UP 4: Postersession

Zeit: Dienstag 17:15–18:30 Raum: Poster EG

UP 4.1 Di 17:15 Poster EG

Measurements for PV-Module outdoor performance — •Jörg Bendfeld — Universität Paderborn, KET, Pohlweg 55, 33098 Paderborn

Reliability and energy yield are the main parameter of interest concerning PV modules. For this reason, long-term PV module tests are carried out to give site-specific reports about the module performance. Unlike laboratory measurements long-term outdoor measurements are not repeatable. But those measurements are the best way to compare the energy yields of different module types under varying weather conditions. In the interests of customers and of the industry, PV laboratories perform long-term outdoor tests. Performing PV outdoor tests should last over a period of at least one year. The equipment for basic energy yield measurements records at least ambient temperature, module temperature, and irradiance in the module plane (plane of array); current and voltage measurements are taken at the maximum power point (MPP). The recording time interval is 5 seconds. This is a compromise between precision and applicability. The ambient weather data and the condition data for any module have to be collected and evaluated.

UP 4.2 Di 17:15 Poster EG

Foundation monitoring for offshore windfarms — •Jörg Bendfeld[1] and Jens Krieger[2] — [1]Universität Paderborn, KET, Pohlweg 55, 33098 Paderborn — [2]Airwerk GmbH, Industriering 14 49393 Lohne

The offshore wind energy industry is still relatively young. There is little or simply not really sufficient experience regarding the safety of the wind turbine foundations; the material stress due to wind and waves is still not completely clear. A continuous foundation monitoring including analysis is therefore needed. A foundation monitoring includes: -*scour monitoring, -*grout monitoring, -*inclination monitoring, -*load monitoring, -*acceleration monitoring, -*monitoring of turbine position, -*metocean sensors. There is not yet a standard concerning the scope of offshore foundation monitoring projects. Realization details depend on wind park project specifics such as foundation type, water depth, soil conditions, etc.

UP 4.3 Di 17:15 Poster EG

Towards traceability in line parameter measurement of CO2 and H2O at 2.7 micrometer by tunable diode laser absorption spectroscopy — •Javis Nwaboh[1], Andrea Pogány[1], Olav Werhahn[1], and Volker Ebert[1,2] — [1]Physikalisch-Technische Bundesanstalt, Bundesallee 100, 38116 Braunschweig — [2]Center of Smart Interfaces, Technische Universiät Darmstadt, Petersenstr. 32, 64287 Darmstadt

Carbon dioxide (CO2) and water vapor (H2O) are important molecules for environmental monitoring. Line strengths and collision broadening coefficients of these species are often used in environmental monitoring and climate modeling; therefore, precise knowledge of these line data is becoming indispensible. Line data retrieved by different spectroscopic techniques are collected in databases such as HITRAN and GEISA. These databases are very useful to the environmental monitoring community. However, the traceability of line data to the SI system of units and uncertainty assessments are often incomplete or missing in the literature. We present measurements of line strengths and broadening coefficients, of single CO2 and H2O lines in the absorption bands around 2.7 micrometer, using tunable diode laser absorption spectroscopy (TDLAS). We provide a GUM-compliant uncertainty assessment for the measured line data and address traceability to the SI units. The relative uncertainties of our line strengths and broadening coefficients are in the 2 and 0.8 % range, respectively. This work has been initiated within the projects MACPoll and GAS, jointly funded by the EMRP participating countries within EURAMET and the EU.

UP 4.4 Di 17:15 Poster EG

BrO/SO_2 Verhältnisse an Vulkanen vom NOCAC Netzwerk: — •Peter Lübcke, Nicole Bobrowski, Leif Vogel und Ulrich Platt — Institut für Umweltphysik, Im Neuenheimer Feld 229, 69120 Heidelberg

