Postdoctoral Position in Physico-Chemical and Morphological Characterization of Biomass Burning Aerosols

Host Laboratory

LPCA – Laboratory of Atmospheric Physico-Chemistry – ULCO
In collaboration with the PC2A Laboratory – University of Lille

Contract Type

Fixed-term postdoctoral contract – 13 months
Possibility of extension depending on funding and project progress.
Salary: approximately €3000 gross/month

Scientific Background

Biomass Burning Aerosols (BBA) play a major role in air quality, atmospheric processes, and the Earth's radiative balance. Their optical properties strongly depend on their chemical composition, morphology, and mixing state, which vary according to combustion conditions and biomass type.

As part of a research project conducted at LPCA in collaboration with the PC2A laboratory, this postdoctoral position aims to improve the understanding of the relationships between the chemical, morphological, and optical properties of biomass burning aerosols produced during controlled pyrolysis and combustion phases.

The project relies on a dedicated experimental platform coupled with several advanced atmospheric particle characterization techniques, including:

- Online chemical analyses using Q-ACSM,
- EC/OC thermo-optical analyses,
- Molecular characterization by ToF-SIMS,
- Elemental composition analysis by XRF,
- Morphological characterization and mixing state analysis by SEM-EDX electron microscopy.

Responsibilities

The postdoctoral researcher will be involved in all experimental and analytical activities of Work Package 2 (Chemical characterization of BBAerosols), in close interaction with the project partners. Short-term assignments at the PC2A laboratory of the University of Lille may also be planned.

Main responsibilities include:

- Conducting experimental campaigns on the combustion platform and implementing particle and ash sampling systems;
- Operating online and offline chemical characterization instruments:
  - Q-ACSM analyses for the non-refractory organic and inorganic fraction of PM2.5,
  - Sample preparation for ToF-SIMS, XRF, and related analyses;
- Performing morphological and microstructural characterization of individual particles using SEM-EDX microscopy, including studies of mixing state, elemental composition, and morphological parameters;
- Processing, analyzing, and interpreting multi-instrument datasets;
- Writing scientific reports and articles for peer-reviewed international journals, and presenting results at national and international conferences.

Candidate Profile

Applicants must hold a PhD in one of the following fields:

- Atmospheric sciences,
- Analytical chemistry,
- Aerosol physico-chemistry.

Desired Skills

- Experience with aerosol analytical instrumentation;
- Knowledge of atmospheric physico-chemistry;
- Experience in mass spectrometry and/or electron microscopy;
- Proficiency in scientific data processing tools (Python, Matlab, R, etc.);
- Strong scientific writing skills in English;
- Ability to work in experimental and collaborative environments.

Application Requirements

Applications must include at least:

- A detailed CV;
- A cover letter.

Applications will be reviewed on a rolling basis until the position is filled.

Contact

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