Killian, L Miller

Algebraic Multigrid for Markov Chains

256 Phillip Street
Unit 7
Waterloo
ON
Canada N2L 6B6
killianmiller7@hotmail.com
Hans De Sterck
My PhD supervisor.
Thomas, A Manteuffel
Colleague.
Steve, F McCormick
Colleague.
John Ruge
Colleague.
Geoff Sanders
Colleague.

An algebraic multigrid (AMG) method is presented for the calculation of the stationary probability vector of an irreducible Markov chain. We propose a modified AMG interpolation formula, which produces a nonnegative interpolation operator with unit row sums. It is shown how the adoption of a lumping technique maintains the irreducible singular M-matrix character of the coarse-level operators on all levels. Together, these properties are sufficient to establish the well-posedness of our algorithm. Numerical results show how our method leads to nearly optimal multigrid efficiency for a representative set of test problems.