

Shape optimization using the aero-structural coupled adjoint approach

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The aero-structural coupled adjoint approach here is an efficient approach to compute the gradients of the aerodynamic coefficients obtained from coupled fluid-structure simulations. These gradients can then be advantageously employed for gradient-based optimizations. In this study, the approach is extended to tackle viscous flows. The method is then applied to optimize the flight shape of a realistic 3D configuration. In these applications, the coupled adjoint approach permits to decrease the drag at constant lift and wing thickness with limited computational effort.