ADVANCED MODELLING, ANALYSIS AND DESIGN OF BEAM, PLATE, MEMBRANE AND SHELL STRUCTURES

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ABSTRACT

Thin-walled spatial structures made of beams, plates, membranes and shell components are widely used in various domains. Transportation (automobile, naval, aircraft) and construction are important traditional domains of applications but day-to-day consumer goods are also concerned (sports equipment, textile, toys, packaging, etc).

Although finite element structural analyses are routine activities in design offices using industrial software, there are still justifications and need for further research investigations and improvement of existing discretization techniques and analysis capabilities for such structures.

The present MS will collect a number of original contributions, presented by worldwide researchers on the following advanced subjects, including, but not limited to:

- Improvement of finite element modelling techniques for 3D beams with open cross section, for plates, membranes and shells of various shapes.
- Status of the development of rotation free and solid-shell elements.
- New discretization techniques (meshless methods, isogeometric modelling).
- Consideration of multilayer composites and functionally graded materials.
- Experimental analysis of beams, laminated plates and shell structures.
- Modelling techniques of instabilities in shells.
- Static and dynamic linear analysis.
- Geometrical and material nonlinear analysis of thin walled structures, including pertinent solution techniques.
- Optimization of thin-walled structures (methodologies, applications).
- Consideration of imperfections and uncertainties.

- New applications in architecture, product design, biomechanics.

The present Minisymposium will be composed of two to three sessions with two or three keynote lectures.