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Profile Measurements of Aerosols and Trace Gases by DOAS during the POLARCAT Kiruna campaign

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A new instrument was installed onboard the Safire ATR-42 during the POLARCAT spring 2008 campaign in Kiruna. This instrument, namely the Airborne Limb Scattering Differential Optical Absorption Spectrometer (ALS-DOAS) is based on a scanning telescope pointing to the limb behind a port of the plane and a grating UV-Visible spectrometer. Atmospheric trace gases absorptions in the measured scattered light spectra are analyzed to retrieve quantitative information on the vertical distribution of NO2 and O3 by an Optimal Estimation technique. We present the algorithm developed for the ALS-DOAS instrument and results from sensitivity studies performed using POLARCAT measurements. Retrieved vertical distribution of aerosol extinction, NO2 and O3 are compared with ancillary information, such as in-situ observations of O3 concentrations simultaneously performed onboard the airplane and NO2 column measurements from satellite.