A Discrete BGK Approximation of Hydrodynamic Equations for Semiconductors

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Abstract

In this talk, we shall study numerically the hydrodynamic model for semiconductor devices, particularly in a one-dimensional n^+-n-n^+ diode. By using a relaxed discrete BGK scheme, we explore the effects of various parameters, such as the low field mobility, device length, and lattice temperature. The effect of different type of boundary conditions is discussed. We also establish numerically the asymptotic limits of the hydrodynamic model towards the energy-transport and drift-diffusion models. This verifies the theoretical results in the literature.

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