Abstract Submitted
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Nanosecond laser pulse propagation and the generation of laser plasma instabilities in a magnetized, under-dense plasma[1] A. HIGGINSON, UCSD, J.-R. MARQUES, LULI-CNRS, J. BEARD, LNCMI, P. LOISEAU, CEA-DAM, A. SOLOVIEV, IAP-RAS, A. CASTAN, CEA-DAM/LULI-CNRS, B. COLEMAN, M. BORGHESI, QUB, T. GANGOLF, L. LANCIA, LULI-CNRS, M. STARODUBTSEV, IAP-RAS, S.J. SPENCER, Univ. Warw., S. ZHANG, C. MCGUFFEY, M. BAILLY-GRANDVAUX, J. STREHLOW, UCSD, B.J. WINJUM, R. LEE, F.S. TSUNG, UCLA, M.J.-E MANUEL, General Atomics, W.B. MORI, UCLA, F.N. BEG, UCSD, J. FUCHS, LULI-CNRS — Laser propagation in an under-dense plasma, and the instabilities generated during its transit are of fundamental interest for inertial confinement fusion. We present an experimental study of the influence that an external magnetic field (B) up to 20 T has on the propagation of a nanosecond, 9×10^{14} Wcm^{-2} intensity laser in a pre-formed plasma. The temporally-resolved transmitted light profile indicates more light transmission in the magnetized case, with a larger transmitted beam. Measurements of stimulated Raman scattering (SRS) and stimulated Brillouin scattering (SBS), both in the backward direction, are also presented. As a function of B, an increase of SRS is detected while no change is detected for SBS. Rad-hydro and particle-in-cell simulations are employed to elucidate the dynamics resulting in this behavior.

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Adam Higginson
University of California, San Diego

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