

Project Details

ROSES ID: NRA-02-OSS-01

Selection Year: 2003

Program Element: Independent Investigation: LWS

Project Title:

Ionospheric response to short term variations in the solar flux

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Project Member(s):

- Woods, Thomas N; Collaborator; University of Colorado, Boulder
- Bailey, Scott ; Collaborator; Geophysical Institute

Summary:

The proposed comparison of the electron density data with solar soft x-ray fluxes will provide quantitative measures of the dependence of the electron density, TEC and hmF2 on the solar measurements for a variety of time scales. While the solar flux is responsible for the ionization rate, it is also responsible for changes in other parameters which affect the observed electron density data. More specifically, while the ion production rates, neutral densities and winds all depend on the solar fluxes, the neutral parameters and ion production have different time dependencies on the solar flux. Ions are produced by the current solar flux. In contrast, there is a time lag of ~ 1 day between changes in the solar fluxes and neutral densities at F region altitudes. Analysis of the time dependencies is needed for the future use of solar soft x-ray fluxes. This information is needed for incorporating short wavelength solar flux measurements, rather than F10.7, into model calculations.

Publication References:

Summary: "

Reference: Eastes, Richard FL Space Institute - Ionospheric response to short term variations in the solar flux

Summary: no summary

Reference: Eastes, R.; Bailey, S.; Bowman, B.; Marcos, F.; Wise, J.; Woods, T.; (2004), The correspondence between thermospheric neutral densities and broadband measurements of the total solar soft X-ray flux, Geophysical Research Letters, Volume 31, Issue 19, CiteID L19804, doi: 10.1029/2004GL020801

Summary: no summary

Reference: Wang, X.; Eastes, R.; Weichecki Vergara, S.; Bailey, S.; Valladares, C.; Woods, T.; (2006), On the short-term relationship between solar soft X-ray irradiances and equatorial total electron content (TEC), Journal of Geophysical Research: Space Physics, Volume 111, Issue A10, CiteID A10S15, doi: 10.1029/2005JA011488

Summary: no summary

Reference: Wang, X.; Eastes, R.; Reinisch, B. W.; Bailey, S.; Valladares, C. E.; Woods, T.; (2007), Short-term relationship between solar irradiances and equatorial peak electron densities, Journal of Geophysical Research: Space Physics, Volume 112, Issue A6, CiteID A06310 , doi: 10.1029/2006JA012128

Summary: no summary

Reference: Wang, X.; Eastes, R.; Weichecki Vergara, S.; Bailey, S.; Valladares, C.; Woods, T.; (2007), Correction to ``On the short-term relationship between solar soft X-ray irradiances and equatorial total electron content (TEC)", Journal of Geophysical Research, Volume 112, Issue A8, CitelD A08305, doi: 10.1029/2007JA012523