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A Study of Advanced Image Processing Techniques on Experimental SWIFT Data CHRISTOPHER TRUJILLO, Los Alamos National Laboratory & New Mexico State University — Accurately tracking the position of explosive-induced shock waves is a critical method for characterizing high explosive (HE) performance. The application of the shock wave image framing technique (SWIFT) has proven to be a successful diagnostic tool that utilizes ultra-high-speed imaging to capture time series images of explosively-driven shock waves propagating through transparent media. The use of common edge-detection algorithms, including Sobel, Canny, and Prewitt, tend to be susceptible to background noise and require noise reduction preprocessing that can alter the position of edge boundaries. In this paper, results produced by the implementation of advanced image-processing techniques on experimental SWIFT data show that shock wave position can accurately be detected and tracked, while also maintaining robustness to background image noise.

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