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Instability formation on thin liners in small-scale experiments using MACH2 JEFF NARKIS, JULIO VALENZUELA, Center for Energy Research, Univ of California, San Diego, HAFIZ UR RAHMAN, Magneto-Intertial Fusion Technologies, Inc., PAUL NEY, Mt. San Jacinto College, FRANK WESSEL, Magneto-Intertial Fusion Technologies, Inc., FARHAT BEG, Center for Energy Research, Univ of California, San Diego — Initial experimental studies on instability formation on thin liners have been conducted on GenASIS (200 kA, 150 ns rise time). In those experiments, thecurrent was applied to Cu and Ni liners with initial length, radius, and thickness of 7 mm, 1 mm, and 3 μm, respectively. Plasma perturbations of the minimum observable wavelength (20 μm) were seen as early as 70 ns. In both materials the most significant perturbations reach a limiting wavelength of the order of the liner radius, but this occurs faster (20 ns) for Cuthan in Ni(100 ns), suggesting the seeding mechanism must be different early in time, when the resistivities are different for the two materials. The 2-1/2 MHD code MACH2 was used to investigate this early-time instability development. The ratio of initial length to thickness (7000:3) presents computational challenges: the initial length was reduced to 2 mm, and to reduce initial density gradients an initial liner thickness of 30 μm was used. To seed instability growth, up to a 10% initial density perturbation was used. Preliminary results have been inconclusive; additional work will explore sub-micron resolutions and alternative initial density configurations.

Jeff Narkis
Univ of California - San Diego

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