

COMPUTATIONAL MECHANICS ISSUES IN EARTHQUAKE ENGINEERING

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ABSTRACT

Earthquakes are of the worst disasters, potentially causing significant losses, for human beings, infra-structures, etc., either directly, or through tsunamis, land-slides, damage of nuclear power plants, and different social and financial problems. Concentrating on civil engineering building and non-building structures, better understanding of the structural behaviours can help the designers towards structural systems with less and fewer seismic damages. In spite of considerable progresses in experimental works in laboratories, computational methods define the most versatile and practical approach in analysis of structural complicated behaviours, especially, when involved in severe nonlinearities (poundings of adjacent buildings, material nonlinearity with unloading, toppling of rigid blocks, etc.) or highly oscillatory behaviours and resonance. Considering these, and other important computational topics in earthquake engineering, e.g. soil-structure interaction, wave propagation, earthquake simulation, earthquake prediction, etc., besides, the main features of structural behaviours and analysis against seismic excitations, including: 1. probabilistic nature of earthquakes, 2. dynamic and nonlinear nature of seismic behaviours, 3. computational expensiveness of time history analyses, 4. financial aspects of large constructions and infrastructures, the main objective in this mini-symposium is to bring together innovative and new ideas about different computational mechanics issues in earthquake engineering, in the friendly environment of WCCM2014, as a step towards better simulation/prediction of earthquakes, better understanding and analyzing of the behaviours of structural/non-structural systems, and consequently, better protection against seismic hazards. This mini-symposium is related to topics like "Uncertainty and stochastic analysis", "Computational Geomechanics", "Boundary Element methods", "Computational Infrastructures and aging structures", "Computational Dynamic Failure and Fracture", "Computational Damage Mechanics", "Computational Nonlinear Dynamics", "Data and Signal Processing", "High Performance and Parallel Computing", "Computational Solid and Structural Mechanics". Abstracts and papers related, but not restricted to these topics, and especially on the applications regarding these topics in earthquake engineering are warmly welcome to this mini-symposium.

REFERENCES

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