

PARTIAL Δ -DIFFERENTIATION FOR MULTIVARIABLE FUNCTIONS ON n -DIMENSIONAL TIME SCALES

MEHMET ZEKİ SARİKAYA, NESIP AKTAN,
HÜSEYİN YILDIRIM AND KAZIM İLARSLAN

Abstract. The general idea of this paper is to study a differential calculus for multivariable functions on time scales. Such a calculus can be used to develop a theory of partial dynamic equations on time scales.

Mathematics subject classification (2000): 26B05, 39A10, 26B10, 53A45.

Keywords and phrases: time scales, delta differentiable, completely delta differentiable, directional derivative.

REFERENCES

- [1] C. D. AHLBRANDT, M. BOHNER AND J. RIDENOUR, *Hamiltonian systems on time scales and some of its applications*, J. Math. Anal. Appl., **250**, 2 (2000), 561–578.
- [2] N. AKTAN, M. Z. SARİKAYA, K. İLARSLAN AND H. YILDIRIM, *Directional ∇ -derivative and curves on n -dimensional Time Scales*, Acta Appl. Math., **105** (2009), 45–63.
- [3] T. M. APOSTOL, *Mathematical analysis*, Addison-Wesley, Reading, second edition, 1974.
- [4] F. M. ATICI AND G. SH. GUSEINOV, *On Green's functions and positive solutions for boundary value problems on time scales*, J. Comput. Appl. Math., **141** (2002), 75–99.
- [5] M. BOHNER AND A. PETERSON, *Dynamic equations on time scales*, An Introduction with Appl., Birkhauser, Boston, 2001.
- [6] M. BOHNER AND A. PETERSON, *Advances in dynamic equations on time scales*, Birkhauser Boston, Massachusetts, 2003.
- [7] M. BOHNER AND G. SH. GUSEINOV, *Partial differentiation on time scales*, Dyn. Syst. Appl., **13** (2004), 351–379.
- [8] G. SH. GUSEINOV AND B. KAYMAKÇALAN, *On a disconjugacy criterion for second order dynamic equations on time scales*, J. Comput. Appl. Math., **141** (2002), 187–196.
- [9] S. HILGER, *Ein Maßkettenkalkül mit Anwendung auf Zentrumsmannigfaltigkeiten*, PhD thesis, Universität Würzburg, 1988.
- [10] S. M. NIKOLSKY, *A course of mathematical analysis*, Volume 1, Mir Publishers, Moscow, 1977.
- [11] U. M. ÖZKAN AND H. YILDIRIM, *Hardy-Knopp-type inequalities on time scales*, Dyn. Syst. Appl., **17** (2008), 477–486.
- [12] U. M. ÖZKAN M. Z. SARİKAYA AND H. YILDIRIM, *Extensions of certain integral inequalities on time scales*, Appl. Math. Letters, Vol. 21, Issue 10, 993–1000, 2008.
- [13] M. Z. SARİKAYA, U. M. ÖZKAN AND H. YILDIRIM, *Time scale integral inequalities similar to Qi's inequality*, J. Inequal. Pure and Appl. Math., **7**, 4 (2006), Art.128.
- [14] M. Z. SARİKAYA, N. AKTAN AND H. YILDIRIM, *On weighted Čebyšev-Grüss type inequalities time scale*, J. Math. Inequal., **2**, 2 (2008), 185–195.
- [15] M. Z. SARİKAYA, *A Note On Grüss type inequalities on time scales*, Dyn. Syst. Appl., **17** (2008), 663–666.