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**Novel Small-scale Technique for Determining Detonation Velocity** DANIEL PRESTON, LARRY HILL, BRYCE TAPPAN, LANL — Measuring the local detonation velocity of an explosive has been limited to rate stick and cylinder tests. These tests traditionally used break wires, pins, and more recently PDV as a velocity diagnostic. These experimental techniques can be very accurate at measuring detonation velocities but are costly and require tens to hundreds of grams of material. This paper presents a novel small-scale technique for inferring detonation velocity from a modest sized pellet of explosive. A streak image is taken of the breakout shock on the flat output side of the pellet. Assuming a spherical shock wave, one can show that the breakout trace is of hyperbolic form. From this, one can simultaneously infer detonation velocity and apparent center. This method is ideal for energetic formulation and synthesis development due to the small amount of material required. Furthermore, this paper discusses the accuracy and limitations of this technique.

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