Well-Posedness and Derivative Blow-Up for a Dispersionless Regularized Shallow Water System

SPEAKER: Jian-Guo Liu, Duke University and NYU Shanghai
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(华东师范大学中山北路校区，地理楼264室)

ABSTRACT

A Hamiltonian model of the classic shallow water equations was recently derived by D. Clamond and D. Dutykh, that resembles a dispersive Green-Naghdi type regularization yet appeared to admit smoothed monotone shocks in numerical experiments. The system is linearly non-dispersive, and smooth solutions conserve an \( H^1 \)-equivalent energy. No shock discontinuities can occur, but the system is known to admit weakly singular shock-profile solutions that dissipate energy. This is a joint work with Bob Pego and Yue Pu of CMU.

BIOGRAPHY

Jian-Guo Liu is a Visiting Professor of Mathematics at NYU Shanghai in Spring 2019. He earned his BS and Ph.D. from Fudan University and UCLA, respectively. He was a Courant Instructor at NYU before joining the Department of Mathematics at Temple University, then he moved to University of Maryland, College Park, and then joined Duke University as a Professor in the Departments of Mathematics and Physics. Dr. Liu’s research is in the areas of PDE, numerical analysis and applied mathematics in general. His current research interests include crystal growth, surface dynamics, water wave systems, analysis of machine learning algorithms, interacting particle systems, mean field limits, analysis some biological systems, and integrable system. He is a fellow of AMS. He published about 200 journal papers and gave more than 300 invited talks, colloquia and seminars.