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中国科学院数学与系统科学研究院
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模拟VPFP方程的切触粒子方法（孙雅娟）

2022-07-11

This paper develops a numerical discretization for solving the Vlasov–Poisson–Fokker–Planck system, which is a model for describing collisional plasma in the presence of a self-consistent electric field. This numerical discretization is established in the particle-in-cell framework in which the dynamical behavior of charged particles follows a stochastic differential equation. We study the geometry structure of the corresponding stochastic differential equation, and construct contact methods to numerically solve it. We also analyze the time accuracy order of the proposed numerical schemes. Numerical experiments are conducted to validate our methods.

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Author:

Yanyan Shi

University of Chinese Academy of Sciences, Beijing 100049, China

Yajuan Sun

LSEC, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100190, China

Email: sunyj@lsec.cc.ac.cn

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电话：86-10-82541777 传真：86-10-82541972 Email: contact@amss.ac.cn
地址：北京市海淀区中关村东路55号 邮政编码：100190

