Internship position in atmospheric greenhouse gas monitoring and modeling strategy for cities

Location: CIRSEE, Le Pecq 78230, France

Duration: 6 months

Starting date: The position is available from September 2022 and will remain open until filled

Remuneration: based on Suez rules, depending on candidate seniority

BACKGROUND

Founded in 2020, Origins.earth (https://www.origins.earth/) is a start-up within the Suez group developing innovative solutions for local governments to address climate change. Today, our mission is to accelerate the low-carbon transition in cities with data, climate science and digital tools.

In collaboration with the Laboratoire des Sciences du Climat et de l'Environnement (LSCE), we have built a network of innovative CO_2 measurement stations and a high-resolution Weather Research and Forecasting model with Chemistry (WRF-Chem) modeling system in the Paris region during the past few years. We leverage this CO_2 monitoring system in combination with data and scientific expertise to deliver historical and current greenhouse gas emissions to decision makers and stakeholders in cities. We are now building upon this experience to expand on our service for different cities within Europe and beyond.

THE SCOPE OF YOUR JOB

The intern will contribute to a project to design an optimal urban in-situ greenhouse gas (GHG) monitoring network by using a trajectory-based ("Lagrangian") atmospheric transport and dispersion model. The network is being designed to better understand the spatiotemporal variations of atmospheric GHG concentrations (spec. CO_2) with the ultimate goal of improving emission estimates for cities. As a first step, a case study will be carried out over the Paris metropolitan areas, followed by a further exploration for some other cities.

The intern will work for Origins.earth under the direct supervision of an atmospheric modeling scientist, closely linked with the Chief Technology Officer and scientific advisers from the LSCE, the Université de Reims-Champagne Ardenne and other institutions.

YOUR TASKS

- Configure the Stochastic Time-Inverted Lagrangian Transport (STILT) model (https://uataq.github.io/stilt/#/), together with a high-resolution emission

inventory developed by Origins.earth for reliable urban CO_2 simulations for Paris.

- Evaluate the model performance against observation datasets.
- Analyze the impact of adding a certain number of additional observation sites into our current Parisien monitoring network.
- Based on the quantification of the modeled CO_2 and several existing network design approaches, propose a synthetic monitoring network design and evaluation framework that could be used to advance CO_2 measurement capabilities for different cities at relevant spatial and temporal scales.

YOUR QUALIFICATIONS

- Master's degree (1st or 2nd year) or equivalent in atmospheric science, computer science and physics, or another relevant field.
- Good programming skills and data analysis, preferably in Python or R. Bash shell scripting with Linux system is required.
- Knowledge of atmospheric dispersion processes and experience with atmospheric transport models will be preferentially considered.
- Communication skills in English (oral presentation and discussion, technical and scientific report writing).

HOW TO APPLY

Please email jinghui.lian@origins.earth and herve.utard@origins.earth to learn more and pursue the conversation.