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NONLINEAR DYNAMICS OF STRUCTURAL SYSTEMS TRACK NUMBER 900

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ABSTRACT

Nonlinearities in mechanical systems subjected to dynamic loads lead to complex responses including amplitude-dependent vibration frequencies, jump phenomena, energy transfers, bifurcations, quasi-periodic and chaotic responses, localization... The physical nature of the nonlinearities can for instance be geometrical, stemming from large amplitude displacement, or related to contact and friction phenomena at the interface between subsystems.

The computation of the dynamical response of such systems is still a challenge nowdays since engineers are often interested in long time responses of several periods of oscillations, either for transient responses or in the periodic or quasi-periodic steady state. A particular interest is the computation of so-called nonlinear modes. In those cases, reduced-order models are crucial to conduct parametric studies, to analyze bifurcation scenarios through continuation techniques or to explore the vibratory response.

Papers are welcomed in the following areas, but not restricted to:

- model reduction and computations based on nonlinear modes,
- continuation methods and their development,
- numerical analysis of stability and bifurcations in nonlinear structural systems,
- numerical methods dedicated to periodic and quasi-periodic solutions,
- targeted energy transfers, vibration reduction, localization,
- finite element-based formulations applied to nonlinear vibrations,
- experimental continuation techniques,
- experimental identification of parameters.