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Hybrid Particle-in-Cell Modeling of Dense Plasma Foci DREW HIGGINSON, A. LINK, I. HOLOD, M. MCMAHON, A. SCHMIDT, Lawrence Livermore Natl Lab, D. WELCH, Voss Scientific — A dense plasma focus (DPF) device drives current through a set of coaxial electrodes to assemble plasma inside the device and then implode that plasma on axis to form a Z-pinch. This implosion drives instabilities that generate strong electric fields, which produces a short intense pulse of x-rays, high-energy (>100 keV) electrons and ions, if using fusion-reactant ions (e.g. D, T), will generate neutrons. As well as being dependent on a the generation of high-energy ion "beam", neutron production relies on the formation of a long, high-density, magnetized "plasma target" that the ions will pass through. Generally, such simulations have been performed either a) using single-fluid magnetohydrodynamic codes, which do not intrinsically capture the formation of ion beams, or b) using fully-kinetic simulations that capture the beam acceleration, but can be computationally prohibitive. Here we will present a middle ground between these two extremes, by using a hybrid model within the framework of the PIC code Chicago [Thoma *et al.* PoP **24**, 062707 (2017)]. This method follows the motion of (fluid or kinetic) ions and models electrons using a magnetized Ohm's law. Prepared by LLNL under Contract DE-AC52-07NA27344.

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