

Growth of transverse cracks from multiple adjacent debonds: debond-debond interaction between rows of partially debonded fibers in UD composites

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Abstract

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1. Introduction

Transverse cracks (or micro- or matrix cracks) represents one of the very first damage mechanism appearing in a Fiber Reinforced Polymer Composite (FRPC). A full understanding of the factors determining its onset and propagation could lead to structural improvements aimed to delay, suppress and possibly control transverse cracking in order to increase the energy absorbing capabilities of polymer composites. Early microscopic observations determined that onset of transverse cracking coincides with the appearance of fiber-matrix interface cracks (also called debonds), which grow along the arc direction of the fiber until a critical size, then kink out of the interface and coalesce with other debonds to form what is macroscopically seen as a transverse crack [1].

2. RVE models & FE discretization

2.1. *Models of Representative Volume Element(RVE)*

2.2. *Finite Element (FE) discretization*

15 3. Results & Discussion

4. Conclusions & Outlook

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References

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