

Abstract

In this thesis, we study the discrete approximation of impulsive and switching system with variable time of impulses. The thesis consists of 3-chapters. The first chapter contains introduction and main definitions and notations as well as some preliminaries results.

In the second chapter we study impulsive systems in case of absence of beating phenomena. The main qualitative properties of such systems as existence and uniqueness of the solution are proved. Numerical example for impulsive switching system is provided.

In the third chapter, we study Runge-Kutta method with beating phenomena. Some numerical examples and basic results in case of beating phenomena are being discussed. In that case it is possible the solution to die, i.e. the solution is bounded but not extendable. Numerical examples are provided.