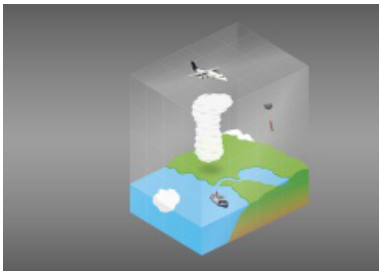

Contribution ID: **9** Type: **Oral presentation**

Global forecasts of atmospheric gravity waves for observational campaigns

Thursday, 13 June 2019 09:30 (20 minutes)

The Institute of Atmospheric Physics of the German Aerospace Center (DLR) organized and participated in three observational campaigns on atmospheric gravity waves (GWs) in the past 7 years: GW-LCYCLE I (Kiruna, Sweden, 2013), DEEPWAVE (Christchurch, New Zealand, 2014) and GW-LCYCLE II (Kiruna, Sweden, 2016). The overreaching goal of all the campaigns with combined airborne and ground-based measurements was a better understanding of the GW sources in the troposphere and lower stratosphere and the wave propagation to the middle and upper atmosphere. The Scandinavian mountain range and the Southern Alps of New Zealand are hotspots of stratospheric mountain wave activity. However, the region of the Andes and the Antarctic Peninsula is the global hotspot in terms of stratospheric GW activity and momentum fluxes. Hence, the investigation of GWs in this region is part of the upcoming SOUTHTRAC campaign in September 2019.

High-resolution operational IFS forecasts (HRES) of the ECMWF have been used for mission and flight planning. Hereby, standardised products on a mission web site as well as an optimized representation in the mission support system (Rautenhaus et al., 2012) were employed. Additionally, HRES forecasts serve as valuable information for controlling autonomous ground-based measurements.

Because of their high fidelity, operational IFS analyses have been often used for post-campaign investigations, e.g., as an overview of the meteorological background conditions, see Gisinger et al., 2017. IFS data were used for the direct comparison or combination of model and observational data (e.g., Ehard et al., 2018) and for interpretation of the results. We found a remarkable agreement of the simulated wave structure in the IFS short-term forecast and space-borne lidar observations (Dörnbrack et al. , 2017). This indicates that the finer resolution and increasing realism of operational NWP model outputs offers a valuable quantitative source for mesoscale flow components which were hitherto not accessible globally.

At the workshop, we want to show briefly how we make use of ECMWF forecasts during a gravity wave campaign. We want to present some selected results of the past campaigns. This will include not only case studies of individual GW events but also long-term (1 year) comparison between model and lidar temperature data
of the middle atmosphere at Rio Grande (Argentina).

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