

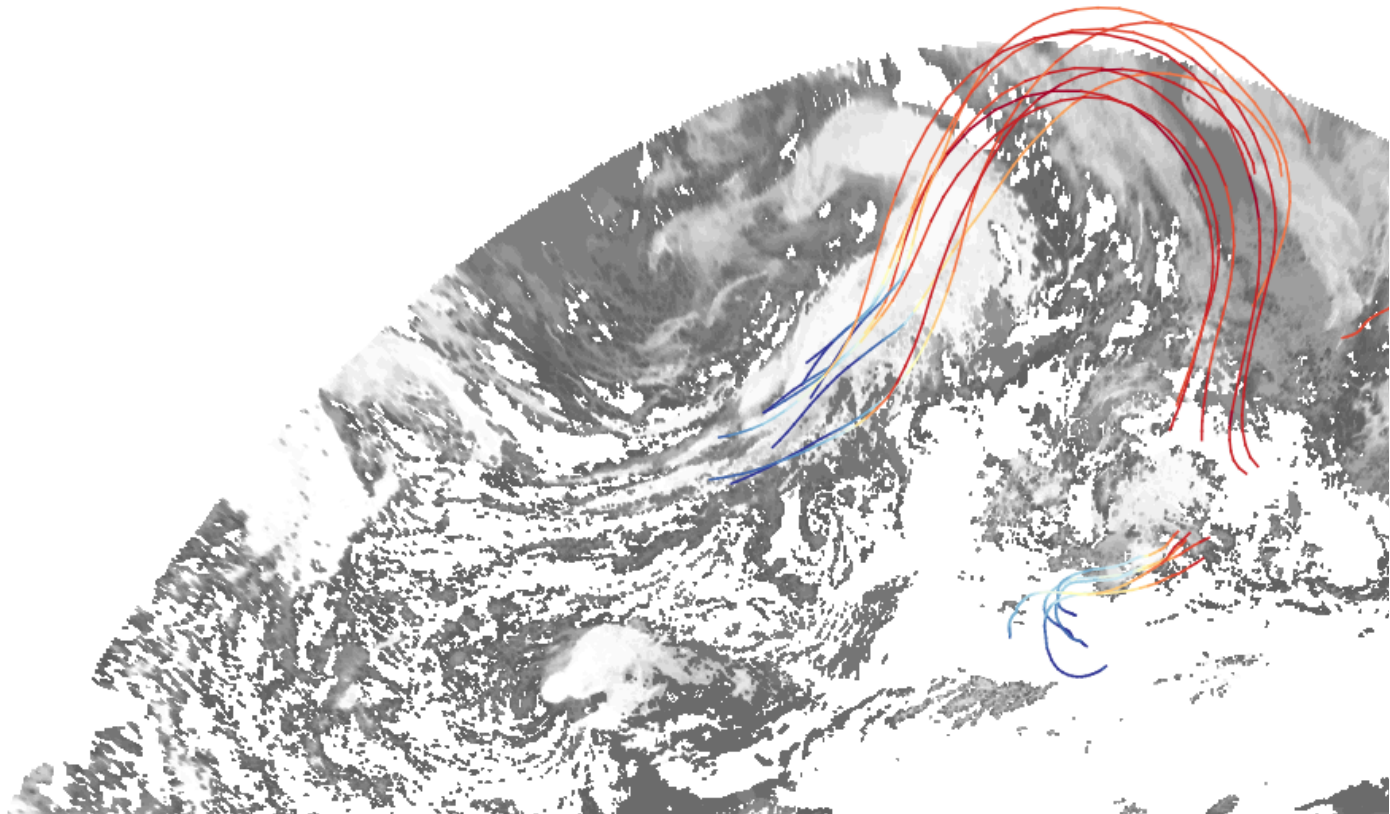
PhD-project:

Embedded convection in warm conveyor belts (WCB)

