

عنوان مقاله:

Tuned Liquid Column Damper for Controlling Non-Linear Friction Driven Oscillator

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خلاصه مقاله:

In this paper, the dynamic behavior of a block-on-belt system subjected to harmonic external excitations is studied. The block is attached to a fixed support through a non-linear spring and linear viscous damper. The belt moves over a pair of pulleys one of which is driven by a non-ideal motor. Investigation the oscillations of the block through the variation of excitation frequency, shows that the system presents some interesting nonlinear phenomena near the fundamental resonance region, including multi-periodic and chaotic motion. When the effect of the static and dynamic friction is considered and the velocity of the mass block is the same as the belt, the phenomenon of no sliding or stick occurs and the oscillating system is excited or damped by the static friction with larger intensity. The control of the chaotic motion of this system using Tuned liquid column dampers (TLCD) is analyzed. The response of the system is studied through the wide range of length ratio of the U-tube. Our numerical results suggest that Tuned liquid column dampers with specific length ratio are effective to suppress chaos and the response of the system lies on periodic oscillations.

کلمات کلیدی:

tuned liquid column damper , chaotic oscillations , Friction-Driven oscillator , TLCD

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