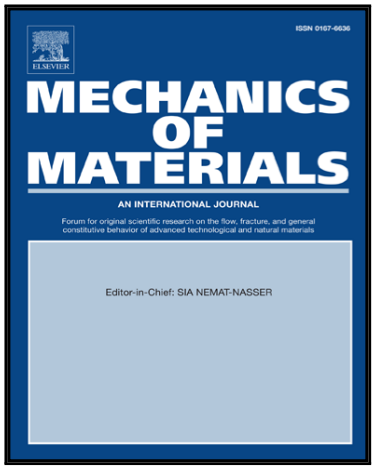

Computational micromechanics model for the analysis of fiber kinking in unidirectional fiber-reinforced polymers

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PII: S0167-6636(19)30638-6
DOI: https://doi.org/10.1016/j.mechmat.2019.103299
Reference: MECMAT 103299

To appear in: *Mechanics of Materials*

Received date: 25 July 2019
Revised date: 31 October 2019
Accepted date: 18 December 2019

Please cite this article as: M. Herráez, A.C. Bergan, C.S. Lopes, C. González, Computational micromechanics model for the analysis of fiber kinking in unidirectional fiber-reinforced polymers, *Mechanics of Materials* (2019), doi: https://doi.org/10.1016/j.mechmat.2019.103299

Highlights

- Development of a novel experimental technique to characterize the compressive strength of reinforcement fibers.
- Development of a simplified micromechanical model to homogenize the nonlinear shear curve of a unidirectional composite lamina.
- Validation of an efficient numerical model to analyze fiber kinking initiation (compressive strength) and damage evolution during kink band broadening.
- Qualitative and quantitative assessment of the post-peak features typical of fiber kinking: kink band broadening, residual crushing stress and fiber rotation.
- Evaluation of the influence of the fiber-matrix interface strength and friction on the initiation and evolution of fiber kinking.