

Nonlinear Phenomena, Chaos, Control and Applications to Structural Dynamics

The need for dynamics and the control of nonlinear oscillating systems is ubiquitous in structural engineering, since real-world engineering systems are, in general, nonlinear, and oscillatory. This multidisciplinary field encompasses computation, physics, mathematics, electrical and mechanical engineering, chemical processes, etc.

This special session aims to create a multidisciplinary forum of discussion on recent advances in nonlinear dynamic techniques and nonlinear control (including sensitivity analysis) applied to engineering systems, as well as new areas of development including new frontiers and challenges such as nonlinear dynamics and control. So, the objective of this theme is to propose a set of publications that will provide a forum for discussing and disseminating the latest approaches, methodologies, results, and current challenges in nonlinear dynamics, control, and chaotic systems.

This special session will also be a great opportunity for disseminating recent developments of analytical, experimental and numerical techniques, and for discussing novel phenomena and behaviors on several aspects of nonlinear dynamics and control. Potential topics include but are not limited to the following:

- Dynamic stability, deterministic, chaotic, random post-critical states;
- Nonlinear vibration of solids and structures under moving loads;
- Nonlinear dynamics, chaos, control of elastic structures;
- Nonlinear engineering systems in macro and micro scales;
- Nonlinear dynamic phenomena and interactions in mechanical systems and structures;
- New materials and their use in new structural components;
- Nonlinear dynamics techniques in signal processing.
- Time-frequency analysis methods in nonlinear dynamics applications;
- Vibration energy harvesting;
- Control of nonlinear systems and nonlinear vibrations control;
- Metamaterials applications.

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