ture of the corrotation winds perpendicular to the orbit as a diagnostic. Among other features, thermal winds from dayside heating and density increases in the cusp region will be presented.

EP 2.9 Fr 17:00 TU BH349

The impact of solar activity modulated galactic cosmic rays (GCR) on clouds — •Susanne Rohs[1], Gebhard Günther[1], Bernd Kärcher[2], Martina Krämer[1], Reinhold Spang[1], Pi-Huan Wang[3], and Cornelius Schiller[1] — [1]Forschungszentrum Jülich GmbH, ICG-1 (Institut für Stratosphärische Chemie), D-52425 Jülich — [2]Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Institut für Physik der Atmosphäre, Postfach 1116, D-82230 Weßling — [3]STC/NASA-LaRC, MS 910, Hampton, VA 23681-2199

Since years the scientific community discusses controversially the solar activity modulated coupling between galactic cosmic rays (GCRs) and cloudiness, which by itself affects the natural climate variability. To further evaluate this GCR-cloud link we have submitted the proposal „SAtellite and model studies of GAlactic cosmic rays and Clouds modulated by solar activity“ (SAGACITY) as part of the dfg Schwerpunktprogram CAWSES. SAGACITY focus on satellite observations of cirrus clouds, both in the long-term data record of the SAGE-2 satellite experiment as well as for episodes of solar proton events and the subsequent Forbush decreases using data of the MIPAS instrument onboard ENVISAT. Additionally we plan to develop appropriate nucleation parameterisations to be implemented in the chemical transport model CLaMS for theoretical studies of the GCR-cloud link. Here, the observed correlations between GCRs and clouds and the discussed mechanism how GCRs could influence cloud microphysics will be reviewed. Further, we present our proposed activities during SAGACITY.

EP 2.10 Fr 17:15 TU BH349

Mean wind and gravity wave trends in the upper mesosphere and lower thermosphere deduced from Collm LF D1 drift measurements 1984-2003 — •Christoph Jacobi[1], Dierk Kürschner[2], and Nikolai Gavrilov[3] — [1]Institut für Meteorologie, Universität Leipzig, Stephanstr. 3, 04103 Leipzig, Germany — [2]Institut für Geophysik und Geologie, Universität Leipzig, Collm Observatory, 04779 Wermsdorf, Germany — [3]St. Petersburg State University, Atmospheric Physics Department, 1 Ul'yanovskaya Street, Petrodvorets, Saint Petersburg, 198904, Russia

Gravity wave activity and mean horizontal winds obtained from LF drift measurements on 177 kHz in the height range 85-110 km at 52.1°N, 13.2°E during 1984-2003 are presented, allowing the analysis of long-term trends, interannual and decadal variations of the upper middle atmosphere wind field. Besides a long-term increase of the westerly mean winds in the lower thermosphere, an 11-year solar cycle signal is found in the summer months, which is strongest in the mesosphere and decreasing with height. Time series of seasonal (3-monthly) mean gravity wave activity show maximum amplitudes around 1989-1991 and 2000-2002, which is concomitant with the solar activity maxima within the 11-year solar cycle, and the time intervals of increased mean wind shear on a decadal scale.

EP 2.11 Fr 17:30 TU BH349

The global signal of the 11-year sunspot cycle in the atmosphere: When do we need the QBO? — •Karin Labitzke — Institut für Meteorologie, Freie Universität Berlin

The global structure and the size of the signal of the 11-year sunspot cycle in the stratosphere and troposphere was examined in earlier studies. The correlations between the solar cycle and heights and temperatures of and at different pressure levels were mainly carried out with the whole data set and only during northern winters the years were separated according to the phase of the Quasi-Biennial Oscillation. Here, this work is expanded and it is shown that the QBO must be introduced throughout the year, because the solar signal is very different in the respective phases of the QBO, particularly over the tropics and subtropics. The structure of the solar signal in northern summer appears to indicate that the mean meridional circulations (Hadley and Brewer-Dobson Circulations) are influenced by the 11-year solar cycle, especially during the east phase of the QBO. This result may help to find the mechanism through which the solar cycle (and the connected variation of the ultraviolet radiation) can influence the atmosphere

