

Post Doctoral Position

Laboratoire de Météorologie Dynamique – Ecole Polytechnique

Title

Development a new standardized and fully automated algorithm for lidar characterization of PBL vertical structure at ICOS-atmospheric stations.

Introduction

This contract (13 months) is proposed by the the Laboratory of Dynamic Meteorology (LMD) of Ecole Polytechnique in Palaiseau (south of Paris) in close collaboration with the Laboratory of Climate Sciences and the Environment (LSCE) of the Atomic Energy Commission and Alternative Energies (CEA) in Saclay.

LMD, laboratory CNRS/UPMC/ENS/X is the European leader in atmospheric physical and dynamic processes for studies, change and forecast of meteorological and climate science. LSCE, laboratory CEA / CNRS / UVSQ, is the European leader in atmospheric measurements of greenhouse gas emissions and modeling of biogeochemical cycles and climate.

Background

ICOS (Integrated Carbon Observation System) is a new European research infrastructure that aims to better understand and quantify the assessment of greenhouse gas emissions in Europe and adjacent areas. It will provide long-term observations that are needed to estimate emissions of greenhouse gas emissions. The Atmosphere Thematic Center (ATC) of ICOS, which one activity is the processing and distribution of atmospheric measurements, is managed by the LSCE. Boundary Layer Height (BLH) is the first-order control on the relationship between trace gas fluxes at the surface and the resulting change in atmospheric tracer mixing ratio. A correct representation of BLH in a tracer transport model is of key importance for interpreting mixing ratio measurements from atmospheric stations. Therefore mixing height observations, retrieved from lidar backscatter profiles, have been made a core parameter of ICOS stations, and will be processed at ATC. Within the framework of the European project ICOS - INWIRE, it is to develop a new automatic retrieval of atmospheric boundary layer height by lidar measurement.

Mission

Within the SIRTA team at LMD and in collaboration with the RAMCES team at LSCE, the candidate in collaboration with an engineer will develop algorithms dedicated to the retrieval of boundary layer height from lidar measurements, will conduct research and test to validate the system for estimating the height of the boundary layer, and will take care of the management and maintenance of the lidar instruments from ICOS.

Main activities

1.Signal processing and algorithm. The candidate will use a recently algorithm developed at LMD for restitution of atmospheric boundary layer height from backscatter lidar data coupled with ground turbulent flow algorithm to test and adapt to several families of instruments, and more sites and assess their performance. The next step is to adapt the scripts to manage the flow of data in the database of the ICOS ATC.

2.Site maintenance of lidar measurements from the ICOS France network. The ICOS network has three lidar deployed or shortly to be deployed on the network for measuring greenhouse gas emissions. The candidate will ensure the proper functioning of equipment deployed at SIRTA and reliability of the automatic transfer of data from the lidar to the data center ICOS ATC, for their integration into the database and their automatic processing.

Candidate profile

- PhD in atmospheric science, atmospheric remote sensing, or related subject
- Knowledge of lidar measurement techniques and lidar signal processing
- Strong skills in scientific Computing Software: Matlab / Python / IDL
- Work environment under linux / windows .
- Good writing skills and good level of English (written and oral)

Contact

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Contract Period

13 months

Salary

Earnings by level and salary scale in force

Links:

LMD: www.lmd.polytechnique.fr

ICOS-INWIRE – <http://www.icos-inwire.lsce.ipsl.fr/>

ICOS – <http://icos-infrastructure.eu/>

SIRTA – <http://sirta.ipsl.polytechnique.fr>

LSCE – <http://www.lsce.ipsl.fr/en/>

ATC – <https://icos-atc-demo.lsce.ipsl.fr/>