

A NOTE ON TWO WEIGHTED DISCRETE CARLEMAN INEQUALITIES

BAOFENG LAI*, RUNQIU WANG AND HAO LIU

Abstract. In this paper, we re-examine two weighted discrete Carleman inequalities, discuss their correctness and optimal constants in detail, and get some correct and relatively complete conclusions.

Mathematics subject classification (2020): 26D15.

Keywords and phrases: Weighted, discrete, Carleman inequality, optimal constant.

REFERENCES

- [1] T. CARLEMAN, *Sur les fonctions quasi-analytiques*, in “Conférences faites au cinquième congrès des mathématiciens scandinaves,” Helsingfors, 1923, 181–196.
- [2] G. H. HARDY, J. E. LITTLEWOOD, AND G. PÓLYA, *Inequalities*, Cambridge Univ. Press, London, 1952.
- [3] G. H. HARDY, *Notes on some points in the integral calculus*, LXIV, Messenger Math. 57 (1928), 12–16.
- [4] L. CARLESON, *A proof of an inequality of Carleman*, Proc. Amer. Math. Soc. 5 (1954), 932–933.
- [5] R. REDHEFFER, *Recurrent inequalities*, Proc. London. Math. Soc. 17 (1967), 683–699.
- [6] H. ALZER, *A refinement of Carleman’s inequality*, J. Approx. Theory. 95 (1998), 497–499.
- [7] B. YANG, L. DEBNATH, *Some inequalities involving the constant e, and an application to Carleman’s inequality*, J. Math. Anal. Appl. 223 (1998), 347–353.
- [8] P. YAN, G. SUN, *A strengthened Carleman’s inequality*, J. Math. Anal. Appl. 240 (1999), 290–293.
- [9] X. YANG, *On Carleman’s inequality*, J. Math. Anal. Appl. 253 (2001), 691–694.
- [10] S. KAISER, L.-E. PERSSON AND A. ÖBERG, *On Carleman and Knopp’s inequalities*, J. Approx. Theory. 117 (2002), 140–151.
- [11] G. PENG, *A note on Hardy-type inequalities*, Proc. Amer. Math. Soc. 133 (2005), 1977–1984.
- [12] C. MORTICI, Y. HU, *A Carleman’s inequality refinement note*, Stud. Res. Ser. Math. Inform. 21 (2011), 41–44.
- [13] B. YANG, *On Hardy’s inequality*, J. Math. Anal. Appl. 234 (1999), 717–722.
- [14] P. YAN, *On the extended Hardy’s inequality*, Int. J. Math. Math. Sci. 27 (2001), 765–768.
- [15] A. ČIŽMEŠIJA, J. PEĆARIĆ, *On strengthened weighted Carleman’s inequality*, Bull. Austral. Math. Soc. 68 (2003), 481–490.
- [16] C.-P. CHEN, W.-S. CHEUNG, AND F. QI, *Note on weighted Carleman-type inequality*, Int. J. Math. Math. Sci. 3 (2005), 475–481.
- [17] G. SUNOUCHI, N. TAKAGI, *A generalization of the Carleman’s inequality theorem*, Proc. Phy-Math. Soc. Japan. 16 (1934), 164–166.
- [18] D. S. MITRINOVIĆ, J. E. PEĆARIĆ, AND A. M. FINK, *Inequalities Involving Functions and Their Integrals and Derivatives*, Kluwer Academic Publishers, 1991.
- [19] J. PEĆARIĆ, K. B. STOLARSKY, *Carleman’s inequality: history and new generalizations*, Aequationes Math. 61 (2001), 49–62.