

## Joint bounds for the Perron roots of nonnegative matrices with applications

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### Abstract

Given a finite set  $\{A_x\}_{x \in X}$  of nonnegative matrices, we derive joint upper and lower bounds for the row sums of the matrices  $D^{-1} A(x) D$ ,  $x \in X$ , where  $D$  is a specially chosen nonsingular diagonal matrix. These bounds, depending only on the sparsity patterns of the matrices  $A(x)$  and their row sums, are used to obtain joint two-sided bounds for the Perron roots of given nonnegative matrices, joint upper bounds for the spectral radii of given complex matrices, bounds for the joint and lower spectral radii of a matrix set, and conditions sufficient for all convex combinations of given matrices to be Schur stable. Bibliography: 20 titles. © 2007 Springer Science+Business Media, Inc.

<http://dx.doi.org/10.1007/s10958-007-0067-8>

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