



Influence of the Wind Profile on the Life Cycle of Convective Precipitation

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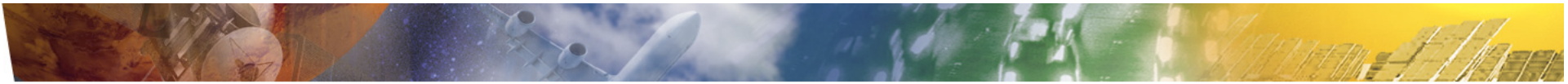
Université de Clermont-Ferrand, France

Observatoire Midi-Pyrénées, Toulouse, France



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft



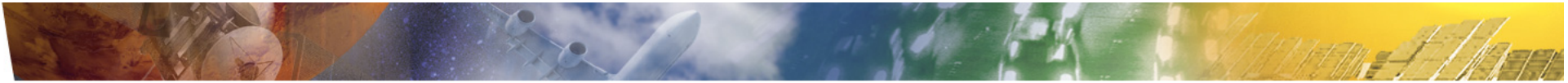


Deployment of C-band polarimetric weather radar POLDIRAD at Waltenheim sur Zorn, Alsace



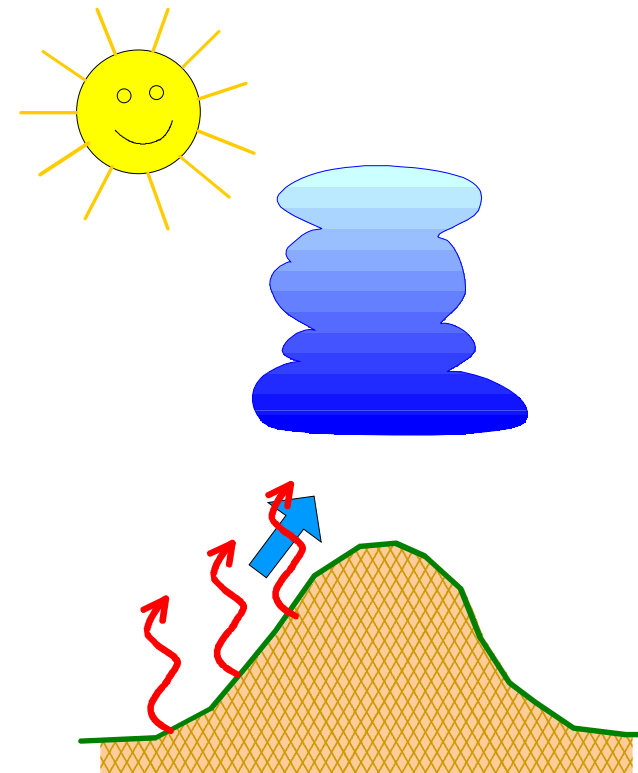
Photo: A. Behrendt

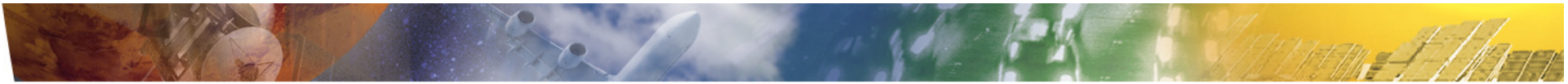




Orographic Effects on the Life Cycle of Convection

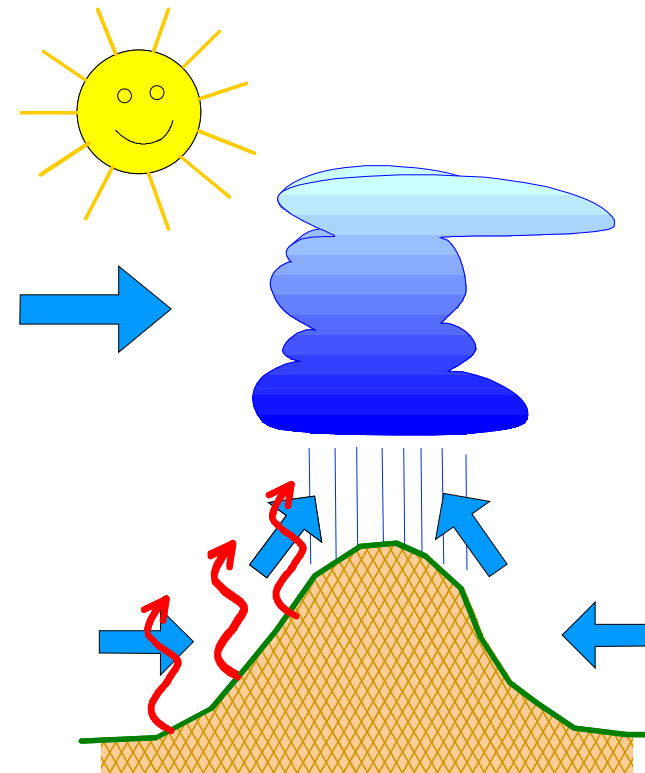
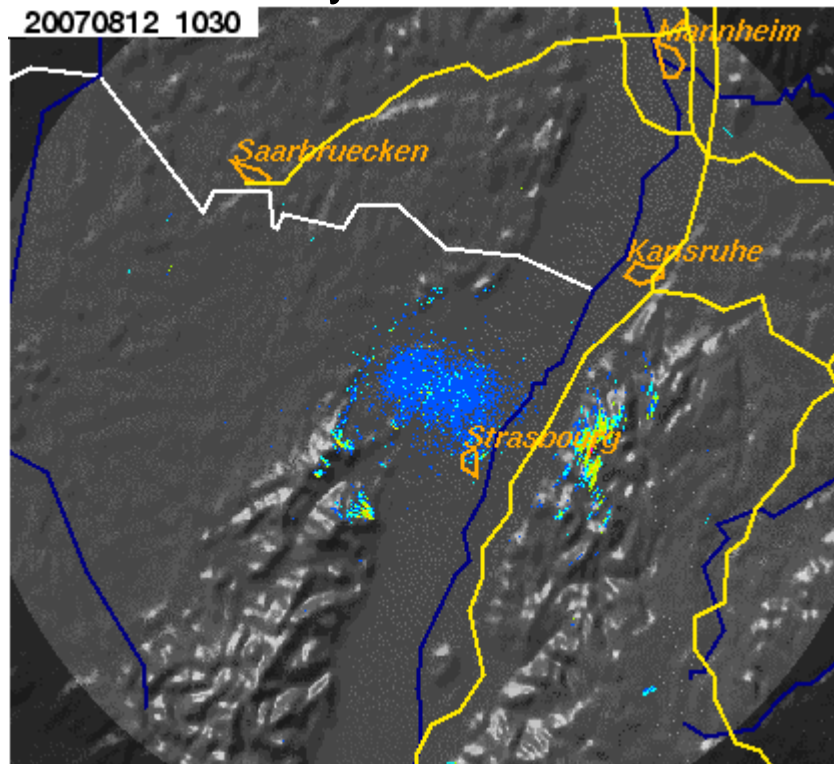
- One of the main objectives of COPS is to study the orographic effect on the initiation and life cycle of convective precipitation.

