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Laser Triggered Electron Injection into a Channel Guided Wakefield Accelerator K. NAKAMURA, C.G.R. GEDDES, P. MICHEL, J. VAN TILBORG, CS. TOTH, G. FUBIANI, C.B. SCHROEDER, E. ESAREY, W.P. LEEMANS, LBNL, C. FILIP, UNR — Laser-plasma accelerators have demonstrated the generation of narrow energy spread ($\simeq$ few %) electron beams with considerable amount of charge (>100 pC). Stability of laser-plasma accelerators, as in the conventional accelerators, requires highly synchronized injection of electrons into the structured accelerating field. The Colliding Pulse Method[1] with pre-formed plasma channel guiding [2] can result in jitter-free injection in a dark-current-free accelerating structure. We report on experimental progress of laser triggered injection of electrons into a laser wakefield, where an intense laser pulse is guided by a pre-formed plasma channel. The experiments use the multi-beam, multi-terawatt Ti:Al_2O_3 laser at LOASIS facility of LBNL. The ignitor-heater method is used to first produce a pre-formed plasma channel in a hydrogen gas jet. Two counter propagating beams (wakefield driver:100-500mJ-50fs, injector:50-300mJ-50fs) then are focused onto the entrance of the channel. Preliminary results indicate that electron beam properties are affected by the second beam. Details of the experiment will be presented. [1]G.Fubiani, et al, Phys. Rev. E 70, 016402 (2004). [2]C.G.R. Geddes et al, Nature 431, 538 (2004). This work is supported by DoE under contract DE-AC02-05CH11231.

Kei Nakamura

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