数学与系统科学研究院

计算数学所学术报告

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报告题目：

New Results of Weak Galerkin Finite Element Methods for Partial Differential Equations

邀请人：　卢本卓 研究员

报告时间：**2017** 年 **6** 月 **16** 日（周五）

下午 **15:30-16:30**

报告地点：　数学院南楼五层

514 教室

Abstract:

In this talk, we present new ideas of weak Galerkin (WG) finite element methods for solving the Darcy and elasticity equations. Given a mesh, the WG methodology sets basis functions in element interiors and edges/faces and establishes (through integration by parts) discrete weak gradient or divergence or curl in certain spaces that have desired approximation capacity. The WG approach offers also nice properties, e.g., local mass conservation and flux normal continuity for Darcy flow and locking-free for elasticity.

For the Darcy equation in 2-dim, we develop the lowest order WG finite element method that utilizes constant approximants for pressure but specifies their discrete weak gradients in Raviart-Thomas spaces. This particular method treats triangular, rectangular, and quadrilateral meshes in a unified approach and attains optimal-order convergence in pressure, velocity, and flux.

Similarly, constant vector approximants can be used in element interiors and edges/faces for solving the linear elasticity equation in 2-dim or 3-dim, whereas first order accuracy is obtained for displacement, stress, and dilation.

欢迎大家参加！