

# Multi-mode solutions in non-linear periodic lattices for energy harvesting applications

Diala Bitar<sup>a</sup>, Najib Kacem, Nouredine Bouhaddi, Manuel Collet

DMA FEMTO-ST, LTDS ECL

a. diala.bitar@femto-st.fr

**Résumé :** *Interest in the nonlinear dynamics of periodic nonlinear lattices has grown rapidly over the last few years. Actually, it exists a practical need to understand nonlinearities and functionalize them in order to efficiently exploit the collective nonlinear dynamics of smart structures. In this context, an analytico-computational model predicting the collective dynamics of an array of coupled Duffing-Van Der Pol oscillators under simultaneous primary and parametric resonances is developed and the distribution of the basins of attraction is analyzed for multistable solutions. It is shown that the multimode branches are robust and may have a remarkable role in several applications such as wide bandwidth energy harvesting.*

**Mots-clés :** NaN