

UPPER BOUND FOR SPECTRA OF JENSEN OPERATOR AND ITS APPLICATION TO REVERSE ARITHMETIC–GEOMETRIC MEANS

HONGLIANG ZUO, MASATOSHI FUJII, JUN ICHI FUJII AND YUKI SEO

Abstract. In this paper we consider Jensen’s operator, which includes bounded self-adjoint operator on Hilbert space, and establish the optimal upper bound for Jensen’s operator by means of discrete Jensen’s functional. The obtained results are applied to operator means, then we get refinements of numerous reverse arithmetic-geometric operators mean inequalities on Hilbert space.

Mathematics subject classification (2010): 47A30, 47A63.

Keywords and phrases: Jensen operator, reverse arithmetic-geometric means, Jensen’s functional.

REFERENCES

- [1] J. BARIĆ, M. MATIĆ AND J. PEČARIĆ, *On the bounds for the normalized Jensen functional and Jensen-Steffensen inequality*, Math. Inequal. Appl., **12** (2009), 413–432.
- [2] S. FURUICHI, *On refined Young inequalities and reverse inequalities*, J. Math. Inequal., **5** (2011), 21–31.
- [3] S. FURUICHI, *Refined Young inequalities with Specht’s ratio*, J. Egyptian Math. Soc., **20** (2012), 46–49.
- [4] T. FURUTA, J. MIČIĆ HOT AND J. PEČARIĆ, Y. SEO, *Mond-Pečarić Method in Operator Inequalities*, Element, Zagreb, 2005.
- [5] F. KITTANEH AND Y. MANASRAH, *Improved Young and Heinz inequalities for matrices*, J. Math. Anal. Appl., **36** (2010), 262–269.
- [6] M. KLARIĆ BAKULA, J. PEČARIĆ AND J. PERIĆ, *On the converse Jensen inequality*, Appl. Math. Comput., **218** (2012), 6566–6575.
- [7] M. KRNIĆ, N. LOVRIČEVIĆ AND J. PEČARIĆ, *Jensen’s operator and applications to mean inequalities for operators in Hilbert space*, Bull. Malays. Math. Sci. Soc., **35** (2012), 1–14.
- [8] F. KUBO AND T. ANDO, *Means of positive operators*, Math. Ann., **264** (1980), 205–224.
- [9] D. S. MITRINOVIĆ, J. PEČARIĆ AND A. M. FINK, *Classical and new inequalities in analysis*, Kluwer Academic Publishers, Dordrecht/Boston/London, 1993.
- [10] J. PEČARIĆ AND P. R. BEESACK, *On Jessen’s inequality for convex functions II*, J. Math. Anal. Appl., **118** (1986), 125–144.
- [11] W. SPECHT, *Zer Theorie der elementaren Mittel*, Math. Z., **74** (1960), 91–98.
- [12] M. TOMINAGA, *Specht’s ratio in the Young inequality*, Sci. Math. Japon., **55** (2002), 583–588.