

Global Transonic Solutions of Compressible Euler-Poisson Equations in Semiconductors

John M. Hong
Mathematics of department
Central University

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Abstract

In this talk, we consider an initial-boundary value problem of compressible Euler-Poisson equations arising in semiconductors. The equations form a 3-by-3 hyperbolic system of balance laws with the global source. We establish the global existence of the transonic entropy solution by framework of a generalized Glimm scheme. We show that the global source in the momentum equation can be replaced by a local source from the Rankine-Hugoniot jump condition. A modified version of wave-interaction estimate and decay of Glimm functionals near the sonic states are provided for the stability of the scheme. In addition, the entropy inequality is also given. This is a joint work with Shih-Wei Chou and Jay Chu.