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Simulations of Targets for Warm Dense Matter and Inertial Fusion Energy Applications on NDCX II[1] J.J. BARNARD, LLNL, J. ARMIJO, F.M. BIENIOSEK, LBNL, A. FRIEDMAN, LLNL, M. HAY, E. HENESTROZA, B.G. LOGAN, R.M. MORE, P.A. NI, LBNL, L.J. PERKINS, LLNL, S.F. NG, CUHK, S.A. VEITZER, J.S. WURTELE, S.S. YU, A.B. ZYLSTRA, LBNL — The Neutralized Drift Compression Experiment II (NDCX II) is an induction accelerator now being constructed at LBNL. The baseline design calls for a 3 MeV, 30 A Li+ ion beam, delivered in a bunch with pulse duration of $\sim$1 ns, and transverse dimension $\sim$ 1 mm. The purpose of NDCX II is to experimentally study material in the warm dense matter regime and ion beam/hydrodynamic coupling, relevant to heavy ion fusion. In preparation for NDCX II, we have performed hydrodynamic simulations of ion-beam-heated, metallic targets, connecting observable quantities with the simulated density, temperature, and velocity, exploring the sensitivity of EOS on observables. Simulated target geometries include spherical and cylindrical bubbles (to create regions of higher pressure), and planar solid and foam targets. Pulse formats include single pulses of fixed ion energy E, and single and double pulses with variable E to study ion-coupling efficiency. Comparisons are made with simulations of ion driven direct drive capsules that show high coupling efficiencies.

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