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Linear Stability Analysis of Magnetohydrodynamic Richtmyer-Meshkov Instability in Cyindrical Geometry[1] ABEER BAKHSH, RAVI SAMTANEY, King Abdullah University of Science and Technology — Numerical simulations and analysis in Cartesian slab geometry for nonlinear ideal magnetohydrodynamics (MHD) indicate that the Richtmyer-Meshkov instability (RMI) is suppressed in the presence of a magnetic field. An analytical solution of incompressible 2-D MHD RMI of an impulsively accelerated interface was investigated by Wheatley et al. (Phys. Rev. Lett. 2005; J. Fluid Mech. 2005) who found that, for a finite magnetic field, although the initial growth rate of the interface is unaffected by the presence of magnetic field, the late-time amplitude of the interface asymptotes to a constant value. In the framework of incompressible MHD, we examine analytically the behavior of an impulsively accelerated interface separating conducting fluids of different densities in *cylindrical* geometry. We investigate the stability properties of such a system and study the influence of the magnetic field on the growth rate of the interface. In converging cylindrical geometry, the RMI is followed by a Rayleigh-Taylor (RT) phase. Our analysis does not account for the RT phase of the instability but is valid for the duration of the RMI phase. We compare results of the incompressible analysis with linear compressible MHD simulations.

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