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**Coarse Grid Selection via Compatible Relaxation**

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The notion of *compatible relaxation* (CR) was introduced by Brandt in [1] as a modified relaxation scheme that keeps the coarse-level variables invariant. Brandt states that the convergence rate of CR is a general measure for the quality of the set of coarse variables. In [2], a supporting theory for these ideas was introduced, and an outline for an algebraic coarsening algorithm was also described.

In this talk, we will describe recent progress developing CR-based coarsening algorithms for algebraic multigrid. In particular, we will discuss some of the motivations (theoretical and heuristic) behind our algorithm, point out its current strengths and weaknesses, and discuss open questions and future directions.

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# Bibliography

- [1] A. BRANDT, *General highly accurate algebraic coarsening*, Electronic Transactions on Numerical Analysis, 10 (2000), pp. 1–20.
- [2] R. D. FALGOUT AND P. S. VASSILEVSKI, *On Generalizing the AMG Framework*, submitted. Also available as LLNL technical report UCRL-JC-150807, 2003.