**DLR** Institut für Physik der Atmosphäre

The department of Atmospheric Remote Sensing at the Institute of Atmospheric Physics (IPA), Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), at Oberpfaffenhofen, Germany, invites applications for a

**Ph.D. position on**

**Modelling of greenhouse gases: the benefit of a geostationary satellite mission for constraining sources and sinks**

Observing and understanding the global distribution of the man-made greenhouse gases carbon dioxide and methane is one of the key science questions addressed by our institute. We develop instruments, algorithms, and models to better quantify sources and sinks of greenhouse gases and to enable carbon monitoring in the future.

The Ph.D. thesis aims at evaluating the performance of a geostationary satellite concept that was proposed recently. A geostationary satellite would provide unprecedented temporal and spatial observation density for continental scale regions such as Europe. To what extent does the enhanced observation density enable improved discrimination between man-made and natural processes and improved quantification of emissions?
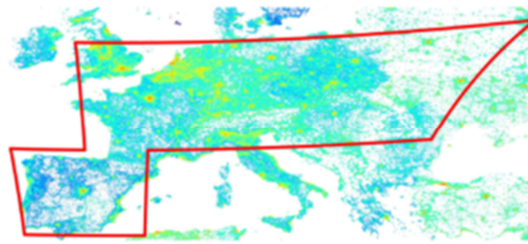


Man-made $CO_2$ emissions and illustrative scan of the Geostationary Emission Explorer for Europe (G3E) over Europe [Butz et al., Atmos. Meas. Tech., 2015]

To answer this question, we plan to operate the modelling system WRF-GHG (Weather Research and Forecasting – GreenHouse Gases) for a continental scale region such as Europe. The modelled greenhouse gas concentration fields will be used to generate simulated geostationary satellite measurements. The latter will then be examined with respect to their added value in constraining sources and sinks.

The Ph.D. thesis is planned as a close collaboration between DLR/IPA and the Max-Planck-Institute for Biogeochemistry in Jena.

Tasks:

- Modelling of carbon dioxide and methane concentrations by WRF-GHG
- Focusing the modelling system on European study region
- Simulating measurements of a geostationary satellite for greenhouse gases
- Analysis of information content with respect to sources and sinks

We are looking for a Ph.D. student with a keen interest in atmospheric physics and atmospheric modelling.

Essential skills:

- Master degree in physics, meteorology or equivalent
- Programming knowledge, preferably in FORTRAN, R, MATLAB
- Experience with complex atmospheric modelling systems
- Excellent English language skills
- Willingness to collaborate with external partners, willingness to travel

The position is awarded for 3 years (payscale TVöD-13 50%). Interested candidates should send a complete application package (CV; cover letter describing background, training and research interests; certificates; list of publications, contact information of a referee) as a single PDF to Prof. André Butz (andre.butz@dlr.de). Applications are being accepted immediately. The position is open until filled.

For further information please contact Prof. André Butz (andre.butz@dlr.de).