M-矩阵及非负矩阵Hadamard积和Fan积的特征值界的估计

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Estimate of bounds on eigenvalues of the Hadamard product and the Fan product of matrices and nonnegative matrices

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摘要 分别给出了非奇异*M*-矩阵的逆矩阵和非奇异*M*-矩阵的Hadamard积与非奇异*M*-矩阵Fan积的最小特征值下界新的估计式;同时给出了非负矩阵Hadamard积的谱半径上界新的估计式;这些估计式都只依赖于矩阵的元素,易于计算.算例表明,这些估计式在一定条件下改进了现有结果.

关键词： *M*-矩阵   非负矩阵   Hadamard积   Fan积   谱半径   最小特征值

Abstract： A new lower bound of the minimum eigenvalues of Hadamard product for inverse A^{-1} of nonsingular *M*-matrix *A* and nonsingular *M*-matrix *B*, a new lower bound of the smallest eigenvalues of Fan product for nonsingular *M*-matrices *A* and *B*, and a new supper bound of the spectral radius of Hadamard product for nonnegative matrices *A* and *B*, are given respectively. These three estimating formulas of the bounds are easier to calculate since they only depend on the entries of matrices *A* and *B*. The given examples show that the estimating formulas of the bounds are better than several known estimating formulas.

Key words： *M*-matrix   nonnegative matrix   Hadamard product   Fan product   spectral radius   smallest eigenvalue

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