DYNAMICS OF NONLINEAR STRUCTURES WITH CONTACT INTERFACES

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ABSTRACT

Most of engineering structures have contact interfaces at which they or their components interact with surroundings or with other components of assembled, jointed structures. Interaction forces at contact interfaces are usually strongly nonlinear due to friction, unilateral interactions, clearances and interferences, varying contact areas, impacts, etc. This mini-symposium will address recent developments in modelling and computational methods for analysis of dynamics of structures with contact interfaces. Transient, steady-state and chaotic vibrations of such structures with friction, gaps and other types of nonlinear interaction at contact interfaces will be discussed.

Among topics to be considered (although not restricted to those) are the issues related to determination of characteristic properties of dynamic behaviour for structures with nonlinear contacts, including specifics of the non-smooth dynamics, and development of constitutive laws for friction contact modelling and characterization of contact interfaces and joints. The challenges of using realistic models for complex structures which comprise large number of degrees of freedom together with approaches (such as reduced-order modelling, model condensation and others) allowing such models to be used efficiently in the analysis of nonlinear dynamics will be also addressed.

Papers dealing with computational methods for analysis of dynamics of structures with contact interfaces and with their applications in aerospace, mechanical and civil engineering, biomechanics and other areas are invited.