Research scientist to monitor the fossil fuel emissions of CO_2 based on atmospheric $^{14}CO_2$ data (3 years)

LSCE: Laboratoire des Sciences du Climat et de l'Environnement
CORSO: Supplementary Observations for the Copernicus CO2 service (CO2MVS)

Context:

Improving the monitoring of the anthropogenic emissions of CO_2 is a strategic objective within the European Green Deal and a key requirement for the application of the Paris agreement on climate change mitigation, adaptation and finance. The European Union supports the development of an operational service for such a monitoring in the frame of **Copernicus**, its Earth observation programme. The service will exploit atmospheric and Earth observation data from various observation systems, in particular satellite images and near surface measurements of atmospheric CO_2 and co-emitted tracers. It will rely on atmospheric modeling together with data assimilation and atmospheric inversion techniques.

The series of European projects H2020 CHE, H2020 CoCO2 and now Horizon **CORSO** aims to provide the prototype system for this service. **LSCE** has been a key partner of these projects, coordinated by ECMWF, and has participated in various activity segments. In particular, in **CORSO**, the LSCE team will participate to the assessment of the added value of $^{14}CO_2$ (radiocarbon) measurements for the monitoring of the fossil fuel emissions (relying on the fact that fossil fuels are radiocarbon free). It will develop a dedicated atmospheric transport modeling and inversion configuration which can assimilate $^{14}CO_2$ data together with CO_2 data and apply it for a 20-year analysis of the emissions at global to European scale.

Job description - Responsibilities:

- Conduct and analyze $^{14}CO_2$ atmospheric transport simulations at global to regional scales using the LMDZ and CHIMERE transport models and $^{14}CO_2$ flux products from the CORSO project
- Implement modules for the assimilation of $^{14}CO_2$ measurements in the Community Inversion Framework (CIF, http://community-inversion.eu/), which is coupled to the LMDZ and CHIMERE models; contribute to the improvement of the interface between LMDZ and the CIF
- Conduct and analyze atmospheric inversions to quantify the fossil fuel emissions of the last 20 years in the Northern Hemisphere using a global $^{14}CO_2$ measurement database, and in Europe during a year of intensive sampling of $^{14}CO_2$
- Interact regularly with LSCE researchers connected to these activities and with the European partners of CORSO to ensure that the developments rely on state-of-the-art approaches and for the analysis of the inversion results
- Lead and contribute to the writing of subsequent peer-reviewed publications
- Promote the results at international conferences

Required skills/experience:

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

Education: PhD in climate, environmental or atmospheric sciences, or in applied mathematics.

What the LSCE and CORSO can offer you:

The LSCE is a world-class research laboratory established as a collaboration between the Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA), the Centre National de la Recherche Scientifique (CNRS) and the University of Versailles Saint-Quentin (UVSQ). LSCE hosts more than 300 researchers, engineers and administrative staff including many PhD and master's students. It is also part of the Institute Pierre-Simon-Laplace (IPSL; https://www.ipsl.fr/) which gathers nine laboratories that study the Earth system.

CORSO provides the opportunity to contribute to the development of a critical service for the environment and climate policy in Europe. The research scientist will be regularly in contact with leading researchers from the LSCE along with a large number of key European research institutes in the domain. It offers integration into a large research community enabling the employee to expand his/her professional network and gain insight from a diverse array of scientists specializing in different fields of research.

The LSCE is an equal opportunity and diverse workplace and applications will be reviewed based on qualifications and merit. We therefore encourage all people who believe they meet the essential selection criteria to apply.

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.
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: gregoire.broquet@lsce.ipsl.fr, philippe.ciais@lsce.ipsl.fr and frederic.chevallier@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.