STABILITY IMPROVEMENT OF THE IMPACT DYNAMICAL SYSTEMS - ANALYTICAL AND NUMERICAL METHODS

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In this paper attention is focused on stabilisation improvement of periodic orbits of a one - and two-degree-of-freedom nonautonomous vibro-impact systems. This approach, among others, includes two (not solved up to now) problems.

1. A possibility of sufficient stability improvement of the considered vibro-impact periodic motion using a feedback loop control is presented. The simulations are carried out using the MATLAB-Simulink environment.

2. An original analytical averaging technique applied to a one-degree-of-freedom system in the resonance as well as non-resonance cases is demonstrated. It enables one to predict the efficient delay loop coefficients in order to achieve the desired stabilisation. In addition, an efficient delay loop control applied to a two-degree-of-freedom system is proposed and illustrated.