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Fundamental magneto-Rayleigh-Taylor Instability Growth Experiments[1] D.B. SINARS, K.J. PETERSON, R.A. VESEY, C. JENNINGS, M.C. HERRMANN, R.D. MCBRIDE, M.R. MARTIN, S.A. SLUTZ, Sandia National Laboratories, Albuquerque, NM — Sandia is investigating a magnetized liner inertial fusion concept that uses cylindrical Be or Al liners to compress magnetized and preheated fusion fuel. As part of this work, we have been studying the growth of instabilities in initially solid liners driven with 20-24 MA, 100-ns current pulses on the Z pulsed power facility. The magneto-Rayleigh-Taylor instability in particular can disrupt the plasma liner during its implosion. Previous experiments studied instability growth starting either from intentionally seeded single-mode perturbations or from diamond-turned best-finish surfaces. Here we report on experiments studying (1) the growth of intentionally seeded multi-mode perturbations, and (2) the growth from polished best-finish surfaces where the tooling mark orientation is changed from being predominantly azimuthal to axial.

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