electron densities at all ionospheric heights and are consistent with those obtained by earlier workers during similar eclipse events.