

The Optimal Parameter of SOR- k Method for p -Cyclic Matrices

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Abstract

Consider a SOR- k method for solving a p -cyclic system $Ax = b$ ($p > 2$) if the p -cyclic matrix A is repartitioned as a k -cyclic matrix for $2 \leq k \leq p$. Suppose that the block Jacobi matrix B associated with A is convergent and all the eigenvalues of B^p are nonnegative. In this paper, a comparison of the optimal spectral radius of the SOR- k iteration matrix $\mathcal{L}_\omega^{(k)}$ for $2 \leq k \leq p$ was given without an assumption of the existence and differentiability of an implicit function. More comparisons of the SOR- k method are given.