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Laser Guiding at $> 10^{18}W/cm^2$ in cm - scale Gas Jets using the Ignitor Heater Method CAMERON GEDDES, LBNL, ERIC ESAREY, LBNL, JEROME FAURE, LBNL, WIM LEEMANS, LBNL, CSABA TOTH, LBNL, JEROEN VANTILBORG, LBNL
Laser wakefield accelerators in the self guided regime and in pre formed channels are studied at LBNL's POASIS facility (10TW, $2 \times 10^{19}W/cm^2$) with the goal of a compact 0.1-1GeV accelerator module. A self modulated, self guided drive beam produced nC electron beams up to 50MeV with large energy spread. Simulations indicate plasma channeled accelerators can substantially increase particle energy and reduce energy spread. We have used channels formed by hydrodynamic shock to guide acceleration relevant intensities of $10^{18}W/cm^2$ with 40% efficiency in initial experiments. Channel optimization and characterization of effects on the electron energy spectrum are under way. Gas target development and injection experiments are also in progress. Recent experimental results will be presented.

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