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**Towards Modernizing the Characterization of Shock and Detonation Physics Performance via Novel
Diagnostics and Tests¹**

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For the bulk of detonation performance experiments, a fairly basic set of diagnostic techniques has evolved as the standard for acquiring the necessary measurements. Gold standard techniques such as pin switches and streak cameras still produce the high-quality data required, yet much room remains for improvement with regard to ease of use, cost of fielding, breadth of data, and diagnostic versatility. Over the past several years, an alternate set of diagnostics has been under development to replace many of these traditional techniques. Pulse Correlation Reflectometry (PCR) is a capable substitute for pin switches with the advantage of obtaining orders of magnitude more data at a small fraction of the cost and fielding time. Spectrally Encoded Imaging (SEI) can replace most applications of streak camera with the advantage of imaging surfaces through a single optical fiber that are otherwise optically inaccessible. Such diagnostics advance the measurement state of the art, but even further improvements may come through revamping the standardized tests themselves such as the copper cylinder expansion test. At the core of this modernization, the aforementioned diagnostics play a significant role in revamping and improving the standard test suite for the present era.

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