

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Short-pulse laser amplification and saturation using stimulated Raman scattering E.S. DODD, J. REN, T.J.T. KWAN, M.J. SCHMITT, LANL, P.B. LUNDQUIST, S. SARKISYAN, E. NELSON-MELBY, A.E. — Recent theoretical and experimental work has focused on using backward-stimulated Raman scattering (BSRS) in plasmas as a means of laser pulse amplification and compression [1,2,3]. We present initial computational and experimental work on SRS amplification in a capillary-discharge generated Xe plasma. The experimental set-up uses a 200 ps pump pulse with an 800 nm wavelength seeded by a 100 fs pulse from a broadband source and counter-propagates the pulses through a plasma of length 1 cm and diameter 0.1 cm. Results from initial experiments characterizing the plasma and on short-pulse amplification will be presented. Additionally, we present results from calculations using pF3d [4], and discuss the role of SRS saturation and determine the possible significance of electron trapping with a model implemented in pF3d [5]. [1] G. Shvets, N. J. Fisch, A. Pukhov, and J. Meyer-ter-Vehn, *Phys. Rev. Lett.* **81** 4879 (1998). [2] V. M. Malkin, G. Shvets, and N. J. Fisch, *Phys. Rev. Lett.* **82** 4448 (1999). [3] R. K. Kirkwood, E. Dewald, and C. Niemann, *et al.*, *Phys. Plasmas* **14** 113109 (2007). [4] R. L. Berger, B. F. Lasinski, T. B. Kaiser, *et al.*, *Phys. Fluids B* **5** 2243 (1993). [5] H. X. Vu, D. F. DuBois, and B. Bezzerides, *Phys. Plasmas* **14** 012702 (2007). Supported by US DOE and LANS, LLC under contract DE-AC52-06NA25396. LA-UR-10-04787

Evan Dodd
Los Alamos National Laboratory

Date submitted: 26 Jul 2010

Electronic form version 1.4