

Sensitivity Analysis of a layered piezoelectric system using ZFEM

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Abstract

This work presents an investigation on the numerical simulation of a layered piezoelectric system using the complex finite element method (ZFEM). This approach allows the standard FEM solution to provide information about the design sensitivity of the mechanical displacement and voltage potential fields with respect to small variations in the material properties of the system. The layered body is formed by PZT-4 and PZT-5 stacked together. Results show that the design sensitivities of the soft grounded piezoelectric are larger compared to those of PZT-4 for the specific configuration analyzed. For solution verification purposes. The standard steady state solution was compared against a commercial FEM package and the error obtained was less than 4%.

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