

A QUANTITATIVE POPOVICIU TYPE INEQUALITY

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Abstract. In this paper, we prove a general quantitative multiple Popoviciu type inequality for positive definite matrices. As corollaries, we obtained generalized multiple Hartfiel's inequalities.

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REFERENCES

- [1] W. BERNDT AND S. SRA, *Hlawka-Popoviciu inequalities on positive definite tensors*, Linear Algebra and its Applications **486** (2015) 317–327.
- [2] S. DONG AND Q. W. WANG, *More generations of Hartfiel's inequality and the Brunn-Minkowski inequality*, Bull. of the Iranian Mathematical Society **47** (2021): 21–29.
- [3] D. J. HARTFIEL, *An extension of Haynsworth's determinant inequality*, Proc. Amer. Math. Soc. **41** (1973) 463–465.
- [4] E. V. HAYNSWORTH, *Applications of an inequality for the Schur complement*, Proc. Amer. Math. Soc. **24** (1970) 512–516.
- [5] Y. HONG AND F. QI, *Refinements of two determinantal inequalities for positive semidefinite matrices*, Math. Inequal. Appl. **25** (2022), no. 3, 673–678.
- [6] R. A. HORN AND C. R. JOHNSON, *Topics in Matrix Analysis*, Cambridge University Press, 1991.
- [7] R. A. HORN AND C. R. JOHNSON, *Matrix Analysis*, Cambridge University Press, 2nd ed. 2013.
- [8] L. HOU AND S. DONG, *An extension of Hartfiel's determinant inequality*, Math. Inequal. Appl. **21** (2018), no. 4, 1105–1110.
- [9] M. LIN, *A determinantal inequality for positive definite matrices*, Electron J. Linear Algebra **27** (2014), 821–826.
- [10] M. LIN, *Extensions of a result of Haynsworth and Hartfiel*, Arch. Math., **104** (2015), 93–100.
- [11] Y. MAO, *Extensions of Hartfiel's inequality to multiple matrices*, Linear Algebra and its Applications **589** (2020), 96–102.
- [12] A. W. MARSHALL, I. OLKIN, AND B. C. ARNOLD, *Inequalities: theory of majorization and its applications*, second edition, Springer Series in Statistics, Springer, New York, 2011.
- [13] F. ZHANG, *The Schur complement and its applications*, Springer, New York, 2005.
- [14] F. ZHANG, *A matrix decomposition and its applications*, Linear Multilinear Algebra **63** (2015), no. 10, 2033–2042.
- [15] F. ZHANG, *Matrix Theory: Basic result and techniques*, second edition, Springer, New York, 2011.
- [16] Y. ZHENG, X. JIANG, X. CHEN, F. ALSAADI, *More extensions of a determinant inequality of Harfiel*, Appl. Math. Comput. **369** (2020), 124827, 5 pp.