

Free Vibration Analysis of Symmetric Sandwich Beams

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Abstract : The aim of the present work is to study the linear free symmetric vibration of three-layer sandwich beam using the energy method. The zigzag model is used to describe the displacement field. The theoretical model is based on the top and bottom layers behave like Euler-Bernoulli beams while the core layer like a Timoshenko beam. Based on Hamilton's principle, the governing equation of motion sandwich beam is obtained in order to calculate the linear frequency parameters for a clamped-clamped and simple supported-simple-supported beams. The effects of material properties and geometric parameters on the natural frequencies are also investigated.

Keywords : linear vibration, sandwich, shear deformation, Timoshenko zig-zag model

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