A GRID STRATEGY FOR IMPULSE CAPTURE

FOR SHOCK REFLECTION ON RIGID SURFACES

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ABSTRACT

This paper presents a grid strategy derived from an intrinsic property of the Euler equation and its numerical solvers, namely, the ability to form shocks in smooth flow. We will take advantage of this property in designing grids with variable grid-spacing to capture accurately the impulse load on structural surfaces from a nearby explosion. It will be shown that the captured impulse from the variable grid agrees to within a few percent of a fixed-grid calculation with a factor of 20 more cells. We present two examples of this highly accurate impulse capture strategy: (1) for a truck bomb near a building, and (2) for a satchel charge near a wall. Because of the substantial savings in the number of cells needed per calculation, the method is expected to be effective for explosions in large urban areas.