



0.1 Effects on the [O]/[N₂]-ratio caused by ionospheric heating during geomagnetic storms

0.2

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From X-ray measurement with PIXIE on the Polar satellite we infer the global distribution of precipitating energetic electrons. X-ray spectra can be used to estimate the Pedersen conductivity, which combined with estimates of the ionospheric electric field from SuperDARN measurement, enable us to calculate the Joule heating. Both the precipitating electrons and the Joule heating can produce heating in local areas, which can cause upwelling and associated changes in the [O]/[N₂]-ratio in the thermosphere. The [O]/[N₂]-ratio is inferred from measurement on the dayside of the

**earth with the GUVI camera on the TIMED satellite.
We study the effects of energetic electron precipitation
and Joule heating on the [O]/[N₂]-ratio during a small
geomagnetic storm on 30. October 2002.**