



## Centre d'Etude en Météorologie Satellitaire (CEMS)

CNRM/UMR 3589 Météo-France/CNRS  
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# Cloud thermodynamical phase retrieval from Meteosat Third Generation visible/infrared radiometer

**Subject:** 12-month Postdoctoral fellowship (renewable) in cloud remote sensing (W / M)

Starting date: **May 1<sup>st</sup>, 2019**

**Area of expertise:** Atmospheric sciences, satellite observations, Cloud remote sensing

**Context:** The open position is to join the CEMS team of the CNRM laboratory (<http://www.umn-cnrm.fr/>). CNRM is the research laboratory of Météo-France (the French meteorological service) and contributes through the CEMS team to the observation of ocean, atmosphere and cloud through spaceborne remote sensing techniques. In the frame of the NWC-SAF (Eumetsat project), the CEMS team of the CNRM has developed algorithm and software for the retrieval of cloud micro- and macro- properties using visible and near infrared observations from different geostationary satellite (MSG, GOES, Himawari). These NWC-SAF cloud products are used by most European meteorological service mainly for nowcasting applications, and more generally by several institutes (such as LSA-SAF, OSI-SAF, French AERIS pole) as support to the use of satellite imagery.

Details on cloud retrieval algorithms can be found on [www.nwcsaf.org](http://www.nwcsaf.org): after the cloud have been detected, their height are retrieved using RTTOV simulations applied to NWP forecasted fields whereas their microphysical properties (cloud phase, droplet/crystal size, optical thickness and ice/water content) are obtained from visible/infrared wavelengths using DISORT and RTTOV modelling. The strategy of using of radiative transfer modelling to adapt to each radiometer characteristics (list of available bands and their exact spectral response) allows preparing the processing of different existing and to-be-launched meteorological geostationary satellites.

The main goal of the CEMS team is now to prepare the processing of the Meteosat Third Generation (MTG) planned to be operational early 2022. The strategy of using radiative transfer modelling to adapt each radiometer already ensures the ability to process the MTG imager. The main remaining challenge is that, prior to the MTG launch, the algorithms are further improved and tuned, and their quality (depending of the spectral bands) evaluated for MTG imager.

**Workplace:** The candidate will be assigned to the "Cloud" team of the Centre d'Etude en Météorologie Satellitaire (CEMS) attached to the Centre National de Recherche Météorologique (CNRM-UMR 3589 Météo-France / CNRS). The work will be done at the Centre de Météorologie Spatiale at Lannion (22, Côtes d'Armor).

**Duration :** 12-month renewable, availability from 1st May 2019.

**Main duties and key responsibilities:** The objective of the open position is to scientifically contribute to the MTG cloud phase retrieval algorithm. This algorithm is mainly based on IR bands, complemented in daytime by the use of visible and near-infrared channels. Hyperspectral IR data (IASI) and radiative transfer modeling (RTTOV and DISORT) will be used to compare the respective ability of

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MSG/GOES/Himawari and MTG IR band for cloud phase retrieval and possibly identify algorithm improvements. The use of solar bands (especially the 2.25 band available on Himawari and GOES but not on MSG) will be enhanced using DISORT simulations. After having access the use of Himawari and/or GOES to prototype MTG imager, space born CALIOP lidar will be used for algorithm validation. The candidate will communicate her/his original findings in international conferences and in scientific articles.

**Qualifications and experience required:** The candidate must hold a PhD in remote sensing. Experience on atmospheric/cloud radiative transfer and/or retrieval of clouds physical properties from satellite data is required. Good skills in English and French language and in Linux and scientific programming (Python, C) are 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 will have to be able to report his 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 the following documents by e-mail to Hervé Le Gleau ([herve.legleau@meteo.fr](mailto:herve.legleau@meteo.fr)) and Pascal Brunel ([pascal.brunel@meteo.fr](mailto:pascal.brunel@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);