

## Relating Interface Properties with Crack Propagation in Composite Laminates

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**Abstract :** The interfaces between organic and inorganic phases in natural materials have been shown to be a key factor contributing to their high performance. This work analyzes crack propagation in a 2-ply laminate subjected to uniaxial tensile mode-I crack propagation loading that has laminate properties derived based on biological material constituents (marine exoskeleton- chitin and calcite). Interfaces in such laminates are explicitly modeled based on earlier molecular simulations performed by authors. Extended finite element method and cohesive zone modeling based simulations coupled with theoretical analysis are used to analyze crack propagation. Analyses explicitly quantify the effect that interface mechanical property variation has on the delamination as well as the transverse crack propagation in examined 2-ply laminates.

**Keywords :** chitin, composites, interfaces, fracture

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