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Self-similar solutions of the spherically symmetric Euler equations for general equations of state. (English) [Zbl 1479.35186](#)

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Summary: The study of spherically symmetric motion is important for the theory of explosion waves. In this paper, we construct rigorously self-similar solutions to the Riemann problem of the spherically symmetric Euler equations for general equations of state. We use the assumption of self-similarity to reduce the spherically symmetric Euler equations to a system of nonlinear ordinary differential equations, from which we obtain detailed structures of solutions besides their existence.

MSC:

- [35C06](#) Self-similar solutions to PDEs
- [35L60](#) First-order nonlinear hyperbolic equations
- [35L65](#) Hyperbolic conservation laws
- [35L67](#) Shocks and singularities for hyperbolic equations
- [35Q31](#) Euler equations

Keywords:

compressible Euler equations; van der Waals gas; spherical symmetry

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