



## Satellite atmospheric composition measurements and ground-based activity data to quantify regional CO<sub>2</sub> emission budgets

### Postdoctoral or research engineer position

The Laboratoire des Sciences du Climat et de l'Environnement (LSCE) and ATOS are looking for a motivated postdoc / engineer young scientist candidate for a joint project focused on methods to quantify regional budgets of anthropogenic CO<sub>2</sub> emissions using activity data and satellite observations of atmospheric CO<sub>2</sub> and co-emitted combustion tracers. If the research finds market applications, a permanent position will be considered by ATOS.

#### Background

CO<sub>2</sub> emissions from the combustion of fossil fuels are the main cause of climate change and must be reduced to achieve the objective of the Paris Agreement. There is a need for science-based monitoring of emission changes to support climate policy. Current emission inventories lack information about temporal and spatial variations and have a low latency. To support the improvement of inventories, the research community has developed methods based on the assimilation of satellite observations of atmospheric CO<sub>2</sub> concentrations in atmospheric transport models. This method is called atmospheric inversion.

#### Overall aim

Improve and apply the atmospheric inversion system of LSCE to constrain CO<sub>2</sub> emissions from satellite measurements at regional scale. The atmospheric transport model will use a zoom to achieve a higher spatial resolution for monitoring emissions over the region of interest. The region of interest will be in South Asia or Africa, where high-quality CO<sub>2</sub> emission inventories are lacking or cannot be updated frequently. The main challenge will be to apply the LSCE inversion model with a zoom so that the patterns of atmospheric transport and emissions can be resolved with the best precision over the regions of interest.

#### Requirements

- Programming skills, preferably in Python, Fortran, including for high performance computing
- Understanding of atmospheric sciences and statistics

#### Selection Criteria:

- MSc. (or equivalent engineering diploma) or PhD
- Autonomy, ability to work in a team and time management skills.

- Experienced in multidisciplinary team-based activities with the ability to effectively communicate with colleagues and with staff from the partners of a project.

#### **What ATOS and the LSCE can offer you:**

##### **LSCE** <https://www.lsce.ipsl.fr>

Is a world-class research laboratory established and a collaboration between CEA, CNRS and the University of Versailles Saint-Quentin (UVSQ). It is part of the Institute Pierre Simon Laplace (IPSL). LSCE hosts approximately 350 researchers, engineers and administrative staff including many PhD and master's students. This project will provide the employee with the opportunity to work directly on advanced methods with researchers from the LSCE and other institutions. The purpose of this joint position between LSCE and ATOS is to develop R&D that becomes sustainable and could lead to a permanent position opening at ATOS during or after the position duration. Location: about 20 km from the heart of Paris, in the Orme des Merisiers green area.

##### **ATOS** [www.atos.net](http://www.atos.net)

Is a global leader in digital transformation with 105,000 employees and annual revenue of over € 11 billion. European number one in cybersecurity, cloud and high-performance computing, the Group provides tailored end-to-end solutions for all industries in 71 countries. A pioneer in decarbonization services and products, Atos is committed to a secure and decarbonized digital for its clients. The purpose of Atos is to help design the future of the information space. Its expertise and services support the development of knowledge, education and research in a multicultural approach and contribute to the development of scientific and technological excellence. Across the world, the Group enables its customers and employees, and members of societies at large to live, work and develop sustainably, in a safe and secure information space.

**Contract duration:** 24 months hired by CEA, managing institution of LSCE, funded by the French Government stimulus package for R&D. If the research finds applications, a permanent position will be considered by ATOS.

**Starting date:** The position is available from Jan 20 2022 and will remain open until filled. The expected start of the position is April 2022.

**Salary:** Competitive salary, full social and health benefits, commensurate with work experience.

**How to apply:** Applicants should submit a complete application package by email to the contacts below. The application package should include (1) a curriculum vitae including e.g. recent publications / projects, (2) statement of motivation (3) answers to the selection criteria above (4) names, addresses, phone numbers, and email addresses of at least two references.

#### **Contacts**

[frederic.chevallier@lsce.ipsl.fr](mailto:frederic.chevallier@lsce.ipsl.fr)

[philippe.ciais@lsce.ipsl.fr](mailto:philippe.ciais@lsce.ipsl.fr)

[laurent.clergue@atos.net](mailto:laurent.clergue@atos.net)