

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Focusing of laser-accelerated proton beams with active plasma lens.¹ JIANHUI BIN, SVEN STEINKE, QING JI, KEI NAKAMURA, ANTHONY GONSALVES, STEPAN BULANOV, CAMERON GEDDES, CARL SCHROEDER, THOMAS SCHENKEL, ERIC ESAREY, Lawrence Berkeley National Laboratory — We report on the first experimental demonstration of radially symmetric focusing of laser-accelerated proton beams with an active plasma lens which provides tunable field gradients of the order of kT/m. MeV level proton beams generated from micrometer solid density targets interacting with a relativistically intense laser were used to examine the focusability and robustness of this new approach. By varying field gradients of the active plasma lens, proton beams with mm focus spot size at selected energies were achieved at a distance of 1.5 meters behind the source. Results were supported by simple numerical calculations. Work towards retrieval of the proton beam source properties (source size, emittance) by combining these methods with dipole magnetic dispersion will be discussed as well.

¹The work was supported by Laboratory Directed Research and Development (LDRD) funding from Lawrence Berkeley National Laboratory provided by the Director, and the U.S. Department of Energy Office of Science Offices of High Energy Physics and Fusion Energy Sciences, under Contract No. DE-AC02-05CH11231. Work at BELLA was also supported by LaserNetUS (<https://www.lasernetus.org/>). J.H.Bin acknowledges financial support from the Alexander von Humboldt Foundation.

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Date submitted: 02 Jul 2019

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