Postdoc position in radiative transfer modelling at Centre National de Recherches Météorologiques (CNRM, Météo-France/CNRS)

Position
Postdoc position on the fine-scale spatial variability of the solar resource and its impact on the photovoltaic (PV) production of a solar farm

Application deadline: 30 November 2022
Duration of contract : 2 months
Expected starting date : March 2023

Context

The Horizon 2020 Smart4RES project aims to bring substantial performance improvements to the whole model and value chain of renewable energy (RES) forecasting. To this end, the performance of Numerical Weather Prediction (NWP) models regarding variables relevant for RES production needs to be improved. In the case of surface solar irradiance (SSI), clouds are the main contributors to forecasts uncertainties. Practically, operational NWP models have resolutions coarser than 1 km, and cannot fully resolve individual clouds, which are responsible for the high frequency variations of the SSI. Within the project, the added value of using high-resolution weather forecasts for (namely large-eddy simulations, LES) is explored.

Objective

The objective of the open position is to assess the capability of LES to reproduce the spatial and temporal variations of SSI observed at the scale of a solar farm. To this end, spatially-resolved PV production observations from a solar plant will be analysed to extract the typical temporal and spatial scales at which SSI varies. In parallel, Monte-Carlo 3D radiative transfer calculations will be performed on the outputs of dedicated LES meant to reliably mimic the cloud behaviour above the solar farm. The simulated SSI will be converted into PV production using a dedicated tool. The detailed comparison of both production fields will allow to evaluate the capability of the LES to statistically reproduce what is observed, and pave the way for the future of RES forecasting.

Required skills

- A PhD in atmospheric physics, applied mathematics or any related fields
- Excellent knowledge in radiative transfer modelling
- Experience with processing large volumes of data
- Experience of working in a Linux-based environment
- Good coding in Python and Fortran
- Aptitude for written and oral communication in English
- Scientific curiosity, autonomy and rigor in the interpretation of the results

Practical aspects

The candidate will be based at the CNRM in Toulouse (France).
The gross monthly salary will be between 3280 and 3890 €, depending on the candidate's experience. This includes French social security (health insurance) and will depend on the candidate's experience.

Application procedure

Interested candidates should send the following documents by e-mail to quentin.libois@meteo.fr **:**
- A curriculum Vitae detailing experience and technical skills
- A motivation letter explaining the interest for the job