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Developments in Algebraic Multigrid Preconditioning for High-Order Spectral Elements

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In this talk we highlight recent attempts to solve systems of equations arising from high-order spectral element discretizations. In particular, we extend the success of Algebraic Multigrid (AMG) preconditioning on structured grids to the unstructured case (using triangles).

We consider high-order nodal spectral elements based on the electrostatic distribution. A low-order finite element preconditioner is utilized and accelerated with Conjugate Gradient. The elements cause a particular challenge as the local grids are also unstructured and suffer from poor aspect ratios. We present numerical evidence in support of this method and discuss the implications of using this approach.