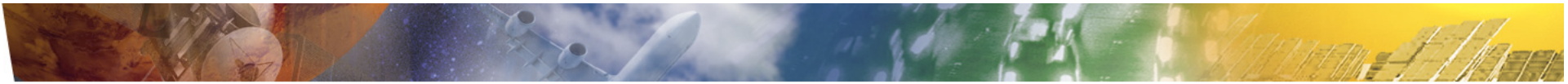




POLDIRAD observations during IOP 15 (daytime)

12 Aug. 2007 11-17 UTC
every 10 minutes



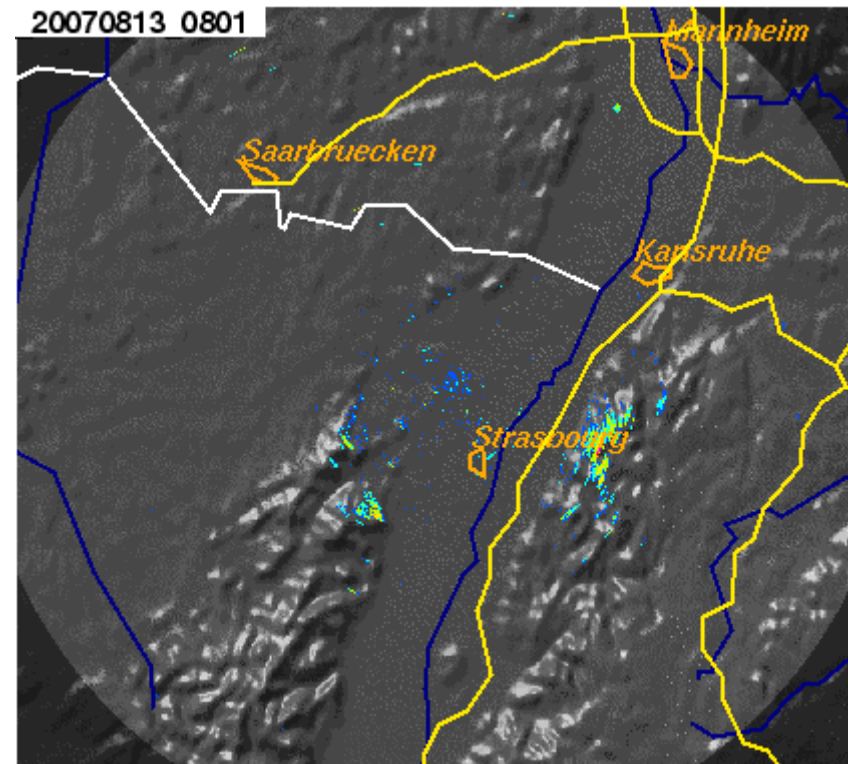
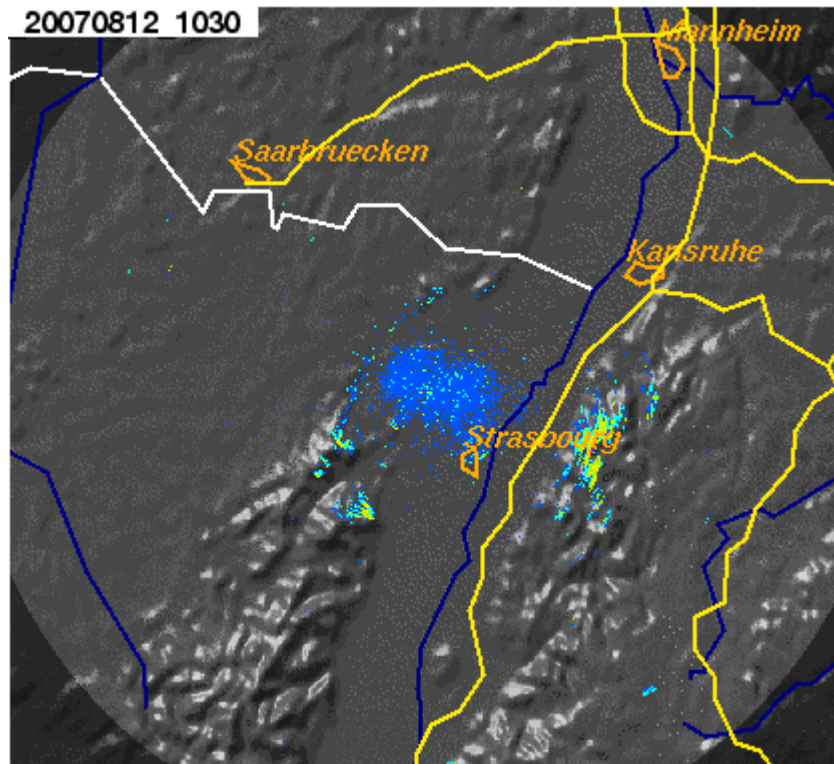


POLDIRAD observations during IOP 15 (daytime)

12 Aug. 2007 11-17 UTC

13 Aug. 2007 8-15 UTC

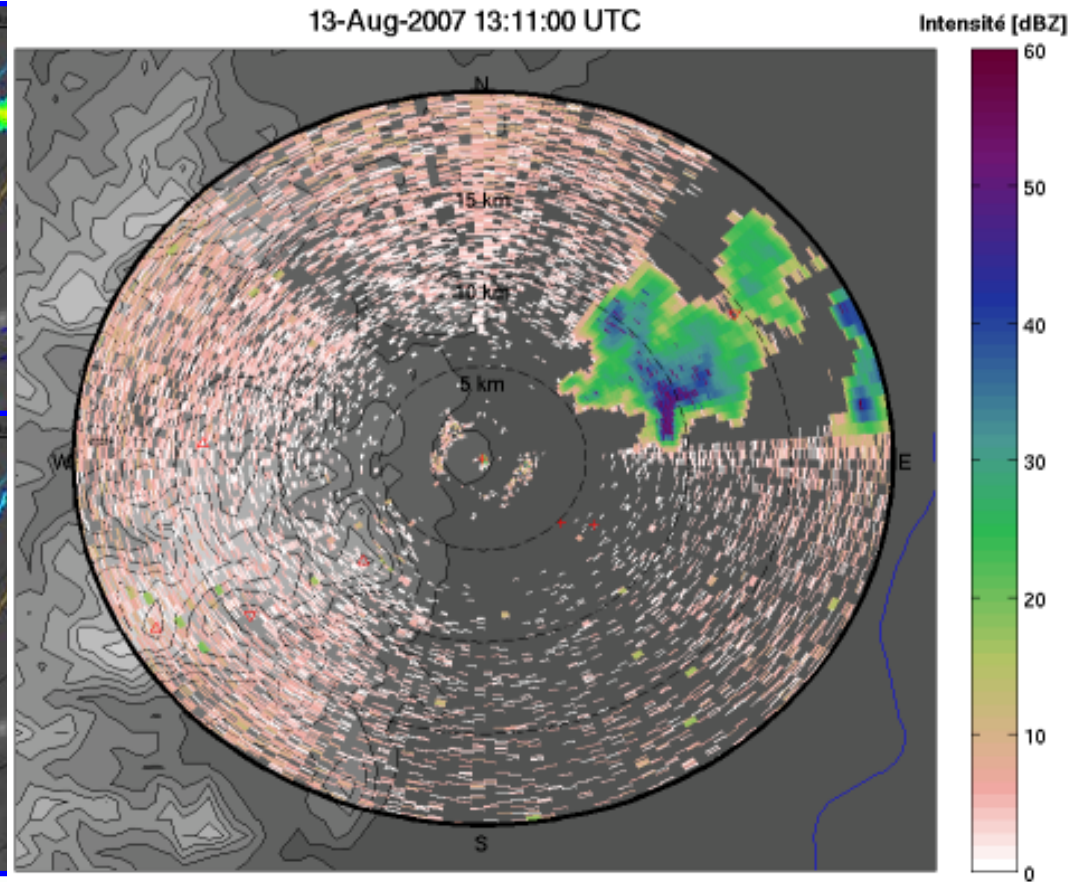
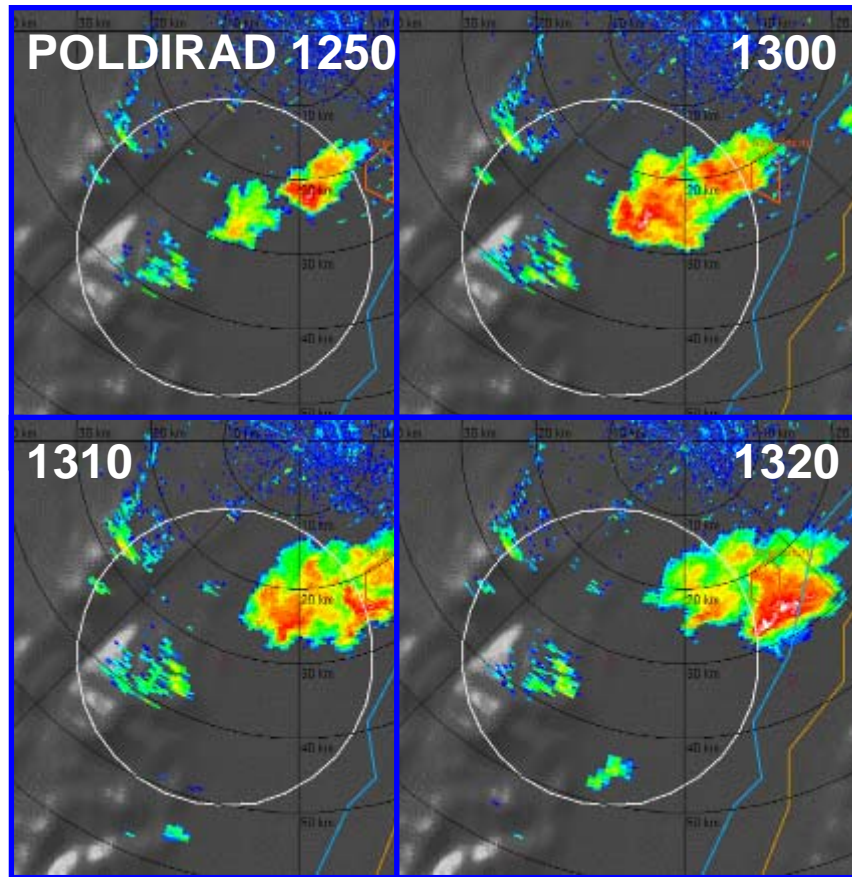
every 10 minutes

