

On vanishing limits of the shear viscosity and Hall coefficients for the planar compressible Hall-MHD system

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Abstract

This paper deals with an initial-boundary value problem of the planar compressible Hall-magnetohydrodynamic (for short, Hall-MHD) equations. For the fixed shear viscosity and Hall coefficients, it is shown that the strong solutions of Hall-MHD equations and corresponding MHD equations are global. As both the shear viscosity and the Hall coefficients tend to zero, the convergence rate for the solutions from Hall-MHD equations to MHD equations is given. The thickness of boundary layer is discussed by spatially weighted estimation and the characteristic of boundary layer is described by constructing a boundary layer function.

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