

Postdoctoral position on the impact of volcanic gases and aerosols on the atmosphere

A postdoctoral researcher is sought to collaborate on the VOLCPLUME French ANR-funded project : « Volcanic plumes: emission, chemistry-transport and impact on the atmosphere and climate ». The position should start around September 2017 and will be for a fixed term of 2 years. The researcher will be based at the Laboratoire d'Optique Atmosphérique (Université Lille 1/CNRS) in the city of Lille (France).

The VOLCPLUME project, at the interface between volcanology and atmospheric sciences, aims at better characterising volcanic gas and ash emissions using inverse modelling procedures that combine ground and satellite observations of the volcanic plume with chemistry-transport modelling. The primary objective of the project is to provide a refined knowledge of source emissions at high temporal resolution which will improve our ability to forecast the atmospheric evolution of volcanic plumes and better assess their short-term impact on air traffic or air quality. On longer term perspectives, this research should provide a refined quantification of the budget and lifecycle of volcanic sulphur-rich aerosols, which represent a key forcing parameter for global climate models.

The successful candidate will retrieve, for specific volcanic case-studies, timeseries of volcanic SO₂ emission flux and height, at high temporal resolution, using inverse modelling techniques exploiting various UV and IR spaceborne observations. Based on this refined SO₂ source and a panel of aerosol observations (including spaceborne-, ground- as well as in-situ observations), the lifecycle of SO₂ and sulfate aerosols within a tropospheric volcanic plume will be investigated using chemistry-transport modelling. The candidate will especially explore the impact of the substantial sulfur-rich degassing of the long-lasting Holuhraun eruption of Bardarbunga volcano (Iceland) on the atmospheric chemistry of the Arctic Polar region. The impact of Etna degassing on the Mediterranean troposphere over the last decade will be also investigated.

The Laboratoire d'Optique Atmosphérique (LOA) is renowned internationally for its expertise in the field of atmospheric observation and modelling. Researches of its about 70 members focus on the study of aerosols of various types (originating from desert, biomass burning, sea, urban pollution and volcanoes), meteorological clouds, gases and the interaction of these various atmospheric components with radiation. Hence, the LOA develops multi-disciplinary and multi-scale (from particle to global scales) researches which benefit from 1- an expertise in the retrieval of multiple satellite observations covering a large spectral range from UV to thermal IR and millimetric waves, 2- two instrumental platforms equipped with a large panel of active/passive remote sensing and in-situ instruments, 3- its participation in international ground-based network observations (LIDAR, sunphotometry, UV radiation), 4- an expertise in the development of instruments for airborne observations serving as spaceborne prototypes and 5- an expertise in modelling the atmospheric dynamics from urban to continental scales.

A PhD in Atmospheric Sciences, Geophysics or related discipline with experience in atmospheric chemistry-transport modeling is highly desirable. Experience in inverse modelling would be an advantage. A strong background in Unix/Linux environment is required.

Salary is calculated in accordance with french public service salaries, taking into account previous work experience.

Applicants should submit a cover letter, a curriculum vitae including a list of publications and the name of 2 or 3 referees.

For more information, application and/or discussion about this position, you can contact Marie Boichu (marie.boichu@univ-lille1.fr) and Jean-Christophe Péré (jean-christophe.pere@univ-lille1.fr).