1051-39-135

Jeffrey J DaCunha^{*} (jeffrey_dacunha@yahoo.com), 4801 Clayton Ct., Midland, TX 79707. Classification of forms of the solutions to time varying and time invariant linear dynamic systems. Preliminary report.

The intent of this paper is to classify the structure of the solutions to first order systems of dynamic equations on time scales as well as provide bounds of the solutions in terms of time scales exponential functions. In a previous paper, the Peano-baker series is introduced for time varying and time invariant system matrices in the generalized time scales case. There is an infinite series representation given for the matrix exponential when the system matrix is constant.

In this paper, we show that the form of the $n \times n$ matrix exponential (as a solution to a first order system of dynamic equations) is an extension of the solution in the scalar case.

In this paper, we examine the form of the solution to dynamic systems when the time varying matrix commutes with its integral (known as Lappo-Danilevskii systems). It is the author's hope that these new structures of the transition matrix and the matrix exponential will offer easier calculations for solutions to time varying and time invariant linear dynamic systems on general time scales. (Received August 21, 2009)