ON ANDO-HIAI TYPE INEQUALITIES FOR SECTORIAL MATRICES

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Abstract. In a recent paper of the same journal, Zhao, Zheng and Jiang generalized a norm inequality of Ando and Hiai for sectorial matrices. We first improve their main result by reducing the coefficient to a smaller one. We also present an analogous inequality involving the logarithmic mean.

Mathematics subject classification (2020): 47A30, 15A45, 15A60. *Keywords and phrases:* Numerical range, sector matrix, invariant norm, inequality.

REFERENCES

- T. ANDO, F. HIAI, Log majorization and complementary Golden-Thompson type inequalities, Linear Algebra Appl. 197, 198 (1994) 113–131.
- [2] R. BHATIA, Matrix Analysis, GTM 169, Springer-Verlag, New York, 1997.
- [3] P. S. BULLEN, D. S. MITRINOVIC AND P. M. VASIC, Means and their inequalities, Reidel, Dordrecht, 1989.
- S. DONG, L. HOU, A complement of the Hadamard-Fischer inequality, Journal of Intelligent & Fuzzy Systems, 35 (2018) 4011–4015.
- [5] S. DRURY, Principal powers of matrices with positive definite real part, Linear Multilinear Algebra 63 (2015) 296–301.
- [6] S. DRURY, M. LIN, Singular value inequalities for matrices with numerical ranges in a sector, Oper. Matrices, 8 (2014) 1143–1148.
- [7] 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] C.-K. LI, N. SZE, Determinantal and eigenvalue inequalities for matrices with numerical ranges in a sector, J. Math. Anal. Appl. 410 (2014) 487–491.
- [9] M. LIN, Extension of a result of Haynsworth and Hartfiel, Arch. Math. 1 (2015), 93–100.
- [10] M. LIN, Some inequalities for sector matrices, Oper. Matrices, 10 (2016), 915–921.
- [11] M. LIN, F. SUN, A property of the geometric mean of accretive operator, Linear Multilinear Algebra 65 (2017) 433–437.
- [12] J. LIU, Generalizations of the Brunn-Minkowski inequality, Linear Algebra Appl. 508 (2016) 206– 213.
- [13] W. LUO, Logarithmic Mean of Multiple Accretive Matrices, Bulletin of the Iranian Mathematical Society 48 (2022) 1229–1236.
- [14] Y. MAO, X. LIU, On some inequalities for accretive-dissipative matrices, Linear Multilinear Algebra 69 (2021) 1657–1664.
- [15] Y. MAO, Y. MAO, Inequalities for the Heinz mean of sector matrices, Bulletin of the Iranian Mathematical Society 46 (2020) 1767–1774.
- [16] Y. MAO, Extensions of Hartfiel's inequality to multiple matrices, Linear Algebra Appl. 589 (2020), 96–102.
- [17] M. RAISSOULI, M. S. MOSLEHIAN, S. FURUICHI, Relative entropy and Tsallis entropy of two accretive operators, C. R. Acad. Sci. Paris, Ser. I 355 (2017) 687–693.
- [18] C. YANG, F. LU, Some generalizations of inequalities for sector matrices, J. Inequal. Appl. (2018) 2018: 183.
- [19] F. TAN, H. CHEN, Inequalities for sector matrices and positive linear maps, Electron. J. Linear Algebra. (2019), 35, 418–423.



- [20] F. TAN, A. XIE, On the Logarithmic Mean of Accretive Matrices, Filomat 33 (2019) 4747–4752.
- [21] F. ZHANG, A matrix decomposition and its applications, Linear Multilinear Algebra 63 (2015) 2033–2042.
- [22] L. ZHAO, Y. ZHENG, X. JIANG, Generalizing the Ando-Hiai inequality for sectorial matrices, Oper. Matrices. 16 (2022) 329–335.

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