

The Tenth International Workshop on Lattice QFT and Numerical Analysis (QCDNA X)



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Type: **Talk**

Algebraic Multigrid: Theory and Practice

Wednesday 28 June 2017 11:45 (45 minutes)

This talk gives an overview of recent progress made in the design and analysis of algebraic multigrid methods. The focus is on the setup algorithm that automatically constructs the multilevel hierarchy used in the solve phase. A sharp two-grid theory is introduced and then used to derive various quality measures of the coarse spaces constructed by the setup algorithm, based on the ideas of compatible relaxation, a related identity that assumes the use of the so-called ideal interpolation operator, and an optimal form of classical algebraic multigrid interpolation that gives the best possible two-grid convergence rate. Various numerical results are presented to illustrate these theoretical results. As a test problem, we focus on a finite volume discretization of a scalar diffusion problem with highly varying (discontinuous) diffusion coefficient.

Title

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