



Multimodal Vibration Damping of a Smart Beam Structure using Modal SSDI-Max Technique

Submitted by Bouchta Sahraoui on Tue, 05/26/2015 - 14:46

Titre	Multimodal Vibration Damping of a Smart Beam Structure using Modal SSDI-Max Technique
Type de publication	Article de revue
Auteur	Chérif, A. [1], Richard, C. [2], Guyomar, D. [3], Meddad, M. [4], Eddiai, A. [5], Boughaleb, Yahia [6], Migalska-Zalas, A. [7], Zawadzka, Anna [8], Hajjaji, A. [9], Sahraoui, Bouchta [10]
Pays	Etats-Unis
Editeur	Old City Publishing
Ville	Philadelphia
Type	Article scientifique dans une revue à comité de lecture
Année	2015
Langue	Anglais
Date	01/2015
Numéro	1
Pagination	1-18
Volume	1
Titre de la revue	Nonlinear Optics, Quantum Optics
ISSN	1944-8325

Résumé en anglais

Advanced materials such as carbon fiber, composite materials et al. are more and more used in modern industry. They make the structures lighter and Stiffer. However, they bring vibration problems. Researchers studied numerous methods to eliminate the undesirable vibrations. These treatments are expected to be a compact, light, intellectual and modular system. Recently, nonlinear techniques which are known as Synchronized Switch Damping (SSD) technique was proposed. These techniques synchronously switched when structure got to its displacement extremes that leading to a nonlinear voltage on the piezoelectric elements. This paper presents a performance analysis of an improved modal SSDI approach called "SSDI Max". The particularity of this new approach is to maximize the self generated voltage amplitude by a proper definition of the switch instants according to the chosen targeted mode. This paper presents simulations performed on a model representative of a smart beam. Damping results are given in the case of multimodal excitations. The paper analyses the control time window influence on the damping performance of the system. Results show that substantial damping increase can be obtained with very slight modification of the control architecture and the same control energy.

URL de la notice	http://okina.univ-angers.fr/publications/ua11857 [11]
DOI	10.1007/s11082-016-0467-4 [12]

Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=20846](http://okina.univ-angers.fr/publications?f[author]=20846)
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=20847](http://okina.univ-angers.fr/publications?f[author]=20847)
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=20848](http://okina.univ-angers.fr/publications?f[author]=20848)
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=20849](http://okina.univ-angers.fr/publications?f[author]=20849)
- [5] [http://okina.univ-angers.fr/publications?f\[author\]=20850](http://okina.univ-angers.fr/publications?f[author]=20850)
- [6] [http://okina.univ-angers.fr/publications?f\[author\]=20811](http://okina.univ-angers.fr/publications?f[author]=20811)
- [7] [http://okina.univ-angers.fr/publications?f\[author\]=20852](http://okina.univ-angers.fr/publications?f[author]=20852)
- [8] [http://okina.univ-angers.fr/publications?f\[author\]=20792](http://okina.univ-angers.fr/publications?f[author]=20792)
- [9] [http://okina.univ-angers.fr/publications?f\[author\]=20853](http://okina.univ-angers.fr/publications?f[author]=20853)
- [10] <http://okina.univ-angers.fr/bouchta.sahraoui/publications>
- [11] <http://okina.univ-angers.fr/publications/ua11857>
- [12] <http://dx.doi.org/10.1007/s11082-016-0467-4>

Publié sur *Okina* (<http://okina.univ-angers.fr>)