

STUDY ON OPTIMAL LOCATION AND OPTIMAL VOLTAGE FOR PZT ACTUATOR ON ALUMINIUM CANTILEVER PLATE

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Abstract

In active vibration control the vibration of a plate is reduced by using opposite directional force to the plate. Nowadays active vibration control is frequently being used in aircraft, submarine, automobile, helicopter blade, naval vessel. In this study an aluminium plate with one piezoelectric patch is used to study the active vibration control. The smart plate consists of rectangular aluminium plate modelled in cantilever configuration with lamination of piezoelectric patches. The study uses ANSYS software to derive the finite element model of the smart plate. Based on this model, the optimal location for actuator is found and actual smart plate is produced. Also optimal voltage was found. Beyond the optimum voltage level, the actuator increased the level of vibration 180 out-of-phase. Modal, harmonic finite element analyses are performed.

Keywords: ANSYS, Cantilever plate, Modal Analysis, Harmonic Analysis, Smart plate.