Das Verhältnis von Halogenen zu Schwefel in Vulkangasen ist ein Indikator für dynamische Veränderungen im oberen Teil eines Vulkansystems. Erst kürzlich wurde das Verhältnis von Brommonoxid (BrO) zu Schwefeldioxid (SO_2) als Indikator für Veränderungen in der Vulkanaktivität vorgeschlagen. Dieses Verhältnis kann durch Fernerkundungsmessungen mit Differentieller Optischer Absorptions Spektroskopie im UV gemessen werden. Das BrO Radikal wird jedoch nicht direkt von Vulkanen emittiert, vermutlich wird Brom in Form von Bromwasserstoff emittiert und zum Teil durch photochemische Prozesse in der Atmosphäre zu BrO oxidiert. Wir stellen Messungen von BrO/SO_2 Verhältnissen die vom "Network for Observation of Volcanic and Atmospheric Change"(NOVAC) gemessen wurden. NOVAC hat insgesamt 64 Spektrometer an 24 Vulkanen weltweit installiert, von denen einige seit 7 Jahren kontinuierlich vulkanische Gasemissionen messen. Wir zeigen, dass es mit den Geräten, die im Rahmen des NOVAC Netzwerkes zur SO_2 Überwachung installiert wurden, möglich ist BrO/SO_2 Verhältnisse zu bestimmen und stellen erste Zeitreihen vor. Dieser große Datensatz erlaubt es Änderungen im BrO/SO_2 Verhältnis im Hinblick auf Zusammenhänge mit verschiedenen möglichen Einflussfaktoren zu untersuchen. Hierbei sind insbesondere die Meteorologie, das Fahnenalter in der Atmosphäre und die Vulkanaktivität interessant.

UP 4.5 Di 17:15 Poster EG

Application of DOAS Instruments for Trace Gas Measurements on Unmanned Aerial Systems — •Martin Horbanski[1,2], Denis Pöhler[1], Tobias Mahr[1,2], Thomas Wagner[1,2], and Ulrich Platt[1] — [1]Institut für Umweltphysik, Im Neuenheimer Feld 229, 69120 Heidelberg — [2]Max-Planck-Institut für Chemie, Hahn-Meitner-Weg 1, 55128 Mainz

Unmanned Aerial Systems (UAS) are a new powerful tool for observations in the atmospheric boundary layer. Recent developments in measuring technology allow constructing compact and sensitive DOAS instruments which can fit the space and weight constraints on UAS. This opens new possibilities for trace gas measurements in the lower troposphere, especially in areas which are not accessible to manned aviation e.g. volcanic plumes or which should be monitored regularly (e.g. industrial emissions of a stack).

A passive DOAS instrument for the APAESO Platform, a medium size UAS, is presented. It is equipped with telescopes for observations in downward and horizontal viewing direction. Thus it allows determining height profiles and spatial distributions of trace gases. For this the light is analyzed by a compact spectrometers which cover the UV-blue range allowing to measure a broad variety of atmospheric trace gases (e.g. NO2, SO2, BrO, IO, ...). Additionally, the nadir direction is equipped with a VIS-NIR spectrometer. It is used to measure and analyse reflection spectra of different types of vegetation. These will serve as references for satellite measurements. The instrumental setup and the results of first test flights are shown.

UP 4.6 Di 17:15 Poster EG

Decadal trends in ozone, bromine monoxide, and nitrogen dioxide from SCIAMACHY limb measurements and multi-instrument comparisons — •Claus Gebhardt[1], Alexei Rozanov[1], René Hommel[1], Mark Weber[1], John P. Burrows[1], Doug Degenstein[2], Lucien Froidevaux[3], and Anne M. Thompson[4] — [1]University of Bremen, Institute of Environmental Physics, Bremen, Germany — [2]University of Saskatchewan, Saskatoon, Canada — [3]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA — [4]Department of Meteorology, Pennsylvania State University, Pennsylvania, USA

The SCIAMACHY/ENVISAT satellite instrument (2002-12) has monitored Earth' atmosphere globally for almost one decade. In its limb viewing geometry, it recorded vertical profiles of the atmospheric limb scatter. O_3, BRO, and NO_2 are among the retrieved species. Their vertical profiles are obtained in 1 km altitude steps. Longterm changes as well as periodically varying features are present in their time series. The longterm changes are statistically described by trends. The trend profiles of SCIAMACHY limb ozone extend throughout the stratosphere.

In our talk, we compare trend profiles of stratospheric O_3 from SCIAMACHY to other measurements ranging from contemporary satellite instruments to different measurement techniques. We further present trend profiles of BRO and NO_2. Being crosslinked through chemical reactions, there are relations between the trend profiles of O_3, BRO, and NO_2.

