Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Observations of plasma instability and precursor plasma in thin liners driven with a compact linear transformer driver JULIO C. VALENZUELA, GILBERT COLLINS, DEREK MARISCAL, FARHAT BEG, university of california, san diego — Results of surface instability formation in thin liners driven by a compact linear transformer driver, capable of producing 250kA in 150ns, are presented. Two different materials, Cu and Ni, were investigated in order to study the liner's resistivity effect on formation and evolution of the instabilities. Dimensions of the liners were kept constant (7mm length, 1mm radius and 3um thickness). Laser probing was implemented to diagnose instability formation and growth. Time-integrated extreme ultraviolet spectroscopy as well as filtered diodes were used to study plasma temperature and density. A constant expansion rate for the liners was observed, independent of liner material. Significant difference was found between the Cu and Ni instability growth; the most significant perturbations in copper grow rapidly and saturate reaching a limiting wavelength of the order of the liner radius, while the most significant wavelength in nickel slowly increases and saturates, also close to the liner radius. A comparison of end on and side on XUV emission indicates formation of precursor plasma. Both materials exhibited precursor plasma temperatures around 40eV and ion densities of 1e19cm^{-3}.

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Date submitted: 12 Jul 2013 Electronic form version 1.4