Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 20, pp. 468-489, August 2010

ELA
http://math.technion.ac.il/iic/ela

WEIGHTED MATRIX EIGENVALUE BOUNDS ON THE INDEPENDENCE NUMBER OF A GRAPH*

RANDALL J. ELZINGA† AND DAVID A. GREGORY‡

Abstract. Weighted generalizations of Hoffman's ratio bound on the independence number of a regular graph are surveyed. Several known bounds are reviewed as special cases of modest extensions. Comparisons are made with the Shannon capacity Θ, Lovász' parameter ϑ, Schrijver's parameter ϑ', and the ultimate independence ratio for categorical products. The survey concludes with some observations on graphs that attain a weighted version of a bound of Cvetković.

Key words. Independence number, Eigenvalues, Ratio bound, Graph, Matrix.

AMS subject classifications. 05C50, 05E99, 15A18.

*Received by the editors January 23, 2009. Accepted for publication July 31, 2010. Handling Editor: Richard A. Brualdi.

†Department of Mathematics, Royal Military College, PO Box 17000, Station Forces, Kingston, Ontario K7K 7B4, Canada (rjelzinga@gmail.com). Research supported by NSERC Canada and by Queen's McLaughlin and Baumann graduate fellowships.

‡Department of Mathematics and Statistics, Queen's University, Kingston, Ontario K7L 3N6, Canada (gregoryd@mast.queensu.ca). Research supported by NSERC Canada.