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

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

![Graphs showing life time and speed of cells](image)
Synoptic Conditions

Radio soundings at Nancy (100 km West)

12 Aug. 12 UTC

13 Aug. 12 UTC
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

North cross-section

13. Aug. 2007 10 UTC

South cross-section

Reflectivity

U-component
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