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Influence of lightning on electron density in the ionosphere using WWLLN lightning data, Ionosonde data and GPS data

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Abstract :

Lightning data from World-Wide Lightning Location Network (WWLLN) and GPS datafrom Trignet have been analysed to ascertain the influence of lightning on total electroncontent (TEC) in the F2 region of the ionosphere over southern Africa. In this study,data from four dual frequency GPS reference stations in regions with different lightningactivity levels within South Africa have been used. The analysis reveal periods of TEC en-hancement between 3-12 TECU on geomagnetic "quiet" days which correspond to periodsof intense lightning activity in the regions. One of the hypotheses for this link betweenatmospheric weather and ionospheric activity is that the enhancement of TEC is causedby the infiltration of energy dissipated by lightning discharges in the troposphere into theF2 region.

Award :

Yes

Level :

MSc

Supervisor :

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Paper :

Yes

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