

PROJECT

HADES

HADES - Optical Hot Air Leak DEtection System

Funding: European (Horizon 2020)

Duration: Mar 2018 - Dec 2020

Status: Complete

Total project cost: €570,000

EU contribution: €399,000



Call for proposal: H2020-CS2-CFP06-2017-01

[CORDIS RCN : 213814](#)

Background & policy context:

Light carbon structures are increasingly used in modern aircrafts for reducing weight and thus fuel consumption. The carbon materials are more sensitive to overheating than metals. Hot air ducts are used to conduct air heated by engine exhaust to the cabin heating system. At several locations, those hot air ducts are installed within or in close proximity to the carbon structures. Therefore, reliable and precise hot air leak detection is an essential safety feature of modern aircrafts. The proposed activity aims at developing an innovative, powerful and reliable fibre-optic technology for an aircraft hot air leak detection system and validating it in a representative aircraft environment.

State-of-the-art electrical hot air leak detection systems detect and localize leaks in aircraft hot air ducts by analysing electric shortcuts. However, the response of such systems just indicates that the critical temperature is exceeded. It is impossible to vary the threshold setting along the cable and false alarms due to stray signals are common. Localization of leaks is difficult, and the sensor cables are irreversibly damaged by exceeding the critical temperature.

Objectives:

Based on our deep understanding of using fibre-optic sensing systems in harsh and safety-critical environments, LIOS will select the optimum fibre-optic technology for hot air leak detection in aircrafts, which overcomes the limitations of the electrical systems, complies with the requirements of the tender and fulfils the other essential requirements of aircraft applications. LIOS will demonstrate the technology's capabilities, using a proof-of-concept system in the LIOS laboratories. After testing, we will re-design the demonstrator to enable a demonstration within an aircraft environment, allowing to pass the respective environmental tests and to fulfil the requested TRL of 6. The re-designed demonstrator will be installed at the facilities of the topic manager and tested in collaboration with the topic manager.

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)

Other programmes: JTI-CS2-2017-CFP06-SYS-02-34 Development of autonomous, wireless, smart and low cost current sensor for monitoring of electrical lines

Lead Organisation:

Nkt Photonics GmbH

Address:

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51063 KOLN
Germany

EU Contribution: €399,000

Technologies:

Information systems

Fibre optics and photonics technology

Development phase: Demonstration/prototyping/Pilot Production

Transport electrification, Vehicle design and

STRIA Roadmaps: manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Safety/Security

Geo-spatial type: Other