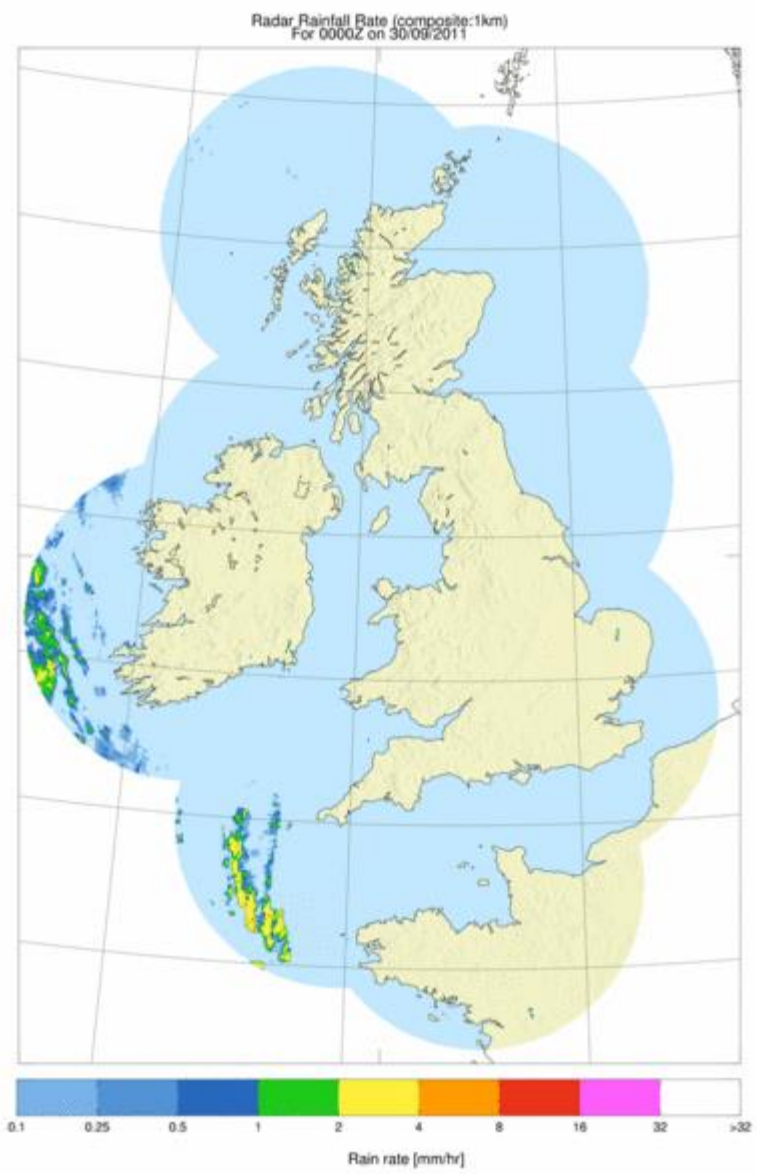
DIAMET project meeting
Manchester, UK
7 March 2013

