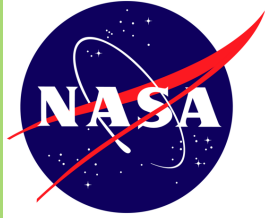




Ionospheric Response to Electron Precipitation Driven by Whistler-Mode Chorus Waves Measured by Arase Satellite and Simulated by STET and SPEAH-RIT



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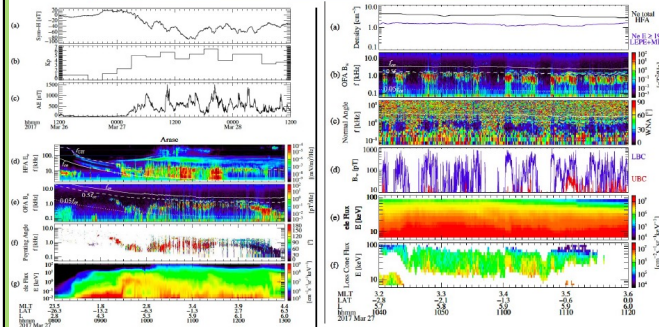


Khazanov, G. V., Ma, Q., & Chu, M. (2023), <https://doi.org/10.1029/2023JA031871>.

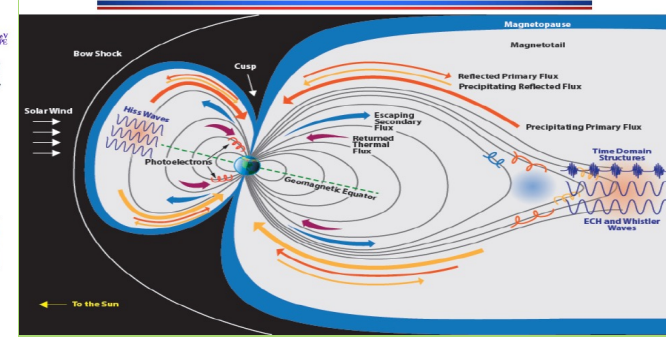
Abstract

Decades lasting research on the pulsation aurora suggested that this phenomenon forms as result of interaction between the magnetospheric keVs electrons and whistler-mode chorus waves. Arase satellite observation reported the direct evidence for this process confirming in situ measurement of highly correlated precipitated electrons and chorus wave activity. This paper presents the theoretical analysis of this observational event based on SuperThermal Electron Transport (STET) code that simulates the highly dynamic environment of measured waves and particle data. Specifically, the STET code simulated results confirms the delicate loss-cone observation results of this mission and reveals the broader energy range of precipitated electron fluxes that was not measurable by Arase satellite.

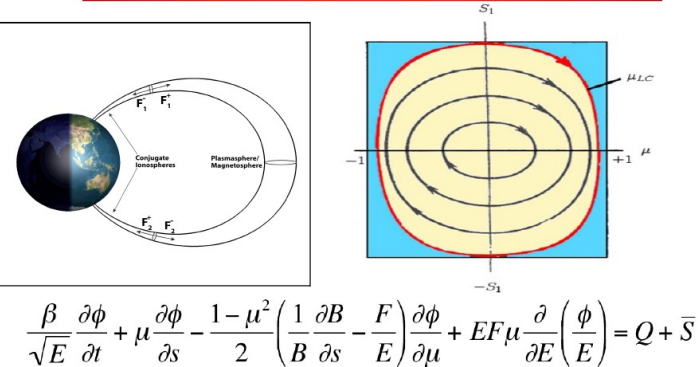
ARASE DATA



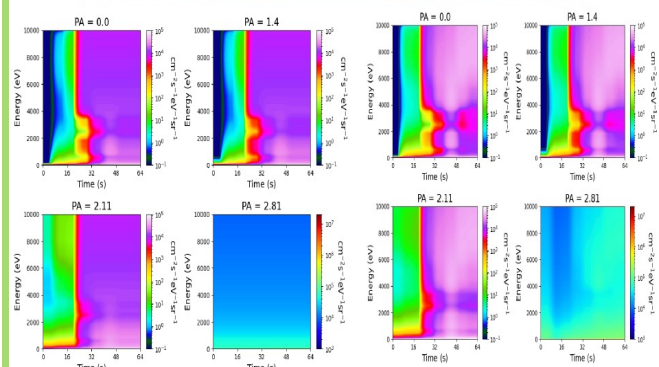
Simulation Scenario



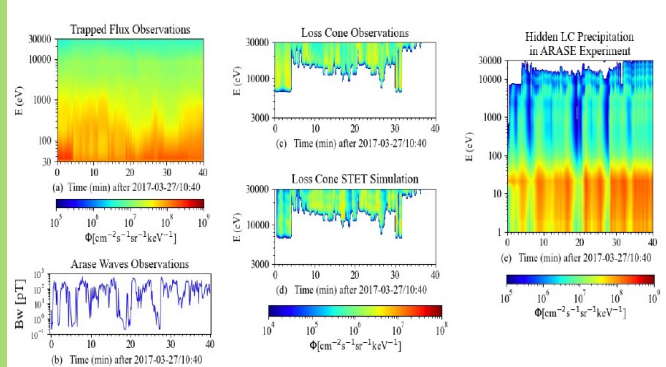
Mathematical Formalism



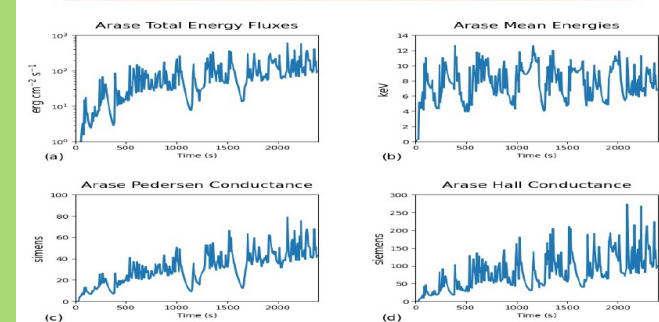
LC & Trapped Zones Communication



Major Results



Conductance Dynamics



Thermal Fluxes and Te Dynamics

