

Abstract

The Volterra Integro-differential equations find applications in demography, the study of viscoelastic materials, and in insurance mathematics through the renewal equations. Basic qualitative results about Volterra integro-differential equations have been studied by many authors.

Motivated by the interesting nature of this problem, an attempt has been made to study some properties of the solution of Volterra Integro-differential equations of the form

$$x'(t) = A(t)x(t) + \int_s^t K(t, u)x(u)du + g(t)$$

where $0 \leq s \leq t < \infty$, x and g are n vector valued functions and A and K are $n \times n$ matrix valued functions.

Moreover, we will investigate the properties of the solution of matrix Volterra integro-differential equations on time scales.