NONLOCAL MODELS AND METHODS FOR MATERIAL FAILURE AND DAMAGE SIMULATION

ADAIR R. AGUIAR[*], MAHMOUD MOUSAVI[¶], ERKAN OTERKUS[†], AND PABLO SELESON[§]

[*] Department of Structural Engineering, University of São Paulo
Av. Trabalhador Sãocarlense, 400 13566-590, São Carlos, São Paulo, Brazil
aguiarar@sc.usp.br (www.set.eesc.usp.br/portal/pt/docentes/110-adair-roberto-aguiar)

[¶] Department of Engineering and Physics, Karlstad University
Universitetsgatan 2, 651 88 Karlstad, Sweden
mahmoud.mousavi@kau.se (https://www.kau.se/en/researchers/mahmoud-mousavi)

[†] Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde
100 Montrose Street, Glasgow G4 0LZ, United Kingdom
erkan.oterkus@strath.ac.uk (http://personal.strath.ac.uk/erkan.oterkus/)

[§] Computer Science and Mathematics Division, Oak Ridge National Laboratory
One Bethel Valley Road, P.O. Box 2008, MS 6211, Oak Ridge, TN 37831, USA
selesonpd@ornl.gov (http://web.ornl.gov/~psc/)

Key words: Nonlocal Models, Computational Mechanics, Material Failure and Damage.

ABSTRACT

Novel nonlocal formulations of continuum mechanics, such as peridynamics, nonlocal elasticity, strain-gradient elasticity, etc. are now gaining momentum as tools for modeling complex material behaviour. In particular, some of these formulations provide alternatives to traditional PDE-based models for the description of fracture paths and damage progression. Theoretical studies complemented with numerical methods have significantly advanced the field of nonlocal models in recent years and demonstrated the effective use of these models in complex fracture mechanics applications. This minisymposium is devoted to the presentation and discussion of nonlocal models and related computational methods and numerical simulations.