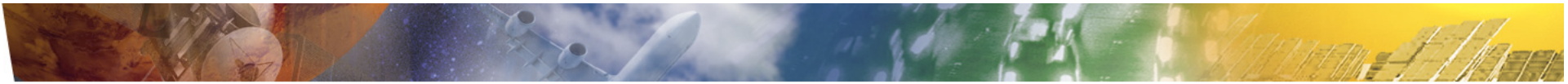




X-Band Radar Bischenberg (30 km south of POLDIRAD)

13 Aug. 1246 – 1321 every 1 min.

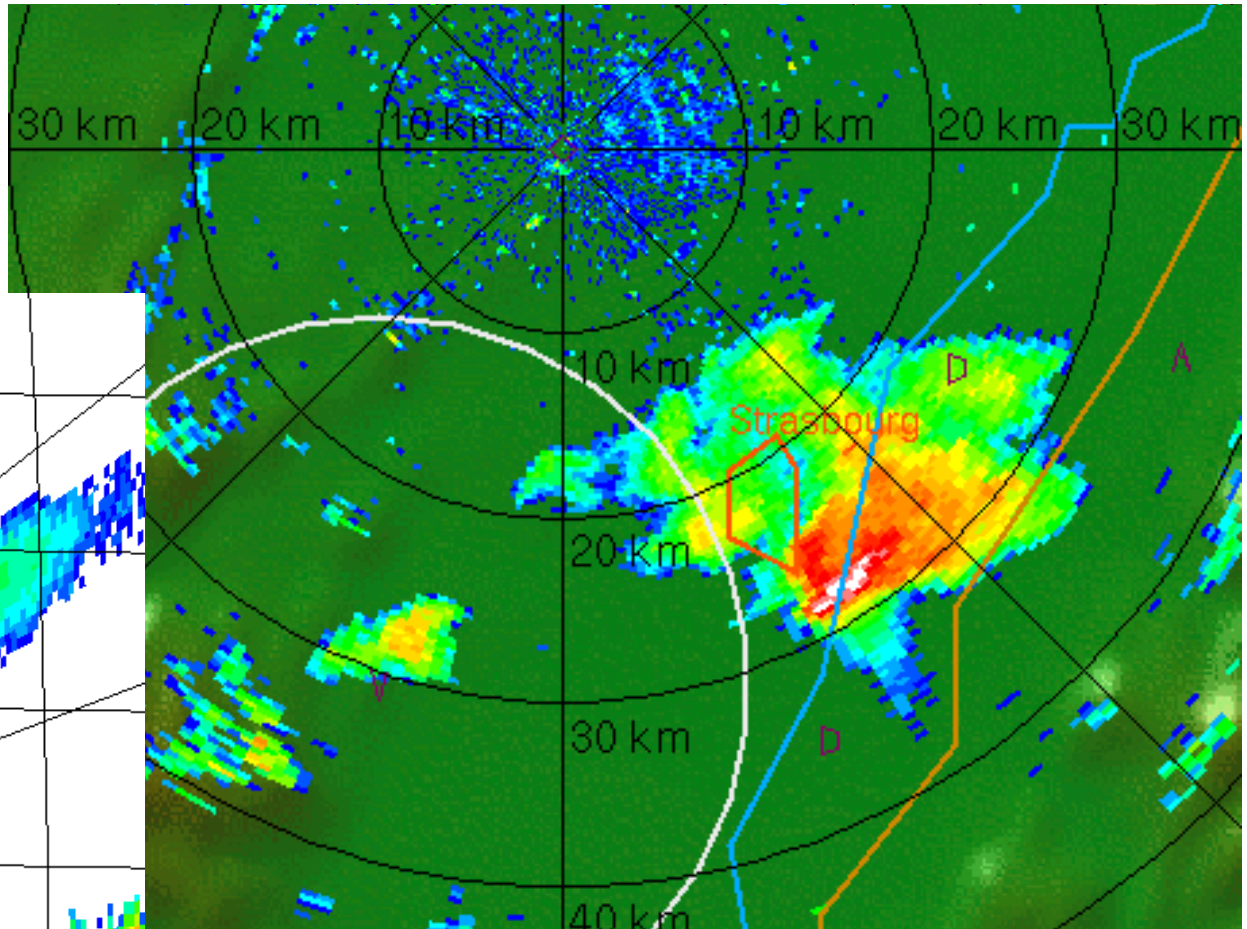
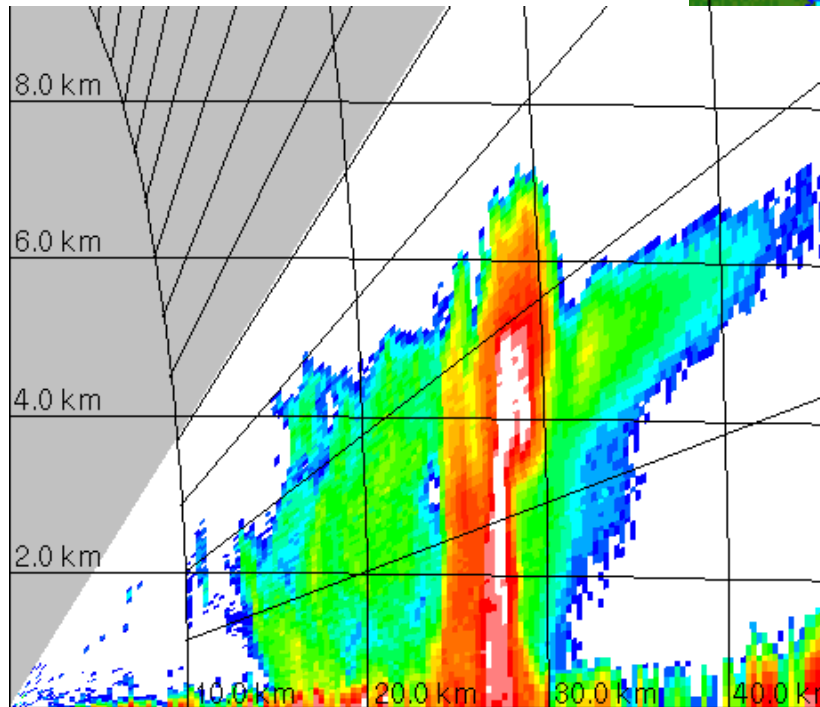




