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Airborne active remote-sensing observations of warm conveyor belts

Tuesday, 10 March 2020 10:25 (25 minutes)

This presentation summarizes the key findings using airborne observations with active remote-sensing instruments that were applied to observe WCBs. A focus is put on observations that were made during the North Atlantic Waveguide and Downstream impact EXperiment (NAWDEX) that was conducted in autumn 2016 with the aim to examine the structure of the jet stream, the impact of diabatic processes on the jet stream disturbances and their influence on high-impact weather downstream.

On the one hand we present NAWDEX cases with warm conveyor belt measurements highlighting uncertainties in the representation of wind and moisture across the tropopause in the outflow region of WCBs. WCB outflows are known to be of crucial relevance for mid-latitude atmospheric dynamics as wind fields are essential for the distribution of potential vorticity and thus the behaviour of Rossby waves. Moisture is important as the strong gradients across the tropopause may impact the mid-latitude flow through radiative heating processes. On the other hand we present lidar observations of the boundary layer humidity structure in the inflow region of a WCB providing the characteristic of an atmospheric river-type flow over the central Atlantic Ocean.

Additionally, this presentation is looking ahead to future field campaigns with the aim to excite a discussion on possible collaborations with the WCB community.

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Track Classification: Workshop: Warm Conveyor Belts –a challenge to forecasting