A LOWER BOUND FOR THE SMALLEST SINGULAR VALUE

LIMIN ZOU

Abstract. In this paper, we obtain a lower bound for the smallest singular value of nonsingular matrices which is better than the bound presented by Yu and Gu [Linear Algebra Appl. 252(1997)25-38]. Meanwhile, we give some numerical examples which will show the effectiveness of our result.

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REFERENCES

[1] R. A. HORN, C. R. JOHNSON, *Matrix Analysis*, Cambridge University Press, Cambridge, 1985.
[2] R. A. HORN, C. R. JOHNSON, *Topics in Matrix Analysis*, Cambridge University Press, Cambridge, 1991.
[3] Y. YU, D. GU, *A note on a lower bound for the smallest singular value*, Linear Algebra Appl. **252** (1997), 25–38.
[4] T. HUANG, *Estimation of* $\left\|A^{-1}\right\|_\infty$ *and the smallest singular value*, Comput. Math. Appl. **55** (2008), 1075–1080.
[5] L. ZOU, Y. JIANG, *Estimation of the eigenvalues and the smallest singular value of matrices*, Linear Algebra Appl. **433** (2010), 1203–1211.
[6] J. M. PENA, T. SZULC, *Loewner matrix ordering in estimation of the smallest singular value*, Electron J Linear Al. **22** (2011), 466–479.
[7] J. M. VARAH, *A lower bound for the smallest singular value*, Linear Algebra Appl. **11** (1975), 3–5.
[8] C. R. JOHNSON, *A Gersgorin-type lower bound for the smallest singular value*, Linear Algebra Appl. **112** (1989), 1–7.
[9] C. R. JOHNSON, T. SZULC, *Further lower bounds for the smallest singular value*, Linear Algebra Appl. **272** (1998), 169–179.
[10] L. Y. KOLOTILINA, *Bounds for the singular values of a matrix involving its sparsity pattern*, J. Math. Sci. **137**, 3 (2006), 4794–4800.
[11] G. PIAZZA, T. POLITI, *An upper bound for the condition number of a matrix in spectral norm*, J. Comput. Appl. Math. **143** (2002), 141–144.