PARTNERS

The AeroGust consortium brings together a total of 12 organisations across 7 countries:

- **Universities** - Bristol, Liverpool and Cape Town
- **Research institutions** - DLR, INRIA and NLR
- **SMEs** - NUMECA, Optimad and VALEOL
- **Aerospace companies** - Airbus Defence and Space, Dassault Aviation, Piaggio Aerospace

Our partners combine academic, industrial and SME expertise. All have relevant experience in the field of numerical modelling of unsteady fluid flows and aeroelastics and are recognized experts in these fields.

The project is university led and has the necessary industrial direction to ensure that the knowledge produced by the project will be exploited to drive future aircraft design procedures.

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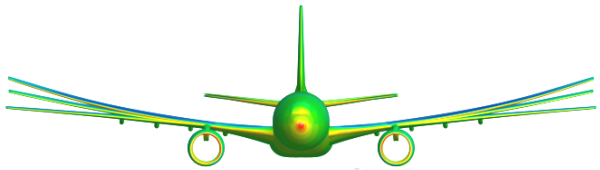
AeroGust

"Driving the competitiveness of European Aviation through cost efficiency and innovation."



The aim of the Horizon2020 project , Aeroelastic Gust Modelling (AeroGust), is the investigation and development of improved simulation methods for gusts .

THE PROJECT

AeroGust is a state of the art and exciting project that will investigate and develop improved simulation methods for gusts by responding to three main areas of work:

1) Investigations using Computational Fluid Dynamics (CFD) to gain a deeper understanding of the complexities in gust interactions with an aircraft;
2) Creation of a numerical gust loads process that does not require wind tunnel data for early design stages;
3) Development of efficient reduced order models for gust prediction that account for aerodynamic and structural complexity at an acceptable cost.

Inspiration for this project was drawn from FlightPath 2050 which aims to maintain and extend industrial leadership in Europe. The success of the project will help industry prepare for future challenges and promote the consolidation of academic, industrial and SME expertise.

EXCELLENCE

For the European aerospace and defence industry to remain competitive in the future, the gust loads process needs to evolve to be quicker and to include more complex physics, so that innovative products can be developed.

The current gust loads process relies on steady wind tunnel data created from the final aerodynamic surface in the predicted cruise shape. This means that gust loads come relatively late when the design options have been narrowed. Accurate and computationally inexpensive numerical methods will allow gust responses behaviour to be included earlier.

AeroGust consists of a number of different research areas, which lie at different Technology Readiness Levels. The project outputs will span a range from TRL 1 to TRL 4. Understanding of the flow physics is at TRL 1-2, but the results will enable the development of methods in other themes at a higher TRL. Reducing the need for experimental testing through CFD based correction will be at TRL 3 to TRL 4, because a range of methods of differing maturity will be considered. Finally, the development of non-linear reduced order aeroelastic modelling for gusts will start from TRL 2 and will progress to TRL 3-4 by the end of the project.

Want to find out more?

Contact us to receive our newsletter

IMPACT

The impacts of **AeroGust** will include:

⇒ Reduced reliance on wind tunnel testing, through a numerical gust loads process to allow greater creative design potential and competitiveness,

⇒ Reduced conservatism by improving accuracy and robustness, to include a better representation of real world physics - leading to lighter, more efficient aircraft,

⇒ Faster exploration of the design space through updating Reduced Order Models, resulting in time/cost reduction,

⇒ More accurate wind turbine load predictions, allowing improved design and increased economic feasibility.

Whilst the project mainly focusses on the problems associated with aeroelastic aircraft, the fundamental physics is common to large wind turbines - this means the methodology of **AeroGust** will find direct application in wind turbine design.

Knowledge produced in AeroGust will be transferred to wind turbine design