ANALYSIS OF VIBRATION OF EULER-BERNOULLI CLAMPED LAMINATED BEAM WITH NON-UNIFORM PRESSURE DISTRIBUTION AT THE INTERFACES

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ABSTRACT

The increase in the utilization of high performance equipments has necessitated the use of laminated beams in aerospace engine, machine structures and electronic devices in order to dampen vibration and reduce noise. In such equipments, two laminates are pressed together and the occurrence of micro interfacial slip between these two laminates helps to effectively dissipate any unwanted vibration or noise. Also, when such structure are subjected to either static or dynamic loading, non-uniformity in interfacial pressure have significant effect on both the energy dissipated and the logarithmic damping decrement associated with the mechanism of slip damping. Thus, laminated beams can be effectively used to increase the level of damping available in such a mechanism. Hence, in this work, with the aid of Finite Difference Method, the effects of laminates on the energy dissipation due to frictional damping between the two laminates are investigated, so also the effects of the material properties on the dynamic behaviour and energy dissipation are also analysed.

Keywords: Laminates; Dynamic deflection; Energy dissipation; Finite difference method.