



Research position on innovative satellite observations of ozone pollution using future spaceborne instruments

Start date: as soon as possible in 2015

Duration: 15 months, with possible extension of 1 additional year

Net salary: according to CNRS standards (up to 2250 euros per month) depending on the candidate experience

Institution: LISA/IPSL laboratory (CNRS/UPEC/UPD) at Paris suburbs (Créteil), France

Scientific framework

Air quality is a crucial worldwide societal issue, which is seriously aggravating in the 21st century. Tropospheric ozone is the main gaseous pollutant, which directly affects human health and seriously damages ecosystems. Advanced air quality-monitoring systems including state-of-the-art observations and numerical models are needed in order to efficiently control the emission/concentrations of pollutants and understand its origins and impacts. A key and very promising component of these systems are the satellite observations. However, current tropospheric ozone observations show limited sensitivity at the lowest atmospheric layers, as they only use measurements from a single spectral band (either IR or UV).

In this framework, the LISA laboratory develops innovative remote sensing approaches, as the new multispectral approach so-called "IASI+GOME2", which has allowed the first observation from space of ozone plumes at the lowermost troposphere (below 3 km of altitude). This unprecedented method relies on the synergism of thermal infrared and ultraviolet measurements respectively from IASI and GOME-2, which are instruments currently in orbit. Such multispectral satellite view of ozone pollution may improve the air quality monitoring systems by assimilation in numerical models. We expect a particularly significant gain for future monitoring systems, which will benefit from a new generation of spaceborne instruments with improved observing skills (like IASI-NG and UVNS), which are already planned for the upcoming decade. Using the future instruments in synergism, as it has been done for IASI and GOME2, we expect a much accurate observation of ozone pollution as well as a substantial gain for the air quality forecasting systems.

Job description

The objective of the offered position is to quantify the potential of future satellite missions to monitor ozone pollution from space using the multispectral approach developed at LISA. For this, the successful candidate will contribute to the development of an Observing System Simulation Experiment (OSSE) on ozone pollution. His/her work will consist on:

- i) Developing a simulator of synthetic multispectral observations of ozone from future satellite instruments (particularly IASI-NG and UVNS onboard the EPS-SG satellite and IRS and UVN on the geostationary platform Sentinel 4/MTG-S),
- ii) Characterizing the capability of these future multispectral satellite measurements for observing ozone pollution and
- iii) Quantifying the improvement of the regional chemistry-transport model CHIMERE when assimilating (done at LISA) these observations with respect to the forecasts.



These research activities will be performed in the framework of the scientific programme “SURVEYOZON”, financed by the Centre National des Etudes Spatiales (CNES, the French Space Agency) and the collaboration with several internationally renowned institutions (e.g. the Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique – CERFACS – in France, the Karlsruhe Institute of Technology – KIT – in Germany, Harvard Smithsonian in USA and the Chinese Academy of Science in China).

Required qualifications

The candidate will hold a PhD degree in atmospheric physics. Experience in remote sensing, numerical modelling and radiative transfer is greatly appreciated. Good programming skills (Fortran, Unix, etc.) are necessary. Fluency in English is preferred.

How to apply

Send a CV, a list of publications, a cover letter and contact information of 2 referees to Dr. Juan Cuesta (cuesta@lisa.u-pec.fr), Dr. Gaëlle Dufour (dufour@lisa.u-pec.fr) and Dr. Gilles Foret (foret@lisa.u-pec.fr)