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Simulation of hot spots formation and evolution in HMX CHENG WANG, TONGHUI YANG, State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing 100081, China — In order to study the formation and evolution of hot spots under shock loading, HMX explosives were selected as the object of study for the two-dimensional finite difference numerical simulation. A fifth order finite difference weighted essentially non-oscillatory (WENO) scheme and a third order TVD Runge–Kutta method are utilized for the spatial discretization and the time advance, respectively. The governing equations are based on the fluid elasto-plastic control equations. The Mie-Gruneisen equation of state and the ideal gas equation of state are selected to use in the state equation of the solid explosives and gas material. In order to simplify the calculation of the model, the reaction can be considered to complete in one step. The calculated area is [3.0*10^{-5} m][3.0*10^{-5} m]. The radius is 0.6*10^{-5} m, and the internal gas is not involved in the reaction. The calculation area is divided into 300*300 grids and 10 grids are selected from the bottom of each column to give the particle velocity u as the initial condition. In the selected grid, different initial velocity 100m/s and 200m/s are loaded respectively to study the influence of hot spot formation and evolution in different impact intensity.

Cheng W
State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing 100081, Ch

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