

Abstract Submitted  
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**Magneto-Rayleigh-Taylor, Sausage And Kink Mode In Cylindrical Liners**<sup>1</sup> Y.Y. LAU, PENG ZHANG, MATTHEW WEIS, RONALD GILGENBACH, Univ of Michigan - Ann Arbor, MARK HESS, KYLE PETERSON, Sandia National Laboratories — This paper analyzes the coupling of magneto-Rayleigh-Taylor (MRT), sausage (azimuthal mode number  $m=0$ ) and kink mode ( $m=1$ ) in an imploding cylindrical liner, using ideal MHD. A uniform axial magnetic field of arbitrary value is included in each region: liner, its interior, and its exterior. The dispersion relation, the feedthrough factor, and the temporal evolution of perturbations were solved exactly, for arbitrary values of  $g$  (= gravity),  $k$  (= axial wavenumber),  $m$ , aspect ratio, and equilibrium quantities in each region. For small  $k$ , a positive  $g$  (inward radial acceleration in the lab frame) tends to stabilize the sausage mode, but destabilize the kink mode. For large  $k$ , a positive  $g$  destabilizes both the kink and sausage mode. This analysis might shed lights into some puzzling features in Harris' classic paper [1], and in the recent cylindrical liner experiments [2] on MRT.

[1] E. G. Harris, Phys. Fluids 5, 1057 (1962).

[2] T. J. Awe, et al., PRL 111, 235005 (2013); PoP 21, 056303 (2014).

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Matthew Weis  
Univ of Michigan - Ann Arbor

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