Functional inequalities for spectral radii of nonnegative matrices.

Linear Algebra Appl. 129 (1990), 103–130.

Let $f(\cdot, \cdots, \cdot)$ be a function from $\mathbb{R}^m_+$ to $\mathbb{R}_+$ and let $A_1, \cdots, A_m$ be $n \times n$ nonnegative matrices. If $A_k = (a_{ij}^k)$, then $f(A_1, \cdots, A_m) = (f(a_{ij}^1, \cdots, a_{ij}^m))_{i,j=1}^n$. In this paper the authors characterize all functions $f$ which satisfy $r_{sp}(f(A_1, \cdots, A_m)) \leq f(r_{sp}(A_1), \cdots, r_{sp}(A_m))$, where $r_{sp}(\cdot)$ are spectral radii. The problem for inverse inequalities is also discussed.

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