

## Analysis of Thick Laminated Panel With Piezoelectric Sensors Based on Three-Dimensional Theory of Elasticity

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In recent years, smart structures with piezoelectric sensors and actuators have attracted serious attention for they can sense and alter the mechanical response during in-service operation. On the other hand, light-weight shell and panel structures may be one of the most popularly used structures in space vehicles. For these reasons, shell-type smart structures have become the subject of focus for many researchers. A study on the elasticity solution of shell panel with piezoelectric sensors is presented. In this paper, the structure is simply supported at four sides, orthotropic and under pressure excitation on outer surface. Three-dimensional equations of equilibrium, which are coupled partial differential equations, are reduced to ordinary differential equations with variable coefficients by means of Fourier series expansion in circumferential and axial directions. The resulting ordinary differential equations are solved by Galerkin finite element method. Finally three layered panels with one piezoelectric layer [0/90/P] are solved and the results are compared with latest published results.

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