POLDIRAD 13 Aug. 2007, 1250 – 1500 UTC

Example of one cell
(2 hours, 70 km)

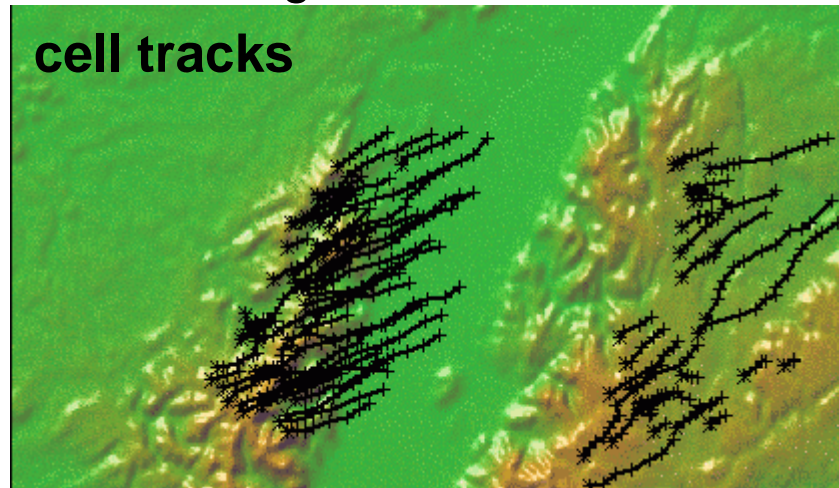
RHI at 1326 UTC



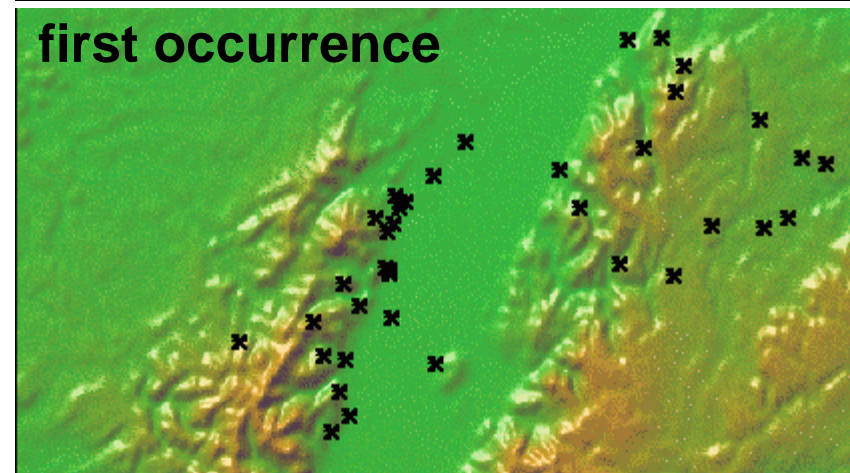
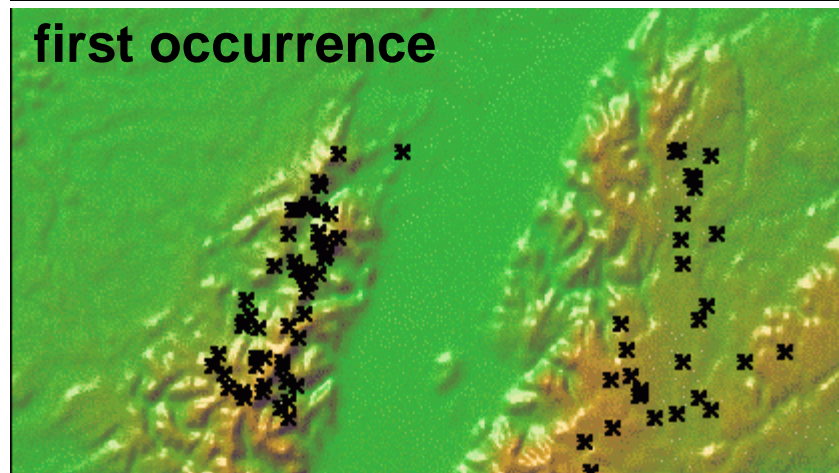
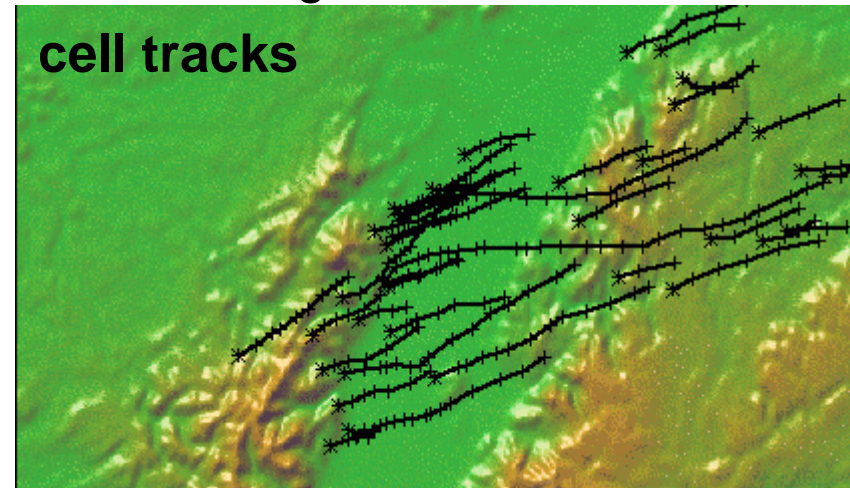


