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“New vibration absorbers and control devices: Piezo-electric systems, energy harvesting and nonlinear energy sinks”

Piezoelectromechanical Structures: a new concept for vibration control

by

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Abstract

A piezo-electromechanical structural member is composed of a host member, a uniformly distributed array of piezoelectric transducers and a passive electric circuit (acting as a controller) interconnecting their electric terminals. Such a circuit has to be designed to assure the most efficient transduction of mechanical into electrical energy. The needed circuits can be synthesized for bars, beams and plates and the performances of the corresponding PEM structures are determined. Once suitable dissipative elements are included in the controller, we prove that, in Piezoelectromechanical structures, mechanical vibrations are the most efficiently damped