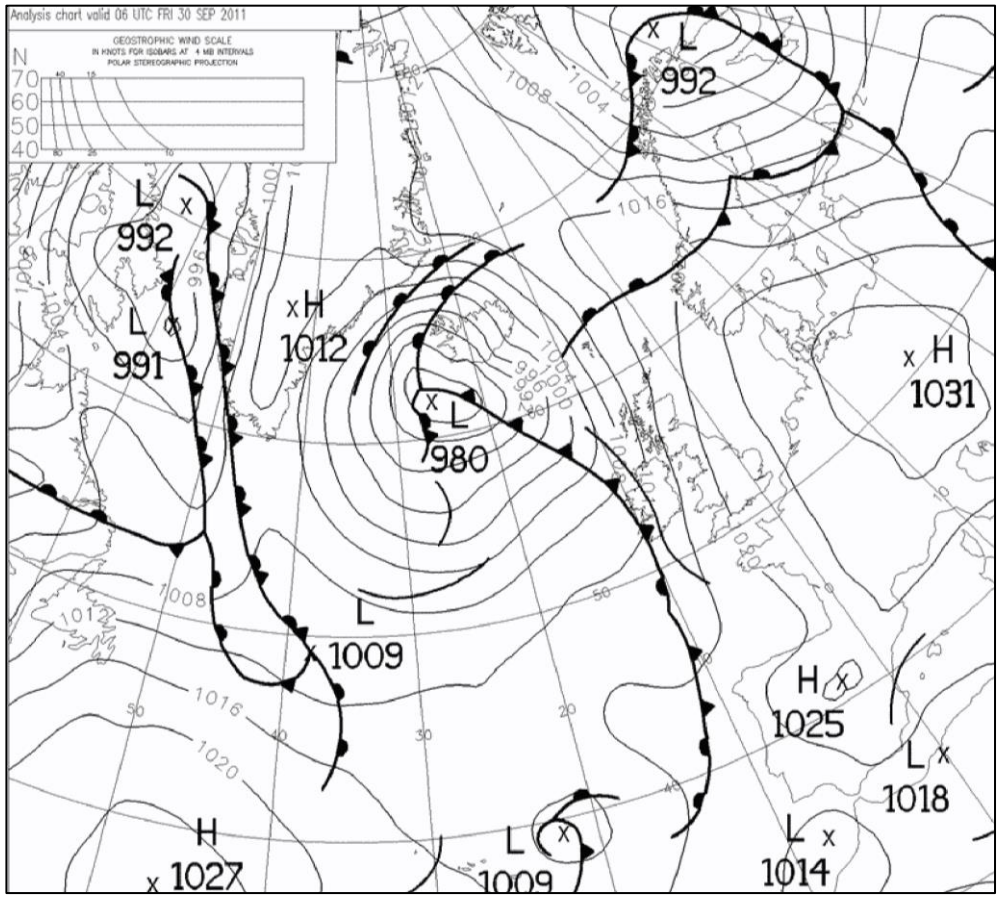
University of Reading
NATURAL ENVIRONMENT RESEARCH COUNCIL

Progress on the analysis 30 September 2011 DIAMET case

Oscar Martínez-Alvarado and Bob Plant

Department of Meteorology
University of Reading





Met Office operational analysis chart at 06 UTC 30 Sep 2011
(archived by http://www.wetter3.de/fax)

