

Title: On the oscillation of certain integral equations

Author(s): John R. Graef, Said R. Grace and Ercan Tunç

The authors present conditions under which every nonoscillatory solution x of the integral equation

$$x(t) = e(t) - \int_c^t (t-s)^{\alpha-1} k(t,s)f(s,x(s))ds, \quad c > 1, \quad 0 < \alpha \leq 1,$$

satisfies

$$|x(t)| = O(t) \quad \text{as } t \rightarrow \infty, \quad \text{i.e., } \limsup_{t \rightarrow \infty} \frac{|x(t)|}{t} < \infty.$$

They also establish some sufficient conditions to ensure the oscillation of all solutions of this equation. The results obtained extend previous results in the literature, and the technique employed can be applied to some related integral equations that are equivalent to certain fractional differential equations.

Address:

John R. Graef
Department of Mathematics
University of Tennessee
at Chattanooga
Chattanooga, TN 37403
USA

Address:

Said R. Grace
Department of Engineering Mathematics
Faculty of Engineering
Cairo University
Orman, Giza 12221
Egypt

Address:

Ercan Tunç
Department of Mathematics
Faculty of Arts and Sciences
Gaziosmanpasa University
60240, Tokat Turkey