Abstract Submitted
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Creation of a multi-centimeter low density plasma channel using high magnetic fields[1] B. POLLOCK, UC San Diego, D.H. FROULA, P. DAVIS, LLNL, J.S. ROSS, UC San Diego, A. COLLETTE, UC Los Angeles, L. DIVOL, P. MICHEL, N. MEEZAN, Lawrence Livermore National Laboratory, G. TYNAN, UC San Diego, S.H. GLENZER, Lawrence Livermore National Laboratory — We will present experimental results that show the formation of a laser produced plasma channel when applying a large external magnetic field. This channel is suitable for guiding laser beams and is directly applicable to wakefield acceleration and short pulse laser amplification. This is accomplished by applying a technique that has been established at the Jupiter Laser Facility; an external magnetic field is used to prevent radial heat transport [D. H. Froula *et.al.*, Phys. Rev. Lett. 98, 135001 (2007)] resulting in an increased temperature gradient. Temporally resolved Thomson-scattering measurements of the electron temperature profile in large magnetic fields show that the heat front, transverse to a high-power laser beam, is slowed resulting in extremely strong local heating. This strong local heating produces a density channel that is measured with interferometry for densities between 10^{17} cm^{-3} to 10^{19} cm^{-3}.

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