**Acoustic Effects On Binary Aeroelasticity Model.**

ABSTRACT

coustics is the science concerned with the study of sound. The effects of sound on structures attract overwhelm interests and numerous studies were carried out in this particular area. Many of the preliminary investigations show that acoustic pressure produces significant influences on structures such as thin plate, membrane and also high-impedance medium like water (and other similar fluids). Thus, it is useful to investigate the structure response with the presence of acoustics on aircraft, especially on aircraft wings, tails and control surfaces which are vulnerable to flutter phenomena. The present paper describes the modeling of structural-acoustic interactions to simulate the external acoustic effect on binary flutter model. Here, the binary flutter model which illustrated as a rectangular wing is constructed using strip theory with simplified unsteady aerodynamics involving flap and pitch degree of freedom terms. The external acoustic excitation, on the other hand, is modeled using four-node quadrilateral isoparametric element via finite element approach. Both equations then carefully coupled and solved using eigenvalue solution. The mentioned approach is implemented in MATLAB and the outcome of the simulated result are later described, analyzed and illustrated in this paper.

**Keyword:** Aeroelasticity; Binary model; Flutter; Structural-acoustic coupling.