

# Complete interpolation of matrix versions of Heron and Heinz means

Rupinderjit Kaur and Mandeep Singh Rawla

*Sant Longowal Institute of Engineering and Technology, India*

## Abstract

The interpolation and comparison of a matrix version of Heron mean,  $F_\alpha(a, b) = (1 - \alpha)\sqrt{ab} + \alpha\frac{a+b}{2}$ ,  $0 \leq \alpha \leq 1$ ,  $a, b \in \mathbb{R}^+$  is considered by [1]. We shall discuss the complete interpolation and comparison of matrix version of such means by extending the range of  $\alpha$  from  $[0, 1]$  to  $\mathbb{R}^+$ . We shall also discuss some more results involving Heinz means.

## Keywords

Positive definite matrices, Matrix means, Norm inequalities.

## References

- [1] Bhatia, R. (2006). Interpolating the arithmetic-geometric mean inequality and its operator version. *Linear Algebra Appl.* 413, 355–363.
- [2] Bhatia, R. (2007). *Positive Definite Matrices*. Princeton: Princeton University Press.
- [3] Bhatia, R. and K.R. Parthasarthy (2000). Positive definite functions and operator inequalities. *Bull. London Math. Soc.* 32, 214–228.
- [4] Hiai, F. and H. Kosaki (1999). Means of matrices and comparison of their norms. *Indiana Univ. Math. J.* 48, 899–36.
- [5] Hiai, F. and H. Kosaki (2003). Means of Hilbert Space Operators. In: J.-M. Morel, F. Takens, B. Teissier (Eds.), *Lecture Notes in Mathematics 1820*. New York: Springer.
- [6] Horn, R.A. and C.R. Johnson (1990). *Topics in Matrix Analysis*. Cambridge: Cambridge Univ. Press.
- [7] Zhan, X. (2002). Matrix Inequalities. In: J.-M. Morel, F. Takens, B. Teissier (Eds.), *Lecture Notes in Mathematics 1790*. New York: Springer.