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DLR – DAAD Fellowships

Fellowship No. 621

Research Area: Space

Research Topic: **Comparing lidar measurements of gravity waves in the middle atmosphere to high-resolution simulations**

DLR Institute: Institute of Atmospheric Physics (PA), DLR Oberpfaffenhofen, Germany

Position: Doctoral Fellow

Openings: 1

Job Specification: Earth's atmosphere is dynamically coupled through atmospheric waves of different scales, ranging from planetary waves to small-scale gravity waves. Gravity waves in particular can propagate from sources close to the ground into the upper atmosphere to altitudes above 100 km. The contribution of these waves to perturbations of the ionosphere ("space weather") is a recent research question. Space weather has important implications for our modern navigation and communication technologies. Therefore, it is of interest to study atmospheric wave disturbances in the height region of about 50 to 150 km and investigate whether these disturbances can be predicted in advance, and whether certain background conditions lead to a change in occurrence frequency of strong wave disturbances.

Datasets of modern, high-power Light detection and Ranging (lidar) instruments from selected geographic locations are available and will continue to grow during the course of the PhD project. Temperature perturbation observations from southern Argentina on the edge of the southern polar vortex provide data on high-amplitude gravity waves in the middle atmosphere. A twin instrument observes the atmosphere above South Pole in the middle of the polar vortex where gravity waves of a different type and a more moderate activity is expected. This unique data is to be analyzed and compared to simulations of a novel, high-resolution numerical model, the extended version of the German Weather and Climate model (UA-ICON). The candidate will work closely with a second PhD student in charge of UA-ICON simulations. In this project, suitable strategies for validation of UA-ICON model data with observational lidar data are to be explored. This will concern the variability of the strength of gravity wave events (e.g, can UA-ICON reproduce the observed variability?) or the predictability of specific events (e.g. under what circumstances can UA-ICON predict this event?).

Required Qualification:	Master degree in physics, atmospheric science or similar. The candidate has an interest in atmospheric dynamics and enjoys data analysis. Basic programming skills for handling and visualization of netcdf data in either IDL, python or similar are required.
Advantageous Skills:	Education in atmospheric science, in particular atmospheric dynamics are of advantage, but not necessary. Experience with working in a Linux environment is of advantage.
English competence:	See requirements on www.daad.de/dlr
Earliest Start Date:	January 2024
Application Deadline:	Open until filled
Further Information:	http://www.dlr.de http://www.daad.de/dlr **for further informations, please contact natalie.kaifler@dlr.de**