



GASCOD/A4pi DOAS ozone measurements aboard M55 Geophysica aircraft during Kiruna ENVISAT validation campaign

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The global climate and its changes are subject of increasing interest during the last decades. This interest is driven by necessity to predict the future of the Earth's climate, hence to provide political makers with reliable information. For this purpose ground-based, balloon, aircraft and satellite measurements are going on to collect experimental data for revealing the trends of atmospheric physical parameters and composition.

The satellite instruments in particular undergo sophisticate calibration and test procedures during the pre-flight phase in order to guarantee the quality of expected data. However further control is required to keep designed instrumental characteristics during in-orbit operation. This control includes dedicated satellite data validation campaigns aimed to verify the ability of the space sensors to reproduce actual atmospheric parameters.

Such validation campaigns with participation of airborne instruments appear be essential, specially in geographic areas where ground-based observational facilities lack or are not well developed yet. For instance, in the polar areas aircraft measurements could provide valuable measurements for validation tasks.

The mid-infrared FT spectrometer MIPAS (Michelson Interferometer for Passive Atmospheric Sounding), launched on March 1st, 2002 on-board the polar orbiting ENVISAT satellite, measures atmospheric temperature and volume mixing ratio of O₃, NO₂, H₂O, HNO₃, CH₄ and N₂O. These parameters were subject of dedicated ESA ENVISAT validation campaign based at Kiruna (Sweden) airport in Febryary-March 2003 period.

The UV-VIS spectrometer GASCOD/A4pi appears a part of the scientific payload of M55 Geophysica stratospheric aircraft deployed during this campaign. The spectrometer is provided with input optical channels for remote probing of target air-masses above, below and laterally the aircraft. Obtained spectra are processed applying DOAS (Differential Optical Absorption Spectroscopy) method to retrieve O₃ and NO₂ mixing ratio along the flight tracks.

This work deals in particular with ozone measurements performed by GASCOD/A4pi instrument in 12 March 2003, when the same air-mass at high latitudes was probed remotely for more than one hour. Obtained results are presented, compared with MIPAS-E data and discussed.

Acquired experience can be useful in the frame of International Polar Year activity.