

1072-35-269

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([hunter@math.ucdavis.edu](mailto:hunter@math.ucdavis.edu)). *Self-similar solutions for the diffraction of weak shocks.*

We formulate a problem for the unsteady transonic small disturbance equations that describes the diffraction of a weak shock near a point where its strength approaches zero and the shock turns into an expansion wave. Physically, this problem corresponds to the reflection of a weak shock wave by a semi-infinite screen at normal incidence. We formulate the equations in special self-similar variables, and obtain numerical solutions using high resolution schemes. Our solutions appear to show that the shock dies out at the sonic line, a phenomenon which has not been previously observed. (Received June 29, 2011)