

Abstract Submitted
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Single shot source size measurement of laser driven proton beams with active plasma lens¹ LIESELOTTE OBST HUEBL, JIANHUI BIN, SVEN STEINKE, QING JI, KEI NAKAMURA, ANTHONY GONSALVES, JEROEN VAN TILBORG, SAM BARBER, STEPAN BULANOV, LAURA GEULIG, CAMERON GEDDES, CARL SCHROEDER, THOMAS SCHENKEL, ERIC ESAREY, Lawrence Berkeley National Laboratory — Using an active plasma lens we demonstrate a single-shot method to measure the energy-dependent source size of laser driven proton beams. The active plasma lens acts as an imaging system, yielding magnified proton beam spots at a distance of 1.5 meters behind the target. A simple Monte Carlo code is used to simulate the transport and retrieve the source size from the measurement. In the energy range of 3 to 7 MeV we show the measured proton beam source size is 210 to 60 micrometers, with an incident laser spot size of 52 micrometers and a peak laser intensity of 2×10^{19} W/cm².

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