Accepted Manuscript

Virtual hybrid test control of sinuous crack

Clément Jailin, Andreea Carpiuc, Kyrylo Kazymyrenko,
Martin Poncelet, Hugo Leclerc, François Hild, Stéphane Roux

PII: S0022-5096(16)30913-9
DOI: 10.1016/j.jmps.2017.03.001
Reference: MPS 3071

To appear in: *Journal of the Mechanics and Physics of Solids*

Received date: 16 December 2016
Revised date: 27 February 2017
Accepted date: 1 March 2017

Please cite this article as: Clément Jailin, Andreea Carpiuc, Kyrylo Kazymyrenko, Martin Poncelet, Hugo Leclerc, François Hild, Stéphane Roux, Virtual hybrid test control of sinuous crack, *Journal of the Mechanics and Physics of Solids* (2017), doi: 10.1016/j.jmps.2017.03.001

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Virtual hybrid test control of sinuous crack

Clément Jailin[a], Andreea Carpiuc[a,b], Kyrylo Kazymyrenko[b], Martin Poncelet[a], Hugo Leclerc[a], François Hild[a], Stéphane Roux[a]

[a] *Laboratoire de Mécanique et Technologie (LMT)*
ENS Paris-Saclay/CNRS/Université Paris-Saclay
61 avenue du Président Wilson, 94235 Cachan, France
[b] *Institut des Sciences de la Mécanique et Applications Industrielles*
UMR EDF-CNRS-CEA-ENSTA 9219, Université Paris-Saclay
828 Boulevard des Maréchaux, 91762 Palaiseau Cedex, France

Abstract

The present study aims at proposing a new generation of experimental protocol for analysing crack propagation in quasi brittle materials. The boundary conditions are controlled in real-time to conform to a predefined crack path. Servo-control is achieved through a full-field measurement technique to determine the pre-set fracture path and a simple predictor model based on linear elastic fracture mechanics to prescribe the boundary conditions on the fly so that the actual crack path follows at best the predefined trajectory. The final goal is to identify, for instance, non-local damage models involving internal lengths. The validation of this novel procedure is performed via a virtual test-case based on an enriched damage model with an internal length scale, a prior chosen sinusoidal crack path and a concrete sample. Notwithstanding the fact that the predictor model selected for monitoring the test is a highly simplified picture of the targeted constitutive law, the proposed protocol exhibits a much improved sensitivity to the sought parameters such as internal lengths as assessed from the comparison with other available experimental tests.

Keywords: A. Crack propagation and arrest. B. Concrete. Crack mechanics. Sensors and actuators. C. Finite element.

2016 MSC: 00-01, 99-00

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/5018141

Download Persian Version:

https://daneshyari.com/article/5018141

Daneshyari.com