北京理工大学
数学与统计学院学术报告

Nonconforming finite element exterior calculus

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时间： 2025.12.30（周二）　10:30-11:30

地点： 良乡 文萃楼D503

摘要： The theory of conforming finite element exterior calculus has been well developed, and the research has now reached a point where extension is appropriate to nonconforming methods, of which some progress will be reported. This talk will firstly present a unified family of consistent nonconforming finite element spaces for $H\Lambda^k$ in $\mathbb{R}^n$, $0\le k\le n$, $n\ge 1$. The spaces employ piecewise Whitney forms as shape functions, based on which discrete de Rham complexes with commutative diagrams are established. A theory of nonconforming finite element exterior calculus is then given. Its combination with the classical conforming one helps reconstructed some structural properties at discrete level, which can not be done by the conforming FEEC alone. Finally, based on these new spaces and the new constructions, some new schemes are introduced for the Hodge Laplace problem, for which reasonable conforming primal discretizations are impossible to construct.

个人简介： 张硕，中国科学院数学与系统科学研究院副研究员。主要从事偏微分方程数值算法研究，研究兴趣包括有限元方法、神经网络方法、多水平方法、保结构算法及先进制造中的计算问题等。以第一作者/通讯作者发表的论文曾获中国计算数学学会优秀青年论文奖二等奖及一等奖各一项。研究工作获国家自然科学基金面上项目（主持）和重大研究计划项目、中国科学院先导专项、国家科技重大专项等资助。是中国计算机学会高级会员，CSIAM第一届金融科技与算法专业委员会委员，和CSIAM信息和通讯技术领域的数学专业委员会委员。