STUDIES OF ALFVEN WAVES OF SMALL TRANSVERSE SCALE*

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An overview is presented of analytical and computational studies of shear Alfvén waves whose scale transverse to the confining magnetic field is on the order of the electron skin-depth or the ion Larmor radius. The analytical studies illustrate the process of direct conversion of a large-scale mode into short-scale waves produced by interactions with ambient density irregularities. A discussion is also presented of the filamentation induced by ambient cross-field flows. The computational studies use a particle-in-cell code to explore nonlinear interactions resulting from the excitation of large amplitude waves at a remote boundary. Some of the related phenomena include electron acceleration, formation of density channels and trapping of standing Alfvén waves.

*Sponsored by NSF