Asymptotic stability of nonlinear diffusion waves for the bipolar quantum Euler-Poisson system with time-dependent damping.

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June 2, 2022

Abstract

We shall investigate the asymptotic behavior of solutions to the Cauchy problem for the one-dimensional bipolar quantum Euler-Poisson system with time-dependent damping effects $\frac{J_i}{(1+t)^{\lambda}}(i=1,2)$ for $-1<\lambda<1$. Applying the technical time-weighted energy method, we prove that the classical solutions to the Cauchy problem exist uniquely and globally, and time-algebraically converge to the nonlinear diffusion waves. This study generalizes the results in [Y.-P. Li, Nonlinear Anal., 74(2011), 1501-1512] which considered the bipolar quantum Euler-Poisson system with constant coefficient damping.

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