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MS - Fuzzy methods in computational dynamics

G. C. Marano, M. Beer and Y. Tsompanakis

ABSTRACT

In real world engineering applications there are inherent uncertainties associated with the design parameters involved (geometrical, mechanical properties, loads), imprecise simulation methods and tools, subjectivity and heuristic assessments of the engineer, etc. In recent years, efficient probabilistic and fuzzy formulations have been developed to cope with these issues which have a great impact in real-life structural problems. Under this perspective, this mini-symposium aims to present the latest advances on the application of fuzzy methods in computational mechanics and dynamics of structures. For this purpose, the main objective of this MS is to present recent developments of methodologies used nowadays for modelling various forms of uncertainty and imprecision using fuzzy methods, not only as alternative but also as a parallel approach with standard stochastic approaches.

This MS will be focused on strategies for modelling uncertainty in computational mechanics using either fuzzy techniques or hybrid ones, in which fuzzy methods can be coupled with other mathematical strategies (e.g., Bayesian probability, imprecise probability, or interval arithmetic). Mathematical formulations, computational analysis methods and data interpretation tools using fuzzy methods are the main aspects to be treated within the framework of this MS. Special attention will be given on design applications in challenging structural problems, such as robust optimization as well as in comparison of test cases using fuzzy and other competing methods for description of uncertainty.

This MS is addressed to top researchers and specialists in the field. It will attract academic staff, researchers and post-graduate students, or even professional engineers seeking for advanced methodologies in demanding practical problems. The participants will present their work, they will exchange ideas, they will enhance their knowledge and they will find initiatives for further study in novel research areas.