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Shock-Wave Diffraction at a Right-Angled Corner in a Particle-Laden Gas[1] A. HASELBACHER, F. NAJJAR, University of Illinois at Urbana-Champaign, S. BALACHANDAR, University of Florida at Gainesville — Many explosions can be abstracted as a strong shock wave moving into the atmosphere, followed by a contact discontinuity which separates the post-shock conditions from a particle- or fragment-laden region. The interaction of the shock wave itself and the flow behind the shock wave with obstacles creates complex flow patterns. The diffraction of a shock wave at a right-angled corner in a particle-laden gas can be viewed as a simple representation of the interaction with an obstacle. We have studied this configuration numerically using an unstructured-grid compressible-flow code with high-resolution spatial-discretization methods and Lagrangian tracking for the particles. The primary focus of the study is to quantify the effect of the particles on the various flow features encontered behind the shock front, such as the contact discontinuity, secondary and tertiary shocks, and the vortex.

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