

# **Self-consistent electron response to shear Alfvén waves in uniform and non-uniform magnetic fields**

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Electrons can be accelerated in the field-aligned direction due to the parallel electric field associated with shear Alfvén waves in the inertial limit. We present results from self-consistent kinetic simulations of the electron response to finite duration propagating pulses of shear Alfvén waves in a magnetised plasma. In the uniform simulations, we concentrate on the parallel electric field evolution and subsequent electron acceleration due to these waves. We show resonant acceleration of electrons due to the presence of a parallel electric field, consistent with linear treatments of the problem. However, the self-consistent simulation reveals the nonlinear evolution of the wave potentials as the pulse travels down the simulation domain. In the nonuniform magnetic field simulations, we discuss the behaviour of the pulse as it travels through plasma with a changing local Alfvén speed. The perpendicular wavenumber of the wave is varied along the simulation domain according to the variation in the ambient magnetic field. The variations in plasma and wave conditions along the simulation domain constrain the acceleration region to a particular location along the field. Comparisons between the uniform and nonuniform cases help us to isolate the physical effects controlling the response of the plasma to the wave pulse.