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A new D(K) relationship for EDC37 ALEXANDER HODGSON, BRIAN LAMBOURN, CAROLINE HANDLEY, AWE, HIGH EXPLOSIVES GROUP, AWE TEAM — The Detonation Shock Dynamics model (DSD) is widely used for the propagation of detonation wave-fronts in hydrocode calculations of polymer bonded explosives. In DSD, a detonation velocity vs. curvature relationship $D(K)$ is used to determine the speed at which the detonation front propagates through the explosive. The $D(K)$ relationship for an explosive is usually obtained from rate-stick wave-curvature data. Recently, Roeske et al. have fired a series of very small rate-stick experiments, using samples of the HMX-based explosive EDC37 machined with a femto-second laser. In this paper, this data is combined with the results of previous 1" and 2" rate-stick experiments, to obtain a new $D(K)$ relationship for EDC37. A wave-shape analysis code is developed which uses weighted least-squares fitting methods which improve on current fitting methods.

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