

Open position in Atmospheric chemistry modelling at Météo-France Research Center (CNRM), Toulouse (France)

Research topic :

Improvement and evaluation of MOCAGE chemistry in the Integrated Forecasting System (IFS) of the European Centre for Medium-Range Weather Forecasts (ECMWF)

Position : *Research engineer / Early career researcher*

Location : *Centre National de Recherches Météorologiques (CNRM), Toulouse, France*

Application deadline : *November 17th, 2019*

Duration of contract : *18 months*

Start : *January 1st 2020 or the sooner after*

Context and Objectives

The current position is a contribution to the second phase of the CAMS_42 project which is the component of the Copernicus Atmosphere Monitoring Service (CAMS) dedicated to the modelling of reactive gases at the global scale. During the first phase of CAMS_42, the chemistry module of the chemistry-transport model MOCAGE developed by Météo-France at CNRM and implemented in the operational C-IFS model of ECMWF – hereafter referred to as IFS(MOCAGE) – was improved and shown to perform reasonably well for both tropospheric and stratospheric air composition forecasts. In the second phase of the project, specific attention will be paid to the modelling of the secondary aerosol gaseous precursors and to air quality applications.

In that respect, the successful candidate will contribute to new developments in the IFS(MOCAGE) implementation in order to :

- represent the secondary organic aerosols (SOA) precursors,
- increase the forecast performance of the model near the surface for three main pollutants (nitrogen dioxide NO₂, sulfur dioxide SO₂ and ozone O₃).

He/she will run numerical simulations and participate to their evaluation through comparisons with both observations and numerical simulations results from other chemical models. Part of his/her work will also include the development of specific tools to evaluate the performance of the models when compared to air quality surface observations.

Required qualification

We will recruit a research engineer, or an early career researcher according to the quality of the received applications. The ideal candidate should have less than 3 years of experience after his/her degree. Applicants should hold a PhD degree in atmospheric chemistry / environmental science, or a university degree in IT / computer science / atmospheric science or similar disciplines.

- Strong numerical (Linux, Fortran, Python) skills are required.
- Some experience with atmospheric numerical modelling and/or with complex codes on high performance computers (HPC) would be a clear asset.

Good reading and communication skills in English are also essential for reading scientific documentations as well as to participate to monthly teleconferences.

Practical aspects

The work will be carried out in the CNRM laboratory in Toulouse (France). The successful candidate will join the COMETS team (<http://www.umr-cnrm.fr/spip.php?article371>) which is the Météo-France research team in charge of the study of the chemical composition (reactive gases, aerosols and green-house gases) of the troposphere and of the stratosphere from the global scale to the regional scale. This team is composed of 8-9 people working on the tracer transport, the chemical processes, the air composition tendency from multi-annual to multi-decadal time range, and the impact of climate change on air composition.

The net monthly salary will be between ~1970 and ~2390 euros depending upon the candidate's experience. This includes French social security (health insurance).

Application procedure

Applicants should send to sophie.belamari@meteo.fr and virginie.marecal@meteo.fr :

- ✓ a curriculum vitae (including research experience, scientific publications and proceedings, computing skills and different language practice, ...),
- ✓ a brief statement of research or engineer interests and motivations for the job,
- ✓ the names and contact details (email + telephone number) of two academic referees.

Please note that attachments larger than ~5 Mo are not supported by our e-mail server and should be made available via a repository box (e.g. Dropbox, WeTransfer, ...)

Applications should be sent by email no later than **November 17th, 2019**.

Consideration of applications begins immediately.

Expected starting date is **January 1st, 2020**.

Hosting institution

The Centre National de Recherches Météorologiques (CNRM) is the research department of Météo-France (<http://www.umr-cnrm.fr/>). It is responsible for conducting the largest part of the research activities in weather forecasting, climate modelling, atmospheric chemistry, oceanography and land-surface processes. Within CNRM, the climate research group hosting the COMETS team is in charge of understanding scale interactions, interactions between the various components of the climate system, the response of the climate system to anthropogenic forcing, and sources of variability and long-term predictability. These activities are carried out in particular through the modelling of climate, atmospheric composition and air quality at global and regional scales, participation in model intercomparison exercises such as CMIP and their analysis, impact studies and the detection-attribution of observed climate change.