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Experimental Measurements of the Chemical Reaction Zone of TATB and HMX based explosives VIVIANE BOUYER, PHILIPPE HÉBERT, MICHEL DOUCET, CEA, DAM, Le Ripault, F-37260, Monts, France, ARNAUD SOLLIER, CEA, DAM, DIF, F91297, Arpajon, France, LIONEL DECARIS, LOUIS-PIERRE TERZULLI, CEA, DAM, Le Ripault, F-37260, Monts, France — In order to have an insight into the chemical reaction zone of explosives, experimental measurement of the detonation wave profile of solid explosives using laser velocimetry techniques are performed. The experiments consist in initiating a detonation wave in a cylinder of explosive using an explosive wire detonator and an explosive booster and measuring the particle velocity of an explosive-window interface or free surface velocity of an accelerated foil. Two explosives (TATB based and TATB-HMX based) have been studied through several configurations where the cylinder diameter and window or plate material could vary. Particle velocity profiles have been measured by VISAR and Heterodyne Velocimetry (HV). The results on the behavior of the explosives have been analyzed and compared with those of Photon Doppler Velocimetry of expanding species experiments. These experiments also enabled to carry on the comparison of the efficiency of VISAR and HV in such applications.

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