

数学与系统科学研究院

计算数学所学术报告

(博士后定期学术报告)

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报告题目: Numerical simulations
on Vlasov equation

合作导师: 袁礼研究员

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计算数学所报告厅

Abstract:

The Vlasov equation describes the evolution of a system of particles under the effects of self-consistent electro magnetic fields. The unknown $f(t,x,v)$, depending on the time t , the position x ,

and the velocity v , represents the distribution function of particles (electrons, ions,...) in phase space. This model can be used for the study of beam propagation or of a collisionless plasma. However, the numerical solution of Vlasov–Maxwell system in phase space requires an important computational effort. In such a situation, we have to take into account the particularities of the physical problem (characteristic length and geometric and physical characteristics) to derive approximate models leading to cheaper computations. The paraxial model is much simpler than the full Vlasov–Maxwell equation. This report is devoted to the analysis and numerical study of the paraxial model, which is often used in Accelerator Physics for analysing the propagation of the beams possessing the optical axis, which is assumed to be a straight line.

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