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Alfven Waves and Electron Energization and Their Interaction with Auroral Ionospheric Plasma Transport FAJER JAAFARI, JAMES HORWITZ, SAM JONES, YI-JIUN SU, WEN ZENG, UT Arlington — When inertial Alfvén waves propagate along auroral field lines, they involve parallel electric fields that can accelerate auroral electrons. Here, we simulate the propagation of Alfvén waves through O+ and H+ auroral ionosphere-magnetosphere density profiles obtained from the UT Arlington Dynamic Fluid- Kinetic (DyFK) ionospheric plasma transport model [e.g; Estep et al; 1999]. A linear one dimensional gyrofluid code [Jones and Parker, 2003] is used for the Alfvén wave description, incorporating electron inertia, electron pressure gradient and finite ion gyroradius effects. Then, the test particle approach of Su et al. [2004] is used to simulate the response of a distribution of electrons to these Alfvén wave electric fields. These electrons are incorporated into the DyFK model to produce a partially-self-consistent approach to producing the associated ionization and thermal electron heating within the ionosphere-magnetosphere system.

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