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Proton acceleration with high intensity lasers interacting on micro-cone targets¹ EMMANUEL D'HUMIERES, TOM COWAN, SANDRINE GAILLARD, NATHALIE LE GALLOUDEC, JENNIFER RASSUCHINE, YASUHIKO SENTOKU, Nevada Terawatt Facility, Physics Department, University of Nevada, Reno, USA — In the last few years, intense research has been conducted on laser-accelerated ion sources and their applications [1,2]. Proton beams accelerated from solid planar targets have exceptional properties that open new opportunities for ion beam generation and control. Experiments conducted at LANL and LULI have shown that high intensity lasers interacting on micro-cone targets can produce proton beams more collimated and more energetic than with planar targets. These micro-cone targets are composed of a curved cone attached to a micro-table. 2D PIC simulations were performed to understand the experiments and separate the effect of the cone from the effect of the micro-table. These new targets could help increase the laser-accelerated protons maximum energy to the 100 MeV range. [1] J. Fuchs et al., Nature Physics 2, 48 (2006). [2] T.Toncian et al., Science Vol. 312, 21 April 2006, p.410-413.

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