

NONLINEAR COMPUTATIONAL ASPECTS IN STRUCTURAL DYNAMICS AND ENGINEERING SCIENCE

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ABSTRACT

Nonlinear structural mechanics problems are encountered in many areas of engineering science. Their understanding, analysis, numerical modelling, and computational implementation are challenging tasks, as the computational strategy strongly depends on the type of nonlinearity involved and the specific nature of the problem being studied.

The proposed MS will focus on recent scientific developments in nonlinear computational dynamics, covering all aspects of numerical modelling of nonlinear phenomena, including numerical methods and computational algorithms involving industrial problematics. The MS will also discuss applications of numerical modelling to nonlinear phenomena, with a focus on new emerging methodologies.

The MS will focus on the following scientific topics:

- Solid computational mechanics
- Detuning and mistuning in turbomachinery
- Fluid-structure interactions and coupled problems.
- Nonlinearities in material constitutive equations
- Geometric nonlinearities
- Localized friction and contact nonlinearities
- Nonlinear reduced-order models
- Uncertainty quantification in nonlinear computational models
- Machine learning and probabilistic learning techniques for stochastic inverse problems