PROJECT

BRIDAS

Brillouin Distributed sensor for Aeronautical Structures

Funding: European (Horizon 2020)

Duration: Jul 2016 - Mar 2019

Status: Complete

Total project cost: €354,594

EU contribution: €350,281

Call for proposal: H2020-CS2-CFP02-2015-01

CORDIS RCN : 205630

Objectives:

The proposal is addressed to the development of a prototype for distributed strain measurements in optical fibres for industrial aeronautical contexts: composite manufacturing plants, structural test platforms and airborne conditions. The prototype will be based on stimulated Brillouin scattering (SBS), and will be aimed to the structural health monitoring of composite parts employed in the aeronautical industry. The developed prototype will have performance significantly superior to those offered by commercial SBS-based interrogation units. In particular, the prototype will have the following characteristics: (a) A spatial resolution of 5 mm; (b) A measurement range of 150 m; (c) A total weight less than 4.75 kg; (d) A specific software for each monitoring scenario, providing all relevant data in an effective and accessible way.

The developed sensor will implement a Brillouin Optical Frequency-Domain Analysis (BOFDA) configuration, characterized by the fact that measurements are carried out in the frequency domain The prototype will be assembled with Original Equipment Manufacturer (OEM) components, selected in order to minimize size and weight, in particular by making use of a vector network analyser (VNA) operating up to 20 GHz. The prototype will be employed in the evaluation of quality and structural health of composite parts for the aeronautical industry, such as complete fuselage, wings, vertical or horizontal tail plane of passenger commercial aircrafts. By measuring the strain along optical fibres embedded into composite parts during their manufacture, damage detection will be possible both in the manufacturing stage and during service life. The developed system will be integrated into one typical industrial application that will be selected with the Topic Manager. At the end of the project, the delivered prototype will be validated based on the research context.

Parent Programmes:

H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Universita Degli Studi Della Campania Luigi Vanvitelli

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EU Contribution: €135,100

Partner Organisations:

Consiglio Nazionale Delle Ricerche

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Organisation Website:
http://www.cnr.it

EU Contribution: €135,156

Optosensing Srl

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EU Contribution: €10,063

Universidad Rey Juan Carlos

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Spain

Organisation Website:
http://www.urjc.es

EU Contribution: €69,963

Technologies:

Sensor technologies
Laser Optics

Development phase: Demonstration/prototyping/Pilot Production

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other