

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

The effect of compressibility on magnetohydrodynamic jets and Kelvin-Helmholtz instability¹ DIVYA SRI PRATURI, SHARATH GIRIMAJI, Texas A&M Univ — We investigate the effect of compressibility and magnetic field on the evolution of planar magnetohydrodynamic (MHD) jets. These jets are susceptible to Kelvin-Helmholtz (KH) instability when subjected to an in-plane transverse velocity perturbation. Various linear stability analyses have shown that compressibility and magnetic field along the jet have a stabilizing influence on the KH instability. We performed three-dimensional numerical simulations using magneto gas kinetic method (MGKM) to study the effect of the Mach number, Alfvén Mach number, and the orientation of the magnetic field with respect to the jet velocity direction on the flow-field evolution. In MGKM, the magnetic effects are added as source terms in the hydrodynamic gas kinetic scheme which also take into account the non-ideal MHD terms for finite plasma conductivity and the Hall effects. An in-depth analysis of linear and nonlinear physics is presented.

¹The first author was supported by Texas A&M University Institute for Advanced Study HEEP fellowship.

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Date submitted: 01 Aug 2015

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