

SOME INEQUALITIES INVOLVING POSITIVE LINEAR MAPS UNDER CERTAIN CONDITIONS

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Abstract. We demonstrate that several well-known classical inequalities also hold for some positive linear maps on matrix algebra. It is shown that for such maps the Jensen inequality hold for all ordinary convex functions.

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REFERENCES

- [1] K. M. R. AUDENAERT AND F. HIAI, *On matrix inequalities between the power means: counterexamples*, Linear Algebra Appl. **439**, (2013), 1590–1604.
- [2] R. BHATIA, *Matrix Analysis*, Springer-Verlag, New York 1997.
- [3] R. BHATIA, *Positive Definite Matrices*, Princeton University Press, 2007.
- [4] R. BHATIA AND R. SHARMA, *Some inequalities for positive linear maps*, Linear Algebra Appl. **436**, (2012), 1562–1571.
- [5] J. C. BOURIN AND E. RICARD, *An asymmetric Kadison's inequality*, Linear Algebra Appl. **433**, (2010), 499–510.
- [6] P. L. ĆEBYŠEV, *Polnoe Sobranie Sočinenii (Complete collected works)*, Moscow-Leningrad **3**, (1948), 128–131.
- [7] M. D. CHOI, *A Schwarz inequality for positive linear maps on C^* -algebra*, Illinois J. Math. **18**, (1974), 565–574.
- [8] C. DAVIS, *A Schwarz inequality for convex operator functions*, Proc. Amer. Math. Soc. **8**, (1957), 42–44.
- [9] K. HOFFMAN AND R. KUNZE, *Linear Algebra*, Prentice-Hall, (1971).
- [10] J. L. W. V. JENSEN, *Sur les fonctions convexes et les inégalités entre les valeurs moyennes*, Acta Math. **30**, (1906), 175–193.
- [11] R. V. KADISON, *A generalized Schwarz inequality and algebraic invariants for operator algebras*, Ann. Math. **56**, (1952), 494–503.
- [12] R. SHARMA AND A. THAKUR, *More inequalities for positive linear maps*, J. Math. Inequal. **7**, (2013), 1–9.
- [13] R. F. WERNER AND A. S. HOLEVO, *Counterexample to an additivity conjecture for output purity of quantum channels*, J. Math. Phys. **43**, (2002), 4353–4357.