



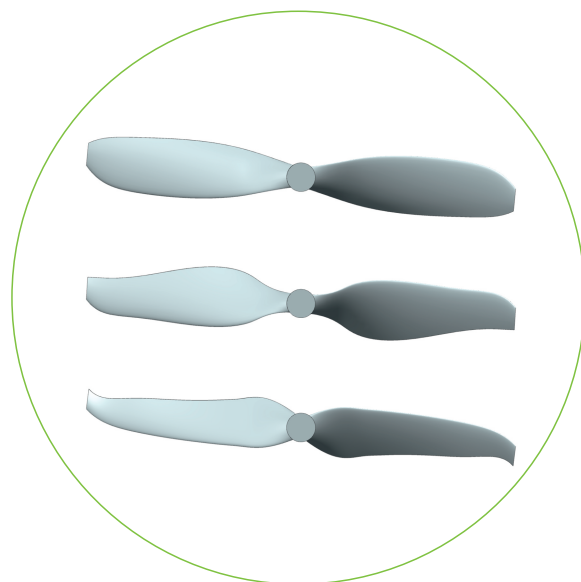
Łukasiewicz
Institute
of Aviation



LOW-NOISE PROPELLER DESIGN

CHARACTERISTICS

Łukasiewicz Research Network – Institute of Aviation offers advanced design and optimization solutions for propellers and rotor systems, aimed at improving aerodynamic performance and reducing noise emissions. The Institute provides support throughout the entire development process, from new design concepts to the validation, testing, and optimization of existing rotor configurations. Advanced computational tools and specialized research infrastructure enable effective evaluation and refinement of rotor systems at every stage of development.



SCOPE OF SERVICES

Design and Optimization

- Design methodologies and computational models adapted to rotor-specific requirements.
- Multi-objective rotor optimization across a range of operating conditions, considering key parameters such as rotational speed, thrust, power consumption, and noise levels.
- Assessment of aerodynamic performance and acoustic characteristics under real operating conditions.
- Tonal and broadband noise reduction solutions.

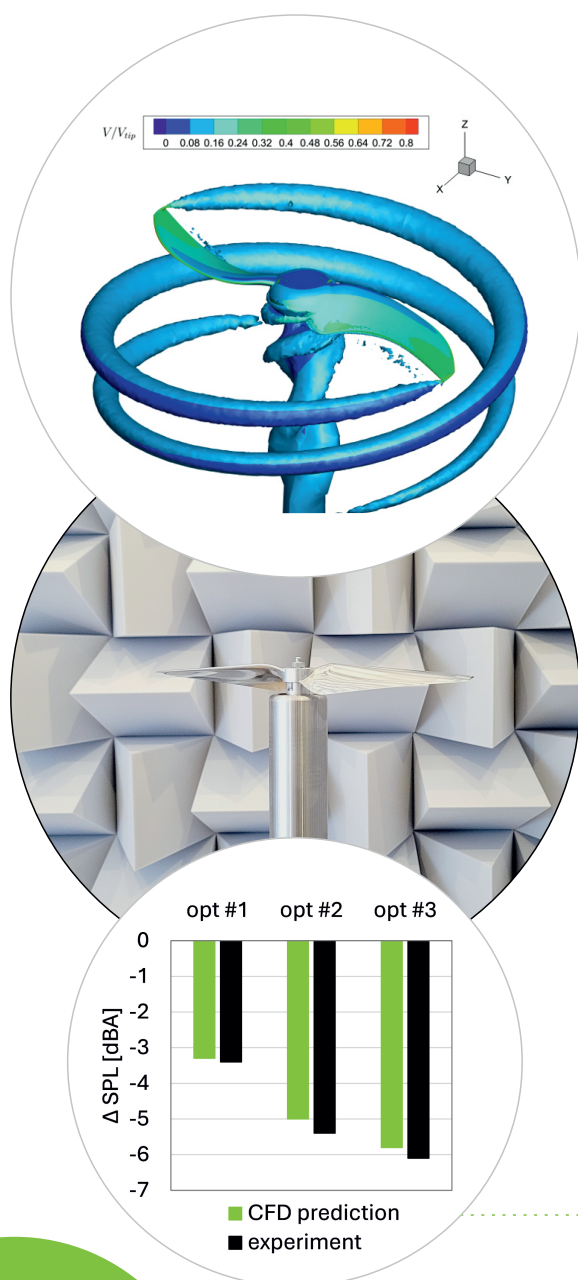
Numerical Simulations

- Design trade-offs and sensitivity of aerodynamic and acoustic performance to geometric parameters and operating conditions using advanced computational simulations.

Testing

- Aerodynamic and acoustic testing in an anechoic chamber (up to 50 cm rotor diameter), including performance verification, simulation validation, and assessment of geometric modifications.

Experimental verification of noise reduction for three optimized propellers, relative to a selected market-available solution.



The Łukasiewicz Research Network – Institute of Aviation offers a wide range of specialized research, engineering services and products. We provide comprehensive solutions, ranging from dedicated analyses, simulations, engineering design, through the selection, testing and certification of materials and structures, to rapid prototyping and additive manufacturing.

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