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INNOVATIVE SOLUTIONS FOR NON-DESTRUCTIVE TESTING

#fiber-optic #non destructive testing #composites #mechanical engineering #custom test bed

The start-up company XSun developed its autonomous solar drone in collaboration with many specialists, including Capacités' experts in mechanical engineering. These engineers are reputed for their expertise in innovative non-destructive testing solutions, and they suggested that XSun integrate fiber-optic sensors directly into the drone's wings. The advantage of this technology is that it can test structural health at the heart of complex composite structures and detect possible damage.

USING FIBER OPTICS FOR MONITORING THE STRUCTURAL HEALTH OF A COMPOSITE STRUCTURE

XSun had reached the limits of usual non-destructive testing techniques (ultrasound, tap testing, thermography, radio frequency, etc.) because they were not able to probe the core of a complex structure. Following advice from Capacités' experts, the start-up company integrated fiber optic sensors into its drone's wings. This cutting-edge technology presents the major advantage of detecting possible damage at the core of the composite material; it is also low-cost, non-invasive, and particularly lightweight.

They also developed a custom-made bending test bench for monitoring the wings. This equipment allowed the drone to be laboratory-tested with each use to regularly monitor its structural health. It is equipped with sensors that are examined with a Rayleigh fiber-optic interrogator before and after each flight; this allows the team to analyze the wings' residual strength and detect any weakened areas.

To complete this project, the Capacités' experts benefited from support and technical equipment from the GEM laboratory (Research Institute in Civil and Mechanical Engineering), joint research unit of Nantes Université and the CNRS. ■

Capacités' experts applied their knowledge of composite structures and were able to identify the areas to be instrumented.

Project carried out for:



Linked expertise:

- Mechanical engineering

CAPACITÉS SAS :

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