Annika Oertel

Supervisors: Maxi Böttcher, Hanna Joos, Heini Wernli

ETHZ – IAC
Atmospheric dynamics

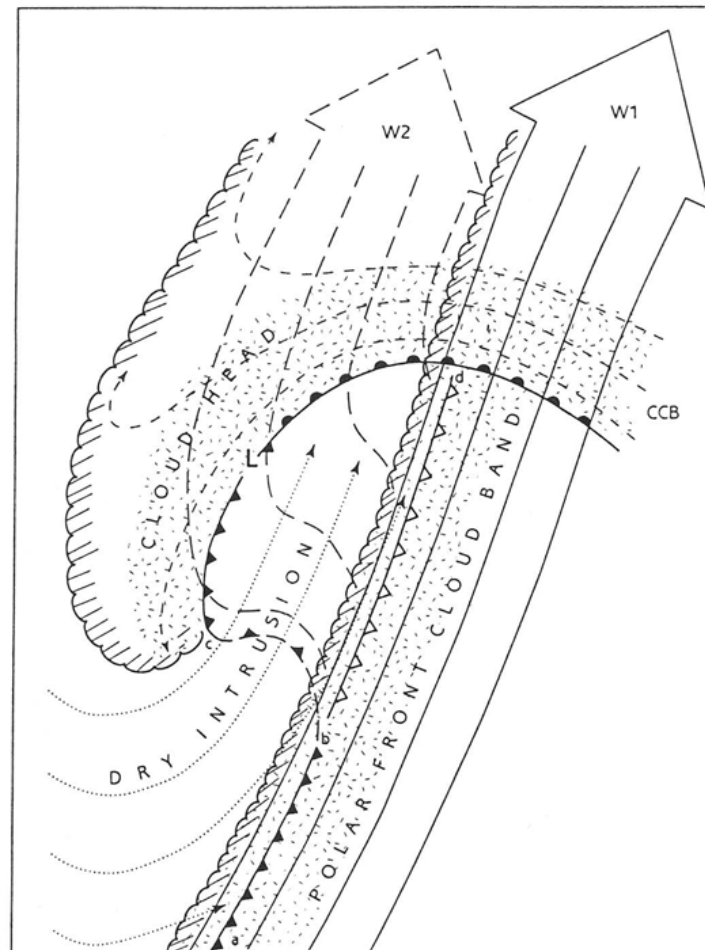


Embedded convection in warm conveyor belts

Introduction

Warm conveyor belts (WCB)

- Strongly ascending airstreams along the cold front propagating poleward and eastward
- Production of clouds and precipitation during ascent
- Modification of potential vorticity (PV)



