EMERGING TRENDS IN VIBRATION CONTROL AND ENERGY HARVESTING: MODELING AND ANALYSIS OF ADVANCED MATERIALS AND STRUCTURES AT MICRO AND MACRO SCALES

GIOACCHINO ALOTTA[1], ALBERTO DI MATTEO[2] AND FRANCESCO P. PINNOLA[3]

[1] "Mediterranean" University of Reggio Calabria
Via Graziella, Localitá Feo di Vito, 89124 Reggio Calabria, Italy
gioacchino.alotta@unirc.it

[2] University of Palermo
Viale delle Scienze, Ed.8, 90128 Palermo, Italy
alberto.dimatteo@unipa.it

[3] University of Naples "Federico II"
via Claudio 21, 80125 Naples, Italy
francescopaolo.pinnola@unina.it

Key words: Energy Harvesting; Vibration Control; Innovative Materials.

ABSTRACT

The MS aims to discuss latest approaches related to modeling, analysis, and implementation of innovative materials and advanced structural systems used in vibration control and energy harvesting applications. Examples include piezoelectric devices, wave energy converter (WEC) systems, oscillating water columns (OWC), nano- and micro-electromechanical systems (NEMS and MEMS), small-scale composites, micro-structured materials, engineered continua design, tuned dampers (TDs), magneto-rheological elastomers (MREs), and dielectric elastomers (DEs), in the context of deterministic or stochastic dynamic regimes. In this context, contributions offering new insights, scientific discussions, and in-depth analyses of enhanced formulations and methodologies are encouraged, covering also novel constitutive relations, linear and nonlinear viscoelasticity models, nonlocal continuum mechanics, plasticity, and damage. Contributions from materials science, solid mechanics, and structural dynamics are especially welcomed. Speakers may focus on theoretical aspects, computational techniques, modeling approaches, interpretation of experimental data, and simulation challenges.