ica, Southern India or the Philippines the PTRMS measures acetone, acetonitrile, methanol, and acetaldehyde at 9-12 km altitude, which in the meantime led to the largest available dataset of these compounds in this altitude range.

The broad experience collected during the CARIBIC flights and with a custom-made PTRMS for laboratory use allowed us to develop a new airborne instrument where all components are optimized in terms of weight, size and function for the deployment onboard aircraft.

For the new German research aircraft HALO (High-Altitude and Long-range Aircraft, Gulfstream GV-550), an extremely lightweight, high-sensitivity, quadrupole PTRMS was developed. The total weight including zero-air generator and calibration system is ˜50 kg (without aircraft rack). The instrument is completely automated and via a sophisticated heating concept allows rapid high-sensitivity measurements shortly after aircraft launch. The first deployment is envisaged for the campaign *Oxidation Mechanism Observations (OMO)* in August 2009.

UP 2.6   Di 15:18   VMP 9 HS
Retrieval of atmospheric CO2 from satellite near-infrared nadir spectra in a scattering atmosphere — •Maximilian Reuter, Michael Buchwitz, Oliver Schneising, Heinrich Bovensmann, and John P. Burrows — Institute of Environmental Physics (IUP), University of Bremen, Germany

Atmospheric CO2 is the dominant anthropogenic greenhouse gas. Satellite measurements of the CO2 mixing ratio (XCO2) derived from the SCIAMACHY instrument aboard ENVISAT can provide valuable information to quantify regional CO2 sources and sinks. XCO2 can be derived by simultaneously retrieving the atmospheric column of CO2 and O2. Therefore, simulated sun normalized radiance spectra within the O2-A absorption band at around 760nm and of the CO2 band at 1580nm can be fitted to SCIAMACHY measurements. Unfortunately, both bands have a relatively large spectral distance and show also large differences of the strength of absorption. For this reason, path length modifications due to scattering by aerosols and clouds in both bands are also not identical, resulting in possible retrieval errors of XCO2. Sub-visible cirrus clouds with an optical depth of 0.03 can already significantly affect the retrieval. SCIAMACHY measurements within the CO2 band do not hold enough information to correct for this effect. However, valuable information about cirrus clouds can potentially be obtained from SCIAMACHY measurements in the O2-A band. We will present an optimal estimation based retrieval that accounts for cirrus clouds by transferring cirrus information obtained from the O2-A band to the CO2 band.

UP 2.7   Di 15:30   VMP 9 HS
Using GOME, SCIAMACHY and Sonde Data to Retrieve Tropospheric Ozon Over the Tropics — •Annette Ladstätter-Weissenmayer, Stefan Bötel, Christian v. Savigny, and John P. Burrows — Institute of Environmenetal Physics, Otto-Hahn Allee 1, 28359 Bremen

The Global Ozone Monitoring Experiment (GOME) launched in April 1995 measures the sunlight back scattered by the surface in nadir viewing mode (240-790 nm) to detect O3, NO2, BrO, OClO, HCHO and SO2. SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric ChartographY) launched in March 2002 measures sunlight, transmitted, reflected and scattered by the earth atmosphere or surface (240 nm - 2380 nm). SCIAMACHY measurements yield the amounts and distribution of O3, BrO, OClO, ClO, SO2, H2CO, NO2, CO, CO2, CH4, H2O, N2O, p, T, aerosol, radiation, cloud cover and cloud top height in limb as well as nadir mode. In this study data for the time period of 1998-2008 is used for the determination of tropospheric O3. Comparisons of the results of the retrieval of tropospheric O3 using satellite based data and sonde profiles will be shown for the tropical region. The main focus will be the comparisons of the results of two retrieval methods: Limb-Nadir-Matching and the Reference Sector Method. The validation will be carried out with the use of sonde data.

