

IMPROVEMENTS OF THE HERMITE–HADAMARD INEQUALITY ON TIME SCALES

RABIA BIBI, JOSIP PEČARIĆ AND JURICA PERIĆ

Abstract. In this paper we give refinements of converse Jensen's inequality as well as of the Hermite–Hadamard inequality on time scales. We give mean value theorems and investigate logarithmic and exponential convexity of the linear functionals related to the obtained refinements. We also give several examples which illustrate possible applications for our results.

Mathematics subject classification (2010): 26D15, 34N05, 28A25.

Keywords and phrases: Integration, time scale, Hermite–Hadamard inequality, converse Jensen's inequality.

REFERENCES

- [1] M. ANWAR, R. BIBI, M. BOHNER AND J. PEČARIĆ, *Integral inequalities on time scales via the theory of isotonic linear functionals*, Abstr. Appl. Anal., **2011**, (2011), Article ID 483595, 1–16.
- [2] M. BOHNER AND G. SH. GUSEINOV, *Multiple integration on time scales*, Dynam. Systems Appl., **2006**, 14 (2005), no. 3–4, 579–606.
- [3] M. BOHNER AND G. SH. GUSEINOV, *Multiple Lebesgue integration on time scales*, Adv. Difference Equ., **2006**, (2006), Article ID 26391, 1–12.
- [4] M. BOHNER AND A. PETERSON, *Dynamic Equations on Time Scales: An Introduction with Applications*, Birkhäuser, Boston, 2001.
- [5] M. BOHNER AND A. PETERSON, *Advances in Dynamic Equations on Time Scales: An Introduction with Applications*, Birkhäuser, Boston, Massachusetts, 2003.
- [6] J. JAKŠETIĆ AND J. PEČARIĆ, *Exponential Convexity Method*, J. Convex Anal., **20**, 1 (2013), 181–197.
- [7] M. KLARIČIĆ BAKULA, J. PEČARIĆ AND J. PERIĆ, *Extensions of the Hermite–Hadamard inequality with applications*, Math. Inequal. Appl., **15**, 4 (2012), 899–921.
- [8] M. KLARIČIĆ BAKULA, J. PEČARIĆ AND J. PERIĆ, *On the converse Jensen Inequality*, Appl. Math. Comput., **218**, 11 (2012), 6566–6575.
- [9] J. PEČARIĆ AND J. PERIĆ, *Improvements of the Giaccardi and the Petrović inequality and related stolarsky type means*, An. Univ. Craiova Ser. Mat. Inform., **39**, 1 (2012), 65–75.
- [10] J. PEČARIĆ, J. PERIĆ, *Remarks on the paper “Jensen’s inequality and new entropy bounds” of S. Simić*, J. Math. Inequal., **6**, 4 (2012), 631–636.
- [11] J. E. PEČARIĆ, F. PROSCHAN, AND Y. L. TONG, *Convex Functions, Partial Orderings, and Statistical Applications*, volume 187 of Mathematics in Science and Engineering, Academic Press Inc., Boston, MA, 1992.