



Analysis of a Set of Trajectories of Generalized Standard Systems: Averaging Technique

Dedicated to the Memory of Yu. A. Mitropolsky

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Abstract: For standard form nonlinear equations with Hukuhara derivative, estimates of deviation of a set of exact solutions from the averaged ones are established and the deviation of a set of trajectories of averaged equations from the equilibrium state is specified in terms of pseudo-linear integral inequalities. Sets of affine systems and problems of approximate integrations and stability over finite interval are considered as applications.

Keywords: *set of standard equations; estimates of set of solutions; set of affine systems; finite-time stability.*

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Introduction

The averaging technique developed in the framework of nonlinear mechanics is a powerful tool widely used for the analysis of nonlinear systems found in various applied investigations (see [1–3] and bibliography therein).

The differential equation with Hukuhara derivative was first considered in [4], where its solution was shown to be a multivalued mapping. In the following papers a lot of authors (see [5, 6] and bibliography therein) established conditions for existence, uniqueness and convergence of successive approximate solutions and many other results. Moreover,

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