Cell Tracking IOP 15 using POLDIRAD Observations

12 Aug. 2007 11-17 UTC



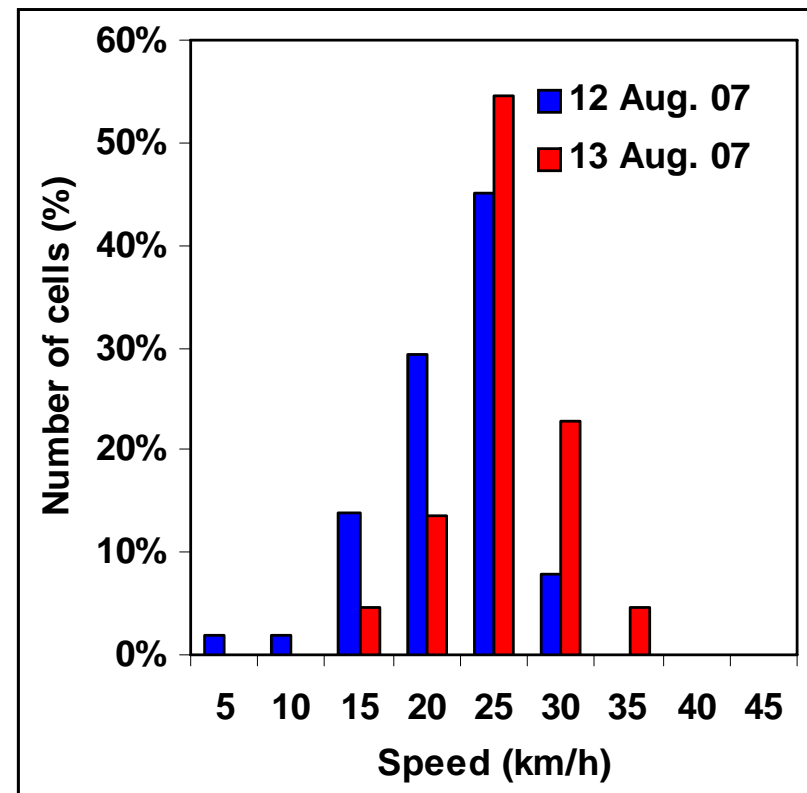
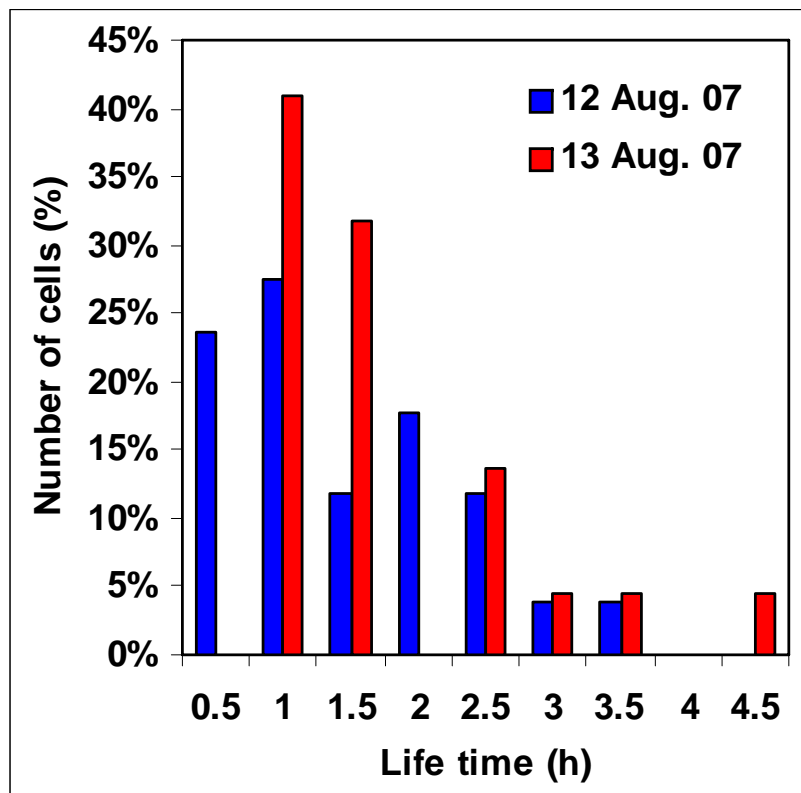
13 Aug. 2007 8-15 UTC





Cell Tracking IOP 15 using POLDIRAD Observations

➤ Life time and speed of cells (only those initiated at the Vosges)

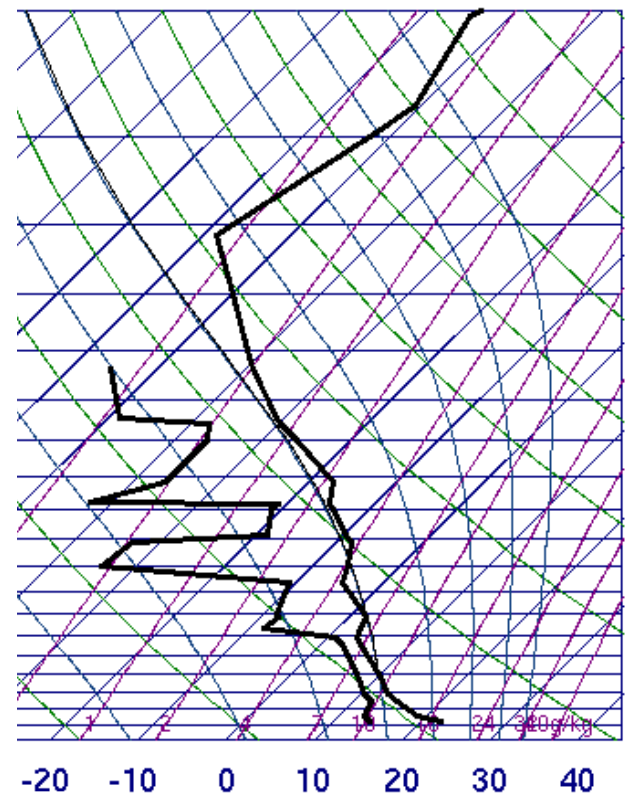
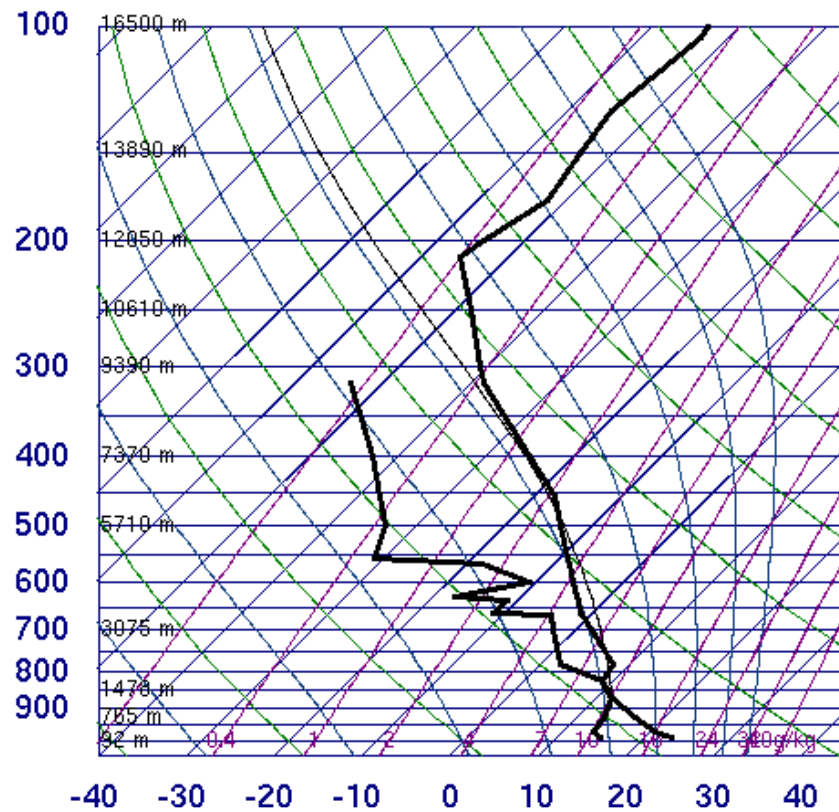




Synoptic Conditions

Radio soundings at Nancy (100 km West)
12 Aug. 12 UTC

13 Aug. 12 UTC



SLAT	48.68
SLON	6.22
SELV	212.0
SHOW	2.98
LIFT	0.56
LFTV	0.40
SWET	156.8
KINX	21.30
CTOT	21.50
VTOT	23.90
TOTL	45.40
CAPE	102.7
CAPV	155.3
CINS	-2.24
CINV	-0.22
EQLV	583.9
EQTV	569.4
LFCT	861.4
LFCV	875.7
BRCH	2.30
BRCV	3.48
LCLT	284.8
LCLP	885.5
MLTH	294.8
MLMR	9.83
THCK	5596.
PWAT	25.26

