

Non-Geometric Sensitivities Using the Adjoint Method

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Abstract : The adjoint method has been used as a successful tool to obtain sensitivity gradients in aerodynamic design and optimisation for many years. This work presents an alternative approach to the continuous adjoint formulation that enables one to compute gradients of a given measure of merit with respect to control parameters other than those pertaining to geometry. The procedure is then applied to the steady 2D compressible Euler and incompressible Navier-Stokes flow equations. Finally, the results are compared with sensitivities obtained by finite differences and theoretical values for validation.

Keywords : adjoint method, aerodynamics, sensitivity theory, non-geometric sensitivities

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