

Report of the 5th COPS Workshop
held on 26 – 28 March 2006
at University of Hohenheim

100 persons of 8 countries participated in the 5th COPS Workshop.
The list of the participants and copies of the presentations are available at the COPS webpage at http://www.uni-hohenheim.de/cops/5th_COPS_WS/5th_COPS_workshop.html.

1) Update on COPS Instrumentation

An overview of the current status of the COPS instrumentation can be found in the appendix of this report.

1.1 Groundbased instruments during COPS

Responsibilities:

Overall coordination:
Andreas Behrendt (behrendt@uni-hohenheim.de)

Supersites

For the report of the COPS Working Group “Supersites”, see
http://www.uni-hohenheim.de/cops/5th_COPS_WS/Report_5th_COPS_WS_supersites_WG.pdf

The locations of all supersites and most instrument locations have been fixed.

From west to east:

Supersite V (Voges Mountains):

Coordination: Cyrille Flamant (cyrille.flamant@aero.jussieu.fr),
Joel van Baelen (joel.vanbaelen@opgc.univ-bpclermont.fr)

Valley: (most instruments)

Meistratzheim, 7.545 °E, 48.443 °N, 155 m ASL

Mountain: (X-band and GPS)

a) Mont Ste Odile Monastery, 7.405 °E 48.438 °N

b) Bishenberg, 7.473 °E 48.483 °N

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_03_SupV.ppt

Supersite R (Rhine Valley):

Coordination: Paolo Di Girolamo (digirolamo@unibas.it)

Water treatment facility Achern, 8.068 °E, 48.643 °N, 140 m ASL

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_04_SupR.ppt

Supersite H (Hornisgrinde):

Coordination: Andreas Wieser (andreas.wieser@imk.fzk.de)

Ulrich Corsmeier (ulrich.corsmeier@imk.fzk.de)

8.204 °E, 48.604 °N, 1160 m ASL

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_05_SupH.ppt

Supersite M (Murg Valley) = AMF site:

Coordination: Kim Nitschke (nitschke@lanl.gov)

8.406 °E, 48.542 °N, 505 m ASL

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_06_SupM.ppt

The operation period of the ARM Mobile Facility is 2 April – 31 December 2007. The operation will begin as planned.

Supersite S (Sindelfingen):

Coordination: Manfred Dorninger (manfred.dorninger@univie.ac.at)

Siegfried Vogt (Siegfried.Vogt@imk.fzk.de)

Gliders Airport Deckenpfronn, 8.813 °E, 48.635 °N, 580 m ASL

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_07_SupS.ppt

Further notes on news:

- Participation of TARA is confirmed: Priority at Hornisgrinde if logistically feasible
- Participation of scanning microwave radiometer ADMIRARI is confirmed. Location still under discussion.
- Additional IR radiometers of ARM will be placed at Supersites R and H.
- Location of the CNR Radiometer still under discussion

Action items:

- **Radiosondes: Availability of radiosondes at all supersites needs to be secured.**
- **TARA: location at Supersite H to be confirmed**
- **Radiometers: locations of CNR radiometer and ADMIRARI to be set**
- **Input for Operations Plan up to 15 April 2007.**

Networks

For the report of the COPS Working Group “Networks”, see

http://www.uni-hohenheim.de/cops/5th_COPS_WS/Report_5th_COPS_WS_networks_WG.pdf

Coordination:

GPS Network: Cedric Champollion (cedric.champollion@aero.jussieu.fr)
Galina Dick (dick@gfz-potsdam.de)

Mesonet: Manfred Dorninger (manfred.dorninger@univie.ac.at)

MRR Network: Gerhard Peters (gerhard.peters@zmaw.de)

Rain gauge network: Martin Hagen (martin.hagen@dlr.de)
Armin Mathes (amathes@uni-bonn.de)

Soil Moisture Network: Christian Hauck (Christian.Hauck@imk.fzk.de)
Juliane Krauß (liane.krauss@imk.fzk.de)

Energy Balance / Sodar: Thomas Foken (thomas.foken@uni-bayreuth.de)

A report of the sub-group "Energy Balance" can be found at

http://www.uni-hohenheim.de/cops/5th_COPS_WS/Report_5th_COPS_WS_EnergyBalance_WG.pdf

Webpage of the energy balance WG: <http://www.bayceer.uni-bayreuth.de/COPS/>

Further notes on news:

- GPS, soil-moisture, MRRs, rain gauges and energy balance stations will be installed at all supersites
- All networks are (nearly) set. The installation of instruments has already begun.

