

# JOB DESCRIPTION

<b>Vacancy reference:</b>	SRF23931
<b>Post Title:</b>	Post Doctoral Research Scientist in Earth Observation (or System Engineer)
<b>Grade:</b>	6
<b>School/Department:</b>	SMPCS/Meteorology
<b>Reports to:</b>	Dr. Michaela I. Hegglin (Associate Professor)
<b>Responsible for:</b>	N/A

## Purpose

Perform research on the validation and merging of vertically resolved water vapour observations from a suite of international satellite instruments, with the end goal to produce high-quality water vapour climate data records. This work involves the generation of a user-friendly programming software for climate data validation, merging, and production.

Some further details of the background scientific issues and methodologies that will be elaborated on can be found in the paper by Hegglin et al. <https://www.nature.com/articles/ngeo2236> in Nature Geoscience (please request copy from [m.i.hegglin@reading.ac.uk](mailto:m.i.hegglin@reading.ac.uk) if access is not available).

The proposed work will be carried out within the framework of the European Space Agency's (ESA) Water Vapour Climate Change Initiative (Water\_Vapour\_cci), which is carried out by a consortium of 12 international partner institutions from across Europe and Canada (including both research institutions and environmental consultant companies).

The start date of the appointment will be 24 November 2018 with a 30-month duration (until 23 May 2021).

## Main duties and responsibilities

The primary aim of the Reading component of the Water\_Vapour\_cci project is to generate high-quality climate data records of vertically resolved water vapour spanning both the troposphere and the stratosphere to contribute to ESA's Climate Change Initiative. Specifically, the post-holder will

- Establish a local database for vertically resolved water vapour observations from different satellite, aircraft, and balloon platforms.
- Perform validation of satellite observations in the upper troposphere and lower stratosphere (UTLS) using methodologies that account for the dynamical variability in this region.
- Enhance existing and establish new merging methodologies for vertically resolved water vapour observations in the troposphere and stratosphere.
- Generate climate data records of vertically resolved water vapour, including a detailed error characterisation.
- Generate and deliver a user-friendly data production system (programming software) that supports the validation and merging of the water vapour climate data records.
- Document work on the validation and merging procedures, as well as on the climate data record production system in technical reports as deliverables to ESA.
- Write scientific papers for publication in peer-reviewed journals.

- Interact with other team members of the Water\_Vapour\_cci project to share ideas and best practices.
- Present the research results at national and international scientific meetings.
- Contribute to departmental research environment (e.g. seminars, group meetings).

### **Supervision received**

Dr. Michaela Hegglin will provide guidance through regular meetings and collaborate on the implementation of the research plan and project deliverables, including the writing of technical reports and the publication of results in refereed journals. She will also oversee the scope of the research activities to ensure they are serving the career development of the research fellow while meeting the goals of the project.

### **Supervision given**

N/A

### **Contact**

Frequent contact with the Water\_Vapour\_cci project partners is foreseen, which will include quarterly project meetings and additional annual conferences together with the wider ESA Climate Change Initiative community. In particular, liaison with project partners at the Rutherford Appleton Laboratory (Harwell/Oxford, UK), Brockmann Consultant (Germany), the Karlsruhe Institute of Technology (KIT Karlsruhe, Germany), the German Weather Service (DWD Offenbach, Germany), and the University of Toronto (Toronto, Canada) will be required, which may involve occasional meetings at these institutions.

### **Terms and conditions**

Full time, fixed term initially for a period of up to 30 months (exact duration depends on starting salary), with potential for extension.

Normal working hours that in general can be flexible. The involvement in the ESA Water\_Vapour\_cci project will require travel for up to three days within the UK and abroad.

This document outlines the duties required for the time being of the post to indicate the level of responsibility. It is not a comprehensive or exhaustive list and the line manager may vary duties from time to time which do not change the general character of the job or the level of responsibility entailed.

**Date assessed: 10 August 2018**

# PERSON SPECIFICATION

Job Title	School/Department
Post-Doctoral Research Scientist in Earth Observations (or System Engineer)	SMPCS/Meteorology

Criteria	Essential	Desirable
<b>Skills Required</b>	<ul style="list-style-type: none"> <li>Quantitative analysis skills of observational and/or model data</li> <li>High level scientific programming skills</li> <li>Ability to communicate scientific ideas effectively on paper and in person</li> <li>Ability to work independently</li> </ul>	<ul style="list-style-type: none"> <li>Strong programming skills in Unix and appropriate data analysis tools (such as IDL, Matlab, and/or Python)</li> <li>Ability to deliver outputs within given deadlines</li> </ul>
<b>Attainment</b>	<ul style="list-style-type: none"> <li>PhD or equivalent in physical sciences, environmental sciences, applied mathematics, or equivalent</li> </ul>	<ul style="list-style-type: none"> <li>PhD or equivalent in atmospheric observations in the UTLS region</li> <li>Experience in computer sciences / system engineering</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>Research techniques in quantitative physical science</li> </ul>	<ul style="list-style-type: none"> <li>Distribution of water vapour and other trace gases in the atmosphere</li> <li>Error propagation, observational uncertainty budgets</li> <li>Data processing systems</li> </ul>
<b>Relevant Experience</b>	<ul style="list-style-type: none"> <li>Proven track record in research, demonstrated through excellent peer-reviewed publications (at a level appropriate to career stage)</li> </ul>	<ul style="list-style-type: none"> <li>Manipulation and analysis of extensive observational data sets relevant to atmospheric composition (in particular satellite data sets)</li> </ul>
<b>Disposition</b>	<ul style="list-style-type: none"> <li>Able to collaborate successfully in a multi-disciplinary team</li> <li>Willingness to contribute to project administration</li> <li>Willingness to write technical reports</li> <li>Willingness to accept advice</li> </ul>	<ul style="list-style-type: none"> <li>Able to travel to collaborating institutions and travel to meetings in the UK and overseas</li> </ul>
<b>Other</b>		

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