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Experiments and Simulations on Magnetically Driven Implosions in High Repetition Rate Dense Plasma Focus LUIS CABALLERO BENDIXSEN, SIMON BOTT-SUZUKI, SAMUEL CORDARO, Center for Energy Research, UC San Diego, MAHADEVAN KRISHNAN, STEPHEN CHAPMAN, Alameda Applied Science Corporation, PHIL COLEMAN, Evergreen Hill Sciences, JEREMY CHITTENDEN, Imperial College London — Results will be shown on coordinated experiments and MHD simulations on magnetically driven implosions, with an emphasis on current diffusion and heat transport. Experiments are run at a Mather-type dense plasma focus (DPF-3, Vc: 20 kV, Ip: 480 kA, E: 5.8 kJ). Typical experiments are run at 300 kA and 0.33 Hz repetition rate with different gas loads (Ar, Ne, and He) at pressures of $\sim$ 1-3 Torr, usually gathering 1000 shots per day. Simulations are run at a 96-core HP blade server cluster using 3GHz processors with 4GB RAM per node.Preliminary results show axial and radial phase plasma sheath velocity of $\sim$ 1x105 m/s. These are in agreement with the snow-plough model of DPFs. Peak magnetic field of $\sim$ 1 Tesla in the radial compression phase are measured. Electron densities on the order of 1018 cm^{-3} anticipated. Comparison between 2D and 3D models with empirical results show a good agreement in the axial and radial phase.

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