

On stability for time scale dynamical systems

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We study systems on time scales that are generalizations of classical differential or difference equations and appear in numerical methods. We consider linear systems and their small nonlinear perturbations. In terms of time scales and of eigenvalues of matrices we formulate conditions, sufficient for stability by linear approximation. We use techniques of central upper Lyapunov exponents (a common tool of the theory of linear ODEs) to study stability of solutions. We develop a new technique to demonstrate that methods of non-autonomous linear ODE theory may work for time-scale dynamics. Also, a time scale version of the famous Chetaev theorem on conditional instability are proved.

The talk is based on joint paper with Sergey Kryzhevich [1].

References

1. S. Kryzhevich, A. Nazarov, Stability by linear approximation for time scale dynamical systems // JMAA, to appear. Preprint available at <http://arxiv.org/abs/1512.02272>.