

WP1: Task 1.2

Preparation of atmospheric models for campaign interpretation (UniVie, CEA, UU, VUA, INCAS, INOE, UBremen)

This task will prepare atmospheric transport models for the simulation of the Task 1.3 measurement campaigns. An automated interactive quantification tool will be designed for computing back-trajectories of measurements using the Flexpart particle dispersion model. This tool will be made publicly available through a web-based Graphical user interface at the ICOS-ATC server for mobile campaigns and fixed measurement sites. The high-resolution DALES Large-Eddy Simulation model will be prepared for 50 m resolution ensemble simulations of methane plumes measured in the Task 1.4 campaigns in Romania to collect statistics on turbulence for precise comparison to surface, aircraft, and satellite measurements.

D1.2: Readiness report on automated data processing

→ Due by December 2025, can possibly be shifted to January 2026

Discussion points

- Objectives: What exactly is the tool supposed to do? (“interactive quantification tool for computing back-trajectories of measurements using the Flexpart”)
- Model: FLEXPART, FLEXPART-WRF, Gaussian plume model?
- Platform: ICOS-ATC, FLEXWEB?
- Uniform data format
- Model forecast for campaigns? (Limited capacities)
- Deliverable content

Objectives

- Tool where datasets can be evaluated in same way
- Lagrangian model to compare to measurements
- Put in data -> get emission rate
- DALES model -> near scale, FLEXPART(-WRF) -> larger scale
- For FLEXPART: emission rate 1kg/s -> then scaling
- DALES model not part of the quantification tool

Model

- GPM by LSCE + Utrecht University
- FLEXPART by University of Vienna
- DALES by VU (not part of automated tool)

Platform

- ICOS-ATC: Information about space and computing power, restriction on available space, data storage
- ICOS will be used as platform for GPM
- Notes on the ICOS platform from Maggie and Ute:
 - There are many large "generalist" repos, but CP while small in comparison offers discipline-specific data curation services that are based on understanding of the themes we cover – atmospheric, ecosystem and ocean greenhouse gas science.
 - Our main missions are to curate and make available to anyone observational data products from ICOS ERIC, as well as modelling and observational data from external research projects – like IM4CA – and research groups that are involved in related Earth and Environmental science.
 - Items that we host range from raw, over near-real time auto-checked, to finalised & fully quality controlled aggregated data, as well as outputs of modelling studies. We also manage documents of various kinds, as well as images.
 - ICOS operates both a catalogue and a storage service, with an associated web interface – the Carbon Portal – that offers a suite of services to discover, visualise, download and interact with the data we hold.
 - The goal is for data and metadata – data about the data – as FAIR as possible, i.e. Findable, Accessible, Interoperable and Reusable.
 - We believe that everyone should be able to use data – as long as they give credit to the data creators and producers through proper citation and acknowledgements in scientific publications. To this end, ICOS applies the Creative Commons Attribution International license for data, and a Creative Commons Zero (no restrictions) license for metadata.
 - Our philosophy is to work tightly with data providers, to find the best ways to describe and manage their data. A key aspect of this collaboration is starting a dialogue early on, so that all necessary specifications and data management processing steps are in place well before publication deadlines.
- FLEXWEB will be extended for FLEXPART (<https://flexweb.wolke.img.univie.ac.at/order?>)

Data format

- To be clarified later

Forecast for campaigns

- No capacities from the Universities of Vienna, to be discussed later

Deliverable

- information on FLEXWEB -> show implementation + example
- comparison of different GPM methods -> show implementation + example
- some information/example of DALES