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Role of Precision Laboratory Experiments in the Understanding of Large-Scale Blast Phenomena

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Abstract

Even today, when powerful algorithms and computer-codes are available and sophisticated numerical simulation methods are at our disposal, one cannot dispense with precision experiments; especially with those that are suited to make the effects visible and with those that yield quantitative data to understand the physics of the phenomena. Experiments are just so important for verification and validation of computer codes and for controlling computed results. The paper demonstrates that small-scale tests are an excellent tool for this purpose.

The requirements for small-scale HE-tests are discussed and some examples are presented, namely the influence of surface properties onto HOB, precursor and decursor effects, wave propagation for detonating cylindrical charges, visualization of the wave pattern at the attack of the Khobar Building, indoor detonation in complex structures, explosively initiated combustion effects. Also some numerical results are compared to corresponding experiments.