EXPERIMENTAL CHARACTERIZATION OF A NEAR-FIELD HOB-DETONATION

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In the near-field ($z \leq 1$ m/kg$^{1/3}$) of a near-surface detonation (HOB < 0.5 m/kg$^{1/3}$) interactions between the high pressure shock wave, the hot expanding detonation gases, and the ground surface lead to irregularities in the emerging blast field and render measurements exceptionally susceptible to variations in setup conditions and surrounding. Accurate predictions about peak pressure or impulse values become increasingly difficult and available data, being scarce anyway, are frequently flawed with rather large fluctuations. Thus, reliable data characterizing the near-field of a HOB-detonation are clearly needed, especially in view of the importance of this configuration in asymmetric warfare (IED attacks).

This paper describes experimental investigations which were part of a more general study initialized at the EMI to address this need. Salient features of the scenario are outlined and their implications for the design of test arrangements are given. We present measurement techniques adapted to the scenario along with scaled and real size model experiments. The origin of apparent scatter in pressure and impulse data in a near-field HOB-detonation is discussed and suggestions for improvement are given.