

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Toward a physics design for NDCX-II, a next-step platform for ion beam-driven physics studies¹ A. FRIEDMAN, D.P. GROTE, W.M. SHARP, LLNL, E. HENESTROZA, M. LEITNER, B.G. LOGAN, W.L. WALDRON, LBNL — The Heavy Ion Fusion Science Virtual National Laboratory, a collaboration of LBNL, LLNL, and PPPL, is studying Warm Dense Matter physics driven by ion beams, and basic target physics for heavy ion-driven Inertial Fusion Energy. A low-cost path toward the next-step facility for this research, NDCX-II, has been enabled by the recent donation of induction cells and associated hardware from the decommissioned Advanced Test Accelerator (ATA) facility at LLNL. We are using a combination of analysis, an interactive one-dimensional kinetic simulation model, and multidimensional Warp-code simulations to develop a physics design concept for the NDCX-II accelerator section. A 30-nC pulse of singly charged Li ions is accelerated to ~ 3 MeV, compressed from ~ 500 ns to ~ 1 ns, and focused to a sub-mm spot. We present the novel strategy underlying the acceleration schedule and illustrate the space-charge-dominated beam dynamics graphically.

¹Work performed under auspices of U.S. DoE by LLNL under Contract DE-AC52-07NA27344 and by LBNL under Contract DE-AC03-76SF00098.

Alex Friedman
LLNL

Date submitted: 14 Jul 2008

Electronic form version 1.4