

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Progress on a 1 GeV laser accelerator at the LOASIS Facility of LBNL¹ W.P. LEEMANS, B. NAGLER, K. NAKAMURA, CS. TOTH, C.G.R. GEDDES, J. VAN TILBORG, E. ESAREY, C.B. SCHROEDER, LBNL, A. GON-SALVES, S. HOOKER, Oxford University, C. FILIP, E. MICHEL, T. COWAN, UNR, D. BRUHWILER, D. DIMITROV, J. CARY, Tech-X Corporation — Progress towards a 1 GeV laser-driven plasma-based accelerator at the LOASIS facility will be presented. The design of the 1 GeV accelerator module consists of an all-optical electron injector and a plasma channel for laser guiding and electron acceleration to high energy via the laser wakefield acceleration (LWFA) mechanism. Experimentally we have previously demonstrated laser guiding at relativistic intensities in preformed plasmas and production of quasi-monochromatic electron beams with energy around 100 MeV [1]. Guiding experiments are underway using the 100 TW-class LOASIS laser with capillary discharges that provide multi-cm scale plasma channels in hydrogen gas at densities on the order of 10^{18} cm^{-3} . Intensities in excess of $5 \times 10^{17} \text{ W/cm}^2$ have been guided in plasma densities that are sufficiently low to provide high phase velocity plasma wakes for GeV electron beams. Progress on acceleration of electrons will be presented. [1]C.G.R. Geddes et al., Nature 431, 538 (2004).

¹This work supported by US DoE, DE-AC03-76SF0098, the Research Councils UK, Basic Technology Programme (GR/R88090), DoE/NNSA under UNR grant DE-FC52-01NV14050, NSF and AFOSR

W. Leemans
LBNL

Date submitted: 24 Aug 2005

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