

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Jie Shen**

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报告题目:

**A new and robust approach to  
construct energy stable schemes for  
gradient flows**

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报告时间: **2018 年 5 月 4 日 (周五)**

**下午 16:00-17:00**

报告地点: **数学院南楼二层**

**202 教室**

## **Abstract:**

We present in this talk the scalar auxiliary variable (SAV) approach and the multiple scalar auxiliary variables (MSAV) approach, to deal with nonlinear terms in a large class of gradient flows. The technique is not restricted to specific forms of the nonlinear part of the free energy, it leads to linear and unconditionally energy stable second-order (or higher-order with weak stability conditions) schemes which only require solving decoupled linear equations with constant coefficients. Hence, these schemes are extremely efficient as well as accurate.

We apply the SAV approach to deal with several challenging applications which can not be easily handled by existing approaches, and present convincing numerical results to show that the new schemes are not only much more efficient and easy to implement, but also can better capture the physical properties in these models.

We shall also present a convergence and error analysis under mild assumptions on the nonlinear free energy.

**欢迎大家参加！**