

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:

**Conditioning problem in Generalized
Finite Element Method**

邀请人: 周爱辉研究员

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计算数学所报告厅

Abstract:

The Generalized Finite Element Method (GFEM) is a Partition of Unity Method, where the trial space of standard Finite Element Method (FEM) is augmented with non-polynomial shape functions of compact support. These shape functions mimic the local behavior of the unknown solution of the PDE. GFEM has been successfully used in a variety of problems, e.g., crack propagation problems, interface problems, problems with microstructure etc. Though GFEM has excellent approximation property, the associated stiffness matrix is badly conditioned -- much worse than the standard FEM. In this talk, we will address this issue by suggesting a modification of the GFEM, which is referred to as the Stable Generalized Finite Element Method (SGFEM). We will show that SGFEM retains the excellent approximation properties of the GFEM and the conditioning of the SGFEM is not worse than the standard FEM. Moreover, SGFEM is robust with respect to certain parameters. In this talk we also give a brief review of the GFEM.

欢迎大家参加!