

In dieser Studie werden BrO-Messungen von SCIAMACHY und GOME2 mit Trajektorienrechnungen verglichen, um Aufschluss über typische Entstehungsgebiete des BrO und seine Transportwege zu gewinnen. Der Schwerpunkt liegt dabei auf einzelnen, gut zu verfolgenden Ereignissen.

UP 4.3 Di 16:30 Poster B1

Halogen oxide measurements at Masaya volcano in Nicaragua using Differential Optical Absorption Spectroscopy — ●CHRISTOPH KERN¹, HOLGER SIHLER¹, LEIF VOGEL¹, CLAUDIA RIVERA², and ULRICH PLATT¹ — ¹Institut für Umweltphysik, Universität Heidelberg, Heidelberg, Deutschland — ²Chalmers University of Technology, Department of Radio and Space Science, Gothenburg, Sweden

Sulphur dioxide (SO₂) and halogen oxide emissions were measured at Masaya Volcano in Nicaragua in April 2007 using Differential Optical Absorption Spectroscopy (DOAS). Next to passive DOAS measurements using scattered sunlight, an active long-path DOAS system was operated for several days with the light beam crossing the crater of the volcano. These measurements for the first time give an insight into the night-time halogen chemistry occurring at volcanoes. While the passive DOAS instruments measured sulphur dioxide (SO₂) and bromine monoxide (BrO) in various viewing geometries and distances from the crater during daytime, the active instrument additionally allowed a quantification of chlorine monoxide (ClO) and chlorine dioxide (ClO₂), as well as being able to measure round-the-clock. The results of the field measurements are presented and their implications for halogen chemistry at volcanoes are discussed.

UP 4.4 Di 16:30 Poster B1

Observations of tropical water vapor using a ground-based microwave sensor — ●HARRY KÜLLMANN¹, BING TAN², THORSTEN WARNEKE¹, JUSTUS NOTHOLT¹, CHRISTIAN MÄTZLER³, and NIKLAUS KÄMPFER³ — ¹Institute of Environmental Physics, University of Bremen, Germany — ²Faculty of technology, University of Suriname, Suriname — ³Institute of Applied Physics, University of Bern, Switzerland

This study presents first results of ground-based measurements of the tropical water vapor content derived from microwave data. The portable TRARA radiometer of the Institute of Applied Physics is operated at the Anton de Kom University of Suriname in Paramaribo and measures continuously since mid of December 2006. The sensor consists of two channels at frequencies of 21 and 35 GHz to observe the integrated water vapor content of the troposphere. The tropospheric opacity is derived from tipping curve calibrations. High variability of water vapor has been found and the results are compared to relative humidity data of radiosonde measurements which are launched about every other week at Paramaribo. In addition, the two-channel radiometer allows the study of the integrated liquid water.

UP 4.5 Di 16:30 Poster B1

Airborne Imaging DOAS — ●DAVID WALTER¹, KLAUS-PETER HEUE¹, STEPHEN BROCCARDO², STUART PIKETH², KRISTY ROSS³, and ULRICH PLATT¹ — ¹Institute of Environmental Physics (IUP), University of Heidelberg, Heidelberg, Germany — ²Climatology Research Group, University of the Witwatersrand, Johannesburg, South Africa — ³Research and Innovation Department, Eskom, South Africa

In order to map the 2D distribution of a series of relevant trace gases, we built an instrument for airborne measurements, based on Imaging Differential Optical Absorption Spectroscopy (I-DOAS).

An imaging spectrometer combined with a CCD camera analyses sun-light backscattered from the earth's surface. The CCD camera records the spectral information in one dimension and spatial information (perpendicular to the aircraft's flight direction) in the other dimension. Due to the forward motion of the aircraft we get 2D-maps of the trace gas slant column densities (SCDs) along the light path. The spatial resolution is given by the instrument characteristics, the flight altitude and the speed. Typical values are in the order of 150 m longitudinal and 50 m perpendicular to the flight direction.

The results have applications for enforcement of air-quality legislation and investigation of plume chemistry and dispersion. A measurement campaign in August 2007 in the Highveld (South Africa) showed strong variations of NO₂ column densities in immediate vicinity of various sources e.g. power plants, steel works and highways. Flights in the surveillance area of satellites (e.g. SCIAMACHY) were realized to validate the satellite retrievals on a regional scale.

