

Abstract Submitted
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Proton acceleration with high intensity lasers interacting on underdense targets¹ EMMANUEL D'HUMIERES, TOM COWAN, SANDRINE GAILLARD, NATHALIE LE GALLOUDEC, YASUHIKO SENTOKU, Nevada Terawatt Facility, Physics Department, University of Nevada, Reno, USA, WIM LEE-MANS, KEI NAKAMURA, Lawrence Berkeley National Laboratory, University of California, Berkeley, USA — In the last few years, intense research has been conducted on laser-accelerated ion sources and their applications [1]. Proton beams accelerated from solid planar targets have exceptional properties that open new opportunities for ion beam generation and control. Recently, experiments have shown that a gaseous target can produce proton beams with similar characteristics [2]. New experiments have been conducted on the 10 TW laser at LBNL to obtain the dependence of the proton beam characteristics on laser and target parameters. The experimental results are well reproduced by 2D PIC simulations and new simulations were performed to determine the optimum parameters for various applications. The proton acceleration efficiency was compared with proton acceleration from a solid target and the influence of electron laser-wakefield acceleration has been investigated. [1] J. Fuchs et al., *Nature Physics* 2, 48 (2006). [2] L. Willingale et al., *Phys. Rev. Lett.* 96, 245002 (2006).

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