



Hirlam and CTM

Sander Tijm

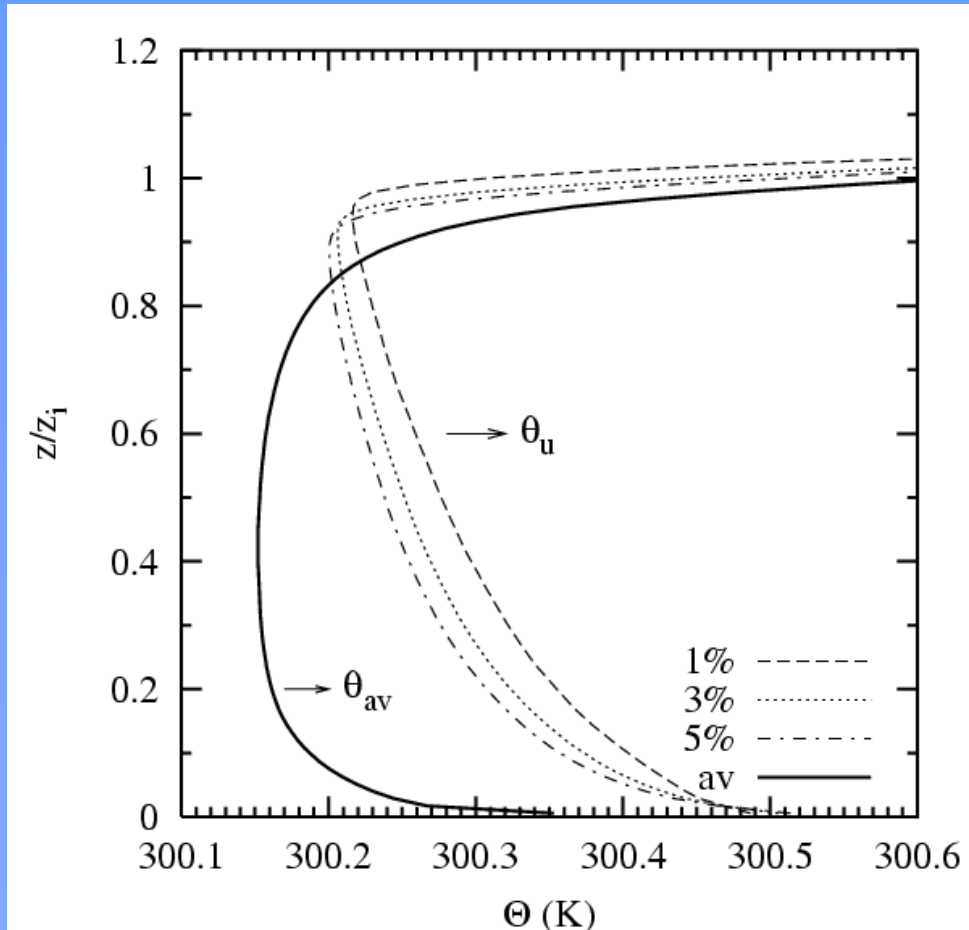
## •••• Contents

- Hirlam plans for mesoscale modelling, synoptic scale modelling and short range ensembles
- Hirlam plan for CTM
- Hirlam and CTM in future

## •••• Hirlam model plans, mesoscale

- Develop mesoscale model for 2-2.5 km resolution in cooperation with Aladin consortium
- HARMONIE
  - Aladin NH-kernel plus Meso-NH physics or Alaro physics, depending on quality, added value and cost
  - Contribution to development of EDMF scheme
  - Contribution to development of surface scheme
  - Testing of Meso-NH physics, Alaro physics compared to Hirlam physics at 2.5 km
  - Definition of surface atmosphere interface, **demands from CTM?**

••• EDMF: important for mixing!



**Updraft at height  $z$   
composed  
of those grid points  
that contain the highest  $p\%$   
of the vertical velocities:  
 $p=1\%,3\%,5\%$ :**





## •••• Hirlam model plans, synoptic scale

- Hirlam model for use at 20-5 km scales, when NH-aspects not important 1-2 km.
  - Main effort will shift to mesoscale, some to EPS
  - Intercomparison of convection/condensation scheme
  - Work on stable boundary layer
  - New surface scheme with
    - Improved snow parameterization
    - Lake scheme
    - Better snow on ice
  - MSO/SSO



## •••• Hirlam model plans, EPS

- Hirlam ensembles as part of GLAMEPS
- Consists of different Hirlam runs with different ensemble generating techniques
  - Multi model multi-analysis ensemble (Spain)
  - Targeted ECMWF Singular Vectors (Norway)
  - Hirlam Singular Vectors (Netherlands, research)
- EPS runs collected at ECMWF and EPS products distributed
- **CTM & EPS?**



## •••• Hirlam CTM plan 2007

- Coupling (offline) of Hirlam to CTM
- .....
- Not much experience with CTM in Hirlam.



## •••• Future Hirlam CTM work, questions



- Interface between meteorological model and chemistry?
- Which parameters are missing in Hirlam output for offline coupling?
- Which species have direct impact on meteorology?
- Which species or chemistry in Hirlam (online coupling)?
- Pollen? Sea salt? Dust? Aerosols?





## •••• Future Hirlam CTM work, questions



- Advection options in Hirlam, cost <->accuracy?
- Common chemistry module in Hirlam,
- Building in in reference, guaranteed in future Hirlam updates
- Surface atmosphere interface for SURFEX
- CTM and EPS?



## •••• Future Hirlam CTM work

- What is necessary (verification)?
- What is interesting?
- How to organize, who is going to do what
- Discussion -> plan