Nonlinear Volterra difference equations with time delays and their applications

ESSAM AWWAD

Department of Mathematics, University of Pannonia, 8200–Veszprém, Hungary

E-mail address: esam_mh@yahoo.com

This article studies the boundedness property of the solutions of nonlinear Volterra difference equations with time delays.

The most important result of this paper is a simple new criterion, which unifies and extends several earlier results (see [1, 2, 3]). We show some results on the critical case for the solutions of Volterra difference equations with time delay to be bounded. Examples are also given to illustrate our main theorems.

It is a joint work with Prof. István Győri and Prof. Ferenc Hartung, Department of Mathematics, Faculty of Information Technology, University of Pannonia, Veszprém, Hungary.

References

- J.A.D. Appleby, I. Győri, D. Reynolds, On exact convergence rates for solutions of linear systems of Volterra difference equations, J. Diff. Equ. Appl. 12(12) (2006) 1257–1275.
- [2] I. Győri, E. Awwad, On the boundedness of the solutions in nonlinear discrete *Volterra difference equations*, Adv. Difference Equ., 2012, 2012:2.
- [3] I. Győri, D. Reynolds, *Sharp conditions for boundedness in linear discrete Volterra equations*, J. Diff. Equ. Appl. **15** (2009) 1151–1164