

RESEARCH POSITION: Inverse modeling and network analysis in the framework of the InGOS project

BACKGROUND: We are seeking a RESEARCH ENGINEER to perform inverse modeling of nitrous oxide/methane (N_2O/CH_4) and network analysis using the variational system developed at LSCE in the framework of the European InGOS project. Different modeling activities are planned within InGOS, among them N_2O/CH_4 inverse modeling and network analysis will be the focus of the hired candidate. The inverse modeling aims at optimizing the N_2O/CH_4 surface fluxes using the LMDZ offline model and surface measurements of N_2O/CH_4 as constraints in the system. The network analysis is based on the analysis of network footprint and uncertainty reduction. The adjoint model of the inverse system allows retrieving footprints in order to analyze the sensitivity of each station (or of one network) to the emissions. A Monte-Carlo approach is used to determine the uncertainty reduction of the variational system. An analytical method has also been developed at LSCE using the same atmospheric transport and chemistry model. This method has been adapted to a greenhouse gas simulator that calculates analytically the uncertainty reduction. Depending on the profile of the successful candidate, both methods will be used for the InGOS project and compared. The position is funded by a European project (FP7 INGOS) and the hired person will have to participate to the planned work, the meetings and the reporting.

DESCRIPTION OF RESPONSIBILITIES: The candidate will be responsible of (1) adapting and performing the inversion of N_2O/CH_4 as required by the InGOS project and (2) leading the network analysis activity (planning the activity, performing the calculation for LSCE, gathering the data from the others groups and analyzing the results). The successful candidate will reinforce and widen the expertise of the team while strengthening synergies within the LSCE. Research duties include all of the following: forward and adjoint simulation, tests, data processing, model validation, model-data comparisons, literature study, participation in project meetings and contribution to publication in peer-reviewed international journals. The position is available for up to 18 months from January 2014.

HOME INSTITUTION:

The Laboratory for the Sciences of Climate and the Environment (LSCE, Orme-les-Merisiers, Gif-sur-Yvette) is a joint research unit of Commissariat à l'Énergie Atomique et des Énergies Alternatives (CEA), Centre National de la Recherche Scientifique (CNRS) and Université de Versailles Saint Quentin-en-Yvelines (UVSQ). LSCE employs over 320 researchers covering 30 different nationalities. Their research mission is to contribute to a better understanding of the interactions between human activities in the Earth System, environment and climate dynamics at different time scales. LSCE is a world class institute and a thriving nexus for climate change research.

QUALIFICATIONS: Given the interdisciplinary nature of the research we are seeking a highly motivated individual with a degree (Master) in, for example, applied mathematics, physic, chemistry, engineering, computer science, meteorology or environmental sciences. A broad interest in natural sciences and more specifically in the N_2O/CH_4 cycle is important. We are looking for a candidate who is able to handle complex modeling frameworks.

REQUIRED CONTENT OF THE APPLICATION

There are no specified application forms. Applications and inquiries should be sent to Philippe BOUSQUET and Marielle SAUNOIS (philippe.bousquet@lsce.ipsl.fr, marielle.saunois@lsce.ipsl.fr). Applications should include (1) a curriculum vitae, (2) statement of motivation, (3) a short description (no more than 1 page) of recent scientific results in relation with the problematic of the position and (4) names, addresses, phone numbers, and email addresses of at least two references. The position is available from **January 2014**. Salary will be adjusted for work experience.