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**Parallel Coarse Grid Selection Strategies**

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Traditional coarse grid selection algorithms for algebraic multigrid use a strength of connection measure to select coarse degrees of freedom. The strength of connection is a heuristic used to determine the influences between degrees of freedom in M-matrices. Coarsening algorithms using a strength of connection are known to select ineffective coarse grids for some cases where the operator is not an M-matrix. Additionally, these methods do not consider other information such as the smoother to be used in the solve phase.

Alternatively, compatible relaxation selects coarse grids without explicitly using a strength of connection measure. Instead, a smoother is applied to identify degrees of freedom where the smooth error is large. This information is then used to select the coarse grid. Recent work on compatible relaxation has produced viable serial implementations and useful theoretical results.

The goal of this work is to produce effective and efficient parallel compatible relaxation methods. In this talk, parallel compatible relaxation implementations will be introduced and discussed, along with results from experiments on both structured and unstructured problems.