Resistive MHD modeling of Coaxial Helicity Injection (CHI) in NSTX[1] E.B. HOOPER, LLNL, R. RAMAN, J.E. MENARD, PPPL, C.R. SOVINEC, U. Wisc. — CHI has generated plasma with current, density, and temperature appropriate for NSTX startup [1] offering the potential of solenoid-free operation of an advanced ST. Whole-device simulations using the NIMROD MHD code [2] have been initiated to extend physics understanding of CHI in NSTX and other STs and to help guide experiments. A computational grid has been developed and boundary conditions applied for external magnetic fields including eddy currents in walls and stabilizing plates. Injection and absorber slots are modeled with current specified at the injector and ExB drift at the absorber to prevent compression of the vacuum toroidal magnetic field, as done in simulations on HIT-II. [3] Initial results will be presented and compared with experiment. Results will also be compared with simulations of the SSPX spheromak [4] to examine the different behaviors in the (q>1) ST and (q<1) spheromak. 1. R. Raman, et al., Phys. Rev. Letters **104**, 095003 (2010). 2. C.R. Sovinec, et al., J. Comp. Phys **195**, 355 (2004). 3. A. Bayless, C.R. Sovinec, unpublished. 4. E. B. Hooper, et al., Phys. Plasmas **15**, 032502 (2008).

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