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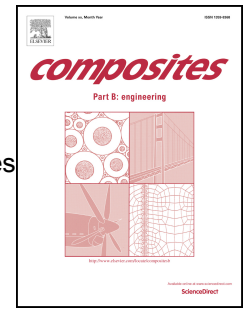

Buckling, postbuckling and progressive failure analyses of composite laminated plates under compressive loading

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Buckling, Postbuckling and Progressive Failure Analyses of Composite Laminated Plates under Compressive Loading

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Abstract

In this study, buckling, post-buckling and progressive failure of composite laminated plates have been investigated numerically and experimentally. Buckling load, load-displacement relations for post buckling and maximum out-of-plane displacements of the plates are determined. Furthermore, the numerical results are compared with experimental findings for two different laminates made of woven fabric and uni-directional tapes. The comparisons show that there is a good agreement between numerical and experimental results obtained for buckling load and post-buckling behavior especially for the laminates with uni-directional tapes.

Keywords: Buckling, Post-buckling, Progressive Failure, Composite Structures

1. Introduction

Investigation of the buckling and post-buckling behavior of the composite laminated plates is an important issue to observe their strength and stiffness characteristics since the structural performance of a composite material depends on its composition, orientation, fiber shape, matrix and fiber material properties and quality of bondings between fiber and matrix [1]. The critical buckling loads of the composite structures have been investigated extremely in the literature and there are many studies about post-buckling behavior of composite laminates [2-15]. The studied structures were generally subjected to mono-axial compression although other types of loading