

## **VIBRATION PROBLEMS IN STRUCTURES**

**JAVIER FERNANDO JIMENEZ-ALONSO<sup>1</sup>, JAVIER NARANJO-PEREZ<sup>2</sup>,  
IVAN MUÑOZ DIAZ<sup>3</sup> AND ELSA CAETANO<sup>4</sup>**

<sup>1</sup> Associate Professor. University of Seville  
Camino de los Descubrimientos s/n 41092 Seville (Spain)  
E-mail [jfjimenez@us.es](mailto:jfjimenez@us.es)

<sup>2</sup> Associate Professor. University of Seville  
Camino de los Descubrimientos s/n 41092 Seville (Spain)  
E-mail [jnaranjo3@us.es](mailto:jnaranjo3@us.es)

<sup>3</sup> Full Professor. Polytechnic University of Madrid  
Calle del Profesor Aranguren, 3, 28040 Madrid (Spain)  
E-mail [ivan.munoz@upm.es](mailto:ivan.munoz@upm.es)

<sup>4</sup> Full Professor. University of Porto  
Rua Dr. Roberto Frias s/n, 4200-465 Porto (Portugal)  
E-mail [ecaetano@fe.up.pt](mailto:ecaetano@fe.up.pt)

### **ABSTRACT**

Structural vibrations represent a critical field of study across all engineering disciplines, from civil and mechanical to aerospace and naval engineering. The dynamic behaviour of structures under operational or extreme loads is a key factor in their design considering either serviceability or safety conditions. As modern structures become more complex, due to the increase of slender together with the reduction of lightweight, the challenges associated with understanding and predicting their vibrational response demand increasingly sophisticated analysis and simulation tools.

This thematic session is dedicated to the latest advancements in the numerical and computational modelling of vibration problems in structures. We aim to create a forum for researchers and engineers to share innovative ideas, methodologies, and findings. The scope of the thematic session is broad, encompassing topics such as linear and non-linear structural dynamics, structure-fluid and soil-structure interaction, and advanced techniques for vibration mitigation and control.

We strongly encourage the submission of original research that highlights the development and application of computational methods to solve challenging vibration problems. Contributions may focus on novel finite element formulations, model order reduction techniques, stochastic dynamics, optimization algorithms for vibration control, and experimental validation of numerical models. This thematic session will provide an excellent opportunity to discuss the current state-of-the-art and future trends in the computational analysis of structural vibrations, fostering collaboration and stimulating new research directions in this exciting field.