Abstract Submitted
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Realistic Simulation of NDCX-II[1] W.M. SHARP, A. FRIEDMAN, D.P. GROTE, R.H. COHEN, S.M. LUND, LLNL, M.A. LEITNER, J.-L. VAY, W.L. WALDRON, LBNL — The Virtual National Laboratory for Heavy-Ion Fusion Science is now constructing NDCX-II, an accelerator facility for studying ion-heated warm dense matter and aspects of ion-driven targets for inertial-fusion energy. Plans call for using twelve or more induction cells to accelerate 30-50 nC of Li^+ ions to 1.2-3 MeV. Plasma neutralization will enable compression of the beam to the sub-millimeter radius and sub-nanosecond duration needed for the desired target experiments. The initial NDXC-II physics design was developed using idealized analytic waveforms. Acceleration schedules were first worked out with a fast-running 1-D particle-in-cell code ASP (Acceleration Schedule Program), then 2-D and 3-D Warp simulations were used to verify the 1-D model, design transverse focusing, and establish tolerances for beam and lattice errors. As part of recent work to refine and validate this physics design, the idealized waveforms in the simulations have been replaced by experimentally measured ones. ASP and Warp results obtained with these realistic waveforms are compared with those from earlier simulations, and ongoing work to optimize the acceleration schedule is discussed.

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