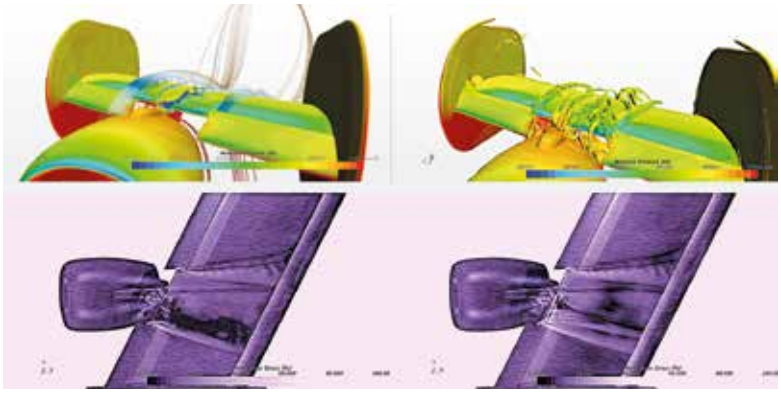
On the Wings of Innovation

Great engineering experience applied to the aircraft sector

This Padova University spin-off was launched early in the last decade and is now much sought after in the area of aircraft-related European projects. We are talking about HIT09, co-founded and currently run by Prof. Ernesto Benini, Professor of Engineering at the University of Padova, with the collaboration of Ms. Rita Ponza, current CEO of the company and an expert of helicopters and tiltrotors. With this significant background, the company participated in several Clean Sky 1 rotorcraft-related projects in recent years (dealing with design, feasibility studies, specific calculations, mathematical models). But it is now expanding the scope of its activities: as part of Clean Sky 2, in addition to a couple of newly launched tiltrotor-related projects, HIT09 is a partner of as many projects dealing with fixed-wing aircraft. The first of them is "X-Pulse" and focuses on active flow control technologies for aircraft with innovative high-bypass ratio engines, significantly larger than current engines, which are difficult to install under the wing, especially when flying at low speeds and high incidence angles (take-off and landing). "We are investigating innovative systems, synthetic jets - Benini and Ponza explained -; some membrane actuators that energise the flow to delay wing stall." Led by HIT09 and the University of Swansea, the "Optimorph" project is equally significant. The goal is to design a special wing type that is quite difficult to install, at least on civil transport aircraft. "We are talking about the morphing system; we are trying to design wings that can change their shape and adapt to different flight conditions and increase their aerodynamic efficiency."

RITA PONZA

ERNESTO BENINI



FLOW FIELD AROUND THE ENGINE/WING JOING (ABOVE);
CONFIGURATION WITH FLUIDIC ACTUATORS (BELOW)

The project aims to create integrated design tools that consider both aerodynamic and structural requirements at the same time.

"We work with the Fraunhofer Institute - the two engineers concluded - which is in turn a partner of Clean Sky 2, and will provide the results to the European carrier, Airbus. The latter should then implement our results by building an actual model for wind tunnel testing, which may finally be applied to both civil and military aircraft." ■