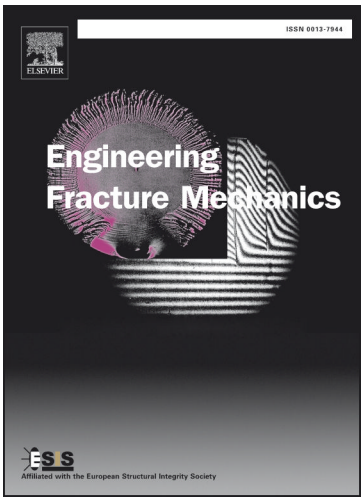

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Introduction of Nanoclay-Modified Fiber Metal Laminates

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Abstract

In this paper we aim to introduce benefits in modification of epoxy resin of fiber metal laminates (FMLs) with mineral nanoclay platelets. FMLs with carbon fibers and aluminum metal were attached by epoxy resin modified with various amounts of nanoclay. Elastic properties and interfacial toughness of fabricated FMLs were obtained for different percentages of nanoclay incorporation. Results reveal that the interfacial fracture toughness of the FML increases approximately double-fold by 0.5 wt% incorporation of nanoclay. This is attributed to the exfoliation of nanoclay (suggested by XRD) and toughening of the resin by crack blunting mechanism (suggested by SEM).

Keywords

Fiber metal laminate; Nanoclay reinforcement; Interfacial fracture toughness; Crack blunting

Nomenclature

a	Crack length (mm)
A'	Extensional compliance tensor (mm/N)
B'	Coupling compliance tensor (N^{-1})
D'	Bending compliance tensor ($N^{-1}.mm^{-1}$)
E_{11}	Longitudinal modulus of CFRP (MPa)
E_{22}	Transverse modulus of CFRP (MPa)

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