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Three-Dimensional Effects in Laser Channeling in Fast-Ignition Targets G. LI, C. REN, V.N. GONCHAROV, Laboratory for Laser Energetics, U. of Rochester, J. TONGE, W.B. MORI, UCLA — Laser channeling aims to reduce the energy loss of an ignition pulse in the millimeter-scale underdense plasma of fast-ignition targets. Currently full-scale particle-in-cell (PIC) simulations for laser channeling can be performed only in 2-D.[1] Here we report results from 3-D PIC simulations with 0.1-mm-scale plasmas. These results show a larger channeling speed in 3-D than in 2-D for the same conditions. The channeling speed difference is partly due to the difference in laser self-focusing (SF) in 2-D and 3-D. We will compare the laser vector potential and spot-size evolution from the simulations to those predicted by a simple model of relativistic and ponderomotive SF. Dimensional effects on other channeling properties such as residual plasma density and temperature will also be presented. This work was supported by the U.S. Department of Energy under Cooperative Agreement Nos. DE-FC52-08NA28302, DE-FC02-04ER54789, and DE-FG02-06ER54879.

[1]G. Li *et al.*, Phys. Rev. Lett. **100**, 125002 (2008).

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