

COPS Overview

Dave Turner

COPS

- Convective and Orographic Precipitation Study
- June - August 2007
- Black Forest Region, Southwestern Germany
- Part of the larger 1-yr long General Observations Period (GOP)
- Principal Investigator: Volker Wulfmeyer and Susanne Crewell
- AMF deployed to Hasselbach, Germany; observations will start 1 April 2007 and end 31 December
- Large international experiment, with significant contributions from German, French, English, Austrian, and Italian colleagues.

Science Questions

- What are the processes responsible for the formation and evolution of convective clouds in orographic terrain?
- What are the microphysical properties of orographically induced clouds and how do these depend on dynamics, thermodynamics, and aerosol microphysics?
- How can convective clouds in orographic terrain be represented in atmospheric models based on AMF, COPS, and GOP data?

Working Groups

- Convective Initiation
- Aerosol and Cloud Microphysics
- Precipitation and Its Lifecycle
- Data Assimilation and Predictability

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- **Aerosol and Cloud Microphysics**
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Understanding of the relation between dynamics, thermodynamics, aerosol properties, and cloud microphysics in complex terrain.

Significant CLOWD opportunity!

M

- AMF
- HATPRO
- 90/150 GHz
- MWL
- WILI
- MRR

H

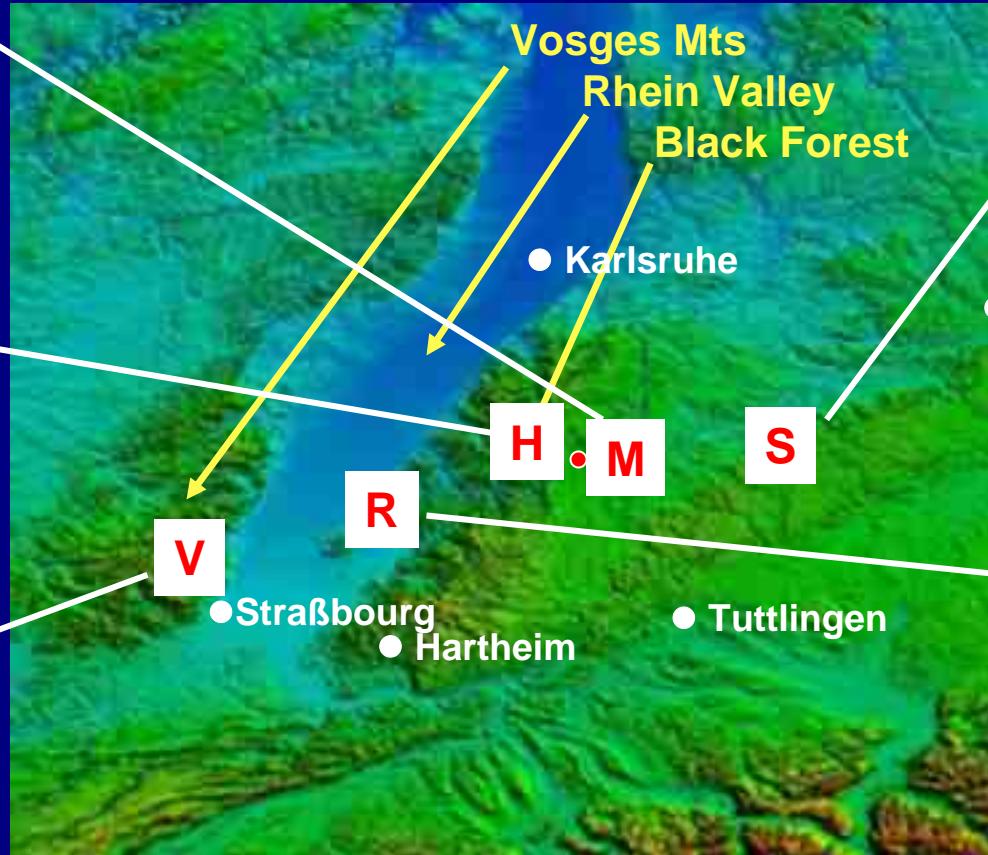
- WV DIAL
- RR Lidar
- WindTracer
- FZK Cloud Radar
- UHOH X-Band
- Radiosondes (FZD)
- UK aerosol in situ

V

- CNRS WV Raman lidar
- CNRS TRESS (aerosol)
- IR radiometer
- LaMP X-Band
- K band rain radar
- MF RaSo, surf. stations
- MF soil moisture (1-3)
- MF UHF prof., sodar

