

ON THE OSCILLATORY AND ASYMPTOTIC BEHAVIOR OF CERTAIN FOURTH ORDER DIFFERENCE EQUATIONS

SAID R. GRACE* RAVI P. AGARWAL†
SANDRA PINELAS‡

January 20, 2011

Abstract

Some new criteria for the oscillatory and asymptotic behavior of solutions of the fourth order difference equation

$$\Delta^2 (a(k) (\Delta^2 x(k))^\alpha) - q(k) f(x(g(k))) = 0$$

with the property that $x(k)/k \rightarrow 0$ as $k \rightarrow \infty$ are established.

34C10, 34C15 Difference equation, asymptotic behavior, fourth order, oscillation.

*Department of Engineering Mathematics, Faculty of Engineering, Cairo University, Orman, Giza 12221, Egypt. E-mail: srgrace@eng.cu.eg

†Department of Mathematical Sciences, Florida Institute of Technology, Melbourne, FL 32901, U.S.A. E-mail: agarwal@fit.edu

‡Departamento de Matemática, Universidade dos Açores, Portugal. E-mail: sandra.pinelas@clix.pt