

Organization

Dates

15 December 2011

Applications due

22 December 2011

Notification of selected participants

Venue

The winter school will take place in the Institute for Meteorology and Climate Research (IMK-IFU) at Campus Alpine of the Karlsruhe Institute of Technology in the Bavarian mountain village of Garmisch-Partenkirchen, located at the foot of Germany's highest peak *Mount Zugspitze*.

Costs

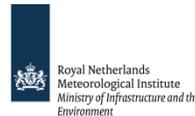
Tuition, accommodation and meals are free for all participants. There will be no travel grants.

Target Group

The winter school is open to young researchers (PhD students & Post-Docs) worldwide in meteorology, hydrology, environmental sciences, signal processing applications, precipitation remote sensing.

Application

Participation is highly competitive and will be limited to a maximum of 25. Please send your application, including a motivation letter and a short CV, to Harald Kunstmann (harald.kunstmann@kit.edu).



Contact

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Microwave Links and Precipitation

Winter School on the Remote
Sensing of Precipitation Using
Microwave Links: Techniques and
Applications

27.2.-2.3.2012

Garmisch-Partenkirchen, Germany

Institute for Meteorology and Climate
Research IMK-IFU



Basic Information

Background

For the improved understanding of all aspects of the regional water cycle, knowledge of the spatio-temporal distribution of precipitation is of crucial importance. Improved and scientifically sound water availability information, however, still suffers from the limited quality of available spatial rainfall products. Why is spatial rainfall estimation still so problematic? Traditional rain gauges provide good local measurements but their spatial representativeness is very low. In contrast, radar reflectivity measurements provide spatial pattern information but the transformation of reflectivity to rain rate values is accompanied by large uncertainties. The need for additional measurements has inspired the use of microwave links, which have been proven to provide more accurate rainfall estimates at the near-surface level.

Aim

The winter school will introduce the new technique of precipitation remote sensing using terrestrial microwave links to young researchers. The potential and limitations of the new technique, as well as solutions and practical examples will be presented by leading scientists in this field.

Covered Topics

Theory

- EM-Theory of microwave propagation
- Effects of rain and humidity

Methodology

- Baseline determination
- Error estimation

Microwave hardware

- High frequency hardware in a nutshell

Microwave link applications

- Tomographic reconstruction
- Improved hydrological statistics
- Copula integration of link, radar and gauge
- Detection of faulty rain gauges
- Radar rain rate adjustment

Experiments

- Monostatic small scale experiment
- Microwave and optical links

Simulation

- EM-Simulation of scattering from Hydrometeors

Exercises

- Data preprocessing
- Spatial methods

Excursion

One afternoon is reserved for a field trip to the pre-alpine region north of Garmisch-Partenkirchen, visiting the PROCEMA and TERENO project hydrometeorological test sites.

Lecturers

Prof. Harald Kunstmann (Karlsruhe Institute of Technology, Institute for Meteorology and Climate Research, Germany)

Prof. Uwe Siart (Technische Universität München, Institute for High Frequency Engineering, Germany)

Prof. Hagit Messer, Prof. Pinhas Alpert, Dr. Rana Samuels (Tel Aviv University, Institute for Electrical Engineering & Department of Geophysics and Planetary Sciences, Israel)

Prof. Remko Uijlenhoet (Wageningen University, Hydrology and Quantitative Water Management Group, The Netherlands)

Prof. Alexis Berne (École Polytechnique Fédérale de Lausanne, Environmental Remote Sensing Laboratory, Switzerland)

Dr. Hidde Leijnse (KNMI Royal Netherlands Meteorological Institute, The Netherlands)

Dr. Alon Rimmer (Yigal Allon Kinneret Limnological Laboratory, Israel)

and several PhD students of the organising institutions working in the field of microwave links.