UP 7: Poster: Atmosphäre und Klima

Time: Tuesday 14:00–15:00 Location: Poster C

UP 7.1 Tue 14:00 Poster C

Variation von HNO$_2$ an verschiedenen Standorten in Europa — •KARIN ACKER und DETLEV MÖLLER — Technische Universität Cottbus, Lehrstuhl Luftchemie und Luftreinhaltung

An mehreren urbanen, suburbanen und ländlichen Standorten in Europa wurden Salpetrige Säure sowie zahlreiche weitere Parameter während komplexer Feldexperimente gleichzeitig und kontinuierlich untersucht. Die Photolyse von HNO$_2$, welches nachts in der planetarischen Grenzschicht akkumuliert wird, ist nicht nur in den frühen Morgenstunden eine bedeutende Quelle von OH-Radikalen. Sie liefert auch über den gesamten Tag einen wichtigen Beitrag zum Radikalbudget, oft vergleichbar mit dem Beitrag der Photolyse von Ozon und Formaldehyd. Erstmalig gibt es simultan auch HNO$_2$ und OH Daten über mehrere längere Zeiträume (Hohenpeißenberg, Deutschland, Meteorologisches Observatorium und Global Atmosphere Watch Station). An allen Orten waren die HNO$_2$-Konzentrationen am Tage unerwartet hoch (teilweise bis zu einige hundert ppt); bei Annahme eines schnell eingestellten photostationären Gleichgewichts in der Gasphase sollten nur einige wenige ppt HNO$_2$ vorhanden sein. Am Hohenpeißenberg variiert das Verhältnis der bekannten HNO$_2$ – Quellen zu den Senken gegen Mittag zwischen 0.03 und 0.24 und zeigt damit, dass eine bedeutende zusätzliche HNO$_2$-Quelle erforderlich ist, um die Diskrepanz auszugleichen. Überraschend und invers zu den Flachlandstationen wurde an Bergstationen trotz effektiver Photolyse ein Anstieg der HNO$_2$-Konzentration im Laufe des Tages bis zu einem breiten Maximum in den Mittagsstunden beobachtet.

UP 7.2 Tue 14:00 Poster C

Spatial Correlations and Phase Coherence of Hydro-Meteorological Long-Term Observations — •REIK DONNER[1], SABRINA DONNER[2], and ANNETTE WITT[3] — [1]Institute of Transport and Economics, Technical University Dresden, Germany — [2]Department of Physics, University of Potsdam, Germany — [3]Department of Geography, King's College London, United Kingdom

Time series of hydro-meteorological observables are not only characterized by temporal, but also by certain spatial correlations. However, the strong influence of the omnipresent annual cycle may lead to artificial results of correlation analysis. Different approaches to overcome this problem are critically compared. The resulting mutual interrelationships between observations obtained at various locations are quantified by several measures (including linear cross-correlation functions and nonlinear mutual information) which allow to derive network-like structures as an approximation of the underlying continuous system. Phase coherence analysis reveals that the meaningful definition of phase variables depends crucially on the considered time scale and observable. Hence, indices from phase synchronization analysis are hardly suited to quantify mutual interdependences between hydro-meteorological records. To dynamically characterize the temporally varying amplitude of correlations between a set of records, we introduce the concept of ensemble correlations. Our corresponding approach is able to detect an increase of collective behaviour of spatially distributed records in the presence of extreme hydro-meteorological conditions.

UP 7.3 Tue 14:00 Poster C

New Operational Software for Automatic DOAS Measurement and Analysis — •ANDRÉ MERTEN — Institut für Umweltphysik; Im Neuenheimer Feld 229; 69120 Heidelberg

The opportunity offered by the DOAS (Differential Absorption Spectroscopy) method to do an automatic measurement and analysis of atmospheric trace gases has not been used because of the leak of adequate software. The requirements of modern measurement software were studied and a new, easier to handle DOAS-software, 'LabDOAS', was developed, which can be used to monitor trace gases: These requirements realized in the software packages are: - Reliable communication with instrument controllers - Complete control by graphical user interface - Status of the devices and the measurement is reported by graphs - Recording of all important information together with the spectra - Parallel execution of measurement and data analysis - Automatic documentation of measurement and analysis - Analysing and visualisation of huge data sets This software package was tested successful at long path telescopes, laboratory measurements and in the analysing of extended data sets of spectroscopic measurements. Its functionality exceeds common DOAS analysis programs, since it not only offers enhanced mathematical manipulations of spectra, but also includes tools for statistical analysis of residual structures and concentration time series. An example application for automatic air pollution monitoring with long path DOAS and economic LED light source is presented.