



Departmental Seminar
Department of Civil Engineering and Engineering Mechanics
Columbia University

Towards Robust Scalable Algebraic Multigrid Solvers

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644 Mudd



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Abstract:

This talk highlights some multigrid challenges that arise from several application areas including structural dynamics, fluid flow, and electromagnetics. A general framework is presented to help introduce and understand algebraic multigrid methods based on energy minimization concepts. Connections between algebraic multigrid prolongators and finite element basis functions are made to be explored. It is shown how the general algebraic multigrid framework allows one to adapt multigrid ideas to a number of different situations. Examples are given corresponding to linear elasticity and specifically in the solution of linear systems associated with extended finite elements for fracture problems.