Abstract Submitted
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Magnetized collisionless shock studies using high velocity plasmoids[1] THOMAS WEBER, THOMAS INTRATOR, KEVIN GAO, Los Alamos National Laboratory — Magnetized collisionless shocks are ubiquitous throughout the cosmos and are observed to accelerate particles to relativistic velocities, amplify magnetic fields, transport energy, and create non-thermal distributions. They exhibit transitional scale lengths much shorter than the collisional mean free path and are mediated by collective interactions rather than Coulomb collisions. The Magnetized Shock Experiment (MSX) leverages advances in Field Reversed Configuration (FRC) plasmoid formation and acceleration to produce highly supersonic and super-Alfvènic supercritical shocks with pre-existing magnetic field at perpendicular, parallel or oblique angles to the direction of propagation. Adjustable shock speed, density, and magnetic field provide unique access to a range of parameter space relevant to a variety of naturally occurring shocks. This effort examines experimentally, analytically, and numerically the physics of collisionless shock formation, structure, and kinetic effects in a laboratory setting and draw comparisons between experimental data and astronomical observations. Approved for Public Release: LA-UR-12-22886

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