PhD position (April 2022 – March 2025)

Impact of turbulent structures on the small-scale variability of pollutants' concentrations

Keywords	Atmospheric dynamics; Turbulence; Air pollution; Remote sensing; Doppler (wind) lidar
Project summary	Experimental studies investigating the impact of atmospheric dynamics on air quality often limit to a one-dimensional approach (dilution of pollutants into an atmospheric boundary layer of varying depth). In parallel, the numerous experimental studies bearing upon the three dimensional structuration of atmospheric turbulence (e.g. convective rolls) rarely show interest for the impact of those structures on the vertical and horizontal dispersion of pollutants. This PhD will make use of the experimental means owned by the LPCA in the field of active remote-sensing (scanning wind lidar, aerosol lidar…) and exploit the algorithmic developments performed in the framework of an another PhD, defended in February 2021, in order the characterize the turbulent structures and dynamic phenomena, and determine their influence upon the small-scale variability (a few 100 m to a few km) of pollutants' concentrations. The granulometry of the aerosols, especially, will be measured at several points at the surface or in altitude. A particular attention will be paid to phenomena occurring in coastal areas (breezes…), to phenomena responsible for winter pollution peaks (thermal inversion, stratification…) and to nocturnal phenomena (jets …). The subject is connected to the ANR project NETPLUME (emergency answer to an industrial accident with particle
Qualifications	The candidate should have a Master's degree in climate sciences or meteorology, or a Master's degree in physics with a major in environment or climate. Skills in data analysis and computer programming (Matlab or equivalent) are mandatory, as well as a good level in English. /!\ *Applications with a Master specialty distant from the subject (e.g. quantum physics or nanomaterials) have infinitesimal chances to succeed.*
Application	Candidates are invited to send their application by email *as soon as possible*. As the project is already funded, a candidate who would already have a Master diploma could start in spring 2022. The application should include a CV, a description of past research activities during lab training periods, a cover letter and the name and contact details of two referees (teachers, training tutors) that could be contacted. The scholarship will be granted after validation of the candidate's record by the university post-graduate school (which will also interview the candidate) and by the funding organism.
Salary	~1450 € monthly net wages before taxes. If the level in French is sufficient, a teacher's assistant position is possible in 3rd year (64h teaching in the year, +200 € net / month) or casual teaching in 1st and 2nd year.
Dates	From April 1st 2022 to March 31st 2025.
Lab location	Laboratory of Physics & Chemistry of the Atmosphere (LPCA) University of Littoral-Opal Coast (ULCO) 189A, avenue Maurice Schumann, 59140 Dunkerque, France
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