

PROJECT

SCONE

Simulations of CrOr and fan broadband Noise with reduced order modelling

Funding: European (Horizon 2020)

Duration: Sep 2017 - Dec 2020

Status: Complete

Total project cost: €616,268

EU contribution: €600,000



Call for proposal: H2020-CS2-CFP04-2016-02

[CORDIS RCN : 211043](#)

Objectives:

The prediction of Open Rotor and UHBR Fan broadband noise on realistic configurations is still an open challenge. The two major sources of broadband noise are the trailing edge noise and the wake interaction noise:

- The first source is related to a strong vortex shedding at the blade trailing edge
- The second is related to the interaction of the front blades wake turbulence with the rear blades leading edge.

Up to now, semi-analytic models used in the industry for the prediction of the broadband noise of these two sources are based essentially on turbulence statistics from steady low-resolution simulations which yield to inaccurate results.

The SCONE project proposes to improve the Open Rotor and UHBR Fan broadband noise prediction by using high-fidelity Large-Eddy Simulation (LES). The turbulence statistics obtained with this high-fidelity approach will allow to directly compute the noise but also to provide enhanced inputs to improve semi-empirical models. In order to reduce the cost of LES simulations, optimized numerical methods will be developed.

Therefore, the SCONE project deals with three objectives:

1. to build improved turbulence statistics data to feed the semi-analytic models by the use of high fidelity CFD methods
2. to provide validated high-fidelity methods for direct broadband noise computation
3. to improve existing semi-analytic models

This project will contribute to the development of 'quiet' CROR and UHBR engines.

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:

Centre Europeen De Recherche Et De Formation Avancee En Calcul Scientifique

Address:

Avenue Gaspard Coriolis 42
31057 Toulouse
France

Organisation Website:

<http://www.cerfacs.fr>

EU Contribution: €350,000

Partner Organisations:**Institut Supérieur De L'aeronautique Et De L'espace****Address:**

AVENUE EDOUARD BELIN 10
31055 TOULOUSE
France

Organisation Website:

<http://www.isae.fr>

EU Contribution: €150,000

Ecole Centrale De Lyon**Address:**

AVENUE GUY DE COLLONGUE 36
69134 ECULLY
France

Organisation Website:

<http://www.ec-lyon.fr>

EU Contribution: €100,000

Technologies:

Aircraft propulsion
Counter Rotating Open Rotor Engine

Development phase: Research/Invention

Aircraft noise reduction at source"

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other