Electronic Transactions on Numerical Analysis.
Volume 6, pp. 153-161, December 1997.

ISSN 1068-9613.

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ASYMPTOTIC STABILITY OF A 9-POINT MULTIGRID ALGORITHM FOR CONVECTION-DIFFUSION EQUATIONS*

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Abstract. We consider the solution of the convection-diffusion equation in two dimensions by a compact high-order 9-point discretization formula combined with multigrid algorithm. We prove the ϵ-asymptotic stability of the coarse-grid operators. Two strategies are examined. A method to compute the asymptotic convergence is described and applied to the multigrid algorithm.

Key words. multigrid method, high-order discretization, asymptotic stability, convection-diffusion equation.

AMS subject classifications. 65F10, 65N06, 65N22, 65N55, 76D07.

* Received May 14, 1997. Accepted for publication September 16, 1997. Communicated by K. Jordan.
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