

Advanced modeling, design and experiment of stress wave propagation

TRACK Number (900 - Structural Mechanics, Dynamics and Engineering)

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ABSTRACT

The study of stress wave propagation is very significant in aerospace, automotive, biomedical and electrical engineering. The development of efficient algorithms and experiments is very important to explore the mechanism of stress wave propagation in different applications such as structural healthy monitoring, vehicle crashworthiness, magnetic resonance elastography as well as control of noise and vibration. The goal of this mini-symposium is to bring together researchers from different disciplines to develop efficient techniques to manipulate the propagation of stress wave. Contributions related to the development of novel computational methods and experiments, application of computational tools to study stress wave propagation, novel designs of materials and structures are welcome. The potential topics include, but are not limited to:

1. Computational methods related to stress wave propagation
 - Stochastic modeling and uncertainties
 - Isogeometric Analysis
 - Molecular dynamics
 - Artificial intelligence
 - Machine Learning
 - Homogenization Methods/ Inverse Homogenization
 - Topology optimization
 - Meshfree methods
 - Multiscale algorithm
2. Application of computational tools related to stress wave propagation
 - Noise and Vibration
 - Structural healthy monitoring / Nondestructive techniques
 - Magnetic resonance elastography
 - Vehicle crashworthiness
3. Novel materials and structures related to stress wave propagation
 - Acoustic Metamaterials / Phononic Crystals
 - Architecture materials
 - Hierarchical materials
 - Soft materials
 - Nano-materials