Computational modelling of damage and fracture

Leong Hien poh1, Ron Peerlings2, Milan Jirásek3
and Anna Pandolfi4

1 Department of Civil and Environmental Engineering, National University of Singapore

1 Engineering Drive 2, E1A 07-03, Singapore 117576

leonghien@nus.edu.sg

2 Department of Mechanical Engineering, Eindhoven University of Technology

PO Box 513, 5600 MB Eindhoven, Netherlands

R.H.J.Peerlings@tue.nl

3 Department of Mechanics, Faculty of Civil Engineering, Czech Technical University in Prague

Thákurova 7, 166 29 Prague 6, Czech Republic

Milan.Jirasek@fsv.cvut.cz

4 Department of Civil and Environmental Engineering, Politecnico di Milano

Piazza Leonardo da Vinci 32, 20133 Milano

anna.pandolfi@polimi.it

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ABSTRACT

The surge in computing power over the last decade has motivated significant advances in the lifetime and reliability analyses of engineering materials and structures. Numerical simulations of the static and dynamic response of systems to various actions are adopted increasingly by the industry for design purposes. In support of this demand, a wealth of novel computational modelling techniques have been developed for predicting inelastic material behaviour, including damage localisation, crack initiation, crack propagation, and other material instabilities.

This mini-symposium aims to provide a platform for discussion of the newest theoretical and numerical developments at all stages of inelastic material response and degradation, up to failure. Topics of interest include, but are not restricted to, the following areas:

* Metals, geo-materials, ceramics, polymers, composites, biological tissues, etc.
* Initiation or propagation of defects and cracks
* Mechanical, thermal, chemical loading, etc.
* Discrete models, micromechanical formulations, continuum damage descriptions
* Multiscale frameworks bridging different length / time scales
* Objective formulations with non-local / gradient / phase-field enhancements
* Transition from continuous to discontinuous formulation
* Relevant numerical methods
* Experimental characterization of damage and fracture