

عنوان مقاله:

Interlaminar stresses analysis in the vicinity of free corner of composite laminates

محل انتشار:

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خلاصه مقاله:

The main aim of this paper is modeling of the free corner effects in cross-ply and angle-ply symmetric layup composite laminates based on global-local theory. In this approach, the global region is analyzed by first order shear deformation theory and the local region is modeled by layer-wise theory (LWT). Finite element method (FEM) is implemented to solve the problem equations. Two types of applied loading including thermal and uni-axial extension loading are considered in the analysis. The obtained results by the presented model are compared with available previous researches which show good agreement. The effects of some factors including layout and fiber angle of layers are observed on the distribution of interlaminar stresses due to the free corner. The results show that by changing the laminate layout, the amount of normal interlaminar stress merely varies, and the shear stresses variations remain the same. Furthermore, the results confirm an influencing parameter on the interlaminar stress is the layers angle. Consequently, free corner effects are more important in angle ply laminate. The obtained results are useful to optimal design of composite laminate against damage mechanisms such as delamination and matrix cracking.

کلمات کلیدی:

Interlaminar stress, Free-corner effect, Global-local model, Finite element analysis

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