Synoptic model validation

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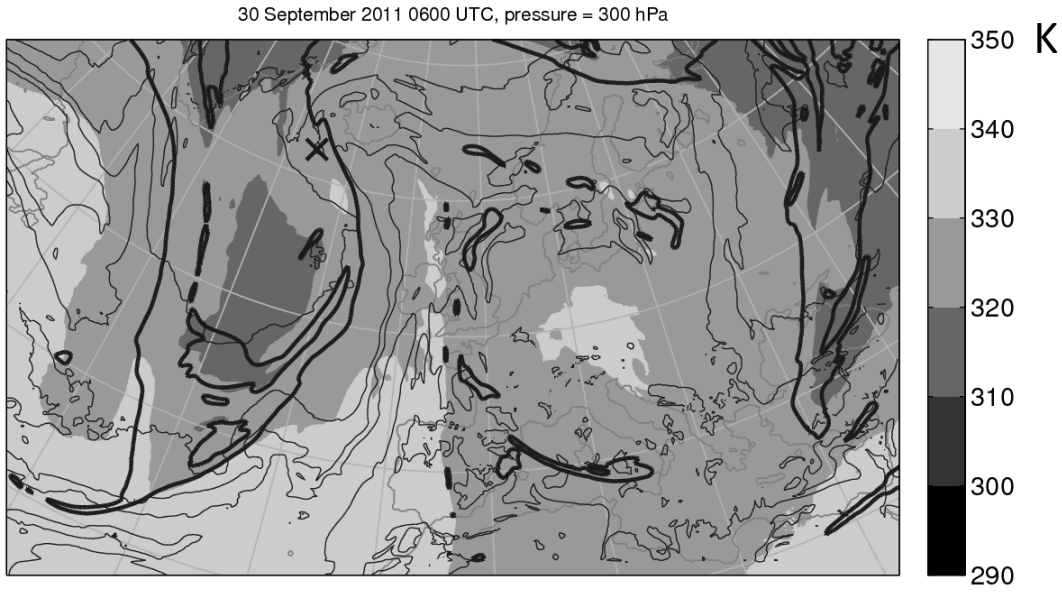
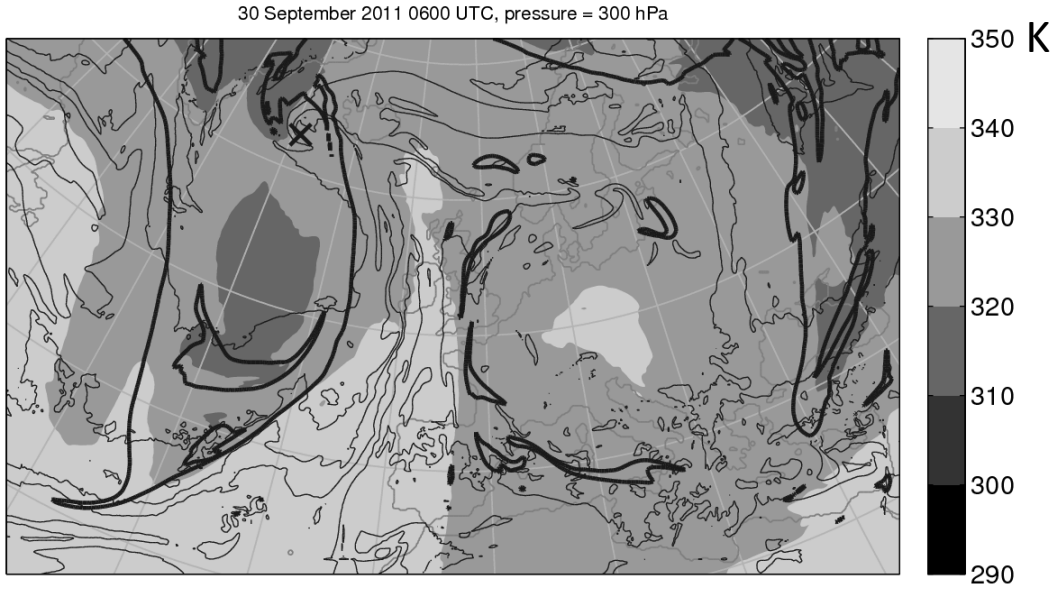


MO operational analysis



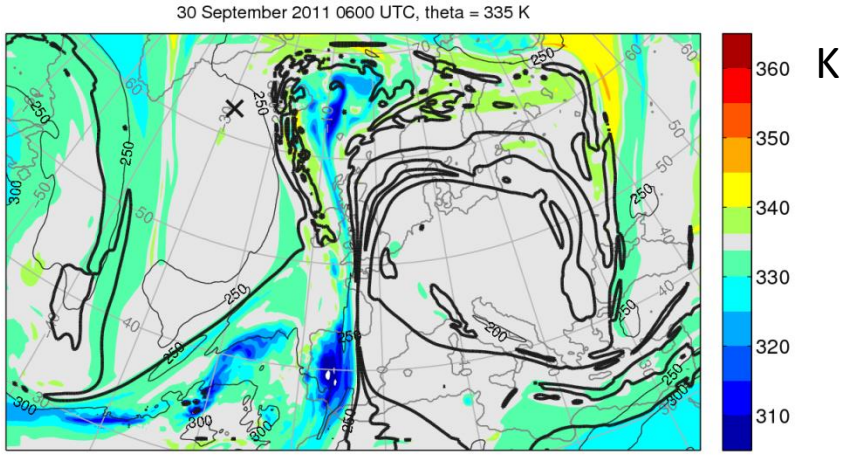
Reading MetUM simulation (T+24)

