

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:

A unified approach to the design and analysis of AMG

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报告地点: 科技综合楼三层

301 小报告厅

Abstract:

In this work, we present a general framework for the design and analysis of two-level AMG methods. The approach is to find a basis for locally-the-best coarse space, such as the space of constant vectors for standard discretizations of scalar elliptic partial differential equations. The locally defined basis elements are glued together using carefully designed linear extension maps to form a global coarse space. Such coarse spaces, constructed locally, satisfy global approximation property and by estimating the local Poincaré constants, we obtain sharp bounds on the convergence rate of the resulting two-level methods. To illustrate the use of the theoretical framework in practice, we prove the uniform convergence of the classical two level AMG method for finite element discretization of a jump coefficient problem and anisotropic problems on a shape regular mesh.

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