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# Validation and Impact assessment of Aeolus Doppler Wind Lidar Observations at the German Weather Service

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## Abstract

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## ABSTRACT

The first European Space Agency (ESA) Earth Explorer satellite mission Aeolus was launched successfully in August 2018, providing globally distributed profiles of horizontal line-of-side (HLOS) wind information. From the beginning, the Deutscher Wetterdienst (DWD), as part of the German project team EVVA (Experimental Validation and Assimilation of Aeolus data), investigated statistics of differences of the Aeolus winds relative to the global ICON model system of DWD, the observation error characteristic and bias behaviour of the HLOS winds, for both Laser A and Laser B, on a routinely basis and giving contributions to the CAL/VAL activities of ESA and for internal use.

Several impact studies were conducted for both, Laser A and Laser B, showing a significant positive impact of the Aeolus HLOS winds in our data assimilation system for both hemispheres and the Tropics. The impact is largest in the tropical upper troposphere and lower stratosphere and over polar areas. All the activities accumulated in the operational use of the Aeolus HLOS winds in May 2020, only 1 and a half year after the first arrival of the winds in our observational data base system. This was only possible by an excellent collaboration between a variety of partners, including ESA, ECMWF, the DISC team and the national EVVA team.

In my talk, I will give an overview of the activities and impact assessments, mainly for Laser B, leading to the successfully operational usage of the Aeolus HLOS winds in the data assimilation and forecasting system of DWD.

**Keywords:** Aeolus Doppler Wind Lidar, Error Characteristics, Observation Impact, NWP System

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