Abstract Submitted
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A 10 GeV laser driven accelerator: the BELLA project[1] W.P. LEEMANS, O. ALBERT[2], E. ESAREY, C.G.R. GEDDES, A. GONSALVES, N.H. MATLIS, K. NAKAMURA, D. PANASENKO, G.R. PLATEAU, C.B. SCHROEDER, CS. TOTH, LBNL, D.L. BRUHWILER, J.R. CARY, Tech X Corp, M. BAKEMAN, E. CORMIER-MICHEL, T. COWAN, UNR, S.M. HOOKER, Oxford University — GeV class beams have been generated from a laser driven accelerator [3]. The experiments used a cm-scale capillary discharge produced plasma channel to guide and control the process of acceleration, similar to the use of laser produced channels [4], and 40 TW laser pulses. Lower plasma density and cm-scale channel length resulted in up to 1 GeV beams, in good agreement with simulations. This forms the basis for the next milestone experiment: a 10 GeV laser driven accelerator. As part of the BELLA project at LBNL, scaling of these experiments to the 10 GeV level is now underway. We will discuss experimental plans for the implementation of a 1 m scale channel guided laser wakefield accelerator and a petawatt class laser system.

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[2]on sabbatical from LOA, France
[3]W.P. Leemans et al., Nature Physics **2**, 696-699 (2006); K. Nakamura et al., Phys. Plasmas **14**, 056708 (2007)
[4]C.G.R. Geddes et al., Nature **431**, 538-541 (2004)

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