

Comparison of Optimization Strategies for High-Lift Design

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The design of high-lift systems represents a challenging task within the aerospace community, being a multidisciplinary, multi-objective and multi-point problem. The DeSiReH project, funded by European Commission under the 7th Framework Program, aimed at improving the aerodynamics of high-lift systems by developing, in a coordinated approach, both efficient numerical design strategies and measurement techniques for cryogenic conditions. Within DeSiReH, different partners used several numerical automatic optimization strategies for high-lift system design purposes. A realistic multi-objective and multi-point optimization problem was defined and solved by adopting different flow models dimensionality, meshing strategies, geometry parameterization and optimization strategies. Special attention was devoted to perform a fair comparison of the results and useful information were obtained about trends, pros and cons of the approaches used. The outcome of these activities is that a very efficient HL design process can be set up through decoupling of the original multi-objective problem into several, sequential sub-optimization processes.

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