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Numerical Investigation of Poling Vector Angle on Adaptive Sandwich Plate Deflection

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Abstract : This paper presents a finite element model for a sandwich plate containing a piezoelectric core. A sandwich plate with a piezoelectric core is constructed using the shear mode of piezoelectric materials. The orientation of poling vector has a significant effect on deflection and stress induced in the piezo-actuated adaptive sandwich plate. In the present study, the influence of this factor for a clamped-clamped-free-free and simple-simple-free-free square sandwich plate is investigated using Finite Element Method. The study uses ABAQUS (v.6.7) software to derive the finite element model of the sandwich plate. By using this model, the study gives the influences of the poling vector angle on the response of the smart structure and determines the maximum transverse displacement and maximum stress induced.

Keywords : finite element method, sandwich plate, poling vector, piezoelectric materials, smart structure, electric enthalpy
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