

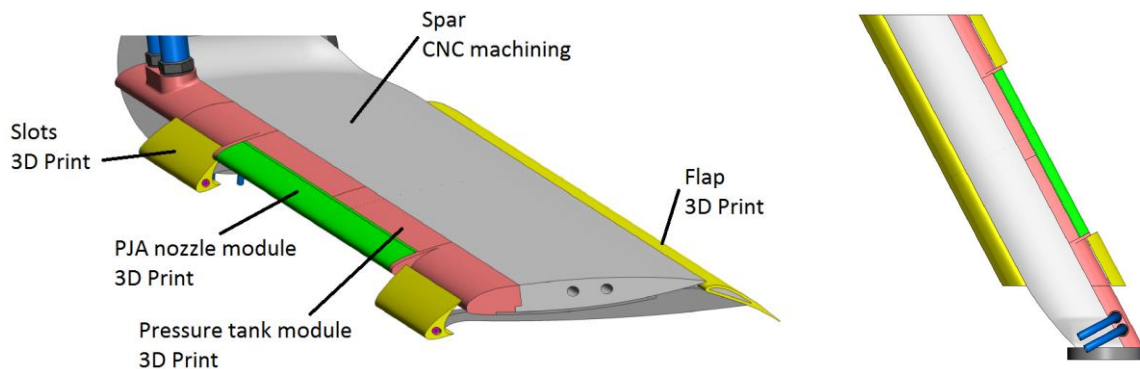
# Development of small scale wind tunnel model for testing power efficient pulsed jets actuator concepts in H2020 Clean Sky 2 WINGPULSE project

Wit Stryczniewicz<sup>1)</sup>, Wieńczysław Stalewski<sup>1)</sup>, Faycal Bahri<sup>2)</sup>, Mark Jabba<sup>2)</sup>

<sup>1)</sup> Łukasiewicz Research Network – Institute of Aviation, al. Krakowska 110/114, 02-256 Warsaw, Poland

<sup>2)</sup> University of Nottingham University Park Nottingham NG7 2RD, United Kingdom

The paper presents development of a model for small scale wind tunnel tests in the WINGPULSE project. The aim of WINGPULSE project is to develop and demonstrate Pulsed Jet Actuator (PJA) concepts for flow separation control with efficiency beyond the state-of-the-art (reducing the net mass flow by a factor of 3-5). To investigate advanced pulsed jet actuation patterns a small-scale wind tunnel model with integrated PJA system was designed and manufactured by Łukasiewicz Research Network – Institute of Aviation. The development process included: conceptual-design studies supported by Computational Fluid Dynamics, development of a system of high performance electromagnetic valves with real time control, PJA silent condition testing and additive manufacturing of pneumatic and high lift parts. The PJA system integrated in the wing allows for variation of jet pulse sequence in the spanwise direction, variations of duty cycle for each jet, and variation of spacing between pair of adjacent blowing slots.



**Fig. 1. Schematic view of the model developed for investigations of advanced PJ actuation patterns on the small-scale**

## Acknowledgments

This publication is part of a project that has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement N°887092.