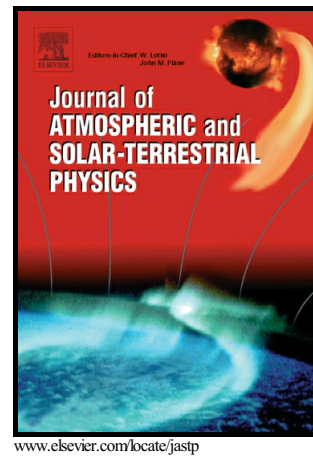


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Topside ionospheric effects of the annular solar eclipse of 15th January 2010 as observed by DEMETER satellite

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Abstract

We present effects of the annular solar eclipse of 15th January 2010 on the topside ionosphere using the DEMETER satellite data. Measurements of the electron-ion density and electron temperature by the ISL (Instrument Sonde de Langmuir) and IAP (Instrument Analyseur de Plasma) instruments on board the DEMETER satellite during the eclipse time over the low latitude (± 40) Indian ocean area are presented. We found the peak decrease in electron density to be about 35% and the peak decrease in ion density to be about 40% from the reference orbits at the altitude of the satellite (~ 660 km). Electron and ion temperatures were found to have decreased by 200-300 K at the same altitude. Instead of simple decrease as in ion density, electron temperature showed a complex wave-like oscillation as the solar eclipse progressed. Electron density decreased to a minimum value before the maximum obscuration and starts to increase before passing through another minimum at the time of maximum obscuration. Both the minima are located at the ± 10 degree geomagnetic latitude. Variations of electron and ion

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