Abstract Submitted
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Progress towards experimental realization of extreme-velocity flow-dominated magnetized plasmas[1] T.E. WEBER, Los Alamos National Laboratory, C.S. ADAMS, Virginia Polytechnic Institute and State University, D.R. WELCH, Voss Scientific LLC, G. KAGAN, Los Alamos National Laboratory, I.A. BEAN, B.R. HENDERSON, Virginia Polytechnic Institute and State University, A.J. KLIM, The Ohio State University — Interactions of flow-dominated plasmas with other plasmas, neutral gases, magnetic fields, solids etc., take place with sufficient velocity that kinetic energy dominates the dynamics of the interaction (as opposed to magnetic or thermal energy, which dominates in most laboratory plasma experiments). Building upon progress made by the Magnetized Shock Experiment (MSX) at LANL, we are developing the experimental and modeling capability to increase our ultimate attainable plasma velocities well in excess of 1000 km/s. Ongoing work includes designing new pulsed power switches, triggering, and inductive adder topologies; development of novel high-speed optical diagnostics; and exploration of new numerical techniques to specifically model the unique physics of translating/stagnating flow-dominated plasmas. Furthering our understanding of the physical mechanisms of energy conversion from kinetic to other forms, such as thermal energy, non-thermal tails/accelerated populations, enhanced magnetic fields, and radiation (both continuum and line), has wide-ranging significance in basic plasma science, astrophysics, and plasma technology applications such as inertial confinement fusion and intense radiation sources.

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