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DLR – DAAD Fellowships

Fellowship No. 549

Research Area : Aeronautics/Space

Research Topic: **Lidar for Wind and Aerosol: Setup, Operation and Analysis of a Dual-Color Direct-Detection Doppler system**

DLR Institute: Institute of Atmospheric Physics

Position: Postdoctoral Fellow

Openings: 1

Job Specification:

The Institute of Atmospheric Physics investigates the physics and chemistry of the global atmosphere from the Earth's surface up to the upper boundary of the middle atmosphere at about 120 km height. The department “Lidar” develops ground-based, airborne and spaceborne lidar systems. It applies them for active remote sensing of key meteorological parameters and atmospheric trace gases enabling research in weather and climate as well as increasing air traffic safety.

The department has developed and validated a prototype of a Doppler Wind lidar based on a novel direct-detection design, namely the use of fringe-imaging from a field-widened Michelson interferometer (project AEROLI). By design, the operation of this interferometric spectrometer (currently in UV, 3rd harmonic of laser wavelength) may be extended to the green (2nd harmonic). This shall allow the acquisition of further atmospheric data besides the wind, i.a. the aerosol-to-molecular backscatter ratio.

This capability is of high relevance for future validation of spaceborne wind and aerosol lidars as well as future evolutions of these.

The proposed PostDoc project is centred around the optical setup and test of this extension to the existing lidar, its operation in a ground-based system and the analysis of the retrieved data. A rough timetable is foreseen as this:

- Year 1: Introduction to this lidar's theory and base lidar measurement equipment. Design of green channels extension.
  Integration, test and operation in ground-based lidar. Iterative setup improvements. Measurements including reference validation instrumentation.
- Year 3: Data evaluation regarding atmospheric properties and systematic error analysis. Publication of results.

More information may be obtained by contacting
patrick.vrancken@dlr.de

Required Qualification:

- Completed graduate university studies (diploma, master) in optical physics, physics, electrical engineering or similar with focus on domains of optical measurement techniques, optronics, signal processing, atmospheric physics or similar education
- PhD in active, laser-based measurement systems
- Profound expertise of geometric and physical optics
- Profound skills in programming, preferably in Matlab
- Longer-term hands-on laboratory experience

Advantageous Skills:

- PhD with instrumental lidar subject
- Experience in lidar systems design and/or operation
- Experience in optical interferometry and laser optics
- Basic knowledge in atmospheric sciences
- Experience and notably interest in optical metrology and electronics

Generalities:

We are committed to increasing the proportion of women and diverse* academics. Consequently, we actively encourage applications of these groups. We also encourage applications from candidates with disabilities and other marginalized groups. With equal qualifications, persons out of these groups shall be preferred.

Applications should be written in English and include a cover letter, the names of two references, a CV (without photograph), copies of degree certificates and transcripts, all combined into a single pdf (max. 10 MB).

English competence: See requirements on www.daad.de/dlr

Earliest Start Date: August 1st, 2024

Application Deadline: Applications review will be started on June 1st, and continued until position filled.

Further Information: http://www.dlr.de
Department webpage on DLR.de
http://www.daad.de/dlr