Ostrowski type inequalities on time scales for double integrals

Liu W., Ngo Q.A., Chen W.

College of Mathematics and Physics, Nanjing University of Information Science and Technology, Nanjing 210044, China; Department of Mathematics, College of Science, Vietnam National University, Hanoi, Viet Nam; Department of Mathematics, National University of Singapore, 2 Science Drive 2, Singapore 117543, Singapore

Abstract: In this paper we first derive an Ostrowski type inequality on time scales for double integrals via ????-integral which unify corresponding continuous and discrete versions. We then replace the ????-integral by the ?? ??-, ?? ??-, and ?? ??-integrals and get completely analogous results. ?? 2009 Springer Science+Business Media B.V.

Author Keywords: Double integrals; Ostrowski inequality; Time scales

Index Keywords: Double integrals; ON time; Ostrowski type inequality; Time-scales; Time measurement; Difference equations

Year: 2010

Source title: Acta Applicandae Mathematicae

Volume: 110

Issue: 1

Page : 477-497

Cited by: 2

Link: Scorpus Link

Correspondence Address: Liu, W.; College of Mathematics and Physics, Nanjing University of Information Science and Technology, Nanjing 210044, China; email: wjliu@nuist.edu.cn

ISSN: 1678019

CODEN: AAMAD

DOI: 10.1007/s10440-009-9456-y

Language of Original Document: English

Abbreviated Source Title: Acta Applicandae Mathematicae

Document Type: Article

Source: Scopus

Authors with affiliations:

1. Liu, W., College of Mathematics and Physics, Nanjing University of Information Science and Technology, Nanjing 210044, China
2. Ng??, Q.A., Department of Mathematics, College of Science, Vietnam National University, Hanoi, Viet Nam, Department of Mathematics, National University of Singapore, 2 Science Drive 2, Singapore 117543, Singapore
3. Chen, W., College of Mathematics and Physics, Nanjing University of Information Science and Technology, Nanjing 210044, China

References:

1. Agarwal, R., Bohner, M., Peterson, A., Inequalities on time scales: A survey (2001) Mathematical Inequalities and Applications, 4 (4), pp. 535-557
2. Almeida, R., Torres, D.F.M., Isoperimetric problems on time scales with nabla derivatives J. Vibr. Control, , http://arxiv.org/abs/0811.3650, (in press)
3. Atici, F.M., Biles, D.C., Lebedinsky, A., An application of time scales to economics (2006) Math. Comput. Model., 43 (78), pp. 718-726. , 05241166 10.1016/j.mcm.2005.08.014 2218315
4. Bohner, M., Guseinov, G.Sh., Partial differentiation on time scales (2004) Dynamic Systems and Applications, 13 (3-4), pp. 351-379
5. Bohner, M., Guseinov, G.Sh., Multiple integration on time scales (2005) Dynamic Systems and Applications, 14 (3-4), pp. 579-606
6. Bohner, M., Guseinov, G.Sh., Double integral calculus of variations on time scales (2007) Computers and Mathematics with Applications, 54 (1), pp. 45-57. , DOI 10.1016/j.camwa.2006.10.032, PII S0898122107001757
7. Bohner, M., Matthews, T., The Gr?ss inequality on time scales (2007) Commun. Math. Anal., 3 (1), pp. 1-8. , 1167.26317 2347770
8. Bohner, M., Matthews, T., Ostrowski inequalities on time scales (2008) J. Inequal. Pure Appl. Math., 9 (1), p. 8. , 2391273
9. Bohner, M., Peterson, A., (2001) Dynamic Equations on Time Scales, , Birkh??user Basel 0978.39001
10. Bohner, M., Peterson, A., (2003) Advances in Dynamic Equations on Time Scales, , Birkh??user Basel 1025.34001
11. Dragomir, S.S., Wang, S., A new inequality of Ostrowski's typ in L1 norm and applications to some special means and to some numerical quadrature rules (1997) TAMKANG JOURNAL OF MATHEMATICS, 28 (3), pp. 239-244
12. Dragomir, S.S., Wang, S., Applications of Ostrowski's inequality to the estimation of error bounds for some special means and for some numerical quadrature rules (1998) Applied Mathematics Letters, 11 (1), pp. 105-109. , PII S0893965997001420
13. Dragomir, S.S., Cerone, P., Barnett, N.S., Roumeliotis, J., An inequality of the Ostrowski type for double integrals and applications for cubature formulae (1999) RGMIA Res. Rep. Collect., 2, pp. 781-796
14. Ferreira, R.A.C., Sidi Ammi, M.R., Torres, D.F.M., Diamond-alpha integral inequalities on time scales (2009) Int. J. Math. Stat., 5 (A09), pp. 52-59. , 2446702
15. Hilger, S., (1988) Ein Makettenkalk?l Mit Anwendung Auf Zentrmsmannigfaltingkeiten, , Ph.D. thesis, Univarsi. W?rzburg
16. Hilscher, R., A time scales version of a Wirtinger-type inequality and applicationsk (2002) Journal of Computational and Applied Mathematics, 141 (1-2), pp. 219-226. , DOI 10.1016/S0377-0427(01)00447-2, PII S0377042701004472
17. Lakshmikantham, V., Sivasundaram, S., Kaymakcalan, B., (1996) Dynamic Systems on Measure Chains, , Kluwer Academic Dordrecht 0869.34039
18. Liu, W.J., An Ostrowski-Gr?ss Type Inequality on Time Scales, , arXiv:0804.3231
19. Liu, W.J., Ng??, Q.A., A generalization of Ostrowski inequality on time scales for k points (2008) Appl. Math. Comput., 203, pp. 754-760. , 1169.26308 10.1016/j.amc.2008.05.124 2458991
20. Liu, W.J., An Ostrowski type inequality on time scales for functions whose second derivatives are bounded Inequality Theory and Applications, 6. , Nova Science Publishers, New York (2009, to appear)
21. Liu, W.J., Xue, Q.L., Wang, S.F., Several new perturbed Ostrowski-like type inequalities (2007) J. Inequal. Pure Appl. Math., 8 (4), p. 6. , 2366264
22. Liu, W.J., Li, C.C., Hao, Y.M., Further generalization of some double integral inequalities and applications (2008) Acta. Math. Univ. Comen., 77 (1), pp. 147-154. , 1164.26017 2412405
23. Liu, W.J., A perturbed Ostrowski type inequality on time scales for k points for functions whose second derivatives are

