Abstract Submitted
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A thin column of dense plasma for space-charge neutralization of intense ion beams[1] P.K. ROY, Lawrence Berkeley National Laboratory (LBNL), P.A. SEIDL, A. ANDERS, LBNL, J.J. BARNARD, Lawrence Livermore National Laboratory (LLNL), F.M. BIENIOSEK, LBNL, A. FRIEDMAN, LLNL, E.P. GILSON, Princeton Plasma Physics laboratory (PPPL), W. GREENWAY, LBNL, A.B. SEFKOW, PPPL, J.Y. JUNG, M. LEITNER, S.M. LIDIA, B.G. LOGAN, W.L. WALDRON, LBNL, D.R. WELCH, Voss Scientific — Typical ion driven warm dense matter experiment requires a plasma density of $10^{14}/\mathrm{cm}^3$ to meet the challenge of $n_p > n_b$, where n_p, and n_b are the number densities of plasma and beam, respectively. Plasma electrons neutralize the space charge of an ion beam to allow a small spot of about 1-mm radius. In order to provide $n_p > n_b$ for initial warm, dense matter experiments, four cathodic arc plasma sources have been fabricated, and the aluminum plasma is focused in a focusing solenoid (8T field). A plasma probe with 37 collectors was developed to measure the radial plasma profile inside the solenoid. Results show that the plasma forms a thin column of diameter ∼7mm along the solenoid axis. The magnetic mirror effect, plasma condensation, and the deformation of the magnetic field due to eddy currents are under investigation. Data on plasma parameters and ion beam neutralization will be presented.

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