UP 2.8   Di 15:42   VMP 9 HS
Bromine chemistry in volcanic plumes — •Leif Vogel, Christoph Kern, Matthias Fickel, Markus Woehrbach, and Ulrich Platt — Institut für Umweltphysik, Uni Heidelberg

Optical remote sensing via scattered sunlight Differential Optical Absorption Spectroscopy (DOAS) has become a standard tool in volcanology to determine trace gases in volcanic plumes. Bromine monoxide (BrO) and sulphur dioxide (SO_2) were simultaneously measured at three different distances (4km, 10km, 16km) from the crater by ground based Multiaxis DOAS in the volcanic plume of Mt. Etna, Italy in July 2008. These distances correspond to plume ages of 3min, 7min, and 11min. Additional measurements of SO_2 fluxes were performed by a novel type of SO_2 UV-Camera as well as conventional road traverses also applying the DOAS technique. A SO_2 flux up to 10000 Mg/d was determined, which is elevated due to Mt. Etna's state of unrest during that period. For the MaxDOAS measurements, an improved evaluation scheme is proposed, which applies a variable fit range in order to minimize radiative transfer effects. Measured ratios are in the order of $BrO/SO_2 = 10^{-4}$. They are slightly lower than previously reported ratios, which might be explained by the new evaluation scheme. The change of ratio over time due to chemical reactions (e.g. "bromine explosion") is in the range of model calculations, although an unexplained minimum is observed in the ratio at 6.6 minutes plume age.

UP 2.9   Di 15:54   VMP 9 HS
An ICOS laser spectrometer for the measurement of CH_4 and CO_2 onboard a passenger aircraft (project CARIBIC) — •Lisa Kattner, Christoph Dyroff, and Andreas Zahn — Institut für Meteorologie und Klimaforschung, Karlsruhe Institute of Technology (KIT)

The flying laboratory CARIBIC (Civil Aircraft for Regular Investigation of the Atmosphere Based on an Instrument Container) has now successfully been running for more than 10 years, and is in its second stage of application onboard a Lufthansa Airbus A340-600. It has already delivered a vast and valuable variety of data concerning atmospheric gases and aerosol particles. Here we present a new system that measures methane (CH_4) and carbon dioxide (CO_2) by using off-axis integrated cavity output spectroscopy (ICOS). It is currently reconstructed to fulfil aircraft requirements. Measurement principles as well as instrument design and performance are described. Measurements of methane concentrations will be of special interest concerning the actual flight route of the CARIBIC passenger aircraft to Chennai (formerly Madras), southern India, which crosses one of the world's most extensive rice producing areas and thus, largest emitter of the third most important greenhouse gas.

UP 3: Atmosphäre III

Zeit: Dienstag 16:30–17:42   Raum: VMP 9 HS

UP 3.1   Di 16:30   VMP 9 HS
Wavelet Analyse von stratosphärischen SCIAMACHY Ozondaten - Die Suche nach dem 27-Tage Zyklus — •S. Dikty, T. Sonkaew, A. Rozanov, C. von Savigny, M. Weber und J. P. Burrows — IUP Bremen

Bereits in den 80er Jahren des vergangenen Jahrhunderts wurde der hochfrequente Einfluss der solaren Strahlung auf das stratosphärische Ozon von Hood (1986) untersucht. Hood und Zhou (1998), Ruzmaikin et al. (2007) und Gruzdev et al. (2008) sind einige zu nennende Studien aus den Folgejahren.

Neben verschiedenen Hilfsmitteln der beschreibenden Statistik, wie etwa der Fourier-Analyse und Kreuzkorrelation und den damit verbundenen Untersuchungen der statistischen Signifikanz, bedienen wir uns auch der Wavelet-Analyse. Der Vorteil gegenüber den erstgenannten Verfahren ist die höhere zeitliche Auflösung bei gleichzeitiger Anpassung zwischen Zeit- und Frequenzauflösung, je nach Wahl des verwendeten Wavelets und dessen Ordnung. Innerhalb einer Zeitreihe ist der Zusammenhang zwischen Ozon und solarer Strahlung nicht immer eindeutig und so sollte diese differenzierter betrachtet werden.

Wir wenden die Wavelet-Analyse zum einen auf einen solaren Proxy, den SCIAGOME MgII Index (Skupin et al., 2005), an. Auf der anderen Seite nutzen wir Ozonprofile, die aus SCIAMACHY Limb-Messungen unter Verwendung der Hartley, Huggins, und Chappuis-Absorptionsbanden abgeleitet wurden. SCIAMACHY (SCanning Ima-