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MATRIX INEQUALITIES BY MEANS OF EMBEDDING*

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Abstract. In this expository study some basic matrix inequalities obtained by embedding bilinear forms $\langle Ax, x\rangle$ and $\langle Ax, y\rangle$ into 2×2 matrices are investigated. Many classical inequalities are reproved or refined by the proposed unified approach. Some inequalities involving the matrix absolute value $|A|$ are given. A new proof of Ky Fan's singular value majorization theorem is presented.

Key words. Eigenvalue, Majorization, Matrix absolute value, Matrix inequality, Matrix norm, Normal matrix, Positive semidefinite matrix, Singular value, Spread, Wielandt inequality.

AMS subject classifications. 15A42, 15A63, 47B15.

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