

Computer Modeling of Material and Structural Failure

Mini-symposium organized by:

Guillermo Etse ⁽¹⁾, Paulo Pimenta ⁽²⁾, Alfredo Huspe ⁽³⁾, Osvaldo Manzoli ⁽⁴⁾

(1) University of Tucumán, Argentina, CONICET, getse@herrera.unt.edu.ar

(2) Paulo Pimenta University of Sao Paulo, Brazil, ppimenta@usp.br

(3) University of Litoral, Argentina, ahuspe@intec.unl.edu.ar

(4) Sao Paulo State University, Brazil, omanzoli@feb.unesp.br

This symposium is devoted to the discussion of developments on computational modeling of material and structural failure for different materials and loading scenarios. Material failure is here understood as the loss of the structural strength due to the formation of localization bands, propagating cracks or shear bands. Topics of interest include:

- Characterization of strong discontinuities in solids for brittle and ductile failures;
- Finite elements with embedded discontinuities;
- Nodally enriched finite element formulations to capture discontinuities, X-FEM, partition of unity methods and others;
- Discontinuous Galerkin technique and cohesive elements;
- Adaptive finite element methods;
- Meshless methods for discontinuous solutions;
- Regularization and strain localization techniques;
- Consideration of dynamic effects, dynamic fracture;
- Localized discontinuous failure in beams and frames, plastic hinges;
- Consideration of coupled problems, including failure in coupled thermo-mechanical and porous media.
- Applications in bio-, micro- and nano- mechanics;
- Crack tracking algorithms;
- Steel reinforced concrete;
- Fiber reinforced concrete;
- Computational multi-scale based material failure models;
- Structural instability due ductile failure;