Project Details

ROSES ID: NRA-03-OSS-01
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Project Title:
Relativistic electrons in the outer radiation belt: Understanding how losses contribute to flux variability during storms

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Summary:
Recent studies show that storms can cause the outer radiation belt electron flux levels to increase or decrease suggesting that both acceleration and loss are enhanced and either process may dominate. The purpose of the proposed research is to understand how losses contribute to the variation of the outer radiation belt electron flux during storms. Several loss mechanisms have been proposed but not confirmed partly because of difficulties even identifying true loss that is often obscured by flux changes due to adiabatic electron motion. We propose to first identify times, locations, and amounts of true electron loss during storms by examining electron phase space density expressed as a function of the adiabatic invariants which highlights true irreversible electron loss. Secondly, we will examine whether precipitation to the atmosphere contributes to electron loss during storms by comparing the time, location, and amount of true loss to measured precipitation. Lastly, we will determine whether magnetopause encounters contribute to electron loss during storms by comparing the time and location of observed loss to modeled magnetopause encounters and by comparing electron and proton phase space density that should both be similarly affected by magnetopause encounters.

Publication References:

Summary: ''

Reference: Janet Green / LASP, University of Colorado - Relativistic Electrons in the Outer Radiation Belt: Understanding How Losses Contribute to Flux Variability During Storms

Summary: no summary

Reference: Green, Janet C.; Kivelson, M. G.; (2004), Relativistic electrons in the outer radiation belt: Differentiating between acceleration mechanisms, Journal of Geophysical Research: Space Physics, Volume 109, Issue A3, CiteID A03213, doi: 10.1029/2003JA010153