

Colloquium

Stability Analysis and Modification of Poisson-Nernst-Planck System

主講人：謝佳佑 博士

國立臺灣大學數學系

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地 點：應用數學系多媒體教室（理 408 室）

摘 要：

The Poisson-Nernst-Planck (PNP) system has been widely used to describe the electron transport of semiconductors and the ion transport of ionic solutions, and plays a crucial role in the study of many physical and biological problems. For one spatial dimension case, if the Robin boundary condition is imposed for the electrostatic potential, the PNP system admits a boundary layer solution as a steady state. In this talk, some stability results for the steady state will be introduced.

Historically, from the Debye-Huckel theory, PNP systems are adopted for dilute ionic solutions. However, in biological system, ionic solutions are usually highly concentrated. Using the energetic variational approaches, new PNP type models are derived. We will also give some existence results for the modified PNP systems by Schauder's fixed point theorem.

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