数学与系统科学研究院

计算数学所学术报告

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（ 国家纳米中心 ）

报告题目：

Computational stduies of Single-Molecule Detection with solid-state Nanopores

邀请人：　　卢本卓 研究员

报告时间：**2015** 年 **12** 月 **15** 日（周二）

上午 **9:30~10:30**

报告地点：　　数学院南楼二层

226 会议室

Abstract:

Nanopores have emerged as promising next generation devices for single-molecule detection. The presence of a single biomolecule in a nanopore modulates the nanopore ionic current, which provides information about the physical and chemical properties of the biomolecule. Different molecules block the pore to different characteristic degrees, resulting in ionic current blockade of different amplitude and duration. DNA translocation can be affected by many factors, such as the temperature, electrolyte viscosity, ion concentration, pore diameter, membrane thickness and other factors. In this report, 3D Poisson-Nernst-Planck (PNP) simulations were carried out to determine current signal characteristics of DNA/RNA translocations of conical and cylinder SiN nanopores. Using PNP simulations, we first investigated the effect of geometrical features of SiN nanopore on the signal amplitudes from DNA, including pore size, membrane thickness, and pore shape. We showed that reducing the thickness of the SiN membrane leaded to increased signal amplitudes from DNA, consistent with experimental observations. Moreover, compared with cylinder shape nanopores, conical shape nanopores can improve the signal amplitudes from biomolecules.

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