

UP 13: Joint-Session with the European Physical Society (EPS) - Environmental Physics Division: "Energy and Environment"

Zeit: Donnerstag 15:00–19:00

Raum: 3B

UP 13.1 Do 15:00 3B

Introduction — ●THOMAS HAMACHER — IPP Garching

UP 13.2 Do 15:15 3B

Global measurement of greenhouse gases and related air pollutants — ●JOHN P. BURROWS — Institute of Environmental Physics and Remote Sensing, University of Bremen, Germany

In order to improve our understanding of the feedbacks within the earth atmosphere system, which determine the magnitude of global climate change, global measurement is required of greenhouse constituents at adequate spatial and temporal sampling scale. One of the holy grails of Earth Observation is the measurements of tropospheric constituents from space. In this context the determination of the loading of greenhouse gases such as Carbon Dioxide, CO₂, and Methane, CH₄, in the boundary layer and lower troposphere at a precision capable of testing our understanding of their sources and sinks is challenging. SCIAMACHY (the Scanning Imaging Absorption spectroMeter for Atmospheric CHartography), which flies aboard ENVISAT is the first Earth Observation instrument to attempt this. It is the forerunner of the missions OCO (Orbiting Carbon Observatory, from NASA and GOSAT, Greenhouse gases Observing SATellite, from JAXA. This presentation will discuss the measurements of natural and anthropogenic greenhouse constituents and related pollutants from space.

UP 13.3 Do 15:40 3B

Climate Chemistry Interaction — ●ADRIAN TUCK — NOAA, Boulder, US

The state of the atmosphere is considered from a molecular dynamics perspective, from which vorticity, winds and temperature are produced following the absorption of solar photons. Via the scaling exponents H, C and alpha, describing respectively the conservation, intermittency and fractality, we consider evidence that the atmosphere is never at equilibrium on any time or space scale and that accordingly Maxwell-Boltzmann distributions of molecular speeds cannot occur. The viewpoint has been expounded in book form, available from January 2008, at <http://www.oup.com/uk/catalogue/?ci=9780199236534>

UP 13.4 Do 16:05 3B

The impact of a nuclear renaissance on the environment — ●HERWIG PARETZKE — GSF, Deutschland

With roughly 400 nuclear power plants in operation, nuclear power covers 17 % of the global electricity production and 6 % of the global primary energy production. A considerable increase in nuclear power capacity will reduce greenhouse gas emissions and save fossil resources. But what would be the environmental impact of a massive nuclear power based economy? No system is completely leak tight; therefore one must face the risk of radioactive material being dispersed in the environment. What would be the expected impact on human health and bio-systems?

UP 13.5 Do 16:30 3B

The Industry response to Climate Change — ●RWE POWER AG — Germany

Environmental concerns have become a major factor in the shaping of future power production systems. New regulations and the introduction of emission trading have a severe impact on the competitiveness of power generating companies. Research needs for future electricity production includes the entire chain of efficiency, storage, transport, production and waste treatment. RWE is interested in science dialogue and collaboration on environmental issues.

UP 13.6 Do 16:55 3B

Environmental issues in urban agglomerations — ●PETER SUPPAN — IMK-FZK

Urbanisation is likely to continue and urban areas will be affected by climate change. Large cities are subject to special climate conditions with higher temperatures compared with the surrounding coun-

try side compounded by high pollution levels. Local emissions from traffic, heating and cooking systems produce high concentrations of pollutants like ozone, NOx and particulates. Managing climate change and reducing air pollution requires a holistic research approach to guide large urban areas into a sustainable future.

UP 13.7 Do 17:20 3B

A global monitoring system for climate and environment — ●FRANK BAIER — DLR Oberpfaffenhofen

It has been recognised by many governments, notably the EU, that there is a need for timely and good quality information on the state of the atmosphere at different scales from global to regional to local. This is necessary for environmental policy monitoring and verification. The GMES programme run by the EC and ESA is directed at this goal and is the European contribution to the international GEO programme. The project PROMOTE responds to these needs by delivering a service for ozone and UV monitoring and forecast, air pollution monitoring and forecast and climate monitoring and emission retrieval. The service is based on satellite and ground measurements and occasional airborne measurements. The data are integrated into models by means of the data assimilation technique known from weather prediction. Current results will be presented.

15 min. break

UP 13.8 Do 18:00 3B

Panel Discussion — ●ALBERT GOEDE — FOM Rijnhuizen**John Burrows:**

A better understanding of the GHG emissions, including the understanding of the natural carbon cycle, is necessary to improve theoretical models for the prediction of climate change. What is needed to build up the necessary observation capabilities to verify and validate these models? Is Europe as well prepared to take a lead in GHG observations, matching their ambition in Post-Kyoto negotiations? What role does Earth Observation play in reaching sustainable development?

Adrian Tuck:

Modelling of climate change is important in order to predict the impact on the economy and on society and to develop mitigation and adaptation measures. As climate change is becoming a major driving force in national and international politics, the reduction of uncertainties in climate modelling is necessary. Is a reduction in uncertainties possible? What systems are needed in future for improved modelling and prediction?

Herwig Paretzke:

Whilst the nuclear debate was characterised by much controversy, did in the mean time research help to develop a common understanding of the environmental effects? What is the current understanding of the effect of low-doses radiation? Is more research needed in this field?

RWE-Power AG:

How do power companies manage to keep up-to-date with environmental issues, how do they ensure competence in public debate, with new regulations introduced? Do companies consider active participation in environmental research fields? How could the link between industry and research best be managed in this field?

Peter Suppan:

Air quality is affected by local pollution, by regional background and by long range transport of pollutants produced several thousands km away. What is needed to integrate this range of scales in observation and model? What are the future ...

What are the future requirements for local modelling, observation and forecasting of air quality?

Frank Baier:

What are the future needs and developments for a global earth observation system that is reliable and of good quality such that it can be used for environmental policy monitoring, verification? What is needed to improve forecast and prediction of climate and environment?

Conclusion: Report to EPS as part of EPS Energy report to the European Commission and the European Research Council.