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PIC Simulations of Short-Pulse, High-Intensity Light Impinging on Structured Targets[1] BARBARA F. LASINSKI, A. BRUCE LANGDON, C.H. STILL, MAX TABAK, RICHARD P.J. TOWN, Lawrence Livermore National Laboratory — The production of energetic electrons in short-pulse, high-intensity laser-plasma interactions is a key component of the fast ignition concept. In present day scenarios this short-pulse high intensity laser propagates down a cone to produce the hot electrons near the compressed core. PIC simulations with our code, Z3, are used to study the laser plasma interaction in such irradiations. We investigate whether shaping the laser beam interaction surface aids in the production of high energy electrons with the desired characteristics for fast ignition. In these idealized simulations, this surface is taken to be a series of 'divots' whose dimensions are of the order of several laser wavelengths. Determining an optimum 'divot' shape is one area of investigation. We also report on simulations of cone irradiations more closely guided by experiment in which we use more realistic beam spatial profiles and consider the effect of (expected) beam pointing inaccuracies. The cone shapes are also varied. In all these simulations presented here, the main metrics are the energetic electron distribution functions.

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