Theta-tracers

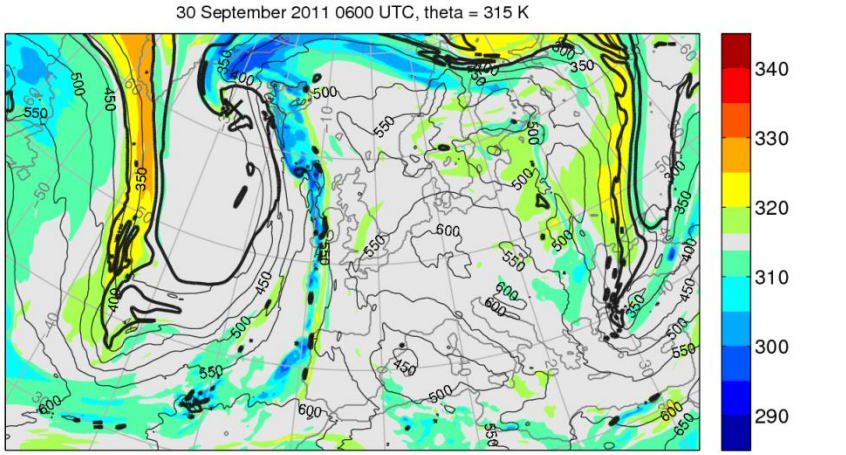
Conserved (subject to advection only) theta-component on theta-levels

