

Block-structured AMR for classical partial differential equations

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In this talk, we will give an overview of the algorithmic design issues for block-structured local refinement methods for classical partial differential equations. These include the formulation of consistent and stable boundary conditions for hyperbolic, elliptic, and parabolic PDE, including the effects of refinement in time; increase of truncation error at refinement boundaries, and its impact on the solution error; and the interaction of conservation and free-stream preservation for coupled elliptic and hyperbolic problems. We will illustrate these issues with examples from a variety of applications in fluid dynamics.