

PROJECT

UHURA

Unsteady High-Lift Aerodynamics - Unsteady RANS Validation

Funding: European (Horizon 2020)

Duration: Sep 2018 - Aug 2021

Status: Complete

Total project cost: €6,119,234

EU contribution: €6,119,234



[CORDIS RCN : 216002](#)

Objectives:

UHURA aims at validating unsteady numerical simulations of the aerodynamics of high-lift systems during deployment and retraction. In detail we perform:

- Validation of numerical simulation methods for prediction of the unsteady aerodynamics and dynamic loads during the deployment and retraction phase of high-lift systems. We expect to verify the ability of predicting the unsteady aerodynamics and corresponding loads on the Krueger flap within an accuracy comparable to steady state calculations (less than 1% error in lift, drag and pitching moment).
- Quantification of the completely unknown aerodynamic characteristics of a slotted Krueger device during deployment and retraction. We expect to quantify the difference of the actual unsteady loads to the values obtained by state-of-the-art approaches to estimate the critical loads, which are either steady-state predictions or handbook estimations. And, we expect to achieve a system complexity reduction of about 70% by verifying the conceptual feasibility of a central drive architecture for a Krueger flap by properly assessing the handling qualities impact during the deployment. We also expect by this to keep the system weight at or below levels of current state-of-the-art slat devices. Further on, the higher accuracy for load calculations shall reduce the necessary safety margin for the structural sizing due to better knowledge of the actual loads.
- Qualification of impact on handling qualities and certification. We expect the Research and Innovation Action to qualify the impact of the unsteady aerodynamic and of the dynamic loads during deployment on the handling qualities and certification issues. The latter also addresses the risk and mitigation of failure cases.

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: MG-1.3-2017 Maintaining industrial leadership in aeronautics

Lead Organisation:

Deutsches Zentrum Fr Luft Und Raumfahrt E.v

Address:

Linder Hoehe
51147 KOELN
Germany

Organisation Website:

<http://www.dlr.de>

EU Contribution: €1,646,749

Partner Organisations:

Ibk Ingenieurbuero Dr Kretzschmar

Address:

Rehdorfer Str. 4
90431 NUREMBERG
Germany

Organisation Website:

<http://www.ibk-aero.com>

EU Contribution: €475,000

Stichting Duits-Nederlandse Windtunnels

Address:

VOORSTERWEG 31
8316 PR Marknesse
Netherlands

Organisation Website:

<http://www.dnw.aero>

EU Contribution: €1,072,850

Kungliga Tekniska Hoegskolan

Address:

Brinellvagen 8
100 44 Stockholm
Sweden

EU Contribution: €599,750

Stichting Centrum Voor De Ontwikkeling Van Transport En Logistiek In Europa

Address:

Van Nelleweg 1
3044 BC Rotterdam
Netherlands

Organisation Website:

<http://www.cetle.org>

EU Contribution: €385,000

Office National D' Etudes Et De Recherches Aérospatiales

Address:

29, avenue de la Division Leclerc
BP72 CHÂTILLON CEDEX
France

Organisation Website:

<http://www.onera.fr>

EU Contribution: €458,063

Asco Industries N.v.

Address:

Weiveldlaan 2

1930 Zaventem
Belgium

EU Contribution: €217,439

Airbus Deutschland Gmbh

Address:

Kreetslag 10
950109 HAMBURG
Germany

Organisation Website:

<http://www.airbus.com>

EU Contribution: €187,500

Dassault Aviation

Address:

9, Rond-Point des Champs-Élysées - Marcel Dassault
75008 PARIS
France

Organisation Website:

<http://www.dassault-aviation.com>

EU Contribution: €284,915

Centro Italiano Ricerche Aerospaziali Scpa

Address:

Via Maiorise s/n
81043 CAPUA (CE)
Italy

Organisation Website:

<http://www.cira.it>

EU Contribution: €331,344

Vyzkumny A Zkuebni Letecky Ustav, A.s.

Address:

Beranovych 130
19905 PRAHA - LETNANY
Czech Republic

Organisation Website:

<http://www.vzlu.cz>

EU Contribution: €223,125

Instituto Nacional De Técnica Aeroespacial

Address:

Carretera de Ajalvir Km 4,5
28850 TORREJON DE ARDOZ
Spain

Organisation Website:

<http://www.inta.es>

EU Contribution: €237,500

Technologies:

Computer-aided design and engineering
Next generation computational fluid dynamics (CFD)

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing, Infrastructure

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other