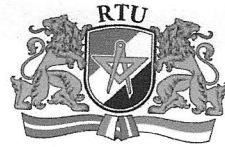




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The Complete Bifurcation Analysis of Boost DC-DC Converter

(M.sc.ing. D.Pikulin)

This paper is concerned with the problem of full bifurcation analysis in piecewise linear systems with controllable switching. Models of this kind of systems are widely used in engineering practice in particular in power electronic converters. In distinction to majority of known researches and methods this paper presents novelty approach, allowing the complete bifurcation analysis. Exact analytical methods for the search of periodic regimes and their stability estimation are used along with various numerical computation techniques. Main results are illustrated on one of the simplest forms of switching converters – step-up (boost) converter, for which the complete one-parametric bifurcation diagrams and two-parametric diagrams are constructed. The results include – the detection of various types of rare attractors, smooth and non-smooth events and the investigation of different principles of birth of chaotic attractors.

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