UP 4.7 Di 17:15 Poster EG

Spectral Soft Calibration for use in Conjunction with an Optimal Estimation based Approach to Retrieve O3 Stratospheric Profiles from SCIAMACHY UV Measurements in the Hartley and Huggins Band — •Stefan Bötel, Mark Weber, Alexei Rozanov, and John P. Burrows — Institute of Environmental Physics, University of Bremen, Germany

Stratospheric profile retrieval of ozone in the Hartley-Huggins band in nadir viewing geometry is one of very few options of obtaining a far-reaching timeseries of ozone profiles. The underlying optimal estimation approach coupled with the specific O3 absorption spectrum in the UV wavelength region lead to the need for a very exact spectral calibration. SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric ChartographY) launched on ENVISAT in March 2002 measures sunlight, transmitted, reflected and scattered by the earth atmosphere or surface (240 nm - 2380 nm) in both nadir and limb viewing geometry. With its long lifetime of close to 10 years and its overlap with both GOME on ERS-2 and GOME II on MetOp it is a good candidate for the start of such a long time series. In order to counter instrument dependant effects and degradation a spectral calibration is neccessary. In this study a possible method for in-flight calibration by means of comparison of measured and simulated reflectance spectra will be shown. The basis for simulated spectra are refernce regions over various latitudes with simulations carried out with SCIATRAN. Such an instrument independant calibration technique can improve the comparability of datasets from different intruments.

UP 4.8 Di 17:15 Poster EG

Limb and Nadir detection of UV/vis/near IR absorbing trace gases from the novel research aircraft HALO around the tropopause and in the troposphere. — •Tilman Hüneke[1], Eric Gentry[2], Mareike Kenntner[1], Sabrina Ludmann[1], Rasmus Raecke[1], and Klaus Pfeilsticker[1] — [1]Institut für Umweltphysik, Universität Heidelberg, Heidelberg, Germany — [2]Massachusetts Institute of Technology, Cambridge, USA

A novel 6-channel mini-DOAS optical spectrometer has been deployed on the novel HALO research aircraft. It is aiming at high sensitive measurements of profiles of O3, NO2, CH2O, C2H2O2, BrO, OClO, IO, gaseous, liquid and solid H2O around flight altitude. The Nadir observation also allows to measure the total tropospheric column of these gases. Upon the retrieval of slant column amounts of the targeted gases, the data reduction involves forward radiative transfer modelling of the observations and standard mathematical inversion technique. For the first time, the novel spectrometer has been deployed on the HALO research aircraft during TACTS (Transport And Composition in the UT/LMS) and ESMVal (Earth System Model Validation) measurement campaigns which took place in summer 2012. The present contribution reports on technical features of the novel instrument, the feasibility of the method together with some first sample results for major absorbers.

UP 4.9 Di 17:15 Poster EG

Influence of antifreeze proteins on the crystal growth in solidification of water — •Bernd Kutschan[1], Silke Thoms[2], Klaus Morawetz[1,3,4], and Sibylle Gemming[5] — [1]Münster University of Applied Sciences, Stegerwaldstrasse 39, 48565 Steinfurt, Germany — [2]Alfred Wegener Institut, Am Handelshafen 12, D-27570 Bremerhaven, Germany — [3]International Institute of Physics (IIP), Avenida Odilon Gomes de Lima 1722, 59078-400 Natal, Brazil — [4]Max-Planck-Institute for the Physics of Complex Systems, 01187 Dresden, Germany — [5]Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, P.O. Box 51 01 19, 01314 Dresden, Germany

Antifreeze proteins (AFPs) are surface-active molecules and inhibit the ice crystal growth during the freezing process. They interact with the diffuse water/ice interface and prevent a complete solidification by freezing. Microstructures evolve as a result of the phase separation in the presence of AFPs. The thermodynamics of pure water-ice phase transition is modified by the inhibitory effect of AFPs on ice formation as a kinetic phenomenon in non-equilibrium. Different hypotheses exist on the detailed mechanisms of the AFPs. Particularly with regard to the modification of the surface tension we are able to compute the interfacial energy from kink solutions. Connecting phase-field methods with reaction kinetics, the "adsorption-inhibition" theory of Langmuir seems to be suited to verify the microstructure formation in sea ice.

