

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Characterization and focusing of laser-accelerated proton beams from hemisphere shells¹ B. QIAO, T. BARTAL, UC San Diego, M.E. FOORD, LLNL, R.B. STEPHENS, M.S. WEI, GA, P. PATEL, H. MCLEAN, M. KEY, LLNL, F.N. BEG, UC San Diego — In proton fast ignition, a focused proton beam with the diameter of 40 μm and the energy about 20kJ is required to deposit in the DT core within 20ps [1]. This proton beam can be produced using a hemisphere shell placed at the end of a hollow cone [2]. Recent experiments on the Trident Laser have demonstrated the production and focusing of proton beams in such a structure [3]. In this talk we will present the LSP simulation results on laser-accelerated proton beams from the hemisphere shells, where the laser-plasma interaction (LPI) package are self-consistently included. The general properties and conversion efficiency of the proton beams will be discussed and will be also compared with those from the previous LSP injection/excitation-model simulations.

[1] S. Atzeni et al., Phys. Plasmas 6, 3316 (1999).

[2] M. Roth et al., Phys. Rev. Lett. 86, 436 (2001).

[3] T. Bartal et al., submitted to Nature Phys (2011).

¹The work was performed under the auspices of the U.S. DOE contract DE-SC0001265.

Farhat Beg
UC San Diego

Date submitted: 26 Jul 2011

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