

UP 5: Atmosphäre - Spurengase

Time: Wednesday 9:30–11:00

Location: MAG 100

Invited Talk

UP 5.1 Wed 9:30 MAG 100

Fernerkundung der Atmosphäre mittels hochauflösender Infrarotspektroskopie — ●JOHANNES ORPHAL — Institut für Meteorologie und Klimaforschung, Karlsruher Institut für Technologie

Für ein verbessertes Verständnis der dynamischen und chemischen Prozesse in der Erdatmosphäre sind hochgenaue Messungen von verschiedenen Spurengasen unentbehrlich. In diesem Vortrag werden neueste Entwicklungen auf dem Gebiet der Fernerkundung der Atmosphäre mittels hochauflösender Infrarotspektroskopie durch Anwendungen in den Bereichen von Stratosphären- und Klimaforschung sowie der Überwachung der troposphärischen Luftqualität illustriert.

UP 5.2 Wed 10:00 MAG 100

The seasonal cycle of total column CO₂ and CH₄ in the high Arctic — ●MATTHIAS BUSCHMANN, NICHOLAS DEUTSCHER, MATHIAS PALM, THORSTEN WARNEKE, TINE WEINZIERL, and JUSTUS NOTHOLT — Institut für Umweltphysik, Universität Bremen, Bremen, Deutschland

The measurement of long-lived greenhouse gases, like CO₂ and CH₄, and identification of their sources and sinks is very important in the context of climate change research. Networks like the 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 in the near infrared (NIR). However, at high latitude sites (like Ny Ålesund, Spitzbergen at 79° N), there is no direct sunlight in winter due to the polar night and the moon is the next best source of NIR radiation. In this talk we will present the first record of the seasonal cycle of carbon

dioxide and methane derived from solar absorption spectra in summer and lunar absorption spectra in the winter.

UP 5.3 Wed 10:15 MAG 100

Carbon monoxide retrieved from ground based FTIR remote sensing in the mid- and near infra-red spectral region — ●CHRISTOF PETRI¹, THORSTEN WARNEKE¹, BAVO LANGEROCK², EMMANUEL MAHIEU³, BRUNO FRANCO³, FRANK HASE⁴, and JUSTUS NOTHOLT¹ — ¹Institute of Environmental Physics, University of Bremen, Bremen, Germany — ²IASB-BIRA, Brussel, Belgium — ³Université de Liège, Liège, Belgium — ⁴KIT, University of Karlsruhe, Karlsruhe, 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. 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. Systematic deviations were found and referred to different sensitivity in the lower troposphere retrieval.

The contributing sites for this study are La Reunion, Jungfrauoch, Izana and Bremen. Bruker 125 HR interferometer have been used which are part of both, the TCCON and the NDACC network. At the Jungfrauoch site a Bruker 120 HR has been used.

Kaffeepause, 30 min