bounded (2008) J. Inequal. Appl., p. 12. , Article ID 597241

24. Martins, N., Torres, D.F.M., Calculus of variations on time scales with nabla derivatives (2008) Nonlinear Anal., , 10.1016/j.na.2008.11.035
25. Mitrinovi?, D.S., Pecari?, J.E., Fink, A.M., (1991) Inequalities Involving Functions and Their Integrals and Derivatives, , Kluwer Academic Dordrecht 0744.26011
26. Mitrinovi?, D.S., Pecari?, J., Fink, A.M., (1993) Classical and New Inequalities in Analysis, , Kluwer Academic Dordrecht 0771.26009
27. Ostrowski, A.M., ??ber die Absolutabweichung einer differentiebaren Funktion von ihrem Integralmitelwert (1938) Comment. Math. Helv., 10, pp. 226-227. , 10.1007/BF01214290 1509574
28. Ozkan, U.M., Yildirim, H., Ostrowski type inequality for double integrals on time scales (2009) Acta Appl. Math., , 10.1007/s10440-008-9407-z
29. Ozkan, U.M., Yildirim, H., Steffensen's integral inequality on time scales (2007) J. Inequal. Appl., p. 10. , Article ID 46524
30. Ozkan, U.M., Yildirim, H., Hardy-knopp-type inequalities on time scales (2008) Dyn. Syst. Appl., 17, pp. 477-486. , 2569514
31. Ozkan, U.M., Sarikaya, M.Z., Yildirim, H., Extensions of certain integral inequalities on time scales (2008) Appl. Math. Lett., 21, pp. 993-1000. , 10.1016/j.aml.2007.06.008 2450628
32. Pachpatte, B.G., On an inequality of Ostrowski type in three independent variables (2000) J. Math. Anal. Appl., 249, pp. 583-591. , 0969.26018 10.1006/jmaa.2000.6913 1781243
33. Rogers Jr., J.W., Sheng, Q., Notes on the diamond-? dynamic derivative on time scales (2007) Journal of Mathematical Analysis and Applications, 326 (1), pp. 228-241. , DOI 10.1016/j.jmaa.2006.03.004, PII S0022247X06002344
34. Sheng, Q., Fadag, M., Henderson, J., Davis, J.M., An exploration of combined dynamic derivatives on time scales and their applications (2008) Nonlinear Anal.: Real World Appl., 7 (3), pp. 395-413. , 10.1016/j.nonrwa.2005.03.008 2235865
35. Sidi Ammi, M.R., Ferreira, R.A.C., Torres, D.F.M., Diamond-? Jensen's inequality on time scales (2008) J. Inequal. Appl., p. 13. , (2008). Article ID 576876
36. Wong, F.-H., Yu, S.-L., Yeh, C.-C., Anderson's inequality on time scales (2007) Appl. Math. Lett., 19, pp. 931-935. , 10.1016/j.aml.2005.07.011 2240487