13th International Atmospheric Limb Workshop



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## Airborne demonstration of the CAIRT measurement geometry with GLORIA observations during the ASCCI campaign 2025

We present trace gas measurements obtained by the airborne infrared imaging limb sounder GLORIA (Gimballed Limb Observer for Radiance Imaging of the Atmosphere) that has been operated onboard HALO (High Altitude and Long Range Research Aircraft) during the ASCCI campaign (Arctic Springtime Chemistry-Climate Investigations; March 2025) from Kiruna, Sweden. The GLORIA instrument is an airborne demonstrator for the ESA Earth Explorer 11 candidate mission CAIRT (Changing-Atmosphere Infra-Red Tomography Explorer). During the ASCCI campaign, a dedicated flight pattern was conducted in order to mimic the anticipated CAIRT measurement geometry and spatial sampling pattern with the GLORIA airborne instrument within the ESA CAREVALAB project. We will present first results from this sophisticated flight pattern together with preliminary diagnostics. For validation, we aim to compare our retrieved temperature and trace gas concentrations with ozone and water vapour measurements from the airborne WALES lidar, which was also deployed on HALO during ASCCI. Further, we will show GLORIA measurements from other ASCCI research flights, targeting pollution and stratospheric trace gases, which we expect to measure in high latitudes.

## Topic

Current and past limb and occultation instruments: algorithms, products, validation

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