PROJECT

EJEMOD

Engine bleed JEt pumps continuous behaviour MODelization

Funding: European (Horizon 2020)

Duration: Jan 2021 - Mar 2023

Status: Ongoing

Total project cost: €696,329

EU contribution: €696,329

Call for proposal: H2020-CS2-CFP11-2020-01

CORDIS RCN : 232700

Objectives:

The EJEMOD project focuses on the study of the physics and operation of new ejector prototypes proposed by the Topic Manager. The main objective of the project is to acquire knowledge on the functioning of these jet pumps, both in their steady (on and off-design modes) and transient behaviour (transition between operating points by a change of boundary conditions). The wide working range analysed and the focus on the transitional phases will serve to acquire knowledge and transfer it into accurate and robust Dymola libraries, applicable (for various purposes) to the modelling of ejector devices whose function is also different to those previously described. Hence, the specific objectives of EJEMOD are the following:

- Perform a CFD analysis of the proposed ejectors, studying all the on-design and off-design modes indicated by the Topic Manager. The analysis will be performed by means of steady-state simulations (WP 1.1) covering on-design (double choked) and off-design (single choked or no-choked) operation. Moreover, a transient model will be employed to analyse in detail transition between two operating points (WP 2.1). Both steady-state and transient CFD models will be validated by comparison with experimental results.
- Perform the experimental testing of the ejectors, following a design of experiments (DoE) approach which covers the operational envelope indicated by the Topic Manager. Testing will be carried out in static conditions (WP 2.1), by setting primary and secondary pressure and temperatures, as well as back-pressure and in time-varying conditions (WP 2.2), by setting time-dependent functions for primary, secondary and back-pressure.
- Development and validation of 0D-1D numerical models on the Dymola platform for the simulation of ejectors, to be used in both static (Development WP 1.3, Validation WP 3.1) and dynamic scenarios (Development WP 2.3, Validation WP 3.2). Surrogate modelling methodologies based on deep learning architectures will be used.

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-CS2-2020-CfP11-LPA-01-93 Engine bleed jet pumps continuous behaviour modelization

Lead Organisation:

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EU Contribution: €184,125

Partner Organisations:

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EU Contribution: €238,663

Institut Von Karman De Dynamique Des Fluides

Address:
Chaussee De Waterloo 72
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EU Contribution: €273,541

Technologies:

Manufacturing processes
Advanced Manufacturing Processes for Gas-Engine Turbine Components

Development phase: Validation

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Safety/Security

Geo-spatial type: Other