UP 4.10 Di 17:15 Poster EG

In situ characterization of mixed phase cloud ice particles. — •Paul Vochezer, Martin Schnaiter, Ahmed Abdelmonem, and Thomas Leisner — Karlsruhe Institute of Technology IMK-AAF, Germany

Clouds alter the Earth's radiative properties and are a major component of the hydrological cycle. A common cloud type in mid-latitudes are mixed phase clouds which contain both ice particles and water droplets. The state of the ice phase is of great importance to the lifetime and the radiative properties of mixed phase clouds. In order to characterize cloud particles in number, size, phase and morphology we deployed a set of three instruments during a cloud chamber campaign (AIDA-RICE01) and a field campaign (CLACE2013). The Small Ice Detector (SID) and the Particle Phase Discriminator (PPD) generate high resolution scattering patterns of individual cloud particles from which the particles size, phase and morphology can be inferred. During CLACE2013 the PPD was operated as part of the novel Ice Selective Inlet (ISI) which was constructed in close cooperation at PSI, Switzerland. The ISI selectively samples ice particles from mixed phase clouds and thus allows for a highly detailed analysis of the ice phase particles with the PPD. The Particle Habit Imaging and Polar Scattering instrument (PHIPS) records both real images and the scattering phase function of individual cloud particles. The PHIPS data complements the output of the other instruments. First ice particle microphysics results from the AIDA-RICE01 and CLACE2013 campaign are presented.

UP 4.11 Di 17:15 Poster EG

Optimierung der Nah-IR DOAS Messung durch den Einsatz neuer Modenmischer — •Jan-Marcus Nasse, Denis Pöhler und Ulrich Platt — Institut für Umweltphysik, Universität Heidelberg

Die Differentielle Optische Absorptions Spektroskopie (DOAS) ist eine im UV und VIS Spektralbereich seit langem sehr erfolgreich angewandte, kalibrationsfreie Messmethode zur Fernerkundung zahlreicher Spurenstoffe. Die Ausweitung auf den Nah-IR Spektralbereich (bis ca. 2000 nm) und somit die Messung von interessanten Spurenstoffen wie Methan und Kohlendioxid ist durch die Verfügbarkeit entsprechender Detektorzeilen seit einiger Zeit theoretisch möglich. Allerdings wurde hierbei meist eine für DOAS nicht zufriedenstellende Messgenauigkeit erreicht.

Ursache dafür ist eine fehlende gleichmäßige Ausleuchtung des Spektrographen. Zur homogenen Mischung des empfangenen Lichtsignals wird es durch Quarz-Lichtwellenleiter zum Spektrographen geleitet, wobei sich Fasermoden ausbilden. Für Anwendungen im Nah-IR hat eine unzureichende Mischung dieser Moden erfolgreiche Atmosphärenmessungen bisher verhindert.

Durch den Einsatz von Modenmischern, die mechanisch auf die Faser einwirken, kann das optische Rauschen aufgrund von Fasermoden reduziert werden. Im UV- und sichtbaren Spektralbereich wird diese Modenmischung seit längerem erfolgreich angewandt. Im Nah-IR haben sich die bisherigen Methoden als nicht ausreichend erwiesen. Wir stellen zwei neue Entwürfe zur Modenmischung vor, mit denen das optische Rauschen im Nah-IR um bis zu 85 % reduziert wird.

UP 4.12 Di 17:15 Poster EG

Temperature effects in MAX-DOAS observations of NO_2 — •Andreas Richter, Folkard Wittrock, Enno Peters, Anja Schönhardt, and John P. Burrows — Institute of Environmental Physics, University of Bremen, Bremen, Germany

Multi Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) measurements are often applied to the observation of atmospheric NO_2. The method is based on absorption spectroscopy and uses the absorption cross-section of NO_2 to identify and quantify its amounts in the troposphere and stratosphere. As NO_2 has a temperature dependent absorption cross-section, atmospheric temperature impacts on the observed signal.

In this study, the effects of the temperature dependence of the NO2 absorption cross-section on MAX-DOAS measurements of stratospheric and tropospheric NO_2 are discussed and the errors introduced by current retrieval approaches are discussed.

Using data from the CINDI campaign, it is then investigated in how far the temperature dependence of the NO_2 signal can be exploited to derive a tropospheric NO_2 column from zenith-sky observations alone, and the results are compared to those obtained from off-axis measurements.

Based on a similar approach, the applicability of the temperature signal for correction of stratospheric observations in polluted places such as Bremen is evaluated by applying a modified Langley Plot method

to zenith-sky observations at twilight.

