

AEROSPACE ENGINEERING

MUR DM 117/NLR - Advancements in Particle Image Velocimetry (PIV) technique for the measurement of the acoustic flow interaction over an acoustic liner

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [Piva/CF:97429780584] Politecnico di TORINO [Piva/CF:00518460019] - NLR [P.Iva NL002760551B01]
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Context of the research activity	<p>The measurement of the flow field over an acoustic liner grazed by a turbulent flow is extremely challenging particularly in presence of high grazing Mach number and large amplitude of the acoustic wave, where the non-linear behaviour appears. However, experimental measurements are extremely needed to validate high-fidelity numerical simulations.</p> <p>Progetto finanziato nell'ambito del PNRR – DM 117/2023 - CUP E14D23001970004</p>
Objectives	<p>In this project, in collaboration with the Dutch Aerospace Research Centre (NLR), we will advance in the development of non-intrusive experimental methods to perform such measurements. The PhD candidate will:</p> <ol style="list-style-type: none">1. Develop an optical non-intrusive measurement setup, i.e. PIV, to measure the flow features near the surface of a conventional single/double degree of freedom liner and a novel meta-liner.2. Perform the acoustic characterization of the acoustic liners.3. Perform post-processing of the experimental data to assess the flow interaction between the grazing turbulent flow and the acoustic field.4. Build an experimental database that can be used to improve low-order models and validate high-fidelity numerical simulations.
Skills and competencies for the development of the activity	<p>The candidate must have a solid background in non-intrusive experimental techniques for fluid dynamics. Background knowledge on acoustic liners and acoustic-flow interaction is a plus.</p>