

2nd GENERATION OF THEORY OF STRUCTURES BY UNIFIED FORMULATION

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ABSTRACT

The second-Generation of Theory of Structures is based on the Carrera Unified Formulation (CUF) that allows for the enhancement of the displacement/stress assumptions at any order of the expansion, N , in both cases of one-dimensional and two-dimensional modeling of structures. This is a step forward to classical theories, namely first-Generation of Theories of Structures, which are based on truncated expansions (fixed N) of the displacement/stress fields. CUF was initially devoted to the development of refined theories for the analysis of multilayered plate/shell structures undergoing mechanical, thermal, electrical and magnetic loadings [1]. In recent works [2], CUF has been extended to beam modeling.

The main objective of this minisymposia is to show applications of CUF to various engineering fields. The following topics are of interest: composite laminates, thermal stress, smart structures, fluid-dynamics, fluid-structure interactions, geomechanics, civil constructions including bridges and skyscrapers, aerospace structures, bio-structures, carbon nanotubes, coupled multifield problems and aeroacoustics. Diverse computational methods can be adopted in conjunction with CUF such as analytical methods, finite element method, and meshless methods (e.g. Radial-Basis Functions, Dynamic Stiffness Method, etc.).

Scientists are encouraged to propose and discuss their latest developments on the 2nd generation of theory of beams, plates and shells.

REFERENCES

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