UP 4.13 Di 17:15 Poster EG

SO_2 Kamera Messungen an Stromboli und Etna — •Marco Huwe[1], Nicole Bobrowski[1], Peter Lübcke[1], Julian Wittmer[1], Giancarlo Tamburello[2], Tom Pering[3] und Ulrich Platt[1] — [1]Institute of Environmental Physics, University of Heidelberg — [2]Dipartimento DiSTeM, Università di Palermo, Italy — [3]Department of Geography, University of Sheffield, UK

Die Analyse von Vulkanemissionen ist seit vielen Jahren eine wichtige Methode in der Vulkanologie. Besonders SO_2, mit einer starken Absorption im UV und einem im Vergleich zur restlichen Atmosphäre hohen Vorkommen in Vulkanfahnen, ist durch optische Techniken gut nachweisbar. Unser Instrument misst die 2D-Verteilung von SO_2 mit Hilfe von 2 Interferenzfiltern. Diese arbeiten im spektralen Bereich schwacher SO_2 Absorption bei 330nm und starker Absorption bei 310nm mit einer Bandbreite von 10nm. Mit einer zeitlichen Auflösung im Sekundenbereich können wir mit diesen Messungen absolute SO_2 Flüsse bestimmen.

Diese Arbeit präsentiert Ergebnisse von SO_2-Kamera-Messungen am Etna und Stromboli, welche durch Ergebnisse von simultan durchgeführten in-situ Messungen ergänzt werden. Des weiteren wurde am Etna mit zwei unterschiedlichen SO_2 Kamera Systemen Daten erhoben. Diese Daten wurden mit zwei unterschiedlichen etablierten Auswertealgorithmen ausgewertet. Ein Vergleich der erzielten Ergebnisse und deren Unterschiede wird vorgestellt und diskutiert.

UP 4.14 Di 17:15 Poster EG

Consistency of CO retrievals between the global networks NDACC and TCCON — •Christof Petri, Thorsten Warnecke, Mathias Palm, Nick Deutscher, and Justus Notholt — Institute of Environmental Physics, University of Bremen, Bremen, Germany

The Network for the Detection of Atmospheric Composition Change (NDACC) and the Total Carbon Column Observing Network (TCCON) are the two leading networks for groundbased atmospheric FTIR measurements of tracegases. NDACC was established to ob- serve stratospheric tracegases, later the activities were extended to the complete atmosphere. TCCON is specialised in the observation of greenhouse gases. While NDACC is measuring in the middle infrared with a resolution of 0.005 wavenumbers, TCCON uses the near infrared spectral region and a resolution of 0.02 wavenumbers. The retrieval strategies in these different spectral regions are examined for interfering gases and compared in precision. The retrieval programs gfit and sfit are used.

The measurements have been performed in Bremen using a Bruker 125HR interferometer which is part of both, the TCCON and the NDACC network.

This study is performed within the Demonstration Network Of ground-based Remote Sensing Observations (NORS), support by the European Commission within the 7th Framework Program.

UP 4.15 Di 17:15 Poster EG

Tropospheric trace gas mapping by airborne imaging DOAS — •Anja Schönhardt, Patricia Altube, Andreas Richter, Sven Krautwurst, Konstantin Gerilowski, and John P. Burrows — Institut für Umweltphysik, Universität Bremen

Aircraft remote sensing measurements are a valuable tool for measurements and mapping of tropospheric trace gases. The presented imaging DOAS instrument is specifically built for airborne applications and is used for observations of anthropogenic nitrogen dioxide, NO_2.
Viewing in nadir geometry, tropospheric column amounts of the retrieved trace gases are determined. Radiation from within about 50 degrees opening angle across track is recorded simultaneously. Taking the aircraft position angles into account, the geolocation of each individual observed scene is corrected and thus determined with high accuracy. Spectral and spatial resolution of the instrument is of good quality and allows trace gas mapping on a spatial sale of 100m.
The determination of NO_2 emission fluxes from a power plant exhaust plume is performed based on the Gaussian plume model. Results from research flights covering different areas with anthropogenic pollution sources are presented.

UP 4.16 Di 17:15 Poster EG

Greenhouse gas measurements with Fourier Transform Spectroscopy on Ascension Island — •Dietrich G. Feist and Sabrina Niebling — Max Planck Institute for Biogeochemistry, Jena, Germany

The Total Carbon Column Observing Network (TCCON) consists of several sites that measure greenhouse gases like CO_2, CH_4, CO, and N_2O across the globe. Each site has a Fourier Transform Spectrometer (FTS) that combines a large bandwith with a high spectral resolution. The instruments use the sun as a light source and retrieve the total column concentrations of the greenhouse gases. They augment the existing network of ground based in-situ measurements and provide a valuable reference for satellite measurements.

The latest TCCON station is the FTS operated by the Max Planck Institute for Biogeochemistry in Jena, Germany, on the remote Ascension Island. It is the only equatorial station so far.

The poster provides details on the many challenges that have to be overcome to operate an automatic instrument in such a remote place. It also shows comparisons with existing data from in-situ observations, satellite measurements and global transport model calculations.

