# Experimental and numerical investigation of fibre-metal-laminates (FMLs) under free vibration analysis

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**ABSTRACT**

The combination of materials between metal alloys and composite materials known as fibre metal laminates (FMLs) has been used for thousands of years to reach better performance requirement. The aluminium alloys (Al 2024-T0) and three different composite materials with two different stacking sequences by hand layup method and tested for evaluating the mechanical properties with considerable trials. The vibration characteristic of FMLs plate were experimentally studied by impulse excitation techniques under fixed-free and fixed-fixed boundary conditions. The accuracy of the results was verified by comparing the ABAQUS finite element method. The results indicated with the presence of aluminium alloy plates in the composite layers, the natural frequency will increase as the value of stiffness increase. The boundary conditions significantly affected the natural frequency of FML plates because of the restraint effect at the edges.

**KEYWORDS**

Boundary condition; Composite beam; FMLs; Free vibration

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