HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

Helmholtz Call for Chinese Applicants Interested in Running for CSC 2021 Fellowship

Helmholtz Centre: Forschungszentrum Jülich GmbH – www.fz-juelich.de

Department/Institute: Institute of Bio- and Geosciences, Agrosphere (IBG-3)
https://fz-juelich.de/ibg/ibg-3/EN/Home/home_node.html

Supervising scientist: Dr. Carsten Montzka

University for registration or for a future degree: University of Bonn

Research Field: Remote Sensing of Land Surface Fluxes

Position open for: **PhD Student** X **Sandwich PhD Student** □

Title of the research: Spaceborne monitoring of latent heat fluxes in agricultural ecosystems

More description of research topic:

Evapotranspiration (ET) is an essential component of the surface energy balance and the water and carbon cycle. Larger uncertainties exist in the estimation of ET from remote sensing for agricultural regions, especially under increasing extreme events such as droughts and heat waves. To improve the knowledge about larger-scale land surface fluxes the following research topics are foreseen for the PhD period:
Topic 1: The separation of canopy transpiration (T) from soil evaporation (E) using energy balance models and satellite data in different agroecosystems. This includes also the in-depth validation against ground reference measurements obtained from Eddy Covariance, Large Aperture Scintillometers, and/or Optical Microwave Scintillometers.
Topic 2: The development and analysis of spaceborne ET products and comparison against available approaches (Sen4ET) for detecting ecosystem water stress at regional, continental and global scale.
Topic 3: With the previously developed methods and data the interactions between soil properties and E and T will be analysed in detail. Most importantly, we will analyze the impact of land surface fluxes estimations on the root zone soil moisture dynamics and also explore the spatio-temporal response of land surface fluxes to soil moisture variations in agroecosystems.

Specific requirements:

- University degree in either remote sensing, geosciences, computer science, physics, or applied mathematics
- Knowledge about water and energy exchange processes at the land surface
- Expertise in remote sensing data processing and analysis
- Hands-on knowledge in the areas of measuring and processing latent heat fluxes by Eddy Covariance, Large Aperture Scintillometers, or Optical Microwave Scintillometers is a clear advantage
- Programming skills with Python, R, Matlab
- Ability to work independently as well as collaboratively in an international, interdisciplinary team across institutes; very good communication and organizational skills

Working Place: Forschungszentrum Jülich, Germany (near Cologne)

Earliest Start: September 2021

Language Requirement: Very good knowledge of English language, written and spoken. German language courses are organised in the context of our in-house training program and are free of charge.

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