Computational Mathematics Seminar Series

Minimum Action Method and Dynamical Systems

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Abstract:
In this work, we present an adaptive high-order minimum action method for dynamical systems perturbed by small noise. We use the hp finite element method to approximate the minimal action path and nonlinear conjugate gradient method to solve the optimization problem given by the Freidlin–Wentzell least action principle. The gradient of the discrete action functional is obtained through the functional derivative and the moving mesh technique is employed to enhance the approximation accuracy. Numerical examples are given to demonstrate the efficiency and accuracy of the proposed numerical method. We also discuss the application of the minimum action method to study the structure of the phase space and some open issues from the numerical point of view.

Speaker's Bio:
I am currently an assistant professor jointly in the Mathematics Department and the Center for Computation & Technology (CCT) at Louisiana State University. I got my PhD from the Division of Applied Mathematics at Brown University. My research interests include stochastic modeling and related numerical algorithms.

Refreshments will be served.
This lecture has a reception.

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