Using High Resolution Design Spaces for Aerodynamic Shape Optimization Under Uncertainty

By Wu Li

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 36 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.This paper explains why high resolution design spaces encourage traditional airfoil optimization algorithms to generate noisy shape modifications, which lead to inaccurate linear predictions of aerodynamic coefficients and potential failure of descent methods. By using auxiliary drag constraints for a simultaneous drag reduction at all design points and the least shape distortion to achieve the targeted drag reduction, an improved algorithm generates relatively smooth optimal airfoils with no severe off-design performance degradation over a range of flight conditions, in high resolution design spaces parameterized by cubic B-spline functions. Simulation results using FUN2D in Euler flows are included to show the capability of the robust aerodynamic shape optimization method over a range of flight conditions. This item ships from La Vergne,TN. Paperback.

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