

Parallel 9-point Local Modified SOR method

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In [1], [2] the Local SOR (LSOR) method was studied for the 9-point stencil, using Fourier analysis. In this paper we study the Local Modified SOR (LMSOR) method with red black ordering for the 9-point stencil by introducing a parameter ω_{ij} for each red point and a parameter ω'_{ij} for each black point in order to accelerate its convergence rate. Under the assumption that the Jacobi iteration matrix has real eigenvalues we give sufficient conditions for convergence and determine the optimum set of local relaxation parameters. The performance of the LMSOR method is illustrated by its application to the numerical solution of the convection-diffusion equation. It is found that the proposed method is significantly more efficient than LSOR. Finally, the parallel implementation of the LMSOR method is discussed and results are presented for distributed memory processors with a mesh topology.

Subject classification : AMS(MOS), 65F10, 65N20, CR:5.13.

References

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