عنوان مقاله:

Semi-Active Pulse-Switching SSDC Vibration Suppression using Magnetostrictive Materials

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خلاصه مقاله:

One of the best vibration control methods using smart actuators are semi-active approaches which are as strong as active methods and need no external energy supply such as passive ones. Compared with piezoelectric-based, magnetostrictive-based control methods have higher coupling efficiency, higher Curie temperature, higher flexibility to be integrated with curved structures and no depolarization problems. Semi-active methods are well-developed for piezoelectrics but magnetostrictive-based approaches are not as efficient, powerful and well-known as piezoelectric-based methods. The aim of this work is to propose a powerful semi-active control method using magnetostrictive actuators. In this paper a new type of semi-active suppression methods using magnetostrictive materials is introduced which contains an equipped vibrating structure with magnetostrictive patches wound by a pick-up coil connected to an electronic switch and a capacitor. The novelty of the proposed damping method is switching on the coil current signal using mentioned switch and capacitor which is briefly named SSDC (synchronized switch damping on capacitor). In this paper the characteristics of the semi-active pulse-switching damping technique with magnetostrictive materials are studied and numerical results show significant damping for almost all types of excitations.

کلمات کلیدی:

Pulse-switching, Magnetostrictive materials, Semi-active, Vibration control

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