



Earth auroral zone: can Alfvén waves generate strong double layers ?

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In the auroral zone of the Earth, the electron acceleration by Alfvén waves is sometimes seen as a precursor of the non-propagating acceleration structures. In order to investigate how Alfvén waves could generate non-propagating electric fields, a series of numerical simulations of counter-propagating waves in a homogeneous medium is presented. The waves propagate along the ambient magnetic field direction. It is shown that non propagating electric fields are generated at the locus of the Alfvén waves crossing. These electric fields have a component orientated along the direction of the ambient magnetic field, and they generate a significant perturbation of the plasma density and plasma acceleration. The present work is mainly focused on the creation process of the non-propagating parallel electric field.