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Seminar

Entropy-structure preserving numerical schemes for nonlinear diffusive equations

Prof. Ansgar Jüngel
Vienna University of Technology

Abstract

Bakry and Emery developed a very efficient tool for the large-time asymptotics of nonlinear diffusion equations and, simultaneously, to derive convex Sobolev inequalities. This method is based on estimating the convexity of the so-called entropy functional. For numerical purposes, it is desirable to devise numerical approximations which preserve this entropy structure. In this talk, some results towards discrete entropy methods are detailed.

Numerical methods include implicit Runge-Kutta and one-leg multi-step time approximations and finite-difference space discretizations. The proofs are based on Dahlquist's G-stability theory, systematic integration by parts, and discrete gradient-flow structures. Examples include the porous-medium equations, cross-diffusion population systems, and nonlinear Fokker-Planck equations.

Date :	December 6, 2016 (Tuesday)
Time :	10:30am – 11:30am
Venue :	Room 219, Lady Shaw Building, The Chinese University of Hong Kong

All are Welcome