

عنوان مقاله:

Sensitivity Analysis of Flutter Velocity to Structural Properties of a Composite Wing

محل انتشار:

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خلاصه مقاله:

The main goal of this article is to analyze the sensitivity and find the most effective property among structural properties that have the most significant impact on the flutter velocity of a composite wing. For this purpose, the corresponding Aeroelastic equations of a composite wing have been derived using the Euler-Bernoulli beam model and discretized by the Galerkin method. Based on Jones's unsteady aerodynamic model, aerodynamic loads have been incorporated into the aeroelastic model. Then, flutter velocity was determined through eigenvalue analysis of the obtained aeroelastic equations. The Flutter velocity changes with a specific interval of each input. With the help of reverse engineering, the effects of structural properties (including material properties and effective stiffness) and their sensitivity were determined. The results show that the Torsional Effective Stiffness has the most significant effect and high sensitivity on flutter velocity. In this work, other parameters (including flow properties, wing geometry, and airfoil) are assumed to be unchangeable. The geometry of the wing is considered rectangular and straight

کلمات کلیدی:

Wing Flutter, Composite Wing, Flutter Velocity Sensitivity Analysis, Jones aerodynamic model

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