Abstract Submitted
for the Second International Workshop on
Laser Plasma Interaction Physics

Backscatter, laser light smoothing and channeling in underdense plasmas.* D. E. HINKEL, R. L. BERGER, A. B. LANGDON, B. F. LASINSKI, C. H. STILL, E. A. WILLIAMS, *Lawrence Livermore National Laboratory* — The three-dimensional (3-D) code F3D with nonlinear hydrodynamics [1] is used to examine temporal beam smoothing, channeling and backscatter driven by non-uniform laser beams. In agreement with analytic estimates, [2] 3-D simulations of uniform, initially stationary plasma show that laser beam RPP hotspots move, yielding a time averaged laser intensity smoother than the instantaneous pattern. This naturally occurring smoothing is quantified in terms of an intensity correlation time. The influence of 3-D beam structure on channeling, Brillouin backscatter and beam smoothing will be examined with and without axial and transverse flow. Preliminary results indicate that transverse flow deflects Brillouin backscatter in the direction opposite to the flow. [3] Simulations of channel formation in underdense plasma at fast ignitor parameter values will also be presented.

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[1] C. H. Still et al., BAPS **40**, 1823 (1995).
[2] D. E. Hinkel and E. A. Williams, BAPS **37**, 1376 (1992).
[3] H. A. Rose, LLNL, 1996.