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Absorption, imprint, and heat transport of optically smoothed KrF laser radiation in direct-drive ICF[1] MICHAEL KESKINEN, DENIS COLOMBANT, JASON BATES, ANDREW SCHMITT, Plasma Physics Division, Naval Research Laboratory — Accurate models of absorption, imprint, and heat transport from optically smoothed lasers are important to maximize gain in direct-drive inertial confinement fusion. Nonuniform single beam imprint can lead to reduction in target yield, depending on the degree of optical smoothing, and can seed Rayleigh-Taylor growth in the acceleration phase. Optically smoothed laser radiation, e.g., induced spatial incoherence (ISI), fluctuates on a coherence time scale. We have developed a time-dependent electromagnetic full-wave Maxwell solver. The electromagnetic wave solver can simulate the propagation and absorption of different wave polarizations for normal and oblique incidence for smooth and rippled critical surfaces. In addition it can model ISI effects. We apply the results to shock ignition and high-Z targets and discuss implications for heat transport.

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