University of Wyoming

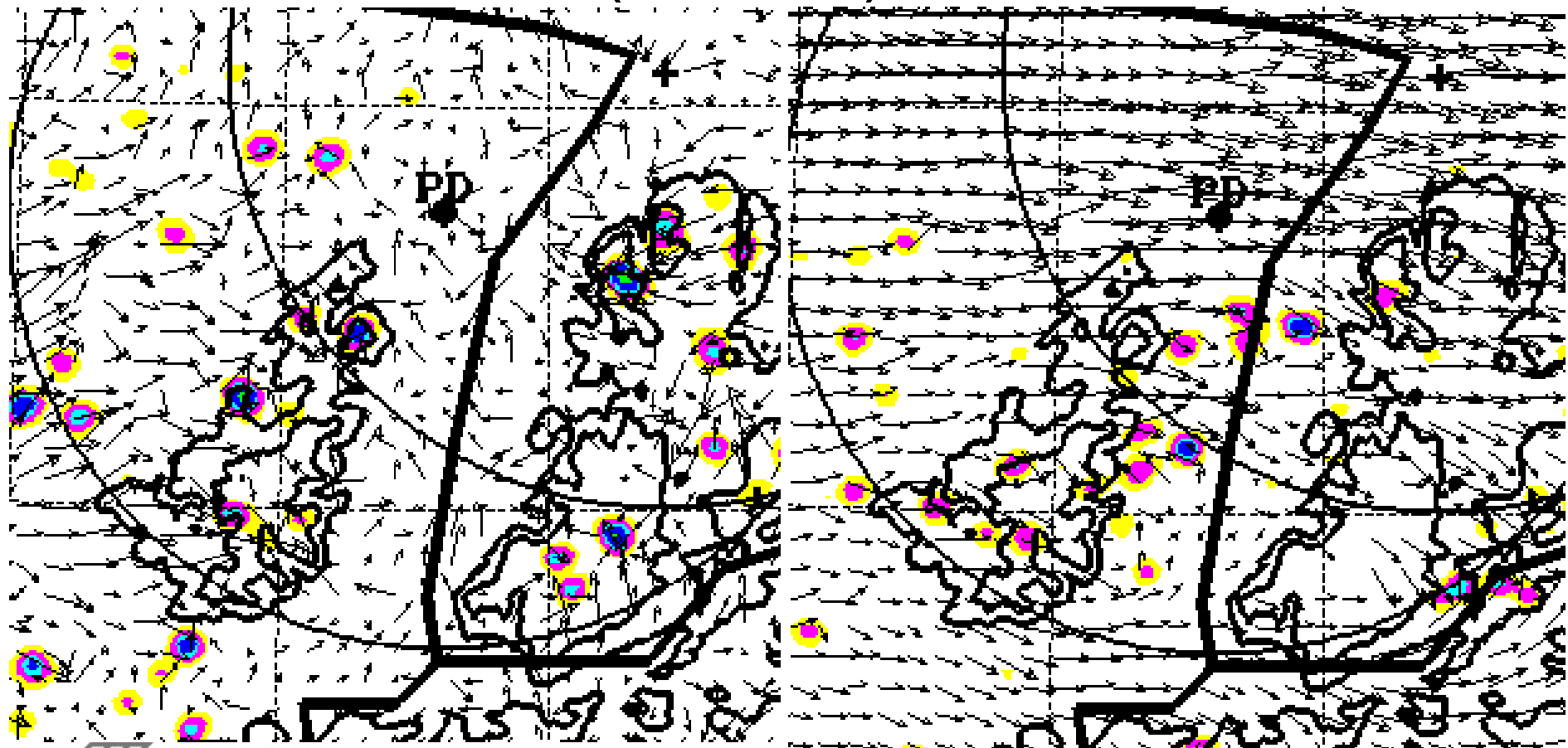


MesoNH Simulations

12. Aug. 2007 15 UTC

13. Aug. 2007 11 UTC

wind field (1000m MSL) and rain rate



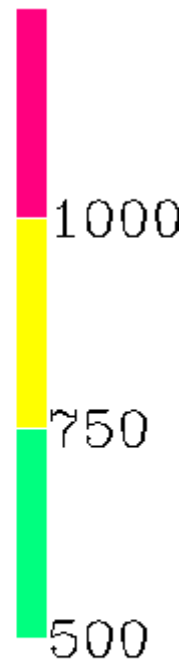
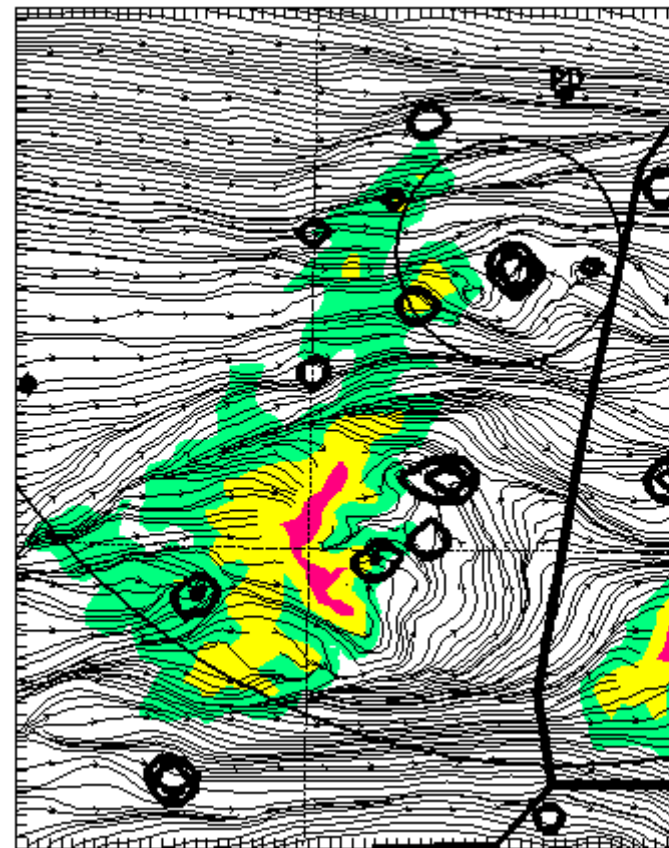
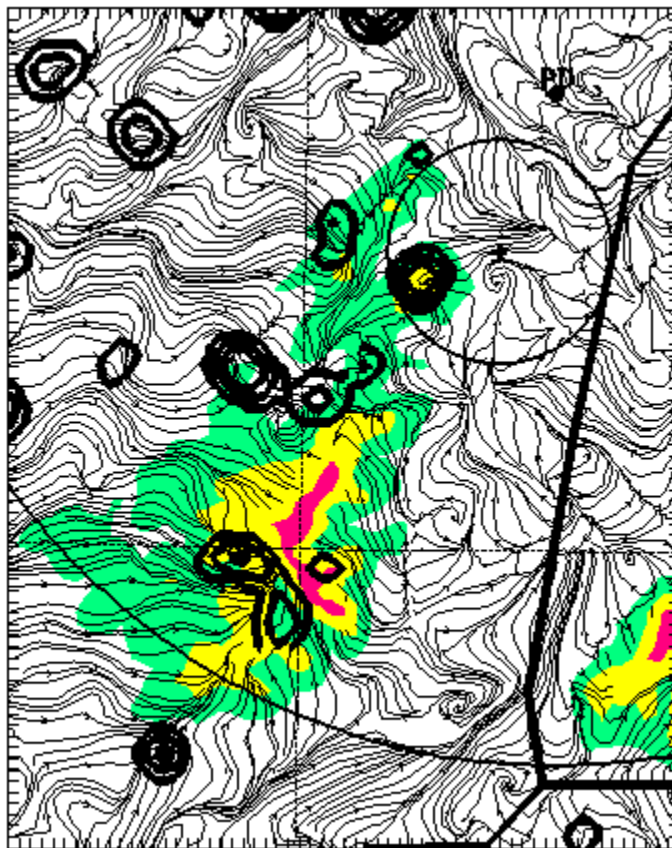


