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2D HYDRA Calculations of Magneto-Rayleigh-Taylor Growth and Feedthrough in Cylindrical Liners[1] MATTHEW WEIS, PENG ZHANG, Y.Y. LAU, RONALD GILGENBACH, Univ of Michigan - Ann Arbor, KYLE PETERSON, MARK HESS, Sandia National Laboratories — Cylindrical liner implosions are susceptible to the magneto-Rayleigh-Taylor instability (MRT), along with the azimuthal current-carrying modes (sausage, kink, etc). "Feedthrough" of these instabilities has a strong influence on the integrity of the liner/fuel interface in the magnetized liner inertial fusion concept (MagLIF) [1]. The linearized ideal MHD equations can be solved to quantify these effects, including the presence of an effective gravity and an axial magnetic field. We investigate the potential of this field to mitigate feedthrough, due to MRT growth from various initial surface finishes (seeded, rough), throughout the implosion using our analytic results and the LLNL code, HYDRA. We will present both low and high convergence cases. Lastly, we illustrate the effect shock compression can have on feedthrough in seeded liners for various fill gases (cold and pre-heated) and magnetic field configurations.

[1] S. A. Slutz, et. al, Phys. Plasmas 17, 056303 (2010).

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