EP 2.12 Fr 17:45 TU BH349

Model Simulations of Thermospheric NO Intrusions and Comparison with MIPAS-ENVISAT observations — •Thomas Reddmann[1], Bernd Funke[2], Thomas von Clarmann[1], Sven Gabriel[1], Wolfgang Kouker[1], Manuel Lopez-Puertas[2], Roland Ruhnke[1], Gabriele Stiller[1], and Roland Uhl[1] — [1]Inst. of Meteorology and Climate Research, Research Center and University of Karlsruhe — [2]Instituto de Astrofisica de Andalucia, Granada

The contribution of NO intrusions from the lower thermosphere into the middle atmosphere to the total NOy budget during periods of higher solar activity and their effect on ozone chemistry is still an open question. During its first two years of operations the MIPAS instrument on the ENVISAT satellite observed NO enhancements in polar winter. In addition, first results of the solar storm period in October/November 2003 also showed enhanced NO concentrations in the upper stratosphere and ozone loss subsequent to this event. The MIPAS observations therefore provide a data set through which models of the middle atmosphere can be validated in respect of downward transport inside the polar vortex and the effect on ozone chemistry can be estimated.

Here we focus on first results of a comparison of the MIPAS observations of NO, ozone and stratospheric tracers with results obtained with the middle atmosphere model KASIMA. We discuss aspects of model initialization as data assimilation and the parameterization of photolysis rates especially for NO at high solar zenith angles.

EP 2.13 Fr 18:00 TU BH349

Enhanced NOx-induced ozone loss in the Arctic middle stratosphere during the 2002/03 winter and spring. — •Paul Konopka, Jens-Uwe Grooss, Martin Kaufmann, and Rolf Müller — Forschungszentrum Jülich, ICG-I, 52425-Jülich

High resolution, 3D simulations of tracer distribution in the Arctic tratosphere during the winter and spring 2002/2003 (SOLVE2/VINTERSOL) have been conducted with the Chemical Lagrangian Model of the Stratosphere (CLaMS). CLaMS is based on a Lagrangian formulation of the tracer transportand, unlike Eulerian CTMs, considers an ensemble of air parcels on a time-dependent irregular grid that is transported by use of the 3d-trajectories. The NOx-induced ozone loss driven by the so-called summertime NOx chemistry is a well-known photolytical mechanism mainly occurring in the middle and upper tratosphere over polar regions in spring and summer. By transporting ozone in CLaMS as a passive tracer, the chemical ozone loss can be deduced as the difference between the observed (HALOE, POAM, MIPAS) and simulated ozone profiles. Our results show that at least for 2002/03 winter the column ozone loss driven by the NOx chemistry is of the same magnitude as the chlorine-induced ozone loss in the lower stratosphere. The NOx-induced ozone decline mainly occurs in high latitudes near the vortex edge, as the stratosphere undergoes a transition from a strong mixing situation in the late winter/spring, when the vortex breaks down (top-down process), to a weakly stirred situation in summer.We discuss NOx sources which are responsible for this ozone loss, in particular the amount of stratospheric NOx that can be traced back to their sources above the stratopause.

EP 2.14 Fr 18:15 TU BH349

Towards a Better Understanding of the Energy Balance in the Upper Mesosphere and Lower Thermosphere: Contributions from the ESA ENVISAT Mission — •Martin Kaufmann[1], Martin Riese[1], Sergio Gil-Lopez[2], Manuel Lopez-Puertas[2], Bernd Funke[2], Gabriele Stiller[3], Thomas von Clarmann[3], Heinrich Bovensmann[4], Pekka Verronen[5], and Anne Smith[6] — [1]Forschungszentrum Juelich, ICG-I — [2]Instituto de Astrofisica de Andalucia — [3]Forschungszentrum Karlsruhe, IMK — [4]Universitaet Bremen, IUP — [5]Finnish Meteorological Institute — [6]National Center for atmospheric research, ACD, Boulder, USA

The mesosphere and lower thermosphere is highly sensitive to external influences from the sun as well as from the atmosphere below. Its chemical and thermal balance can change significantly due to natural influences as well as due to human-induced changes.

The combination of three instruments on board of ESA's ENVISAT satellite give a unique possibility to improve our understanding of this region. MIPAS is able to measure temperature, CO_2, and ozone during day- and nighttime. GOMOS measures nighttime ozone, and the SCIAMACHY instrument yields temperature, daytime-ozone, atomic oxygen, and in combination with the other instruments atomic hydrogen.

In this talk we focus on ENVISAT datasets which are already existing