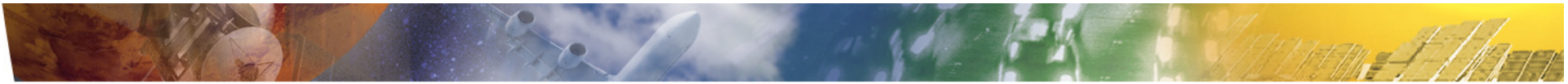
MesoNH Simulations

12. Aug. 2007 15 UTC

13. Aug. 2007 10 UTC

stream lines (1000 m MSL) and rain rate



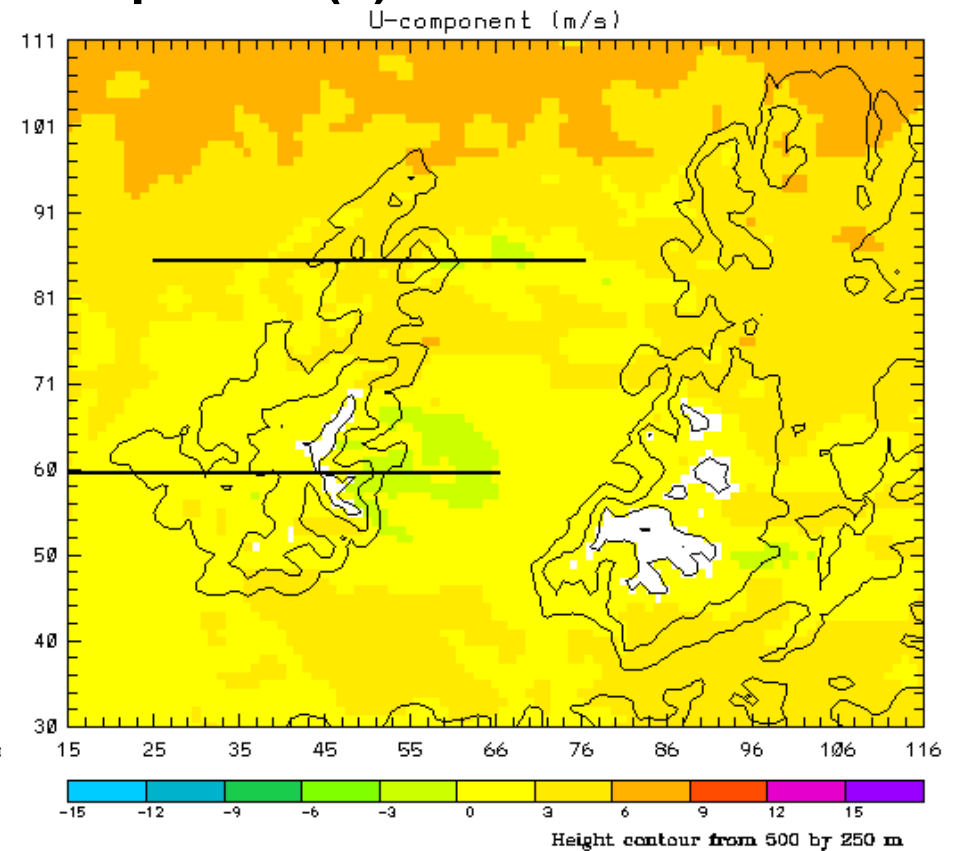
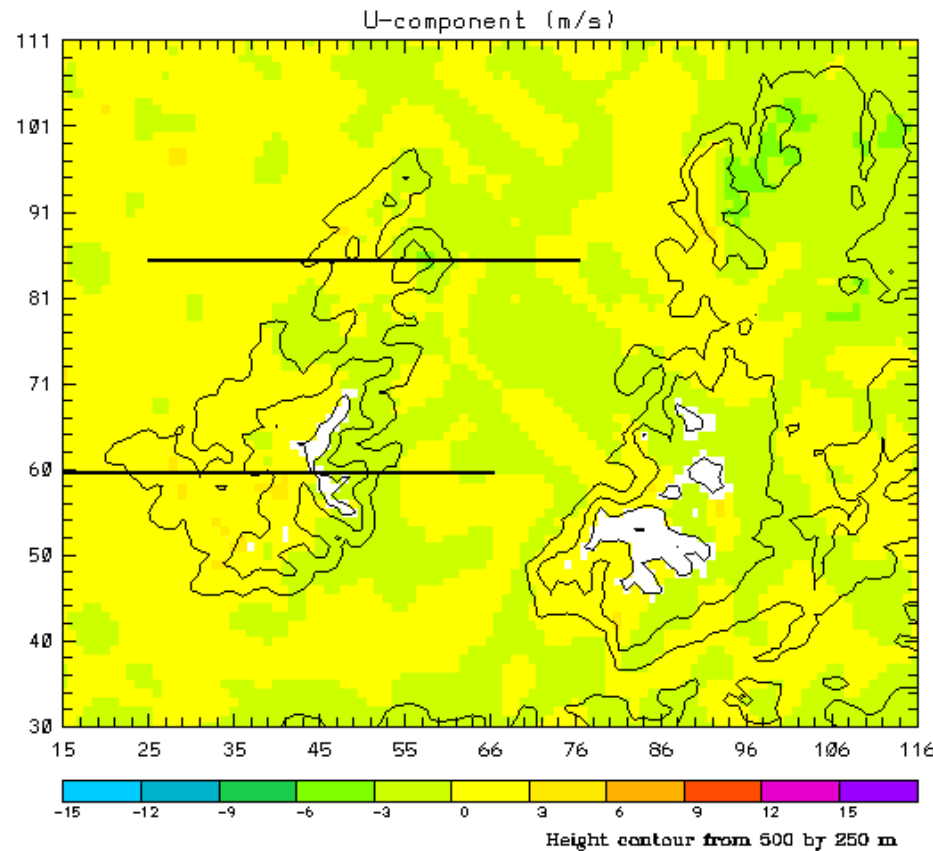


MesoNH Simulations

12. Aug. 2007 15 UTC

13. Aug. 2007 10 UTC

west-east wind component (u)



