



Post-doc Position

Air Quality Modeling

CEREA

Atmospheric Environment Center
Joint Laboratory of École des Ponts ParisTech & EDF R&D
Université Paris-Est

Background: Air pollutants, which are emitted from a variety of sources, contribute to the formation of various forms of air pollution such as ozone (O₃), nitrogen dioxide (NO₂), and fine particulate matter (PM_{2.5}). CEREA uses an air quality model, which simulates the concentrations of those pollutants based on an emissions inventory, meteorological inputs and boundary conditions for the modeling domain. It is important to evaluate the results of the model simulations with ambient atmospheric data to ensure that the model can reproduce satisfactorily the atmospheric processes of interest. Once the model has been evaluated, it can be used to understand the processes that govern air pollution and to study the effects of future emission scenarios. Those different aspects will be addressed during this post-doc.

Topic: The first part of the post-doc will focus on the evaluation of the air quality model with two data bases: one corresponds to air pollution over the northeastern United States and the other corresponds to air pollution over western Europe. This model performance evaluation will be conducted as part of the Air Quality Model Evaluation International Initiative (AQMEII), which is coordinated by the U.S. Environmental Protection Agency (EPA) and the Joint Research Center (JRC) of the European Commission.

The second part of the post-doc will consist in using the model to investigate various air quality issues in France. For example, ozone concentrations in the Paris region have increased, whereas emissions of ozone precursors (nitrogen oxides and volatile organic compounds) in France have decreased significantly. This research will aim at identifying the main processes (non-linear chemistry of ozone formation, long-range transport), which could explain the observed trend in ozone concentrations. Furthermore, fine particulate matter (PM_{2.5}) are now regulated in Europe and it is imperative to understand the processes that lead to their formation in the atmosphere (from the oxidation of sulfur dioxide, nitrogen oxides, organic compounds and ammonia) and to estimate the relative contributions of local emissions and long-range transport.

Host Laboratory and Administrative Information: This post-doc will be conducted at École des Ponts ParisTech in Champs sur Marne under the direction of the CEREA director and an assistant research professor (<http://cerea.enpc.fr>). The post-doc position is for an 18-month period and the compensation before taxes is about 2400 € per month.

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