How to use the Synergy of COPS Remote Sensing Data to Analyse Convection Initiation Processes in Complex Terrain?

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IOP 9c

• Composite plots, CI sites, BL Hornisgrinde,
• Highlights for COPS Overview paper

IOP 8b

• CI locations of COPS, cloud top cooling rate, lid

IOP 13a

• Saharan dust, outflow boundary, DIAL data versus D-PHASE models

IOP 3a

• Temperature variance profile
IOP 9c, 20 July 2007
IOP 9c: Flooding in Bavaria (Erlangen, Forchheim)

„.....up to 75 l/m²“
# COPS Remote Sensing Instruments

|    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| IO  |   |   |   |   |   |   |   |   |   | 5a | 5b | 6  | 7a | 7b | 8a | 8c | 9a | 9b | 9c | 10 | 11a| 11b| 12 |
| No. of CI event | 2  | 8  | 1  | 0  | 3  | 0  | 0  | 0  | 0  | 3  | 0  | 6  | 5  | 0  | 0  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |
| Airborne |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DLR DIAL |    |    | x  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Leandre2 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Mobile |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DOW1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DOW2 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| SuSiH |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| WV DIAL |    |    |    |    |    | x  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| RRL |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Windtracer |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CloudRadar |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CNR MWR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| SuSiR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| BASIL |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Doppler Lidar |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CloudRadar |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| TARA |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| MWR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| SuSiM |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| BERTHA |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| WILI |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| MPL |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CloudRadar |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HATPRO |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| SuSiV |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| TRESS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CNRS RL |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| SuSiS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ceilometer |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| WTR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| MICCY |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| POLDIRAD |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

24 instruments (in addition to AMF, op. radars, GPS, MRRs, MSG RSS)!

7th COPS workshop, Strasbourg, 27 – 29 October 2008
IOP 9c: Precipitation Sum, Karlsruhe Radar

21.07.2007
00:00:21

10 – 22 UTC

7th COPS Workshop, Strasbourg, 27 – 29 October 2008
IOP 9c: MSG Multi-Channel Composite & DWD Radar

900 UTC

930 UTC

1000 UTC

1030 UTC

1100 UTC

1130 UTC

10:00

10:30

11:00

11:30

(mm/h)

100.0

77.8

60.5

46.9

36.3

27.9

21.4

16.4

12.4

9.3

6.8

4.9

3.4

2.3

1.4

0.7

0.1

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IOP 9c: WiLi at Susi M

Updraft 9 m/s  Downdraft 5m/s
IOP 9c: POLDIRAD & Karlsruhe Radar, 1000 UTC
IOP 9c: UHOH RRL & DIAL

Gradient of Potential Temperature, [K/100m]

Particle Backscatter coefficient, [1/m² km]

Water Vapor Mixing Ratio, [g/kg]

Altitude, m AGL

Time, UTC
IOP 8b: MSG Rapid Scan Data

10.8-μm Channel

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94 CI events on 30 analysed IOP days.

IOP 8b: MSG Rapid Scan Data

Minimum Bt10.8 (K)

Maximum Radar Reflectivity (dBZ)

Time (UTC)

1430 UTC

1437 UTC

1448 UTC

-4.0 K/minute


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IOP 8b: UHOH RRL

Δz = 3.75 m
Δt = 13 s
IOP 8b: UHOH RRL

Δz = 300 m
Δt = 3 min

Strengthening lid, perturbed in height
IOP 13a/b, 1/2 August 2007
Saharan dust

Outflow boundary
IOP 13a/b: UHOH DIAL
IOP 13 a/b: Comparison of UHOH DIAL and Mesoscale Models

7th COPS Workshop, Strasbourg, 27 – 29 October 2008
IOP 3a, 14 June (weakly forced convection): UHOH RRL

$\Delta t = 10 \text{ s}$
$\Delta r = 3.75 \text{ m}$

$\Delta t = 10 \text{ s}$
$\Delta r = 37.5 \text{ m}$
(75 m gl. av.)
**IOP 9c**
- Composite plots, CI sites, WiLi, BL Hornisgrinde: DIAL & RRL,
- Highlights for overview paper of COPS field phase

**IOP 3a**
- Temperature variance profile

**IOP 8b**
- CI locations of COPS, cloud top cooling rate

**IOP 13a**
- DIAL data versus D-PHASE models

**Outlook**
- Synergetic lidar data products: Latent & sensible heat fluxes, buoyancy, ...

Composite plots (MSG, Radar, GPS IWV): Poster **C4**, Fumiko Aoshima et al.
UHOH DIAL: Poster **C6**, Sandip Pal et al.
UHOH RRL: Poster **C10**, Marcus Radlach et al.