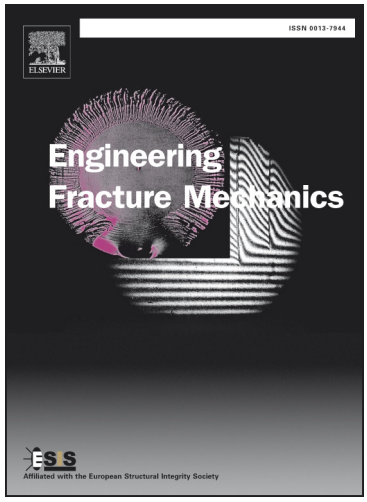
Accepted Manuscript



FEMME: A multi-scale Finite Element Microstructure MEshfree fracture model for quasi-brittle materials with complex microstructures

Luis Saucedo Mora, T. James Marrow

PII: S0013-7944(15)00256-8
DOI: http://dx.doi.org/10.1016/j.engfracmech.2015.05.059
Reference: EFM 4656

To appear in: *Engineering Fracture Mechanics*

Received Date: 17 December 2014
Revised Date: 15 May 2015
Accepted Date: 28 May 2015

Please cite this article as: Mora, L.S., James Marrow, T., FEMME: A multi-scale Finite Element Microstructure MEshfree fracture model for quasi-brittle materials with complex microstructures, *Engineering Fracture Mechanics* (2015), doi: http://dx.doi.org/10.1016/j.engfracmech.2015.05.059

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

FEMME: a multi-scale Finite Element Microstructure MEshfree fracture model for quasi-brittle materials with complex microstructures.

Luis Saucedo Mora [a] and T. James Marrow [*a,b]

University of Oxford, [a] Department of Materials, [b] Oxford Martin School,
Parks Road, Oxford OX1 3PH, United Kingdom
[*]e-mail: james.marrow@materials.ox.ac.uk

Abstract

In this paper we develop a very efficient Finite Element Microstructure MEshfree (FEMME) method to account for the effect of microstructure on quasi-brittle properties within finite element simulations of damage, improving the accuracy and computational cost of calculations at engineering length-scales. This method provides two sets or layers of elements representing the finite element model and the microstructure. The first is used to link the engineering scale problem with the microstructure, obtaining the stress and strain fields of the macro-mechanical problem; from these, we compute the micro-mechanical fields using the second set of elements, which describes explicitly the microstructure.

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/7169734

Download Persian Version:

https://daneshyari.com/article/7169734

Daneshyari.com