

NEW WEIGHTED ČEBYŠEV–OSTROWSKI TYPE INTEGRAL INEQUALITIES ON TIME SCALES

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Abstract. In this paper we obtain some weighted Čebyšev-Ostrowski type integral inequalities on time scales involving functions whose first derivatives belong to $L_p(a, b)$ ($1 \leq p \leq \infty$). We also give some other interesting inequalities as special cases.

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REFERENCES

- [1] R. AGARWAL, M. BOHNER, A. PETERSON, *Inequalities on time scales: a survey*, Math. Inequal. Appl., **4** (2001), 535–557.
- [2] F. AHMAD, N. M. MIR, A. RAFIQ, *Weighted Čebyšev Type inequalities involving functions whose first derivatives belong to $L_p(a, b)$, $\forall (1 \leq p < \infty)$* , Kragujevac J. Math. **32** (2009), 13–26.
- [3] G. ANASTASSIOU, *Duality principle of time scales and inequalities*, Appl. Anal., **89** (2010), 1837–1854.
- [4] M. BOHNER, A. PETERSON, *Dynamic Equations on Time Scales*, An Introduction with Applications, Birkhäuser Boston, Inc., Boston, MA, 2001.
- [5] M. BOHNER, A. PETERSON, *Advances in Dynamic Equations on Time Scales*, Birkhäuser Boston, Boston, MA, 2003.
- [6] M. BOHNER, T. MATTHEWS, *The Grüss inequality on time scales*, Commun. Math. Anal., **3** (2007), 1–8.
- [7] M. BOHNER, T. MATTHEWS, *Ostrowski inequalities on time scales*, JIPAM. J. Inequal. Pure Appl. Math., **9** (2008), Article 6, 8 pp.
- [8] M. BOHNER, T. MATTHEWS, A. TUNA, *Diamond-alpha Grüss type inequalities on time scales*, Int. J. Dyn. Syst. Differ. Equ., **3** (2011), 234–247.
- [9] M. BOHNER, T. MATTHEWS, A. TUNA, *Weighted Ostrowski–Grüss inequalities on time scales*, African Diaspora Journal of Mathematics, Volume 12, Number 1, 2011, 89–99.
- [10] C. DINU, *Ostrowski type inequalities on time scales*, An. Univ. Craiova Ser. Mat. Inform., **34** (2007), 43–58.
- [11] S. HILGER, *Ein Maßkettenkalkül mit Anwendung auf Zentrumsmannigfaltigkeiten*, Ph. D. thesis, Universität Würzburg, Würzburg, Germany, 1988.
- [12] B. KARPUZ, U. M. OZKAN, *Generalized Ostrowski’s inequality on time scales*, JIPAM. J. Inequal. Pure Appl. Math., **9** (2008), Article 112, 7 pp.
- [13] V. LAKSHMIKANTHAM, S. SIVASUNDARAM, B. KAYMAKCALAN, *Dynamic Systems on Measure Chains*, Mathematics and its Applications, 370, Kluwer Academic Publishers Group, Dordrecht, 1996.
- [14] W. J. LIU, Q.-A. NGÔ, *An Ostrowski-Grüss type inequality on time scales*, Comput. Math. Appl., **58** (2009), 1207–1210.
- [15] W. J. LIU, Q.-A. NGÔ, *A generalization of Ostrowski inequality on time scales for k points*, Appl. Math. Comput., **203** (2008), 754–760.
- [16] W. J. LIU, Q.-A. NGÔ, W. B. CHEN, *A perturbed Ostrowski-type inequality on time scales for k points for functions whose second derivatives are bounded*, J. Inequal. Appl., 2008, Art. ID 597241, 12 pp.

- [17] W. J. LIU, Q.-A. NGÔ, W. B. CHEN, *A new generalization of Ostrowski type inequality on time scales*, An. Ştiinţ. Univ. "Ovidius" Constanţa, **17** (2009), 101–114.
- [18] W. J. LIU, A. TUNA, *Weighted Ostrowski, trapezoid and Grüss type inequalities on time scales*, J. Math. Inequal., **6** (2012), 381–399.
- [19] Q.-A. NGÔ, W. J. LIU, *A sharp Grüss type inequality on time scales and application to the sharp Ostrowski-Grüss inequality*, Commun. Math. Anal., **6** (2009), 33–41.
- [20] A. OSTROWSKI, *Über die Absolutabweichung einer differentiierbaren Funktion von ihrem Integralmittelwert*, Comment. Math. Helv., **10** (1937), 226–227.
- [21] A. RAFIQ, A. M. MIR, F. AHMAD, *Weighted Čebyšev-Ostrowski type inequalities*, Applied mathematics and Mechanics (English Edition), **28** (7) (2007), 901–906.
- [22] M. Z. SARIKAYA, *A note on Grüss type inequalities on time scales*, Dynam. Systems Appl., **17** (2008), 663–666.
- [23] M. Z. SARIKAYA, *New weighted Ostrowski and Čebyšev type inequalities on time scales*, Computers & Mathematics with Applications, Volume 60 Issue 5, September, 2010, 1510–1514.
- [24] M. Z. SARIKAYA, N. AKTAN, H. YILDIRIM, *On weighted Čebyšev-Grüss type inequalities on time scales*, J. Math. Inequal., **2** (2008), 185–195.
- [25] M. R. SIDI AMMI, D. F. M. TORRES, *Combined dynamic Grüss inequalities on time scales*, J. Math. Sci. (N. Y.), **161** (2009), 792–802.
- [26] A. TUNA, D. DAGHAN, *Generalization of Ostrowski and Ostrowski-Grüss type inequalities on time scales*, Comput. Math. Appl., **60** (2010), 803–811.
- [27] A. TUNA, Y. JIANG, W. J. LIU, *Weighted Ostrowski, Ostrowski-Grüss and Ostrowski-Čebyšev Type Inequalities on Time Scales*, Publ. Math. Debrecen, **81** (2012), 81–102.
- [28] C. C. YEH, F. H. WONG, H. J. LI, *Čebyšev's inequality on time scales*, Journal of Inequalities in Pure and Applied Mathematics, Volume 6, Issue 1, Article 7, 2005.