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GPS DERIVED IONOSPHERIC TEC RESPONSE TO GEOMAGNETIC STORM ON 24 AUGUST 2005 AT INDIAN LOW LATITUDE STATIONS

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Summary: Results pertaining to the response of the low latitude ionosphere to a major geomagnetic storm that occurred on 24 August 2005 are presented. These results shows variation of GPS derived total electron content (TEC) due to geomagnetic storm effect, local low latitude electrodynamics response to penetration of high latitude convection electric field and effect of storm induced traveling atmospheric disturbances (TAD's) on GPS-TEC in low latitude zone. The dual frequency GPS data have been analyzed to retrieve vertical total electron content at two Indian low latitude stations (IGS stations) Hyderabad (geographic latitude 17º 20' N, longitude 78º 30' E) and Banglore (geographic latitude 12º 58' N, longitude 77º 33' E).

1 INTRODUCTION

During the geomagnetic disturbances; such as geomagnetic storms and substorms, the energy inputs from the magnetosphere render dramatic effects into the upper atmospheric environment. One of such effects is the change in ionospheric electron density (or TEC), which perturb communication and navigation systems[1,2]. Effects of storm time electrodynamics, neutral winds and subsequent compositional changes, show both increase and decrease in the ionospheric F-region density[3] characterized by positive and negative ionospheric storms, respectively. The electrodynamic effects of the geomagnetic storm manifest on varied time scales and include the prompt penetration of the convection electric field and the disturbance dynamo electric field.

2 CONCLUSIONS

- The ionospheric TEC responseto geomagnetic storm of 24 Aug 2005 has been presented.
- The storm time enhancement in VTEC is partly due to prompt penetration electric field and partly due to storm induced travelling ionospheric disturbences (TID's), which travel form high latitude to equatorial/low latitude.

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