数学与系统科学研究院

计算数学所学术报告

报告人： Associate Prof. XUEHAI HUANG

（ *College of Mathematics and Information Science, Wenzhou University* ）

报告题目：

FAST AUXILIARY SPACE PRECONDITIONER FOR LINEAR ELASTICITY IN MIXED FORM

邀请人： 张硕 博士

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下午 15:00~16:00

报告地点： 科技综合楼三层

311 报告厅

Abstract：

A block diagonal preconditioner with the minimal residual method and an approximate block factorization preconditioner with the generalized minimal residual method are developed for Hu-Zhang mixed finite element methods of linear elasticity. They are based on a new stability result of the saddle point system in mesh-dependent norms. The mesh-dependent norm for the stress corresponds to the mass matrix which is easy to invert while the displacement it is spectral equivalent to Schur complement. A fast auxiliary space preconditioner based on the H1 conforming linear element of the linear elasticity problem is then designed for solving the Schur complement. For both diagonal and triangular preconditioners, it is proved that the conditioning numbers of the preconditioned systems are bounded above by a constant independent of both the crucial Lame constant and the mesh-size. Numerical examples are presented to support theoretical results. As byproducts, a new stabilized low order mixed finite element method is proposed and analyzed and superconvergence results of Hu-Zhang element are obtained.

欢迎大家参加！