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Focusing of Intense Subpicosecond Laser Pulses in Wedge Targets
MATTHEW LEVY, Rice University, LLNL, ANDREAS KEMP, SCOTT WILKS, LAURENT DIVOL, LLNL, MATTHEW BARING, Rice University — Two dimensional particle-in-cell simulations characterizing the focusing of ultraintense lasers in the range $10^{18} \leq I \leq 10^{20} W/cm^2$ in idealized wedge targets over ~ 2 picoseconds are presented. We describe key dynamical features and trends as laser intensity and cone angle are systematically varied, such as optimal order-of-magnitude laser focusing in the narrow 17 target at early times. Also observed in this geometry is a clear trend where the region of peak laser intensity regresses away from the target tip at intensity-dependent rates that saturate at $dz_{peak}/dt \approx 17\ \mu m/ps$. Particle heating in the narrow and intermediate width targets is characterized by the presence of a dominant hot electron filament aligned with the target tip, while the wide 45 target exhibits two equally dominant filaments off to the sides of the tip with electron acceleration through the tip effectively suppressed.

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