

Uniform Exponential Stability of Volterra Integro-Dynamic Equations on Time Scales

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Abstract: We introduce new sufficient conditions for boundedness and exponential stability of nonlinear n -dimensional Volterra integro-dynamic equations on unbounded time scales using Lyapunov's first method. To achieve this result, we reduce the n -dimensional equation to a corresponding scalar equation using the definition of matrix measure and a simplified proof of Coppel's inequality on the time scales. This research aims to prove the relationship between boundedness, exponential stability, and matrix measure on time scales.

Russo and Wirth introduced the concept of matrix measure on time scales, thus extending the concept of logarithmic norm on time scales.

Keywords: Volterra integro-dynamic equations, time scales, matrix measure, Coppel's inequality, boundedness, exponential stability.

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