

Project Details

ROSES ID: NNH07ZDA001N

Selection Year: 2008

Program Element: Focused Science Topic

Topic: Focused science topics for Strategic Goal 4 (Ionosphere-Thermosphere): Determine the sources of daily variability in the thermosphere and ionosphere

Project Title:

Towards a Predictive Model for the Day-To-Day Variability of Equatorial Ionospheric Spread-F Bubbles

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Project Member(s):

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Summary:

An outstanding problem in ionospheric-thermospheric physics, which has a major impact on human technology, is the day-to-day variability of equatorial ionospheric spread-F bubbles. The objective of the proposed research is the development of a predictive model for the day-to-day variability of equatorial spread-F bubble structures. The approach will be to use our recently developed 3D time-dependent first-principles nonlinear plasma fluid simulation model in combination with different seeding mechanisms. The effects of different seeding mechanisms, both separately and in combination, will be studied and assessed. The proposed research is significant in that it will lead to a much improved understanding of the mechanism(s) for the triggering and subsequent growth of equatorial ionospheric spread-F bubbles and a predictive model for the day-to-day variability of these bubble structures.

Publication References:

Summary: no summary

Reference: Keskinen, M. J.; Vadas, Sharon L.; (2009), Three-dimensional nonlinear evolution of equatorial ionospheric bubbles with gravity wave seeding and tidal wind effects, Geophysical Research Letters, Volume 36, Issue 12, CiteID L12102, doi: 10.1029/2009GL037892

Summary: no summary

Reference: Vadas, Sharon L.; Keskinen, M. J.; (2010), Correction to "Three-dimensional nonlinear evolution of equatorial ionospheric bubbles with gravity wave seeding and tidal wind effects", Geophysical Research Letters, Volume 37, Issue 3, CiteID L03101, doi: 10.1029/2009GL041216

Summary: no summary

Reference: Keskinen, M. J.; (2010), Equatorial ionospheric bubble precursor, Geophysical Research Letters, Volume 37, Issue 9, CiteID L09106, doi: 10.1029/2010GL042963