Effect of uniform distributions of bonded and debonded fibers on the growth of the fiber/matrix interface crack in cross-ply $[0_n^\circ, 90^\circ]_S$ laminates with different fiber contents under transverse loading

Luca Di Stasio[a,b], Janis Varna[b], Zoubir Ayadi[a]

[a] *Université de Lorraine, EEIGM, IJL, 6 Rue Bastien Lepage, F-54010 Nancy, France*
[b] *Luleå University of Technology, University Campus, SE-97187 Luleå, Sweden*

Abstract

A set of criteria is proposed to predict the initiation and propagation of fiber-matrix interface debonds and the transition to collective mesoscopic behavior in the form of transverse cracks. It features:

- a group of deterministic equations to determine the driving quantities of the fracture process: Energy Release Rates and dilatational energy;
- a set of probabilistic expressions to quantify the random distributions of critical values.