

Abstract Submitted  
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**Experimental Measurements of the Chemical Reaction Zone of Detonating Liquid Explosives** VIVIANE BOUYER, CEA, DAM, Le Ripault, F-37260, France, STEPHEN A. SHEFFIELD, DANA M. DATTELBAUM, RICHARD L. GUSTAVSEN, DAVID B. STAHL, Los Alamos National Lab., MICHEL DOUCET, CEA, DAM, Le Ripault, F-37260, France — We have a joint project between CEA-DAM Le Ripault and Los Alamos National Laboratory (LANL) to study the chemical reaction zone in detonating high explosives using several different laser velocimetry techniques. The short temporal duration of the features (von Neumann spike and sonic locus) of the reaction zone make these measurements difficult. Here, we report results obtained from using and PDV (photon Doppler velocimetry) methods to measure the particle velocity history at a detonating HE (nitromethane)/PMMA interface. Experiments done at CEA were high-explosive-plane-wave initiated and those at LANL were gas-gun-projectile initiated with a detonation run of about 6 charge diameters in all experiments, in either glass or brass confinement. Excellent agreement of the interface particle velocity measurements at both Laboratories were obtained even though the initiation systems and the velocimetry systems were different. Some differences were observed in the von Neumann spike height because of the approximately 2 nanosecond time resolution of the techniques – in some or all cases the spike top was truncated.

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