Action items:

- Which GPS receivers need weather station to measure surface pressure?
- Coordinator needed for all COPS radiosonde stations? (air traffic control issues, data format, intercomparisons, frequencies to avoid interference) Note that we have 4 different types: FZK: GRAW; UK: RS80, Supersite V and AMF: RS92; Supersite S: Meteolab Snowwhite. Intercomparisons at of May at AMF site?
- **Input for Operations Plan up to 15 April 2007.**

1.2 Aircrafts during COPS

Responsibilities:

Coordination of all by COPS Project Office

Flight coordination of all COPS aircrafts: Heinz Finkenzeller (Heinz.Finkenzeller@dlr.de)

Mission scenarios are coordinated by

"Forced convec."	Ulrich Corsmeier/Christoph Kiemle
"High-pressure convec."	Ulrich Corsmeier/ Christoph Kiemle
"Targetted upstream"	Martin Weissmann/George Craig

Action items:

- Iterate COPS Mission Plans with German and French air traffic control authorities.
- Coordinate the EUFAR missions with COPS mission plans so that no interference occurs.
- **Drafts for Operations Plan up to 15 April 2007.**

- **Details of the COPS flight planning will be written in a special document dedicated to the flight coordination called “COPS Aircraft Missions”.**

1.3 DOWs

Proposals for the deployment of 2 DOWs within COPS are currently under review. The decision is expected at mid of April.

1.4 Satellite Data

MSG rapid scans will be performed during COPS, for details see http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/02_06_EUMETSAT.ppt

2) Common Data Implementation Plan for COPS/GOP/D-PHASE

The Data Implementation Plan will be refined and implemented to the COPS Operations Plan.

COPS Archive:

Coordination: Claudia Wunram, service email address: cops@zmaw.de

User information: cops.wdc-climate.de

Related presentation: http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/04_04_archive.pdf

A report of the working group “Data Archive” can be found at http://www.uni-hohenheim.de/cops/5th_COPS_WS/Report_5th_COPS_WS_DataArchiving_WG.pdf

Action item:

- **Draft for Operations Plan up to 15 April 2007.**

3) COPS Operations Center

The COPS-OC will be located at Baden Airpark and is organized by Christian Barthlott (christian.barthlott@imk.fzk.de) of Research Center Karlsruhe.

The web-based Data Management System can be found at <http://www.cops2007.de/>. Note that this site is currently under construction. The existing site www.uni-hohenheim.de/cops/ will be mirrored at <http://www.cops2007.de/>.

Related presentation: http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/03_02_OperationsCenter.pdf

A report of the working group “Operations Center” can be found at http://www.uni-hohenheim.de/cops/5th_COPS_WS/Report_5th_COPS_WS_OperationsCenter_WG.pdf

Forecasters at COPS-OC:

DWD offers counseling from Offenbach; request for forecaster at COPS-OC under discussion
A forecaster of the MeteoFrance regional office of Strasbourg will be at the COPS-OC during IOPs in July.

A forecaster of MeteoSwiss can be at the COPS-OC at least for 1 week – details are under discussion.

Communication:

- Radio link from aircraft?
- Conference phone in operations center
- Each PI must be reachable per phone or cell phone (dial in during mission decision process and mission performance)

Action items:

- Search candidates for positions in OC.
- Finalize decision procedures.
- Visualization of EUMATSAT rapid scans at OC.
- A separate mailing list will be organized by Christian Barthlott to distribute mails during the COPS filed phase. Please register at http://www.cops2007.de/html/subscribe_mailinglist.html
- **Draft for Operations Plan up to 15 April 2007.**

4) International coordination

see presentations on at COPS webpage, especially:

Recent developments of WWRP at http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/01_01_WWRP.ppt

The status of D-PHASE (http://www.map.meteoswiss.ch/map-doc/dphase/dphase_info.htm) is described at

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/01_04_DPHASE.ppt

D-PHASE model visualizations for COPS will be made and be available for the COPS missions planning and guidance. The visualization program was developed by Matthias Grzeschik (grz@uni-hohenheim.de).

Action items:

- Finalize list of D-PHASE visualization products for COPS.
- **Drafts for Operations Plan up to 15 April 2007.**

The status of ETReC is described at

http://www.uni-hohenheim.de/cops/5th_COPS_WS/presentations/02_03_ETReC07.ppt

5) Real-time data assimilation during COPS

The real-time data assimilation efforts during COPS are coordinated by Hans-Stefan Bauer (hsbauer@uni-hohenheim.de). A table of COPS data available in real time as well as the demands from the modeling site are in preparation.

