Interaction of intense multi-picosecond laser pulses with matter\textsuperscript{1}

ANDREAS KEMP, LAURENT DIVOL, BRUCE COHEN, LLNL — We present new results on the two- and three-dimensional kinetic modeling of short-pulse laser-matter interaction of Petawatt pulses at the spatial and temporal scales relevant to current experiments. We address key questions such as characterizing the multipicosecond evolution of the laser energy conversion into hot electrons, i.e., conversion efficiency as well as angular- and energy distribution; the impact of return currents on the laser-plasma interaction; and the effect of self-generated electric and magnetic fields on electron transport. We will report applications to current experiments at LLNL’s Titan laser and Omega EP, and to a Fast-Ignition point design.

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