



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

SHI JIN

Institute of Natural Sciences
Shanghai Jiao Tong University, China

Hypoocoercivity Based Local Sensitivity Analysis for Multiscale Kinetic Equations with Uncertainties

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Jones 226, 5747 South Ellis Avenue

ABSTRACT

Hypoocoercivity based analysis is a powerful tool for kinetic equations which allows one to understand the regularity and long-time behavior of both linear and nonlinear kinetic equations, despite that kinetic operators are degenerately dissipative.

We extend such analysis to linear and nonlinear kinetic equations with random uncertainties in initial data or collisional kernels, which allows us to establish regularity, local sensitivity with respect to uncertain random parameters, and long-time exponential decay of the solution toward the global equilibrium in the random space, as well as spectral convergence and long-time error decay of the polynomial chaos based stochastic Galerkin methods, a popular method used for uncertainty quantification.

Organizers:

Daniel Sanz-Alonso, Department of Statistics, sanzalonso@uchicago.edu
CAM Colloquium URL: <https://cam.uchicago.edu/seminars/colloq/index.shtml>.

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