LMS Seminar

10 March 2022 at 2:00 pm
Jean Mandel room

Prediction of interfacial debonding with the coupled criterion

Eric Martin

Bordeaux INP, Université de Bordeaux

──── ABSTRACT ────

The coupled criterion which combines a stress and an energy conditions is an efficient tool to describe failure mechanisms in composite materials at different scales [1-2]. This will be illustrated in this work which uses such a coupled criterion to describe the nucleation of interfacial debonding between a stiff particle and a soft matrix submitted to tensile loading [3]. Numerical results report the influence of mixed mode conditions and residual stresses. It is shown how this approach can be used in order to analyze experimental data for the identification of the interfacial fracture parameters.

──── BIOGRAPHY ────

Eric Martin is Professor at Bordeaux INP and member of the LCTS (Laboratoire des Composites Thermostructuraux). His research interests are on finite fracture mechanics and the mechanical behavior of composite materials.
`https://orcid.org/0000-0003-0688-1649`

──── REFERENCES ────

[1] E. Martin, D. Leguillon, N. Carrère, Finite Fracture Mechanics: A Useful Tool to Analyze Cracking Mechanisms in Composite Materials, in: P.W.R. Beaumont, C. Soutis, A. Hodzic (Eds.), The Structural Integrity of Carbon Fiber Composites, Springer International Publishing, Cham, 2017: pp. 529–548. https://doi.org/10.1007/978-3-319-46120-5_19.

[2] A. Doitrand, E. Martin, D. Leguillon, Numerical implementation of the coupled criterion: Matched asymptotic and full finite element approaches, Finite Elements in Analysis and Design. 168 (2020) 103344. https://doi.org/10.1016/j.finel.2019.103344.

[3] E. Martin, D. Leguillon, A. Catapano, N. Carrère, Prediction of interfacial debonding between stiff spherical particles and a soft matrix with the coupled criterion, Theoretical and Applied Fracture Mechanics. 109 (2020) 102749. https://doi.org/10.1016/j.tafmec.2020.102749.