COPS Supersites

2 mobile
sonde stations



- Sodars (entrance of Murg, Kinzig, and Rench valleys)
- 2 more sodars to deploy

- Transect of 7 additional MRRs from E-to-W (Hamburg)
- Arrays of GPS, flux, soil moisture, precipitation, and automated weather stations

S

- WTR
- MRR
- Radiosondes
- Tethered sonde
- CNS radiometer
- UK Doppler lidar

R

- UNIBAS Raman lidar
- UK Doppler lidar
- UK radiometer
- UHH cloud radar
- TARA
- Radiosondes (UK)
- UK sodar

BAE-146

DLR Falcon

French Falcon

DO128

Aerosol and Cloud Microphysics WG

Cloud microphysics

Aerosol properties (esp CCN)

Dynamics

Thermodynamics

LWC (z) and LWP

Droplet size spectrum (z)

Macrophysical properties (base & top height, fraction)

Instruments:

Doppler cloud radar (35 or 95 GHz, with spectra)

Raman lidar (water vapor and aerosol)

Doppler lidar

Microwave radiometer

“Rain” radar (X, K, or S, etc., with spectra)

Wind profiler

Frequent radiosondes

In situ aerosol microphysics

In situ cloud microphysics

Aerosol properties (CCN, number concentration, size distribution, chemical composition, etc)

Vertical velocity

Temperature and humidity profiles
(inside and outside cloud)

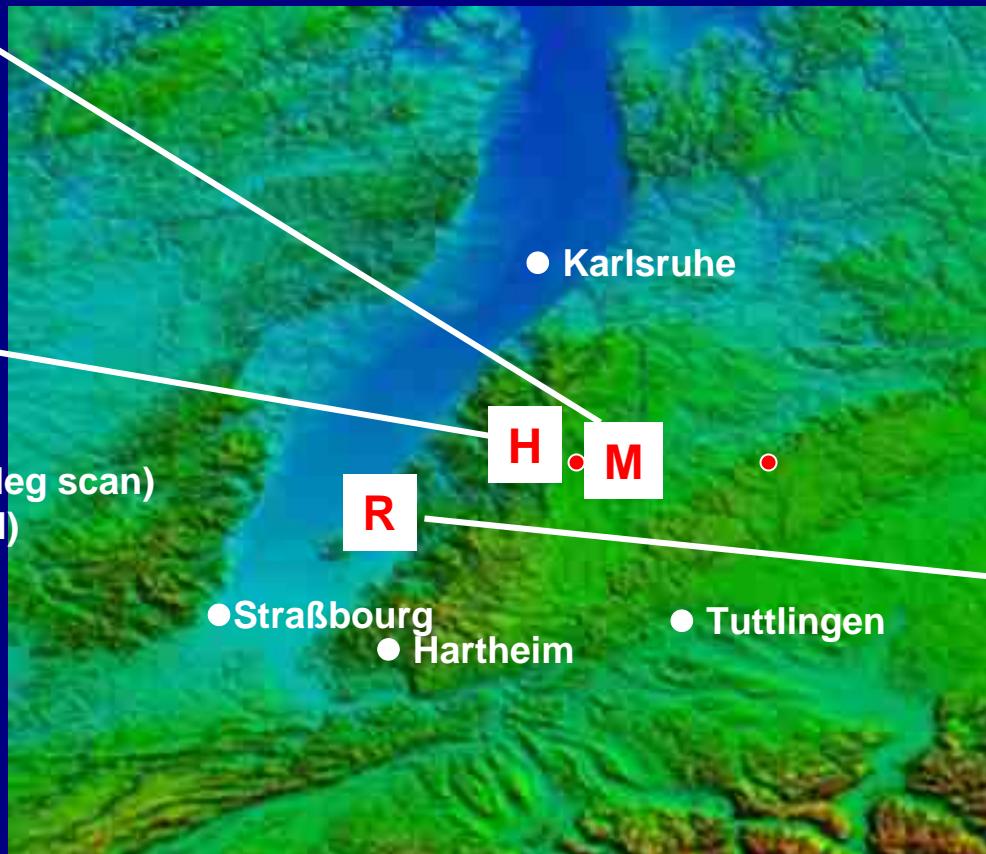
M

- AMF
- HATPRO
- 90/150 GHz
- MWL
- WILI
- MRR

H

- WV DIAL
- RR Lidar
- WindTracer
- FZK Cloud Radar (45 deg scan)
- UHOH X-Band (vertical)
- Radiosondes (FZD)
- UK aerosol in situ

COPS Supersites

**R****R**

- UNIBAS Raman lidar
- UK Doppler lidar
- UK radiometer
- UHH cloud radar
- TARA
- Radiosondes (UK)
- UK sodar

BAE-146
DLR Falcon
French Falcon
DO128