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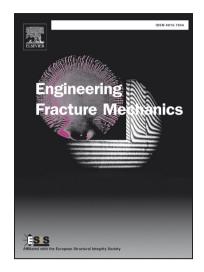
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Interfacial Debonding Propagation in Orthotropic Layered Plates with a Compliant Internal Layer

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ABSTRACT

The failure of layered plates with internal compliant layers is associated with interfacial debonding mechanisms, whose geometrically irregular propagation is governed by a three-dimensional stress state. This paper faces this challenge by developing a multi-layered, high-order plate theory and a triangular finite element that incorporate cohesive interfaces. The formulation tracks the evolution of two-dimensional debonding areas at the layered plate's interfaces. The model is used to study debonding mechanisms in a narrow plate with initial delaminations. Attention is given to the unstable response along equilibrium paths, the evolving irregular debonding front contours, and their impact on the structural resilience.

KEYWORDS

Cohesive Zone Models; Layered Plates; Debonding Propagation; High Order Plate Theory; Interfacial Debonding

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