

A HALF-DISCRETE HILBERT-TYPE INEQUALITY WITH A GENERAL HOMOGENEOUS KERNEL OF DEGREE 0

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Abstract. In this paper we establish a half-discrete Hilbert-type inequality with a general homogeneous kernel of degree 0 including two interval variables. The equivalent forms, the operator expressions, the reverses and some particular cases are also considered.

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REFERENCES

- [1] Á. BÉNYI, O. CHOONGHONG, *Best constant for certain multilinear integral operator*, J. Inequal. Appl. (2006), no. 28582.
- [2] L. AZAR, *On some extensions of Hardy-Hilbert's inequality and Applications*, J. Inequal. Appl. (2009), no. 546829.
- [3] G. H. HARDY, J. E. LITTLEWOOD, G. PÓLYA, *Inequalities*, Cambridge University Press, Cambridge, 1934.
- [4] J. JIN, L. DEBNATH, *On a Hilbert-type linear series operator and its applications*, J. Math. Anal. Appl. **371** (2010), 691–704.
- [5] M. KRNIĆ AND J. PEČARIĆ, *General Hilbert's and Hardy's inequalities*, Math. Inequal. Appl. **8** (2005), 29–51.
- [6] M. KRNIĆ, J. PEČARIĆ, *Hilbert's inequalities and their reverses*, Publ. Math. Debrecen **67** (2005), 315–331.
- [7] M. KRNIĆ, J. PEČARIĆ, *Extension of Hilbert's Inequality*, J. Math. Anal. Appl. **324** (2006), 150–160.
- [8] M. KRNIĆ, *Multidimensional Hilbert-type inequality on the weighted Orlicz spaces*, Mediterranean Journal of Mathematics, in press, DOI: 10.1007/s00009-011-0160-6.
- [9] J. KUANG, *Introduction to real analysis*, Hunan Education Press, Chansha, 1996 (China).
- [10] J. KUANG, *Applied inequalities*, Shangdong Science Technic Press, Jinan, 2004 (China).
- [11] Y. LI, B. HE, *On inequalities of Hilbert's type*, Bull. Austral. Math. Soc. **76** (2007), 1–13.
- [12] D. S. MITRINOVIĆ, J. E. PEČARIĆ, A. M. FINK, *Inequalities involving functions and their integrals and derivatives*, Kluwer Academic Publishers, Boston, 1991.
- [13] B. YANG, *On Hilbert's integral inequality*, J. Math. Anal. Appl. **220** (1998), 778–785.
- [14] B. YANG, T. RASSIAS, *On the way of weight coefficient and research for Hilbert-type inequalities*, Math. Inequal. Appl. **6** (2003), 625–658.
- [15] B. YANG, *A mixed Hilbert-type inequality with a best constant factor*, Int. J. Pure Appl. Math. **20** (2005), 319–328.
- [16] B. YANG, I. BRNETIĆ, M. KRNIĆ, J. PEČARIĆ, *Generalization of Hilbert and Hardy-Hilbert integral inequalities*, Math. Inequal. Appl. **8** (2005), 259–272.
- [17] B. YANG, *Hilbert-type integral inequalities*, Bentham Science Publishers Ltd., 2009.
- [18] B. YANG, *The norm of operator and Hilbert-type inequalities*, Science Press, Beijing, 2009 (China).
- [19] B. YANG, *Discrete Hilbert-type inequalities*, Bentham Science Publishers Ltd., 2011.
- [20] B. YANG, *A half-discrete Hilbert's inequality*, Journal of Guangdong University of Education **31** (2011), 1–7.

- [21] W. ZHONG, *The Hilbert-type integral inequality with a homogeneous kernel of lambda-degree*, J. Inequal. Appl. (2008), no. 917392.