Abstract Submitted
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Instabilities observed at the bubble edge of a laser produced plasma during its expansion in an ambient tenuous plasma[1] BO RAM LEE, Tech Univ Darmstadt, S.E. CLARK, University of California, Los Angeles, D.H.H. HOFFMANN, Tech Univ Darmstadt, C. NIEMANN, University of California, Los Angeles — The Raptor kJ class 1053nm Nd:Glass laser in the Phoenix laser laboratory at University of California, Los Angeles, is used to ablate a dense debris plasma from a graphite or plastic target embedded in a tenuous, uniform, and quiescent ambient magnetized plasma in the Large Plasma Device (LAPD) which provides a peak plasma density of $n_i \sim 10^{13} cm^{-3}$. Its background magnetic field can vary between 200 and 1200G. Debris ions from laser produced plasma expand out conically with super-Alfvénic speed ($M_A \sim 2$) and expel the background magnetic field and ambient ions to form a diamagnetic bubble. The debris plasma interacts with the ambient plasma and the magnetic field and acts as a piston which can create collisionless shocks. Flute-type instabilities, which are probably large Larmor radius Rayleigh Taylor instabilities or lower hybrid drift instabilities, are developed at the bubble edge and also observed in the experiment. The amplitude and wavelength dependence of the instabilities, which might be a strong function of debris to ambient mass to charge ratio, is studied and the experimental results are compared to the two dimensional hybrid simulations.

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