

SM11B-3276 - e-POP observations of suprathermal electron bursts in the ionospheric Alfvén resonator



Monday, 9 December 2019



08:00 - 12:20



Moscone South - Poster Hall

Abstract

The Ionospheric Alfvén resonator (IAR) [Trakhtengertz and Feldstein, 1987; Lysak, 1991] is established when Alfvén waves are reflected both at the ionospheric boundary and at altitudes around 1 Re where a sharp gradient exists in the Alfvén speed. The resulting resonant structure has a characteristic fundamental frequency of approximately 1 Hz. When the electron inertial effect is included, an oscillating parallel electric field can exist and accelerate electrons to hundreds of eV. With the Suprathermal Electron Imager (SEI) onboard the e-POP satellite, we collected 52 events of suprathermal electron bursts (STEB) recurring at frequencies consistent with the IAR. Each event contains 3-6 STEBs with a time separation of near 1 s. The e-POP satellite also observed magnetic oscillations at a similar frequency. The events occur on both the dayside and nightside with a preference for the midnight (2100-0300 MLT) and postnoon (1200-1500 MLT) sectors. The magnetic latitudes of the events range from 64° to 78°, with an average at 72°. In one particularly interesting event with four consecutive STEBs, two STEBs in the middle show typical dispersion (high energy particles with field-aligned pitch angle arriving first) and inverse dispersion (low energy particles spread over broad pitch angles arriving first). Previously there has been only one direct observation of IAR-accelerated electrons in the literature [Chaston et al., 2002]; our results significantly increase the number of observations, allowing a statistical characterization of their properties.

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