

## POST-DOCTORATE PROPOSAL

**Title: Aviation Impact on Air Pollution: impact of new technologies and uncertainties evaluation**

Reference : **PDOC-DTIS-2026-01**  
(to be recalled in all correspondence)

**Start of contract:** beginning of 2026

**Application deadline:** January 2026

**Duration: 12 months**

### Keywords

Atmospheric Pollution, Airport, Multi Fidelity, Model Reduction

### Profile and skills required

Knowledge in applied mathematics and aerospace sciences, Python programming, Atmospheric Sciences

Aviation is undergoing a major technological transition, with new propulsion systems, sustainable fuels, and evolving operational practices. As the sector continues to grow while others decarbonize, aviation is expected to play an increasingly critical role in environmental issues such as air quality.

The Impact Monitor 2 European project addresses this challenge by combining advanced atmospheric modeling and uncertainty quantification to better understand aviation's contribution to local and regional pollution.

This postdoctoral position offers the opportunity to work at the interface between numerical modeling, environmental physics, and applied mathematics, contributing to the development and evaluation of next-generation tools for aviation impact assessment within a strong European collaboration network.

### The postdoctoral researcher will:

- Work with the Open-Alaqs open-source model and the Meso-NH meteorological research model.
- Develop methods to couple emission models (provided by European partners) with Open-Alaqs and Meso-NH for consistent air quality simulations.
- Perform high-resolution Large Eddy Simulation (LES) runs with Meso-NH, including on-line chemistry, to provide detailed pollutant concentration fields at the airport level.
- Apply model approximation techniques to construct simplified surrogate models and fasten simulation (e.g. for error propagation, Kalman filter design...)
- Assess uncertainties in the simplified Open-Alaqs model by benchmarking it against Meso-NH high-resolution simulations.
- Contribute to the multi-fidelity exploration of modeling approaches within the project, aiming to improve the robustness of aviation air quality assessments.

### Candidate profile:

PhD in atmospheric sciences, applied mathematics, or a related field.

- Experience in numerical modeling of atmospheric processes (air quality, chemistry, meteorology) or fluid dynamics.
- Familiarity with emission inventories, model coupling, or uncertainty quantification is desirable.
- Good programming skills (Fortran, Python, or similar).
- Ability to work in a European research consortium and to contribute to collaborative publications.

**External collaborations**

A collaboration with Eurocontrol to use Open-ALAQs is envisaged and with Météo France and CNRS for Meso-NH.

**Host laboratory at ONERA**

Department : Information Processing and Systems Department

Location (ONERA centre): Toulouse

**Contact:** Claire Sarrat and Thierry Lefebvre

Phone: +33 5 62 25 28 98.....

Email : [claire.sarrat@onera.fr](mailto:claire.sarrat@onera.fr)