**Centre National de Recherches Météorologiques (CNRM)**

CNRM/UMR 3589 Météo-France/CNRS
42, avenue Gaspard Coriolis
31057 Toulouse Cedex 1 France

**Fast radiative transfer model RTTOV for space-borne cloud and precipitation radars**

**Subject:** Postdoctoral fellowship of 12 months in fast radiative transfer model RTTOV.

Starting date: **March 1st 2021**

**Area of expertise:** Atmospheric sciences, satellite observations, radiative transfer model, radar

**Context:** The open position is to join the GMAP/OBS team of the CNRM laboratory (http://www.umr-cnrm.fr/). CNRM is the research laboratory of Météo-France (the French meteorological service) and contributes to the satellite observation of oceans, atmosphere and clouds. In the frame of the NWP-SAF (Eumetsat project), CNRM contributes to the development and validation of the fast Radiative Transfer Model (RTM) RTTOV (https://www.nwpsaf.eu/site/software/rttov). RTTOV is a world-wide used fast RTM for satellite data assimilation in NWP models.

**Workplace:** The candidate will be assigned to the “OBS” team with the NWP research group (GMAP) of the Centre National de Recherche Météorologique (CNRM-UMR 3589 Météo-France / CNRS). The work will be done at Météo-France, 42, avenue Gaspard Coriolis, 31057 Toulouse Cedex 1 France

**Duration :** 1 year from March 1st 2021.

**Main duties and key responsibilities:** The successful applicant will be in charge of the extensive validation of the active sensor module available within the next version of RTTOV in order to simulate cloud and precipitation radars including the GPM/DPR, Cloudsat/CPR and EarthCare/CPR. This will primarily entail:

* Validating RTTOV simulations performed using AROME mesoscale forecasts against observations at various frequencies of both the GPM/DPR and Cloudsat/CPR instruments. A dedicated method of comparison, such as the Most Resembling Column validation method (MRC, Borderies et al., 2018), will be used to disentangle the biases within the simulator itself from temporal and spatial mismatches between the observations and the model first guess.
* Assessing the performance of the simulator to represent melting layer effects on bright band simulations, in particular for the Ku band reflectivities. The work will start using the Bauer et al. (2001) modeling approach. Depending on the outcome of the study, other descriptions of the melting layer could also be examined (for instance the one described in Le Bastard et al. (2019)).
* Reporting the results to the NWP-SAF project team, as well as in leading scientific journals and international conferences.

**Qualifications and experience required:** The candidate must hold a PhD in atmospheric physics or related discipline. Experience in atmospheric radiative transfer and in radar is required. Strong knowledge and skills in a programming language such as Fortran/Python is required.

**Personal attributes:** The candidate will have to demonstrate scientific curiosity, autonomy, team spirit, responsiveness, analytical skills and rigor in the interpretation of results and their formatting. He/She will have to be able to report his/her activity to the project team. In this context, some trips to Europe are planned.

**Salary:** The gross monthly salary is between 3280 € and 3890 € based on experience. This includes French social security.

**How to apply:** Interested candidates should send before 11 December 2020 the following documents by e-mail to Philippe Chambon (philippe.chambon@meteo.fr) and Mary Borderies (mary.borderies@meteo.fr):

- Curriculum Vitae detailing experience in research and other skills. A list of publications and communications in conferences is mandatory;

- A sample of research publication or communication;

- Application letter explaining research interests and motivation for the job;

- The names and contact details of two referees (recommendation letters shall be appreciated but are not compulsory);

**References:**

Peter Bauer (2001), Including a melting layer in microwave radiative transfer simulation for clouds, Atmospheric Research, [https://doi.org/10.1016/S0169-8095(00)00072-7](https://doi.org/10.1016/S0169-8095%2800%2900072-7)

Borderies, M., Caumont, O., Augros, C., Bresson, É., Delanoë, J., Ducrocq, V., Fourrié, N., Bastard, T.L. and Nuret, M. (2018), Simulation of  W‐band radar reflectivity for model validation and data assimilation. Q.J.R. Meteorol. Soc., 144: 391-403. <https://doi.org/10.1002/qj.3210>

Le Bastard T. 2019. Utilisation des données radar volumiques et d’un modèle de pnt à haute résolution pour une meilleure estimation quantitative des précipitations en plaine et sur les massifs montagneux. PhD thesis, École doctorale Sciences de l’univers, de l’environnement et de l’espace (Toulouse), URL https://www.theses.fr/2019INPT0140.