

数学与系统科学研究院  
计算数学所定期学术报告

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报告题目:

**A Finite Volume Method for the  
Multi Subband Boltzmann Equation  
with realistic 2D Scattering in DG  
MOSFETs**

邀请人: 郑伟英副研究员

报告时间: **2010 年 10 月 14 日(周四)**

**下午 16: 00~17: 00**

报告地点: **科技综合楼三层 311**

**计算数学所报告厅**

## **Abstract:**

**We propose a deterministic solver for the time-dependent multi-subband Boltzmann transport equation (MSBTE) for the two dimensional (2D) electron gas in double gate MOSFETs with flared out source/drain contacts. A realistic model with six-valleys of the conduction band of silicon and both intra-valley and inter-valley phonon-electron scattering is solved. We propose a second order finite volume method based on the positive and flux conservative (PFC) method to discretize the BTEs. In order to reduce the splitting error, the 2D transport problem in the wavevector space is solved directly by using the PFC method instead of splitting into two 1D problems. The solver is applied to a nanoscale DG MOSFET and the current-voltage characteristic is investigated. Comparison of the numerical results with ballistic solutions show that the scattering influence is not ignorable even when the size of a nanoscale semiconductor device goes to the scale of the electron mean free path.**

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