J O U R N A L C L U B

Inertial Alfven Waves and Discrete Auroral Arcs

by

Dan Swift
Geophysical Institute, UAF

ABSTRACT

When the perpendicular wavelength of the shear Alfven wave becomes comparable to the electron inertial length, electron inertia parallel to the magnetic field becomes important. Inertial Alfven waves have a component of the electric field parallel to the magnetic field, which can efficiently accelerate electrons in a way that demands the structure characteristic of the discrete aurora.

I will present a brief tutorial on inertial Alfven waves and describe results of simulations showing electron acceleration that were presented at the 3rd Alfven conference. I will then review pertinent observations of Alfven waves midway between the plasma sheet and auroral ionosphere. Finally, I will show how these auroral Alfven waves are generated and how they are formed. A major conclusion is that we close to a fundamental understanding of the discrete aurora.

Friday, Oct. 8, 2004
Globe Room, Elvey Bldg
3:45 pm