

PhD position (October 2023 – September 2026)

Low-level jets in the English Channel and North Sea:
characteristics, formation mechanisms and impact of climate change

Keywords	Atmospheric dynamics; Low-level jet ; Remote sensing; Doppler (wind) lidar; mesoscale weather model; weather reanalyzes
Project summary	Low-level jets (LLJs) are low-altitude layers of air where the wind is enhanced. This pretty common phenomenon (~5 % of the time in Dunkerque) can impact aviation, wind energy production, pollutant dispersion and maritime traffic. Three types of LLJs are suspected to exist in Dunkerque: the land/sea breezes, the channeling of air masses passing in the Dover Straight, and LLJs generated by the passage of a meteorological front. During this project, the PhD student will characterize the properties, the seasonality and the conditions of occurrence of the LLJs above Dunkerque using observations from a long-range wind lidar. In a second time, the horizontal extension of the LLJs will be assessed using weather reanalyzes data from the European center (ECMWF), which will also allow to draw conclusions about the LLJs' formation mechanisms (as the three types have different spatial scales). The reanalyzes will then allow to study the LLJs' evolution over the last 40 years, in the climate change context. Finally, high-resolution numerical simulation will be run on a few chosen case studies, using the mesoscale model WRF, in order to characterize more finely the horizontal extension of the three types of LLJs and the way they form and dissipate.
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. /!\ <i>Applications with a Master specialty distant from the subject (e.g. quantum physics or nanomaterials) have infinitesimal chances to succeed.</i>
Application	Candidates are invited to send their application by email on April 23 rd 2023 by the latest. 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	1594 € monthly net wages before taxes. Casual teaching is possible if the level in French is sufficient.
Dates	From October 1 st 2023 to September 30 th 2026.
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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