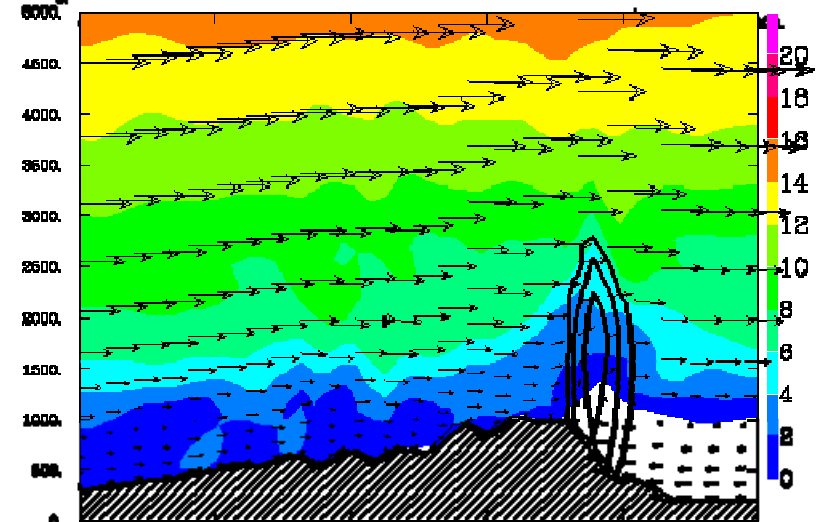
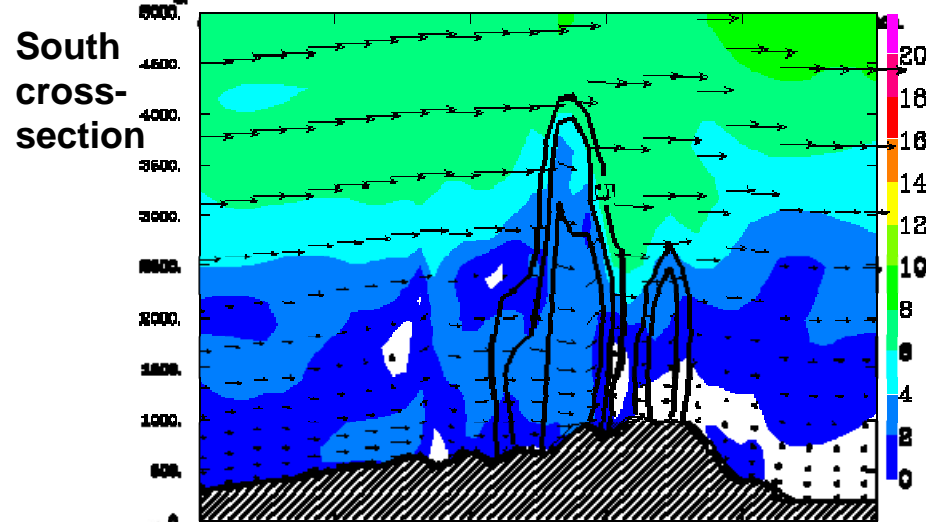
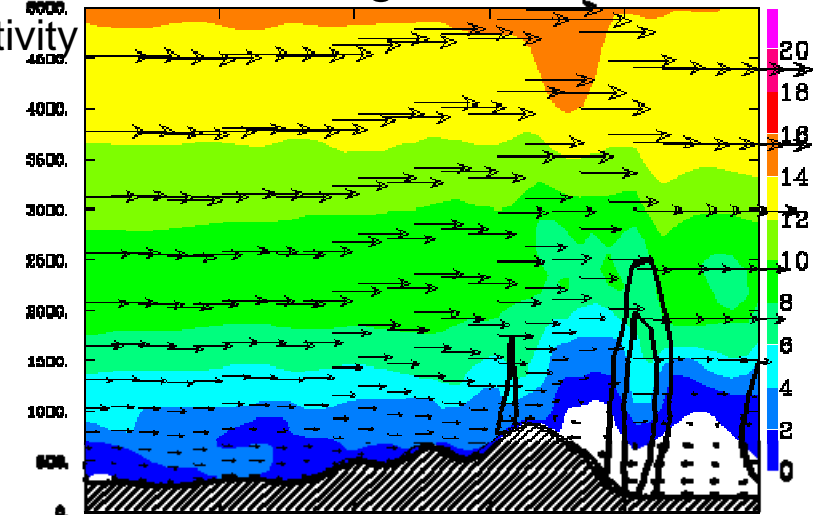
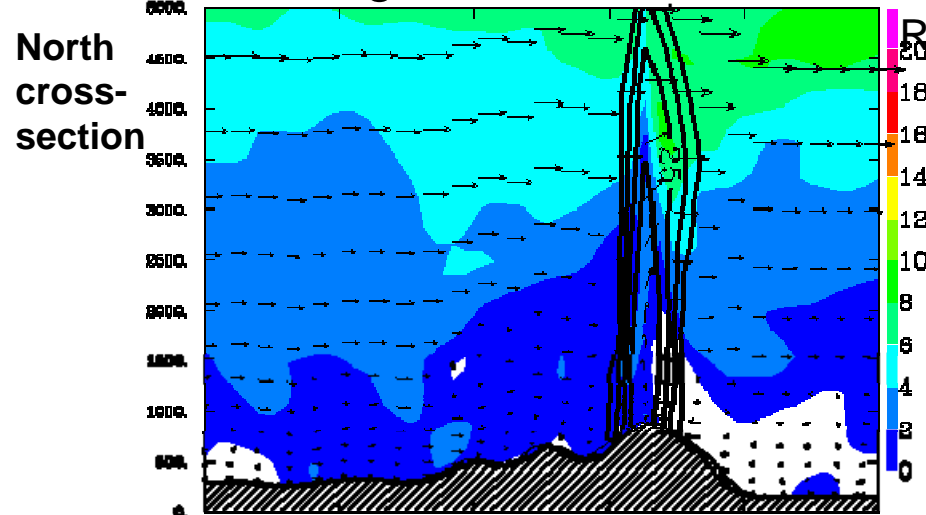


MesoNH Simulations

12. Aug. 2007 15 UTC

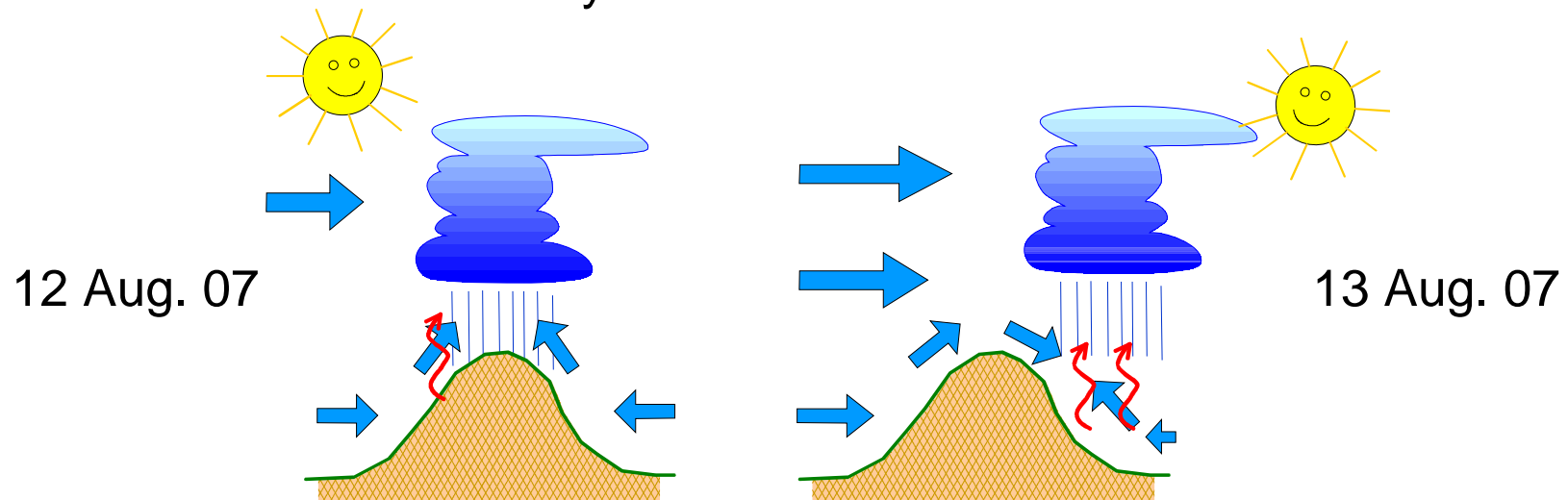
U-component

13. Aug. 2007 10 UTC



Conclusions

- Differences are caused by the wind field



- Models are able to simulate the situation and can provide additional information on the background of observations
- one of the COPS fundamental hypotheses
“Location and timing of the initiation of convection depends critically on the structure of the humidity field in the planetary boundary layer”
has to be amended: ➔ the wind field is also of importance



**Open
PhD position
at DLR
Oberpfaffenhofen**

**Topic:
Investigation of
Life Cycle using
Radar and Lidar**