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Initial results on neutralized drift compression experiments (NDCX) for high intensity ion beam

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Abstract

Ion beam neutralization and compression experiments are designed to determine the feasibility of using compressed high intensity ion beams for high energy density matter and fusion ignition. To quantitatively ascertain the various mechanisms for beam compression, the Neutralized Drift Compression Experiments (NDCX) is constructed at Lawrence Berkeley National Laboratory (LBNL). In this compression experiments, a 260 KeV, 25 mA, K⁺ ion beam of centimeters size is radially compressed to mm size spot by a localized plasma plug and beam current of μ sec pulse length is longitudinally compressed to nsec scale by an induction tilt core. Instrumentation, preliminary results of the experiments and practical limits of compression, such as transverse and longitudinal emittance, degree of neutralization using plasma source, control of velocity tilt core, and accuracy of measurements (fast and spatially resolved diagnostic) will be presented in this proceeding.

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