

Invariant Manifolds for Stationary Boltzmann Equation

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Abstract:

We will present the study on the center, stable and unstable manifolds for stationary Boltzmann equation, done with Shih-Hsien Yu of National University of Singapore. Because equation is of infinite dimensions, the spectral information yields only quantitative information on the fluid waves. Our approach makes use of the pointwise information of the Green's function. Our study yields information on the boundary layers and shock layers. We show that, in the resonance case of small Mach number, there are only purely kinetic Knudsen boundary layers. In the case when the Mach number is around one, there are the combination of the Knudsen and viscous layers. We also show that the shock layers are monotone in the fluid variables.