

Research scientist to develop new inversion methods based on local scale atmospheric dispersion models to quantify CH₄ emissions from industrial facilities

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 launches new 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 will develop 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:

- Apply fine scale atmospheric dispersion models to simulate the local transport of CH₄ and other tracers emitted from various industrial facilities,
- Develop an associated inverse modeling framework assimilating near field atmospheric CH₄ measurements within and around the industrial sites, to quantify the CH₄ emissions from these sites,
- Test the framework for concrete case studies in the project, and use it to support the atmospheric measurement strategy and derive statistics of uncertainties in the estimate of emission factors,
- Interact regularly with the scientists of TRACE that are responsible for the measurements, and with the engineers and technicians from corporate partners to ensure that the model developments and experiments are in line with site specific emission and transport features,
- 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:

- Experience with local scale dispersion models (LES or other Eulerian or Lagrangian CFD models)
- Knowledge in atmospheric sciences; the additional knowledge in statistical inversion and data assimilation techniques would be an asset
- 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>)

Contract duration: 2 years renewable.

Starting date: as soon as possible. It 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 Grégoire Broquet, Thomas Lauvaux and Philippe Ciais: 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.