

Abstract Submitted  
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**Developments in strong shock wave position tracking** PHILIP RAE, BRAIN GLOVER, LEE PERRY, LANL, WX-6 & WX-7 TEAM — This poster will highlight several modified techniques to allow the position vs. time to be tracked in strong shock situations (such as detonation). Each is a modification or improvement of existing ideas either making use of advances in specialist materials availability or recent advances in electronics.) Shorting embedded mini-coaxial cable with a standing microwave pattern. This technique is a modified version of an old LANL method of shock position tracking making use of a traveling short imposed in an embedded coaxial cable. A high frequency standing wave (3-8GHz) is present in the cable and the moving short position can be tracked by monitoring the output voltage envelope as a function of time. A diode detector is used to allow the envelope voltage to be monitored on a regular low frequency digitizer significantly reducing the cost. The small and cheap high frequency voltage generators now available allow much greater spatial resolution than possible previously. 2) Very thin shorting resistance track gauges. Parallel tracks of constantan resistance material are etched on a thin dielectric substrate. The gauges are less than 0.2mm thick. The ionized gas present in a detonation front sweeps up the tracks lowering the measured resistance. A potential divider circuit allows the shock position vs. time to be monitored on a regular digitizer after easy calibration. The novel feature is the thin section of the gauge producing minimal perturbation in the detonation front.

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