Action items:

- **Draft for Operations Plan up to 15 April 2007.**

6) Miscellaneous

Note: **The instrument PIs are responsible for getting the permissions to operate their instrument (radar, lidar etc.)**

Time schedule:

Next version of OP: 30 April 2007

- GOP phase: since 1 January 2007
 - AMF operational: since 2 April 2007
 - COPS archive test run: May 2007
 - COPS instrument preparation: May 2007
 - COPS Operations Center preparation: May 2007
 - COPS performance: June - August 2007
 - D-PHASE performance: June - November 2007
 - COPS data archiving phase: Until March, 2008
 - ETReC07: around July 2007
- Next COPS Workshop: 2 days end of September or early October, 2007, exact date will be proposed soon.

Appendix. COPS Instruments

Status 3 April 2007

Special satellite products during COPS

EUMETSAT

Instrument	Measured Parameters/Type
Special satellite products	
MSG	Rapid scans
MSG	Global Instability Index (GII)
MSG	Cloud microphysical parameters
Metop: IASI, GRAS, MHS	Several; COPS data for validation

Aircrafts during COPS

Aircraft and location	PI	Range, km	Height, km	Operation times, flight days, flight hours	Endurance, h Speed, m/s	Key instruments except standard meteorology	Resolution and accuracy	Expected contributions to COPS WGs	Expected contributions to Phase 1-4	Contributions to other projects linked with COPS
DLR Falcon, Oberpfaffenhofen	Gerhard Ehret, Christoph Kiemle Gerhard.Ehret@dlr.de Christoph.Kiemle@dlr.de	tbd	4-12	28.06.-05.08. 30 days 45 h	tbd 120	WV DIAL Doppler lidar, 57 dropsondes	5% tbd	CI, ACM, DAP	1 – 3	ETReC07, D-PHASE
SAFIRE Falcon Baden Airpark	Cyrille Flamant Cyrille.Flamant@aero.jussieu.fr	2250	5-6 Level 150	10.07 – 02.08. 24 days 35 h	3:45 h 165-175	WV DIAL 120 dropsondes	5%	CI, ACM, DAP	1 - 3	D-PHASE
DO-128 Baden Airpark	Ulrich Corsmeier Ulrich.Corsmeier@imk.fzk.de	800	Up to 7	11.06.-31.07. 35 days 125 h	3.5 65	Tracer, radiation, fluxes	see instr. description	CI, ACM	1 – 3	TRACKS
BAe 146 Baden Airpark	Alan Blyth, Stephen Mobbs, Phil Brown blyth@env.leeds.ac.uk	tbd	Up to 8	9.07 – 27.07. 84 h	5 100	Extensive aerosol and cloud micro- physics	see instr. description	CI, ACM, PPL	1 - 3	TRACKS
Learjet 35A Hohn	Horst Fischer, Mark Lawrence hofi@mpch-mainz.mpg.de , lawrence@mpch-mainz.mpg.de	~1600	Up to 13 (level 400)	16.07.-28.07. 3-4 flights	3 ½ (4 h prep. time) tbd	Photochemistry	see instr. description	CI, ACM	1 – 4	TRACKS
Zeppelin NT Friedrichshafen or Baden Airpark	Frank Holland, Andreas Hofzumahaus F.Holland@fz-juelich.de a.hofzumahaus@fz-juelich.de	550	0.02 – 1.0	16.07.-31.07. 80 h	10 0-25	Photochemistry	see instr. description	CI, ACM	1 - 2	TRACKS
UltraLight Schmidtler Enduro Baden Airpark	Rainer Steinbrecher, Wolfgang Junkermann Rainer.Steinbrecher@imk.fzk.de Wolfgang.Junkermann@imk.fzk.de	500	0.02 - 4.5	15.06.-30.06. 8 days 4-5 h/day VFR condition	6 25	Radiation, Aerosol microphysics, turbulence, fluxes	10 %	CI, ACM	1 – 2	TRACKS
Dimona HK-36 Baden Airpark	Bruno Neiningner, Heiner Geiß bruno.neiningner@metair.ch h.geiss@fz-juelich.de	800 km	< 4	16.07.-31.07. 4 days	4 – 5, 40	Photochemistry Tracer, Wind & Turbulence + standard meteorology	see www.metair.ch/ SYSTEMS.htm Or EUFAR pages	CI, ACM	1 – 2	TRACKS

Accepted EUFAR proposals related to COPS: Christine Brandauer: Parternavia; Susanne Crewell, Dimona; Paolo Di Girolamo, SAFIRE Falcon, Yann Dufournet, ATR

