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DYNAMO Design methods for durabilitY aNd operAbility of low eMissions cOmbustors

Fact Sheet

Project Information

DYNAMO

Grant agreement ID: 620180

Project closed

Start date
1 January 2014

End date
31 December 2016

Funded under
Specific Programme "Cooperation": Joint Technology Initiatives

Total cost
€ 796 529,00

EU contribution
€ 597 395,00

Coordinated by
LOUGHBOROUGH UNIVERSITY
United Kingdom

Objective

"Design methods for durabilitY aNd operAbility of low eMissions cOmbustors: DYNAMO

Lean burn combustor systems are a key technology to reduce NOx emissions for future engines. The ability to maintain the desired combustor metal temperature is critical to achieving acceptable durability. The levels of fuel-air premixing inherent in lean burn designs makes them susceptible to thermo-acoustics instabilities which will have a drastic impact on the durability of the combustor. The overall aim of this project is to develop validated methodologies for the prediction of combustor temperature and thermo-acoustics instabilities to allow confident design of the combustion system of a demonstrator engine at TRL6. The first work package focusses on cooling and radiative heat transfer. It uses Computational Fluid Dynamics to highly resolve the combustor liner geometric features so that a cheaper model may be obtained for design purposes. In addition the sensitivity of radiative heat transfer to the choice of physics models is assessed. The resulting models will be validated against existing experimental data from Loughborough University and the industrial partner. The second work package develops a smart system for combustor design by bringing together a variety of analysis techniques and creating software that can directly drive CAD software. A response surface supported by multi-fidelity, multi-objective robust design approaches will be used to deliver a world class combustor design process. Thermoacoustics are considered by using CFD to study the response of a fuel injector to acoustic plane waves and by modelling a complete annular combustion system in order to resolve circumferential modes. The thermoacoustic results will be validated against existing experimental data available at Loughborough and Cambridge University."

Fields of science (EuroSciVoc)

natural sciences > computer and information sciences > **software**

natural sciences > physical sciences > classical mechanics > fluid mechanics > fluid dynamics > **computational fluid dynamics**

engineering and technology > environmental engineering > **energy and fuels**

Programme(s)

FP7-JTI - Specific Programme "Cooperation": Joint Technology Initiatives

Topic(s)

JTI-CS-2013-1-SAGE-06-005 - Design methods for durability and operability of low emissions combustor

Call for proposal

SP1-JTI-CS-2013-01
See other projects for this call

Funding Scheme

JTI-CS - Joint Technology Initiatives - Clean Sky

Coordinator

LOUGHBOROUGH UNIVERSITY

EU contribution

€ 312 298,00

Total cost

No data

Address

ASHBY ROAD
LE11 3TU Loughborough
United Kingdom

Region

East Midlands (England) › Leicestershire, Rutland and Northamptonshire › Leicestershire CC and Rutland

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation
Website
Participation in EU R&I programmes
HORIZON collaboration network

Participants (2)

THE CHANCELLOR MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE

United Kingdom

EU contribution

€ 135 335,00

Address

TRINITY LANE THE OLD SCHOOLS
CB2 1TN Cambridge

Region

East of England > East Anglia > Cambridgeshire CC

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

UNIVERSITY OF SOUTHAMPTON

United Kingdom

EU contribution

€ 149 762,00

Address

Highfield
SO17 1BJ Southampton

Region

South East (England) > Hampshire and Isle of Wight > Southampton

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

Last update: 12 March 2015

Permalink: https://cordis.europa.eu/project/id/620180