2013 Workshop: Sprites Jets and TGFs

Long title
Lightning Effects in the Middle and Upper Atmosphere
Conveners
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Description

This workshop will cover all aspects of coupling between lightning and the ionosphere/thermosphere/mesosphere system. Results from observational, theoretical and modeling studies regarding the energetic coupling of lightning activities with the middle and upper atmosphere will be presented and discussed. Contributions on sprites, jets, elves, terrestrial gamma ray flashes, and related electromagnetic effects are welcome, as are those on related topics, such as the local and global effects of these processes, the characteristics of lightning responsible for these phenomena, and other related nonlinear electromagnetic wave/ionosphere interactions. We are also interested in developments of new observational instruments and remote sensing techniques as well as future observation campaigns. The workshop will be consisting of scheduled short presentations. Students are strongly encouraged to contribute to this workshop.

Justification

As identified in "CEDAR: The New Dimension," there is a urgent need to integrate various lightning-induced phenomena such as sprites and jets to the overall electrodynamic coupling in the space-atmosphere interaction region to describe the electrical system of Earth. This workshop will focus on understanding the dynamics of the lightning-induced upper atmospheric phenomena, the deposition of lightning electromagnetic energy through those processes, the pathways of the neutral and ion species created, and the incurred charge transfer. It will improve our knowledge of the response of the upper atmosphere upon impacted by short, intense external forces. It directly pertains to the CEDAR strategic thrust #1: "Encourage and undertake a systems perspective of geospace,” thrust #2 "Explore exchange processes at boundaries and transitions in geospace," and thrust #6 "Fuse the

knowledge base across disciplines in the geosciences." This will contribute to achieve one of the science goals formulated in the 2013-2022 Decadal Survey in solar and space physics - understanding the dynamics and coupling of Earth’s magnetosphere, ionosphere, and atmosphere and their response to solar and terrestrial inputs.

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