EXPERIMENTAL AND NUMERICAL VIBRATION STUDY OF WOVEN REINFORCEMENT COMPOSITE LAMINATED PLATE WITH DELAMINATION EFFECT

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ABSTRACT

In this work, a natural frequency of composite laminated plate presented, with different size and location of delamination effect, through long and width of composite plate in addition to effect of delamination through the thickness of plate. The composite plate studied made of woven reinforcement glass fiber and polyester resin with eight layer with different delamination through the plate. The natural frequency of woven composite plate calculated by using experimental work for different aspect ratio and boundary conditions of plate and compare the experimental results with numerical study by using of finite element method with using of ANSYS program. The natural frequency of woven laminated plate are evaluated by analysis the acceleration signal evaluated by experimental work with fast Fourier transformation by using of sig-view program, to evaluated natural frequency of plate by FFT method. The resulted of natural frequency with delaminated effect show that the delamination decreasing of natural frequency of plate and decreasing the stiffness of plate. The compare of experimental with numerical results given good agreement with maximum error about 5.8% and minimum error about 2.3%.

KEYWORDS: Delamination Effect, Vibration Composite Plate with Delamination, Internal Crack Effect, Defect Effect, Plate with Defect Effect, Vibration with Delamination Effect