

MULTIDISCIPLINARY DESIGN OPTIMIZATION (MDO) OF A TYPICAL LOW ASPECT RATIO WING USING ISIGHT

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Abstract

The design of wing is the most important activity in aircraft development. The two major factors considered in a wing design are the lift to drag (L/D) ratio and the weight. The problem was multidisciplinary in nature since both aerodynamic and structural performances were considered. In this paper, the multi-objective problem of maximizing L/D ratio and minimizing weight is explored using Isight as the MDO framework. An aerodynamic analysis code called AVL developed in-house at ADA and the commercially available structural analysis code MSC/NASTRAN were used for the study, along with CATIA V5 for parametric modeling. The entire workflow was automated and integrated seamlessly using Isight. The automated MDO process was able to provide optimum values of wing design parameters by simultaneously meeting target specifications from both aerodynamics and structural disciplines.

Keywords: Aerodynamic, L/D, Isight, MDO, Wing, Weight