Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Three-Dimensional Modeling of Laser–Plasma Interactions Near the Quarter-Critical Density in Plasmas H. WEN, A.V. MAXIMOV, R. YAN, C. REN, J. LI, J.F. MYATT, Laboratory for Laser Energetics, U. of Rochester — Three dimensional particle-in-cell simulations have been performed in the plasma region near quarter-critical density for the parameters typical for direct-drive inertial confinement fusion experiments.[1] The laser–plasma instabilities of two-plasmon decay (TPD), stimulated Raman scattering (SRS), and stimulated Brillouin scattering have been identified in the time evolution of different electric- and magnetic-field components. A good agreement between the simulation results and the theories of TPD and SRS[2] has been observed. In the nonlinear saturation regime, the field intensities and the fast-electron distributions are compared for plane-wave and speckled laser beams. The effects of collisions are studied. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]J. F. Myatt *et al.*, Phys. Plasmas **21**, 055501 (2014).
[2]A. Simon *et al.*, Phys. Fluids **26**, 3107 (1983); J. F. Drake and Y. C. Lee, Phys. Rev. Lett. **31**, 1197 (1973); H. Wen *et al.*, Phys. Plasmas **22**, 052704 (2015).

A.V. Maximov
Laboratory for Laser Energetics, U. of Rochester

Date submitted: 21 Jul 2015 Electronic form version 1.4