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The Scaling Group of the 1-D Invisicid Euler Equations EMMA SCHMIDT, SCOTT RAMSEY, ZACHARY BOYD, ROY BATY, Los Alamos National Laboratory — The one dimensional (1-D) compressible Euler equations in non-ideal media support scale invariant solutions under a variety of initial conditions. Famous scale invariant solutions include the Noh, Sedov, Guderley, and collapsing cavity hydrodynamic test problems. We unify many classical scale invariant solutions under a single scaling group analysis. The scaling symmetry group generator provides a framework for determining all scale invariant solutions emitted by the 1-D Euler equations for arbitrary geometry, initial conditions, and equation of state. We approach the Euler equations from a geometric standpoint, and conduct scaling analyses for a broad class of materials.

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