Bold line: 2-PVU isoline

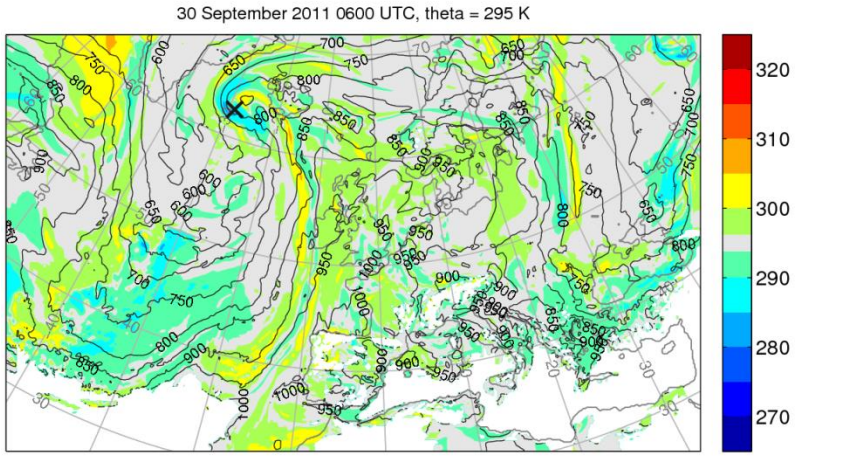
335 K



315 K

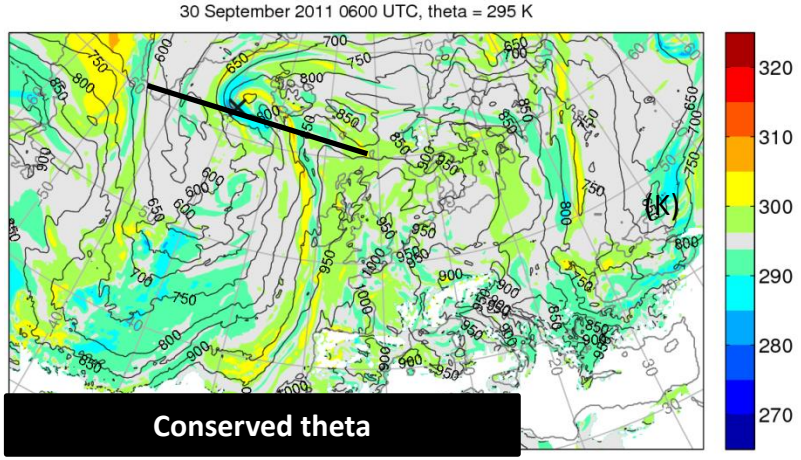


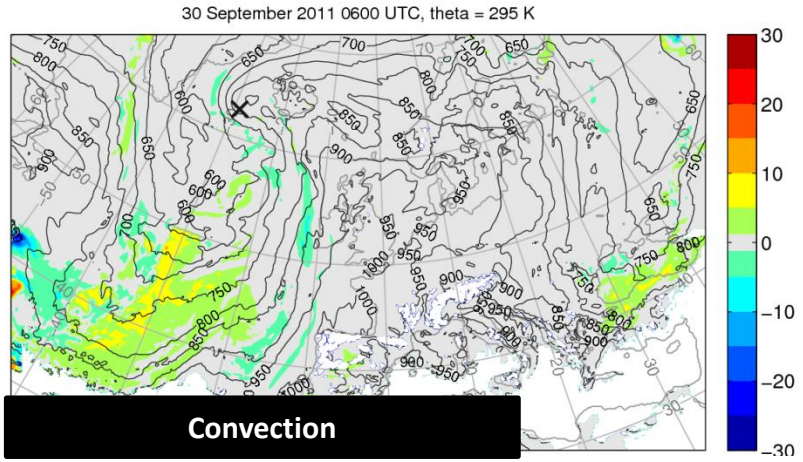
295 K

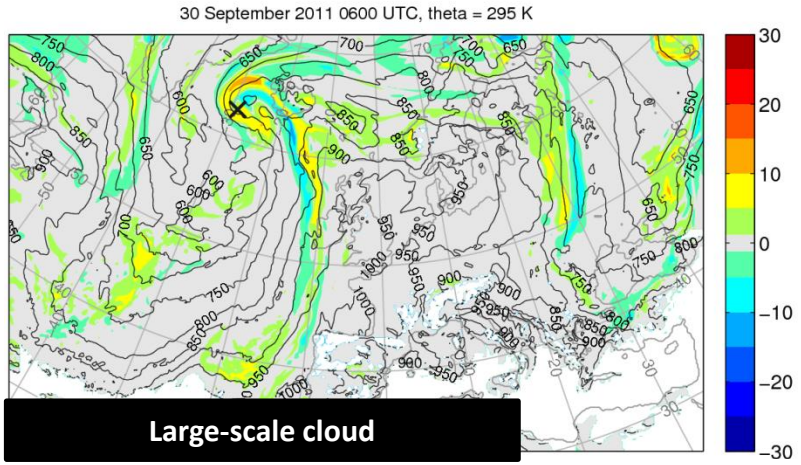


