

ADAPTIVE APPROACHES TO ALGEBRAIC MULTIGRID

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Abstract

By the time of its development Algebraic Multigrid (AMG) was thought of as a black box solver for systems of linear equations. However, the classical formulation of AMG turned out to lack the robustness to overcome certain challenges encountered in many of today's computational simulations. In recent years several methods have been proposed that try to overcome such difficulties by means of adaptive techniques, such as the framework of smoothed aggregation or bootstrap algebraic multigrid.

In this talk we discuss the general concept of algebraic multigrid and its features that can make it a highly efficient solver. We give examples of the challenges that need to be overcome and give an overview on the techniques and strategies developed in recent years. We try to give an extensive insight into various approaches, discuss their differences and similarities and try to connect them in a common framework.