USING THE DIRECT SIMULATION MONTE CARLO APPROACH FOR THE BLAST-IMPACT PROBLEM

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The viability of using the Direct Simulation Monte Carlo (DSMC) approach to study the blast-impact problem is assessed. An uncoupled analysis of the problem is performed where the solid body is not allowed to move or deform. The numerical simulations are designed to mimic the actual shock-tube experiments. Our code is validated against the shock-tube (Riemann) problem. A novel approach to model the inflow boundary condition is presented which can be used with both particle and continuum methods. A generic implementation of the solid boundary condition for particle methods is described which can easily and efficiently handle arbitrary-shaped bodies. This approach is demonstrated by computing load definition for two model geometries - a box and an 'I' shaped beam.