DESIREH - Design, simulation and flight reynolds number testing for advanced high-lift solutions

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DeSiReH focus on both, the numerical design tools and the experimental measurement techniques for cryogenic conditions, with the objective to improve the industrial design process for laminar wings in terms of product quality, efficiency, and development cost reduction. The work focuses on the design of high lift devices.
DeSiReH addresses the following quantified objectives which will make a significant contribution to meeting Vision 2020 goals:
* Reduction of industrial A/C development costs by 5% by reduced and more efficient Wind Tunnel Testing
* Decrease time-to-market by 5% by improved aerodynamic design turn-around time
* Improve industrial High-Lift design process efficiency by 15%
* Reduce A/C drag by 5% by enabling NLF though compatible High-Lift-Design.
To accomplish these objectives the project is planned for a period of 4 years and a budget of 7.6 Million Euro.
The consortium consists of 6 industry partner, 7 research establishments, 3 universities, 2 small and medium-sized enterprises and the European Transonic Wind tunnel (ETW). Existing and validated high-fidelity numerical tools are composed to an efficient High-Lift design and optimization process chain in WP1.
The strategies and tools developed are applied in WP 2 to the aerodynamic design of a high lift system for the future pointing HARLS wing (High Aspect Ratio Low Sweep) with the constraint to maintain Natural Lamiar Flow at cruise to the best possible extend.
WP 3 focuses on the improvement of the experimental measurement technique for cryogenic testing. The objectives here are to enhance the measurement accuracy of the results and to generate the capability to apply different important techniques (e.g. transition measurement & deformation measurement).
These techniques are finally applied in the ETW at High-Reynolds-Numbers on the HARLS model equipped with the High-Lift-System, designed in WP2.

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