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Controlling Laser Plasma Instabilities Using Temporal Bandwidths Under Shock Ignition Relevant Conditions[1] FRANK TSUNG, University of California, Los Angeles, J. WEAVER, R. LEHMBERG, NRL — We are performing particle-in-cell simulations using the code OSIRIS to study the effects of laser plasma interactions in the presence of temporal bandwidth under plasma conditions relevant to experiments on the Nike laser with induced spatial incoherence (ISI). With ISI, the instantaneous laser intensity can be 3-4 times larger than the average intensity, leading to the excitation of additional TPD modes and producing electrons with larger angular spread. In our simulations, we observe that although ISI can increase the interaction regions for short bursts of time, time-averaged (over many pico-seconds) laser plasma interactions can be reduced by a factor of 2 in systems with sufficiently large bandwidths (where the inverse bandwidth is comparable with the linear growth time). We will quantify these effects and investigate higher dimensional effects such as laser speckles and the effects of Coulomb collisions.

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Frank Tsung
University of California, Los Angeles

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