

Master 2 training studentship position offer

Topic : Study of the atmospheric CO₂ variability in the PACA region and coastal Mediterranean Sea.

Starting date : Early 2017

Duration : 5 months

Workplace : MIO (Mediterranean Institute of Oceanography, Luminy and/or Toulon sites)

Responsibles :

Dr Irène Xueref-Remy (irene.xueref@lsce.ipsl.fr)

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This M2 fellowship is proposed within the AMC project (Aix-Marseille Carbon Pilot Study, 2016-2019). In the context of climate change, the AMC project is a first pilot study toward the implementation of a **long-term Carbon Observatory in the PACA region and coastal Mediterranean Sea**. Today, more than 70% of global fossil fuel CO₂ emissions come from urbanized and industrialized areas such as the Aix-Marseille metropolis. The associated combustion processes lead also to the emissions of other carbonated species (CO, C-aerosols...). Furthermore, due to its geographical features, the PACA region is much exposed to suffering damages from climatic change. However, the carbon budget (CO₂, carbonated aerosols...) from the Aix-Marseille area is nowadays poorly defined, as well as the impacts of regional anthropogenic emissions on the composition and physic-chemical – especially radiative – properties of the atmosphere, and on marine and terrestrial ecosystems. In order to make progresses on these important questions, AMC is a multidisciplinary project focused on CO₂ that aims at developing a synergy between CO₂ observation and modelling approaches within the PACA region and the coastal Mediterranean basin, integrating the CO₂ atmospheric, terrestrial and coastal components.

The M2 student will analyze the variability of the continuous timeseries of atmospheric CO₂ and related anthropogenic species such as CO and aerosols collected at the Endoume and Cinq Avenues sites in Marseille and at the Observatoire de Haute Provence. All stations are equipped with Cavity Ring-Down Spectrometers and have been providing high-resolved datasets for several months. The student will calibrate these datasets and perform their data quality control. He/she will then analyze the variability of the atmospheric CO₂ (and related species) concentration at the hourly, diurnal, synoptic and seasonal scales in relationship with several controlling factors such as anthropogenic, biospheric and marine surface fluxes, and atmospheric dynamics (wind fields, boundary layer height). This work will be performed in collaboration with AIRPACA (Association de Surveillance de la Qualité de l'Air en PACA). The student might participate to some field work at the observing stations.

This work will help at understanding the representativity of the three sites for monitoring atmospheric CO₂ in the Aix-Marseille area. **An extension of this work within a PhD thesis is strongly expected.** The AMC project has been recently funded by Labex OT-Med (<http://www.otmed.fr>) which includes 10 research laboratories and one research federation ECCOREV with experts of different fields: environmental sciences, economics and social sciences.