Ground-based COPS Instruments

Germany

Instrument	Measured Parameters/Type	PI	Institution	Comments
Ground-based Lidars				
UHOH Water Vapor DIAL, scanning	4D high-resolution, high-accuracy water vapor, aerosol backscatter, wind field by aerosol tracking, cloud structure	Wulfmeyer	U. Hohenheim + IfT + U. Potsdam + DLR	Confirmed; located at Supersite H
UHOH Rotational Raman Lidar, scanning	Temperature & aerosol profiles, cloud structure	Behrendt	U. Hohenheim/ COSI-TRACKS	Confirmed, located at Supersite H
WindTracer, scanning	LOS wind & aerosol profiles, cloud structure	Wieser	FZK	Confirmed, located at Supersite H
MWL & WiLi	Multi-wavelength aerosol optical properties, depolarization + vertical wind + radiosondes	Althausen	IfT	Confirmed located at Supersite M
Radiometers				
HATPRO, scanning	MW radiometer, temperature and water vapor profiling, stability index, LWP	Crewell	U. Munich	Confirmed, located at Supersite M
ADMIRARI, scanning	MW radiometer, water vapor profiling, stability index, LWP	Simmer	U. Bonn	Confirmed, location under discussion, Supersite H?
Radars				
POLDIRAD, C-Band, Dopplerized, scanning	Rain rate, hydrometeor distribution, LOS wind, drop size distribution	Hagen	DLR	Confirmed, Waltenheim sur Zorn, 7.610 °E, 48.739 °N, ca. 120 m above the Rhine Valley
Karlsruhe Radar, C-Band, Dopplerized	Weather Radar, C-band, scanning	Beheng	FZK	Confirmed, Research Center Karlsruhe
UHOH X-Band	Precip radar	Schaberl	U.Hohenheim	Confirmed, located at Supersite H

IMK Cloud Radar	Cloud Radar	Beheng	FZK	Confirmed, located at Supersite H
UHH Cloud Radar	Cloud radar	Peters	U. Hamburg	Confirmed, located at Supersite R
MRRs	Micro Rain Radars (funded within GOP for 12 months)	Peters	U. Hamburg	Confirmed, located at all supersites
GPS				
GPS Network	GPS, 5 additional stations for COPS	Gendt	GFZ	Confirmed
WTR + Sodar + RASS				
WTR	Mobile wind temperature radar	Vogt	FZK	Confirmed, located at Supersite S
2 Sodars	Sodar	Kalthoff	FZK	Confirmed
Sodar-RASS	Sodar, RASS	Foken	U. Bayreuth	Confirmed
Flat array sodar	Sodar	Mayer	U. Freiburg	Confirmed
Surface in-situ				
2 Energy balance stations		Kalthoff	FZK	Confirmed
5 Turb. Towers		Kalthoff	FZK	Confirmed
SISOMOP	Soil Moisture sensors	Hauck	FZK	Confirmed
Rad.-Tur. Cluster	3 Energy balance stations + Bowen ratio system + Scintillometer	Foken	U. Bayreuth	Confirmed
12 Automatic Weather Stations		Smith	U. München	Confirmed
Masts + tethered balloons				
4 MMM	Micro-Meteorology-masts, comb. w. Drop-up sondes	Kalthoff	FZK	Confirmed
12-m Mast		Foken	U. Bayreuth	Confirmed
Hartheim site		Mayer	U. Freiburg	Confirmed
Tuttlingen site		Mayer	U. Freiburg	Confirmed
Radiosonde stations				
2 Mobile RS Stations		Kalthoff	FZK	Confirmed
Drop-up sondes	Advanced radiosondes (30 sondes, 5 kits)	Corsmeier	FZK	Confirmed

Precip. measurements				
10 high-precision precipitation meas. systems	OTT	Ahrens	U. Frankfurt	Confirmed
Networks				
Routine Observations of DWD			DWD	Confirmed
Routine Observations of Landesamt für Umweltschutz Baden – Württemberg (LUBW)	100 precipitation measurement stations, with 35-40 stations with measure also humidity, pressure, temperature, wind, and solar radiation (not every parameter measured at every station); 2 soil-moisture stations; see http://www2.lfu.baden-wuerttemberg.de/lfu/hvz/	Schulz	Landesamt für Umweltschutz Baden – Württemberg (LUBW)	Confirmed