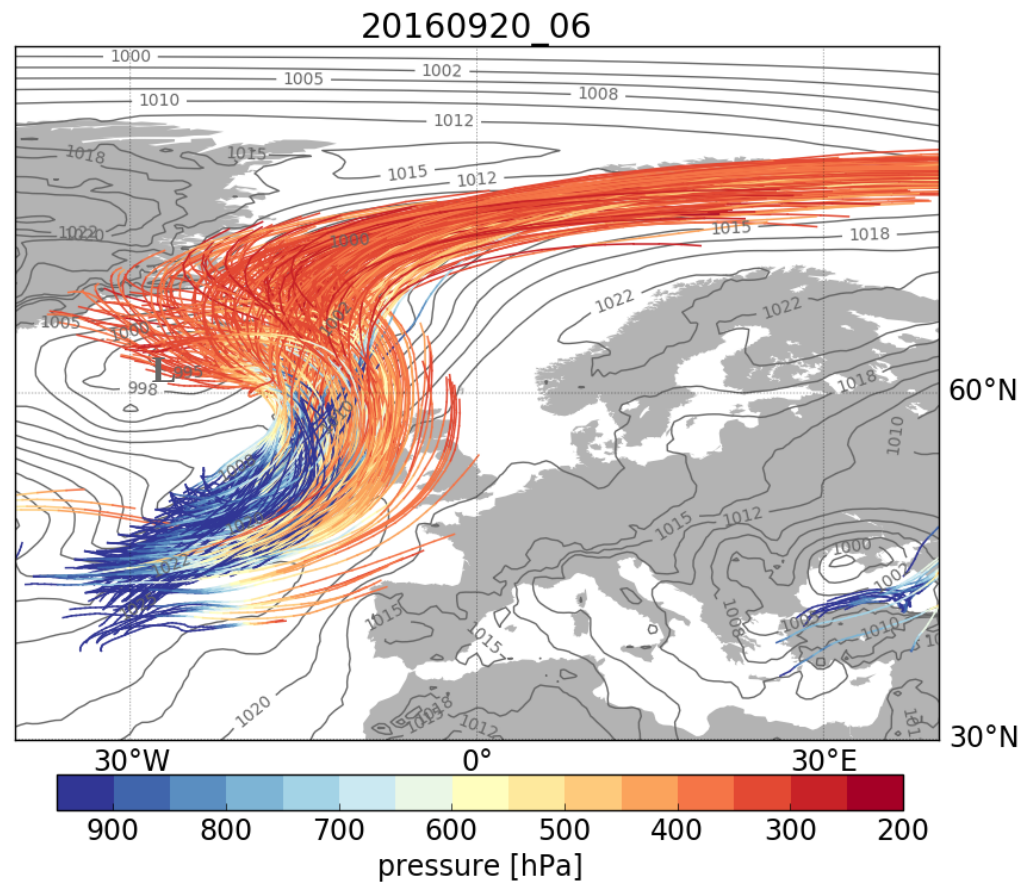
Browning 1999

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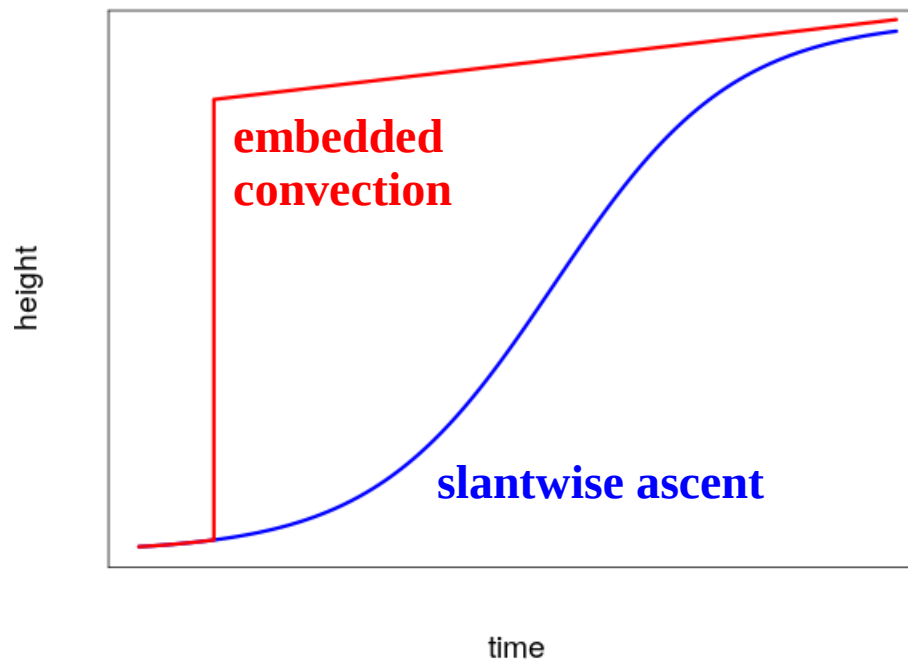
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Embedded convection in WCBs

- Co-occurrence of large-scale slantwise ascent and small-scale upright convection during a WCB ascent



Embedded convection in warm conveyor belts

Project overview

- 1) Identification and classification of regions of embedded convection in WCBs with satellite derived data in the eastern North Atlantic and Europe

Comparison of cloud top pressure of satellite data and pressure of ERA-Interim based WCBs

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Calculation of online trajectories with convection-permitting COSMO at 2 km horizontal resolution

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- 3) Investigation of the impact of embedded convection in WCBs on the microphysics

