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Simulation of Piezoelectric Laminated Smart Structure under Strong Electric Field

Authors : Shun-Qi Zhang, Shu-Yang Zhang, Min Chen

Abstract : Applying strong electric field on piezoelectric actuators, on one hand very significant electroelastic material nonlinear effects will occur, on the other hand piezo plates and shells may undergo large displacements and rotations. In order to give a precise prediction of piezolaminated smart structures under large electric field, this paper develops a finite element (FE) model accounting for both electroelastic material nonlinearity and geometric nonlinearity with large rotations based on the first order shear deformation (FSOD) hypothesis. The proposed FE model is applied to analyze a piezolaminated semicircular shell structure.

Keywords : smart structures, piezolamintes, material nonlinearity, strong electric field
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