UP 4.6 Di 16:30 Poster B1

High precision column measurements of CO₂ and CH₄ derived from mid IR and near IR FTS at Permanent Ground-Truthing Facility Zugspitze/Garmisch — ●RALF SUSSMANN, FRANK FORSTER, TOBIAS BORSORFF, and MARKUS RETTINGER — Research Center Karlsruhe, IMK-IFU, Kreuzackbahnstr. 19, 82467 Garmisch-Partenkirchen, Germany

The Permanent Ground-Truthing Facility at Garmisch is operating a near IR high-resolution FTS (47.42° N, 10.98° E, 744m a.s.l) and is part of the global Total Carbon Column Observing Network (TC-CO₂). From these spectra, accurate and precise column-averaged mixing ratios of CO₂/O₂ and CH₄/O₂ are retrieved. These observations used to validate measurements of the NASA Orbiting Carbon Observatory (OCO) satellite missions will also provide input data for the inverse modeling of sources and sinks. Due to the high atmospheric background concentration of CO₂ and CH₄ high requirements are put on the measurement precision, i.e., a single-column-measurement precision of less than 0.1% is required. The Permanent Ground-Truthing at the Zugspitze is operating also a mid IR high-resolution FTS (47.42° N, 10.98° E, 2964m a.s.l) which is part of the Network for the Detection of Atmospheric Composition Change (NDACC). From these spectra, accurate and precise partial column profiles of CH₄ are retrieved. The retrieval from these partial column observations is optimized for validation of satellite measurements from ENVISAT/SCIAMACHY.

UP 5: Poster: Atmosphäre und Aerosole: Datenauswertung und Modellierung

Zeit: Dienstag 16:30–19:00

Raum: Poster B1

UP 5.1 Di 16:30 Poster B1

Cavity Enhanced DOAS as a novel technique for trace gas detection. — ●JAN MEINEN¹, JIM THIESER², ULRICH PLATT², and THOMAS LEISNER¹ — ¹Atmosphärische Aerosolforschung (IMK-AAF), Forschungszentrum Karlsruhe GmbH, 76344 Eggenstein-Leopoldshafen — ²Institut für Umweltphysik, Im Neuenheimer Feld 229, 69120 Heidelberg

A new instrument for measuring the trace gas radical NO₃ in the ppt region by optical absorption was developed using a cavity enhanced absorption cell (CEAS). The standard technique of CEAS is very vulnerable to aerosol impact and background absorbers. Using a broadband light source in CEAS provides the feasibility of employing a differential fitting approach in the data acquisition and evaluation. The instrument is self calibrating by pulsing a LED in cavity ringdown approach (CRDS) to obtain mirror reflectivity for a certain wavelength. The combination of the broadband CEA approach utilizing LEDs and classical DOAS data analysis provides a remarkably simple, low cost and robust device for trace gas detection. Required additions of the standard CRD und CEA theory and the setup of the instrument will

be shown. We call this new approach Cavity Enhanced Differential Optical Absorption Spectroscopy (CE-DOAS). First laboratory and field data from the NO₃/N₂O₅ intercomparison campaign at the SAPHIR chamber in Jülich will be used to discuss the operational reliability of the instrument.

UP 5.2 Di 16:30 Poster B1

Ausbreitungssimulation und Validierung der Transmission polydisperser Aerosole — ●EBERHARD ROSENTHAL¹, PHILIPP LODOMEZ¹, BERND DIEKMANN¹ und WOLFGANG BÜSCHER² — ¹Physikalisches Institut der Universität Bonn, Nussallee 12, 53115 Bonn — ²Institut für Landtechnik der Universität Bonn, Nussallee 5, 53115 Bonn

Am Physikalisches Institut der Universität Bonn werden in Zusammenarbeit mit dem Institut für Landtechnik der Universität Bonn der für die Transmission wichtige physikalische Effekt (Agglomeration, Deposition, Resuspension und Sedimentation) für reale Staubpartikel eingehend untersucht. Mit Hilfe der hieraus gewonnenen Erkenntnisse wird die Ausbreitungssimulationssoftware STAR3D (Simulated Trans-