

Research scientist to study concepts of space-borne concentration observations for the monitoring of hotspots of CO₂ and CH₄ emissions

LSCE : Laboratoire des Science du Climat et de l'Environnement

Context:

Comprehensive information about greenhouse gas emissions is essential for decision makers to track the effectiveness of emission control policies in the context of the Paris Agreement on Climate. To answer that need, LSCE has launched a research program known as TRACE (<http://trace.lsce.ipsl.fr>) funded for four years by the French National Research agency and corporate partners THALES ALENIA SPACE, SUEZ and TOTAL. The TRACE program develops new GHG emissions measurement methods, going from the scale of industrial sites up to national and global CO₂ and CH₄ budgets, using satellite-mounted infrared spectrometers instruments and arrays of low-cost sensors deployed in situ, on the surface, around emitting industrial sites.

Job description - Responsibilities and tasks:

- Develop a high resolution atmospheric inverse modeling system assimilating column CO₂ and CH₄ satellite data and ground based measurements for the monitoring of emissions in western Europe,
- Apply this system for studying the potential of different configurations of new concepts of space-borne greenhouse gas (GHG) observation for reducing uncertainties in emissions at the scale of populated regions, large cities and large point sources,
- Work on the coupling of this system with inverse radiative transfer models developed by the Laboratoire de Météorologie Dynamique (LMD) to retrieve atmospheric column CO₂ and CH₄ data from satellite radiance measurements; this should lead to the development of an “end-to-end” simulation platform in support to the design and exploitation of satellite measurements,
- Interact regularly with engineers from corporate partners and LMD to ensure that the model developments and experiments are in line with the measurement constraints and exploit their full potential,
- Work with LSCE researchers and co-supervise a PhD student in the project for the exploration of the joint assimilation of atmospheric data on co-emitted species (such as CO and NO₂ data),
- Lead and contribute to the writing of peer-reviewed publications with the results from TRACE,
- Contribute to research projects connected to the objectives of TRACE,
- Promote the project results at international conferences

Required skills/experience:

- Knowledge in atmospheric sciences and/or statistical inversion techniques
- Experience with atmospheric transport, meteorological models and/or data assimilation systems
- Programming (ideally in Fortran and Python)
- Ability to work collaboratively with a team of researchers and engineers
- Previous involvement in research projects

Education: PhD in climate, environmental or atmospheric sciences.

Location: Laboratoire des Science du Climat et de l'Environnement (<https://www.lsce.ipsl.fr>), in Gif-sur-Yvette, near Paris (France).

Contract duration: 3 years, with annual renewals conditioned by performance reviews.

Starting date: The position will start as soon as possible and will remain open until filled.

Salary: Salary includes full social and health benefits, adjusted for work experience.

How to apply: Applicants should submit a complete application package by email to: contact-trace@lists.lsce.ipsl.fr. The application package should include (1) a curriculum vitae, (2) statement of motivation and (3) names, addresses, phone numbers, and email addresses of at least two references.