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ON log MAJORIZATIONS FOR POSITIVE SEMIDEFINITE MATRICES

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Abstract. In this paper, we show that every log majorization for positive semidefinite matrices can be expressed in countable sets of log majorizations and all of them are equivalent to one another.

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REFERENCES

[1] T. ANDO AND F. HIAI, *Log majorization and complementary Golden-Thomson type inequalities*, Linear Algebra Appl. **197 (198)** (1994), 113–131.

[2] R. BHATIA, *Positive Definite Matrices*, Princeton Press, 2007.

[3] T. FURUTA, *$A \geqslant B \geqslant O$ assures $(B^rA^pB^r)^{1/q} \geqslant B^{(p+2r)/q}$ for $r \geqslant 0,\ p \geqslant 0,\ q \geqslant 1$ with $(1+2r)q \geqslant p+2r$*, Proc. Amer. Math. Soc. **101** (1987), 85–88.

[4] T. FURUTA, *An extension of the Furuta inequality and Ando-Hiai* log *majorization*, Linear Algebra Appl. **219** (1995), 139–155.

[5] T. FURUTA, *Invitation to Linear Operators*, ISBN: 0-415-26799-4, Taylor & Francis, 2001.

[6] T. FURUTA, *Further extension of an order preserving operator inequality*, J. Math. Inequal. **2** (2008), 465–472.

[7] T. FURUTA, *Log majorization via an order preserving operator inequality*, Linear Algebra Appl. **431** (2009), 132–138.

[8] T. FURUTA, *An extension of order preserving operator inequality*, Math. Inequal. Appl. **13** (2010), 49–56.

[9] F. KUBO AND T. ANDO, *Means of positive linear operators*, Math. Ann. **246** (1980), 205–224.

[10] C.-S. LIN, *On operator inequalities in terms of geometric mean*, Internat. J. Pure Appl. Math. **58** (2010), 299–308.

[11] C.-S. LIN, *Generalization of β-power-mean for operators*, Internat. J. Pure Appl. Math. **62** (2010), 275–285.

[12] C.-S. LIN, *On countable sets of order preserving operator inequalities in Hilbert spaces*, Internat. J. Pure Appl. Math. **68** (2011), 189–199.

[13] C.-S. LIN AND Y. J. CHO, *Characterizations of operator inequality $A \geqslant B \geqslant C$*, Math. Inequal. Appl. **14** (2011), 575–580.