

July 11, 2005

Minutes COPS 2nd workshop WG1 meeting 28.06.2005

Univ. Hohenheim, Germany

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Jörg Trentmann (University of Mainz)
Joel van Baelen (University of Clermont-Ferrand)
Tammy Weckwerth (NCAR)

I. Presentation of novel measurement systems & data sources for the COPS experiment:

- (1) Marianne König (EUMETSAT, Darmstadt):
 - invitation to use EUMETSAT data for COPS
 - e.g. infer cloud physics, aerosol concentrations from satellite imagery or soil moisture from scatterometer data
 - COPS data could be used as validation data for EUMETSAT products
 - satellite data can be supplied on a pixel-wise spatial resolution for the COPS area
- (2) IASA:
 - profiles for temperature and humidity will be available
- (3) Ralf Sussmann (IMK-IFU, Garmisch-Partenkirchen)
 - water vapour products from different sensors at Zugspitze and Garmisch-Partenkirchen available for the COPS-period
 - i. GPS columns (Zugspitze/Garmisch)
 - ii. FTIR columns (Zugspitze/Garmisch)
 - iii. LIDAR profiles (Zugspitze)
 - iv. FTIR profiles (Zugspitze/Garmisch)

(4) Jens Bange (TU Braunschweig)

- Helipod available for COPS: helicopter-based measurements of temperature, moisture and wind vector, convective/turbulent fluxes, aerosols
 - measurement of heat/moisture fluxes on different scales in the PBL
 - any point in the investigation area can be reached in 30 minutes
 - can be used to supplement aircraft measurements
 - no measurements in clouds
 - development of 2m wing spaced aircraft finished
 - totally autonomous
 - measurements of temperature, moisture and wind vector
 - turbulent fluxes with accuracy of ca. 10 W/m^2
 - 25 m/s speed
 - navigation per predefined waypoints
 - flight patterns of ca. 50min duration
 - swarm flights possible (e.g. 3-4 aircrafts = 1 swarm)
 - not yet clear, whether this microplane can fly through clouds

(5) Bart Geerts (University of Wyoming)

- if funding, aircraft "Wyoming King Air" would be available
 - in-situ probes and remote sensing
- WCR radar: vertical and horizontal plane, dual Doppler radar profiling configuration
 - on the ground fully mobile, airborne with various antennas on different aircrafts
 - unique at the moment
 - information from within the clouds

(6) Frank Holland (Forschungszentrum Jülich)

- Zeppelin as measurement platform
 - high payload
 - will be available 2007 for first measurements
 - measurements possible at night, in clouds, but not in Cb's
 - strong wind restrictions: 6m/s maximum climbing/sinking speed

(7) Christoph Kiemle (DLR, Oberpfaffenhofen)

- FALCON aircraft
- LIDAR downward for latent heat fluxes in the boundary layer, 3D wind field components, humidity
- high-resolution boundary layer flights

(8) Joel van Baalen (Lab. Meteorology & Physics, Univ. of Clermont Ferrand)

- network of 20-25 GPS water vapour stations: either as additional network in the COPS area or as upstream network in France
 - in Germany over 400 stations operational, but only 3 in the COPS area (40km distance between stations) – in France only 30-40 stations
 - joint 3D tomography possible (4km spacing)
- small version of NCAR radar available: high-resolution wind-profile & momentum fluxes in the PBL
- platform either FOKKER or new aircrafts, not yet clear

II. Discussion of the draft version of the Scientific Overview Document (C. Kottmeier)

C. Kottmeier presented the draft version of the Scientific Overview Document. Concerning the objectives several points were discussed:

- *Small-scale inhomogeneities*: boundary layer heights & dry layer shall be included
- *Identification of causes for initiation and intensity of convection*: it was discussed whether initiation and intensity should be separated, as the intensity of convection is comparatively well understood – however, in COPS, the new aspect is the influence of orography on initiation and intensity
- *How frequent are bores in complex terrain*: could be determined through GOP measurements – generalisation of this objective to “unusual convective phenomena” or “secondary initiation”
- *To which extent does cloud-shading influence CI ?*: belongs to the convective inhibition factors and small-scale inhomogeneities
- *Urban areas as sources of local heat influence CI ?*: difficult to address everything in COPS – restrictions exist due to the number of supersites (ca. 3) and available measurement techniques. One possibility would be to address this point via the influence of soil moisture variability

It is concluded that the overall aim should be:

How can CI be represented correctly in the models ? (especially concerning the diurnal cycle)

The objectives can be regrouped in:

Primary effects on CI

Upper tropospheric forcing

Secondary effects (orography, secondary convection)

Convective inhibition factors (topography, transient features like mountain & gravity waves)

Intensity and organisation of convection (CI component)

III. Available Instrumentation

The list of available instrumentation for COPS shall be adapted. Each instrument should be related to a specific scale, especially whether it will be included in one of the supersites or not.

IV. Field Sites

3 scales will be addressed:

Supersites:

- 20 x 20 km
- combine a lot of instruments: weather radar, surface energy balance stations, cloud radar, LIDAR, wind profiler, synergy of instruments (e.g. water vapour and wind LIDAR)

- more or less in east-west direction, because the LM model bias is located there
- 3 supersites are proposed: (1) flat terrain (around Hohenheim/Stuttgart) (2) high mountain with frequent deep convection (Black Forest) and (3) upwind area (West or East of Vosges ?)
- the supersites must fulfil the requirements for the flux station measurements

Mesoscale:

- 200 x 200 km
- around Strassbourg, Karlsruhe, Stuttgart, Freiburg
- aircrafts, operational measurements

Upwind condition:

- FALCON
- Forecast time-scale

V. Proposed questions to the full group interested in COPS

- What would be the minimum funding required ?
- What would be the maximum funding if possible ?
- What could you contribute, if no funding is available ?