France

Instrument	Measured Parameters/Type	PI	Institution	Comments
Airborne				
SAFIRE Falcon 20	Aircraft + WV DIAL + Dropsondes; 24 days in July/August 2007, 35 flight hours, 120 dropsondes	Flamant	CNRS	Confirmed
Groundbased				
TReSS	Mini Raman lidar, sun photometer, IR radiometer, full-sky camera	Flamant	CNRS	Confirmed, located at Supersite V
Raman lidar		Flamant	CNRS	Confirmed, located at Supersite V
Radiosondes station		Boutier	Météo France	Confirmed, located at Supersite V
UHF + sodar		Boutier	Météo France	Confirmed, located at Supersite V
3 Surface Flux stations		Boutier	Météo France	Confirmed
1-3 soil		Flamant	CNRS	Confirmed

moisture stations				
X-band radar	Horizontal scanning	Van Baelen	CNRS	Confirmed, located at Supersite V
K-band radar	vertical	Van Baelen	CNRS	Confirmed, located at Supersite V
16+ GPS stations		Van Baelen	CNRS	Confirmed
Upstream site SIRTa, Paliseau	http://sirta.ipsl.polytechnique.fr	Flamant	CNRS	Confirmed
Routine Observations of Météo France		Boutier	Météo France	Confirmed
Additional Disdrometers ?				
Additional Rain gauges ?				

UK

Instrument	Measured Parameters/Type	PI	Institution	Comments
Airborne				
FAAM BAe 146	Aircraft + cloud and aerosol analysis instrumentation 3 months, 2-3 days detachments, 60-80 science hours, stationed in Cranfield, UK			Confirmed
Groundbased				
Doppler lidar	Winds aerosol backscatter		U. Salford	Confirmed, located at Supersite R
MW Radiometer	T, RH (14 channels, scanning)		U. Salford	Confirmed, located at Supersite R
2 towers	3D winds, turb & rad fluxes		U. Leeds	?
Wind profiler	3D winds		U. Manchester	Confirmed, located at Supersite R
2 radiosonde stations	T, T _D , winds		U. Leeds, U. Manchester, U. Reading	Confirmed, located at Supersite R and H?

3 sodars	Winds		U. Leeds	Confirmed, located in Murg Valley
GB aerosol, chem	Volatility, size & cnc, opt. Thick, O ₃		U. Manchester, U. Leeds	Confirmed, located at Supersite H
10 automated weather stations	T, RH, winds		U. Leeds	Confirmed, located in Murg Valley

Austria

Instrument	Measured Parameters/Type	PI	Institution	Comments
Groundbased				
Supersite S				
Surfafe energy balance system	Scintec	Dorninger, Steinacker	U. Vienna	Confirmed, located at Supersite S
Disdrometer	OTT	Dorninger, Steinacker	U. Vienna	Confirmed, located at Supersite S
Micro Rain Radar (MRR)	METEK, vertical	Dorninger, Steinacker	U. Vienna	Confirmed, located at Supersite S
Tethersonde system	Vaisala, 4 sensors	Dorninger, Steinacker	U. Vienna	
Site 2 (near Nagold valley)				
15 temperature stations	Hobo	Dorninger, Steinacker	U. Vienna	Confirmed
3 automated weather stations	Hobo	Dorninger, Steinacker	U. Vienna	Confirmed
4 3D SONIC anemometer	GILL	Dorninger, Steinacker	U. Vienna	Confirmed
Mobile station on a car	Vailsala	Dorninger, Steinacker	U. Vienna	
Site 3 (near Tübingen)				
100 automatic weather stations	Hobo	Dorninger, Steinacker	U. Vienna	50 Confirmed
3 automatic weather stations	MAWS	Dorninger, Steinacker	U. Vienna	Confirmed
Site 4 (near Horb)				
1 Radiosonde system	MeteoLabor, 60 sondes	Dorninger, Steinacker	U. Vienna	Sondes not yet

				confirmed
Site tbd				
1 Mobile vertical pointing radar	METEK	Dorninger, Steinacker	U. Vienna	

USA

Instrument	Measured Parameters/Type	PI	Institution	Comments
Groundbased				
ARM Mobile Facility	http://www.arm.gov/sites/amf.stm	Wulfmeyer	UHOH	Confirmed, located at Supersite M
DOWs	Doppler on wheels	Weckwerth	NCAR	

Italy

Instrument	Measured Parameters/Type	PI	Institution	Comments
Groundbased				
BASIL	Raman lidar; WV, T, aerosols; vertical	Di Girolamo	UNIBAS	Confirmed, located at Supersite R
MW Radiometer	T, WV, LW profiles; TP/WVP-3000	Pappalardo	CNR	Confirmed

The Netherlands

Instrument	Measured Parameters/Type	PI	Institution	Comments
Groundbased				
TARA		Russchenberg	TU Delft	Confirmed, located at Supersite H?