Program Support

CONTRAILS
Contrails in the Climate System: from Observation to Impact Modeling and Prediction

Motivation The observation, modelling and prediction of contrails and high clouds is an important and challenging area of atmospheric science, especially with regard to the interaction with air traffic and their immediate and long-term climate impact.

Goal The CONTRAILS project aims to develop and combine advanced trustworthy AI methods and physical models to improve contrail and high cloud identification, characterisation, data assimilation and prediction. Overall, a better understanding of the entire physical process underlying the formation of contrails should be achieved.

Intended Outcomes New ground-based all-sky camera observations and satellite-based cloud observations in the infrared and visible range will be automatically evaluated for contrail and high cloud visibility in real time using artificial intelligence methods. The results are automatically fed into the observation pool for the analyses of the numerical weather forecast, where they provide a significantly improved formation probability of contrails and the climate-relevant clouds that arise from them.

Impact With global to regional forecast systems based on modern ensemble data assimilation techniques, new artificial intelligence techniques and new observation systems can be seamlessly integrated into the analysis and forecast process. The knowledge gained from this contributes to the reduction of contrail formation and serves optimised planning in air traffic. The results of this project would provide tools for monitoring contrails and their impact on the climate.

Tags Data assimilation, aviation, climate models, AI; meteorology

3 YEARS DURATION

Mar. 2022 - Feb. 2025

4 PARTNERS

France:
THALES Group;
University of Versailles Saint Quentin en Yvelines (UVSQ)
LATMOS; Reuniwatt;
Germany:
Deutscher Wetterdienst (DWD)

€ 2.7 MILLION FUNDING

The total cost of the project is €4.0 million, of which €2.7 million will be funded.

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