12-month post-doc offer on
“Variability of atmospheric moisture : comparing satellite data records and climate models”

The “Laboratoire Atmospheres and Observations Spatiales” (LATMOS-IPSL) is offering a 12-month post-doctoral position on the analysis of water vapour variability in climate models using spaceborne data records. This position is part of the ESA Climate Change Initiative (CCI) project on water vapour (http://cci.esa.int/watervapour) and will rely on the data records developed within the project.

Context:
Water vapour (H$_2$O) in the atmosphere is a key component of the Earth’s hydrological cycle, critical in shaping the global environment and supporting life on Earth as we know it. Manifold physical processes thereby help redistributing the water from the oceans to the land involving the formation of clouds, precipitation, and extreme weather events. Water vapour also has a key role in constraining the Earth’s energy balance. It is the single most important natural greenhouse gas in the atmosphere and constitutes a strong positive feedback to anthropogenic climate forcing from carbon dioxide (CO$_2$). The water vapour feedback is critically important in understanding past and determining future climate change and its global and regional impacts. It is due to its importance, that the Global Climate Observing System (GCOS, co-sponsored by the WMO) has identified water vapour as an essential climate variable.

However, the properties of the Earth’s atmospheric water vapour distribution challenge not only climate research, but also Earth observation science, from instrument development to retrieval science. ESA’s “Water Vapour CCI” project will help to consolidate our knowledge of past changes as derived from observations and to establish climate data records for use in climate research. The ESA’s “Water Vapour CCI” project aims at generating a new global high-quality climate data records of both total column and vertically resolved water vapour, which are homogeneous in space and time, work towards fulfilling GCOS requirements, and respond to the user needs of the climate research community in the best possible way.

This post-doc offer belongs to this international project which has started in May 2019 and is led by the University of Reading and the Deutscher Wetterdienst.

Description of post-doc work:
The post-doc fellow will participate to the phase 3 of the ESA’s “Water Vapour CCI” project by analyzing the data records produced by the team. The goal is to characterize the variability of the atmospheric moisture, as observed by the spaceborne instruments considered in the project (MERIS, MODIS, OLCI, SSMIS and SSM/I), and to confront the patterns to those produced by a selection of climate models participating to the CMIP6 experiment. In particular, he/she will develop metrics that will be used to make process-based diagnostics on the models. The work will specifically consist in:

- Handling the data records produced within ESA “Water Vapour CCI” project: their specifications, errors, etc.
- Selecting and developing process-based metrics based on the known patterns of natural variability (NAO, MJO, El Nino, etc...) to assess the data records
- Transferring the metrics to the model’s world (IPSL, CNRM, UKMO, ...) and to re-analysis (ERA-Interim, ERA-5) and analysing the results
- Communicating the results through international conferences and at least one scientific article in a peer review journal.
Start, duration and salary: The post-doctorate will be hired by the Université de Versailles-Saint-Quentin (UVSQ) for 12 months with a net monthly salary around 2 000 euros (including social services and health insurance), commensurate with experience. This includes social services and health insurance. The work will start in June 2020 (at best), together with Phase 3 of the ESA CII “Water Vapour” project.

Required experience: a PhD is required, preferably in remote sensing, atmospheric or climate sciences, with an experience in statistical analysis. Ease in using UNIX, shell scripting, and other programming languages (ideally R) is necessary, as well as being able to work in teams.

Contact for applications: Applications should be submitted by e-mail to H. Brogniez (helene.brogniez@latmos.ipsl.fr) and L. Picon (laurence.picon@lmd.jussieu.fr) as soon as possible and must include
- a CV that includes a list of publications or communications
- a statement of research interests
- the names of at least two references including e-mail addresses and telephone numbers.