UP 4.17 Di 17:15 Poster EG

Washout Coefficients for Particle Bound Radionuclides in Rain and Snow Events — •Felix Bernauer, Kerstin Huerkamp, and Jochen Tschiersch — Helmholtz Zentrum München, Department of Radiation Sciences, Munich, Germany

For the removal of particle bound radionuclides and aerosol particles in general wet deposition processes play a key role. Supposing that wet deposition depends strongly on the type and characteristics of the precipitation event we present field experiments on the quantification of wet deposition of radionuclides by snowfall and rain events. The experiments take place in the free atmosphere at the Environmental Research Station Schneefernerhaus on Mt. Zugspitze (2650m a.s.l.). Snowfall event characterization, quantification of the washout of aerosol particles in the size range from $10^{-2}\mu$m to 10μm and determination of the overall activity washout coefficient for the radionuclides ^{7}Be, ^{137}Cs and ^{210}Pb are the key tasks in our experiments. A 2D Video-Distrometer (Joanneum Research), a high volume aerosol sampling station ASS1000 (Fischer, PTI), an electrical low pressure cascade impactor ELPI+ (Dekati) and a low-level background gamma spectrometer (Canberra Broad Energy Germanium Detector) make these parameters accessible and software tools for data handling and processing will be developed. First results on precipitation event characterization are shown. Relating the radioactivities in the freshly fallen snow and rain to those in the collected aerosol allows us to quantify the washout efficiency for different precipitation events.

UP 4.18 Di 17:15 Poster EG

Comparison of middle and near infrared total column xCO_2 retrieval — •Matthias Buschmann[1], Nicholas Deutscher[1,3], Susanne Dohe[2], Vanessa Sherlock[4], David Griffith[3], and Justus Notholt[1] — [1]Institute of Environmental Physics, University of Bremen, Bremen, Germany — [2]Institute for Meteorology and Climate Research (IMK-ASF), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany — [3]School of Chemistry, University of Wollongong, Wollongong, Australia — [4]National Institute of Water and Atmospheric Research (NIWA), Wellington, New Zealand

Monitoring networks like the NDACC (Network for the Detection of Atmospheric Composition Change) and TCCON (Total Carbon Column Observing Network) continuously monitor a variety of trace gases in the atmosphere by employing ground based Fourier Transform InfraRed (FTIR) spectroscopy on solar radiation. TCCON uses near infrared (NIR) spectral windows to retrieve total column CO_2, which yield a high enough precision ($< 0.2\%$) to use as validation for satellite retrievals and model data. On the other hand, it has been considered difficult to obtain results with comparable precision from the middle infrared (MIR) from NDACC spectra. It would, however, be useful to be able to use the longer time series of the NDACC stations. Here we present an intercomparison study using different monitoring stations, that routinely take both NIR and MIR spectra. This results in a validation scheme for a MIR time series based on the already well validated TCCON data.

UP 4.19 Di 17:15 Poster EG

Retrieval of tropospheric ozone columns from SCIAMACHY limb-nadir matching observations — Felix Ebojie[1], Christian von Savigny[1,2], •Annette Ladstätter-Weissenmayer[1], Alexei Rozanov[1], Mark Weber[1], Stefan Bötel[1], Heinrich Bovensmann[1], and John Burrows[1] — [1]Institute of Environmental Physics (IUP), University of Bremen, P.O. Box 330440, D-28334 Bremen, Germany — [2]Institut für Physik , Felix-Hausdorff-Str. 6, Ernst-

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Satellite observations of tropospheric ozone are of critical importance in obtaining a global and more thorough knowledge of the phenomena affecting air quality. Tropospheric ozone has a significant adverse effect on the climate system. In the lower troposphere, during summer, it is a major constituent of photochemical smog and excess of it is toxic to the ecosystem, animal and man. It is equally known as a major oxidant and also involved in the production of other oxidants such as hydroxyl (OH) radicals. In the middle and upper troposphere, ozone acts as a greenhouse gas. The retrieval of tropospheric ozone from UV/VIS/NIR satellite spectrometer such as the Scanning Imaging Absorption spectroMeter for Atmospheric CHartographY (SCIAMACHY) instrument onboard the ESA satellite Envisat is difficult because only about 10 % of the Total Ozone Column (TOC) is in the troposphere. In this analysis we present the retrieval of tropospheric ozone columns from SCIAMACHY limb-nadir matching observations.