

Abstract Submitted
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Characterization of Magnetohydrodynamic (MHD) Shock Sensor using Schlieren Imaging OWEN ROCKWELL, MICHAEL HARGATHER, New Mexico Tech — Schlieren imaging is used to quantitatively determine the speed and pressure duration of a shock wave traveling through air. The high-speed quantitative schlieren images are then used to characterize a new magnetohydrodynamic (MHD) shock sensor. This device uses the air density and particle velocity changes across a shock wave to determine the shock velocity via the distortion of a magnetic field. Using Faraday's law of electromagnetic induction, the shock velocity and pressure can be interpreted from a change in potential across the electrodes within the device. This principle along with the assumption that the shock wave is traveling through the undisturbed air allows for the calculation of shock velocity. Piezoelectric pressure gauges are used for comparison to measure the pressure pulse magnitude and duration.

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