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# Toward a physics design for NDCX-II, a next-step platform for ion beam-driven physics studies

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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.

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