

CONCAVE FUNCTIONS OF PARTITIONED MATRICES WITH NUMERICAL RANGES IN A SECTOR

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Abstract. We prove two inequalities for concave functions and partitioned matrices whose numerical ranges in a sector. These complement some results of Zhang in [Linear Multilinear Algebra 63 (2015) 2511–2517].

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REFERENCES

- [1] J. S. AUJLA AND J. C. BOURIN, *Eigenvalues inequalities for convex and log-convex functions*, Linear Algebra Appl., **424**, (2007), 25–35.
- [2] R. BHATIA, *Matrix Analysis*, Springer-Verlag, New York (NY), 1997.
- [3] R. BHATIA AND F. KITTANEH, *The singular values of $A + B$ and $A + iB$* , Linear Algebra Appl., **431**, (2009), 1502–1508.
- [4] J. C. BOURIN AND E. RICARD, *An asymmetric Kadison's inequality*, Linear Algebra Appl., **433**, (2010), 499–510.
- [5] J. C. BOURIN AND E.-Y. LEE, *Unitary orbits of Hermitian operators with convex and concave functions*, Bull. London Math. Soc., **44**, (2012), 1085–1102.
- [6] S. DRURY AND M. LIN, *Singular value inequalities for matrices with numerical ranges in a sector*, Oper. Matrices, **8**, (2014), 1143–1148.
- [7] H. X. FU AND Y. LIU, *Rotfel'd inequality for partitioned matrices with numerical ranges in a sector*, Linear Multilinear Algebra, **64**, (2016), 105–109.
- [8] A. GEORGE AND KH. D. IKRAMOV, *On the properties of Accretive-Dissipative Matrices*, Math. Notes, **77**, (2005), 767–776.
- [9] KH. D. IKRAMOV, *Determinantal Inequalities for Accretive-Dissipative Matrices*, J. Math. Sci., **121**, (2004), 2458–2464.
- [10] KH. D. IKRAMOV AND V. N. CHUGUNOV, *Inequalities of Fisher and Hadamard types for accretive-dissipative matrices*, Dokl. Ross. Akad. Nauk, **384**, (2002), 585–586.
- [11] E.-Y. LEE, *Extension of Rotfel'd theorem*, Linear Algebra Appl., **435**, (2011), 735–741.
- [12] C. K. LI AND N. S. SZE, *Determinantal and eigenvalue inequalities for matrices with numerical ranges in a sector*, J. Math. Anal. Appl., **410**, (2014), 487–491.
- [13] M. LIN, *Reversed determinantal inequalities for accretive-dissipative matrices*, Math. Inequal. Appl., **15**, (2012), 955–958.
- [14] M. LIN, *Fischer type determinantal inequalities for accretive-dissipative matrices*, Linear Algebra Appl., **438**, (2013), 2808–2812.
- [15] M. LIN, *Extension of a result of Haynsworth and Hartfiel*, Arch. Math., **104**, (2015), 93–100.
- [16] M. LIN AND D. ZHOU, *Norm inequalities for accretive-dissipative operator matrices*, J. Math. Anal. Appl., **407**, (2013), 436–442.
- [17] R. C. THOMPSON, *Convex and concave functions of singular values of matrix sums*, Pacific J. Math., **1**, (1976), 285–290.
- [18] F. ZHANG, *A matrix decomposition and its application*, Linear Multilinear Algebra **63**, (2015), 2033–2042.

- [19] P. ZHANG, *A further extension of Rotfel'd theorem*, *Linear Multilinear Algebra*, **63**, (2015), 2511–2517.
- [20] P. ZHANG, *Extension of Matic's results*, *Linear Algebra Appl.*, **486**, (2015), 328–334.