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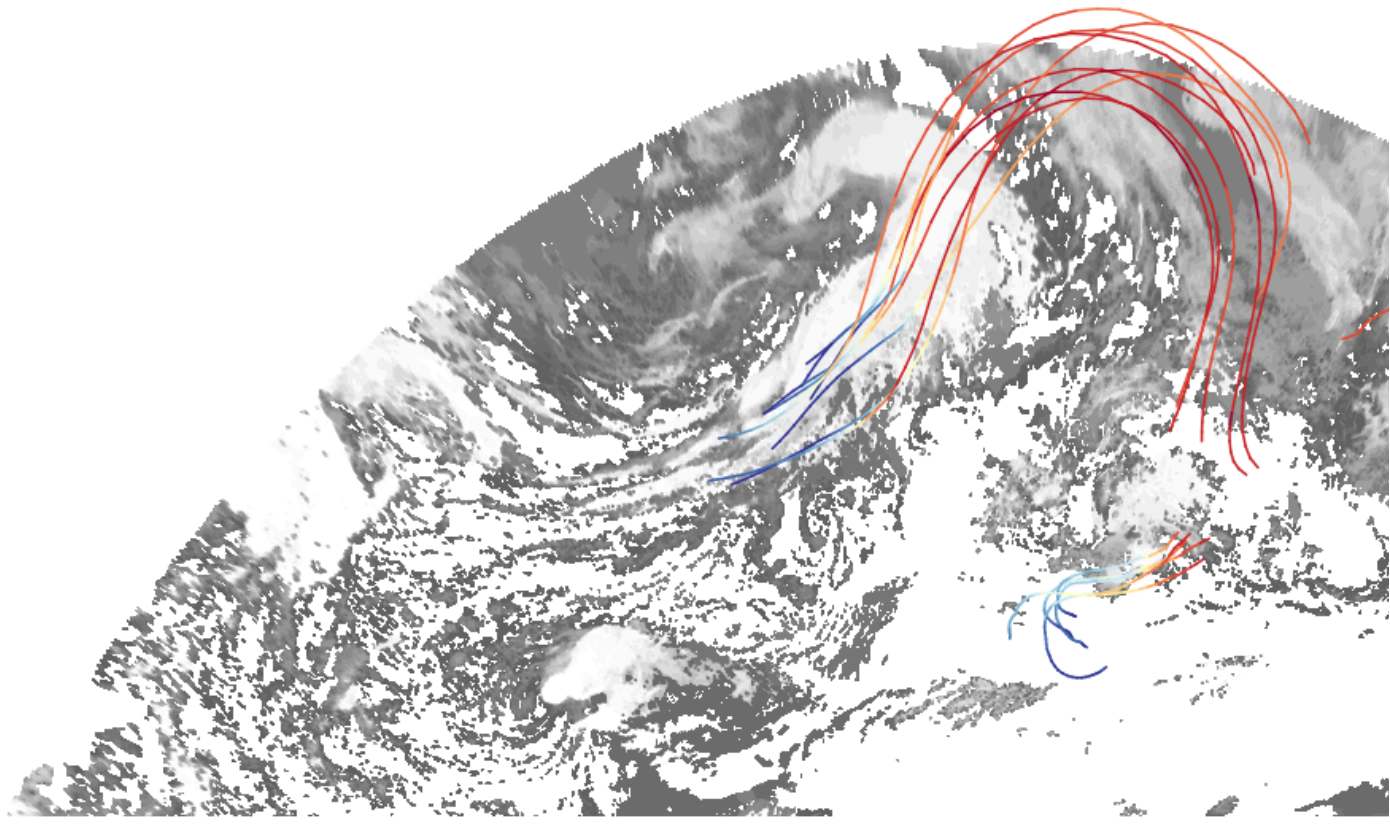
- 3) **COSMO**: Comparison of high resolution convection-permitting (2 km) and coarser scale models (7 km and 28 km)

Comparison of the representation of embedded convection in COSMO-2 with models with coarser resolution

- 1) Analysis of potential problems of the parameterization of convection in coarser scale models, in particular with respect to PV and surface precipitation

Embedded convection in warm conveyor belts

Thank you
for your attention



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References

Browning, K. A., 1999: Mesoscale aspects of extratropical cyclones: An observational perspective. In: Shapiro, M. A. and Grønås, S. (eds.), *The life cycles of extratropical cyclones*, Springer, 265-283.