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Replicating magneto-inertial fusion compression by colliding a magnetized plasma jet with a heavy gas cloud AMELIA GREIG, PAUL BELLAN, Caltech, HUI LI, Los Alamos National Laboratory — The Caltech plasma jet experiment is arranged to have a neutral gas cloud in the path of a magnetized plasma jet. When a hydrogen jet collides with an argon gas cloud, the jet is compressed as argon is much heavier than hydrogen. The compression is equivalent to the Magnetized Inertial Fusion situation of a heavy liner compressing a low-density, magnetized plasma, providing an inexpensive analog for non-destructive studies of the plasma compression physics. The strategy is to measure density, magnetic field and temperature in and around the compression region over a range of parameters both with and without the neutral gas cloud in the path of the jet, with the ultimate goal of determining an equation of state characterizing the observed behavior. Initial density and magnetic field measurements have been made and temperature measurements are about to begin. To complement the experimental measurements, 3D numerical MHD simulation is being performed based on a code used previously to model the magnetized plasma jet experiment. In addition, plans are underway to do modeling using a hybrid code.

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