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Blowup for C^1 solutions of compressible Euler equations with time-dependent damping.

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Summary: In this paper, we will show the blowup phenomenon of solutions to the compressible Euler equations with time-dependent damping. Firstly, under the assumptions that the radially symmetric initial data and initial density contains vacuum states, the singularity of the classical solutions will formed in finite time in $\mathbb{R}^n (n \geq 2)$. Furthermore, we can also find a sufficient condition for the functional of initial data such that smooth solution of the irrotational compressible Euler equations with time-dependent damping breaks down in finite time for all kinds of fractional coefficients in $\mathbb{R}^n (n \geq 2)$.

MSC:

35Qxx Partial differential equations of mathematical physics and other areas of application
35B30 Dependence of solutions to PDEs on initial and/or boundary data and/or on parameters of PDEs
35B44 Blow-up in context of PDEs
35Q31 Euler equations

Keywords:

Euler equations; singularity formation; time-dependent damping; vacuum

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