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Non-ideal detonation behaviour of PBX 9502 STEFAN SCHOCH, NIKOS NIKIFORAKIS, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, THE LABORATORY FOR COMPUTATIONAL DYNAMICS TEAM — Numerical experiments are performed investigating the non-ideal detonation behaviour of PBX 9502 in two setups. In the first setup we consider a three-dimensional rate stick experiment. A booster charge initiates a reaction front leading to a curved detonation wave. The numerical results are compared to theory and experimental evidence. The effects of weak and strong confinement are discussed. The second setup considers the so called “hockey puck experiment.” Experimental results show the appearance of a dead zone due to the effect of the geometry. This is captured by the numerical results, which also reveal that the initially spherical detonation is diffracted leading to local detonation failure. The numerical simulations are performed by solving a mathematical model for a three-phase medium based on the Euler equations. The numerical results are obtained using high-resolution shock-capturing methods combined with adaptive mesh refinement.

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