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Optical diagnostics on the Magnetized Shock Experiment (MSX)[1]

J.C. BOGUSKI, University of Wisconsin, T.E. WEBER, T.P. INTRATOR, LANL, R.J. SMITH, University of Washington, J.P. DUNN, T.M. HUTCHINSON, K.W. GAO, LANL — The Magnetized Shock Experiment (MSX) at Los Alamos National Laboratory was built to investigate the physics of high Alfvén Mach number, supercritical, magnetized shocks through the acceleration and subsequent stagnation of a Field Reversed Configuration (FRC) plasmoid against a magnetic mirror and/or plasma target. A suite of optical diagnostics has recently been fielded on MSX to characterize plasma conditions during the formation, acceleration, and stagnation phases of the experiment. CCD-backed streak and framing cameras, and a fiber-based visible light array, provide information regarding FRC shape, velocity, and instability growth. Time-resolved narrow and broadband spectroscopy provides information on pre-shock plasma temperature, impurity levels, shock location, and non-thermal ion distributions within the shock region. Details of the diagnostic design, configuration, and characterization will be presented along with initial results.

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