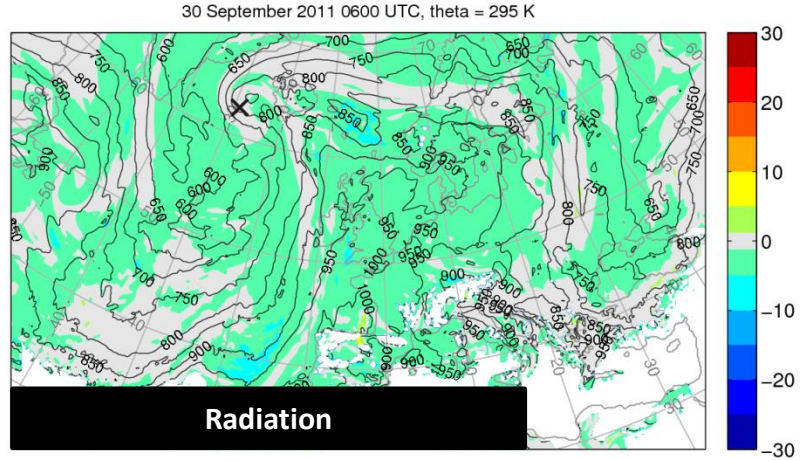
Diabatic theta

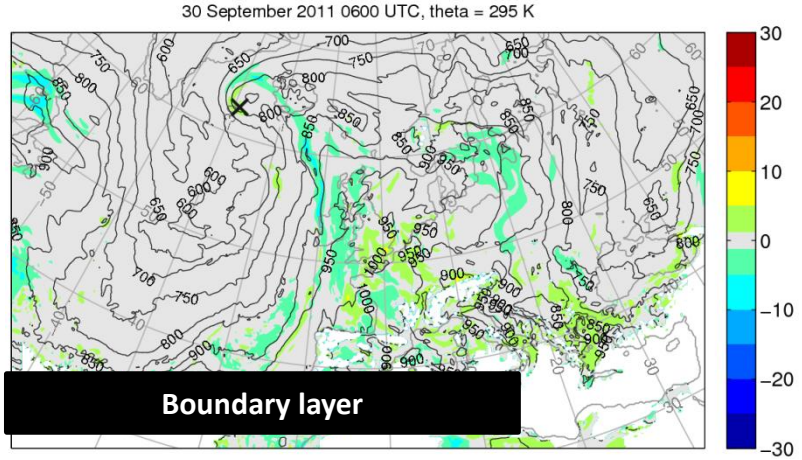
295 K





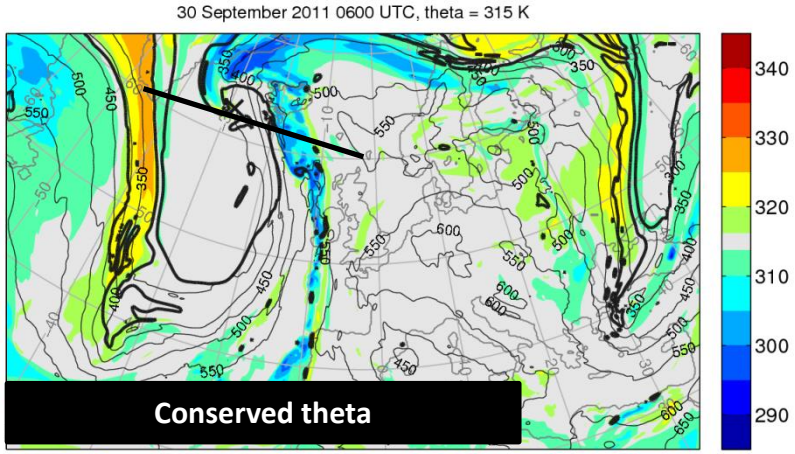


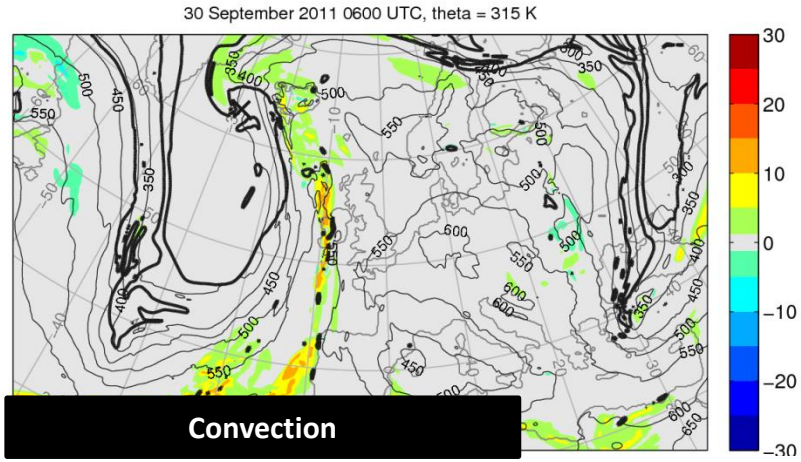


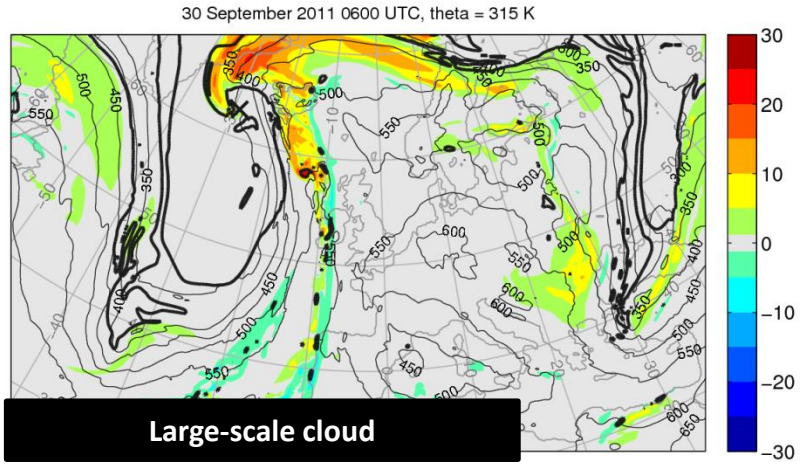


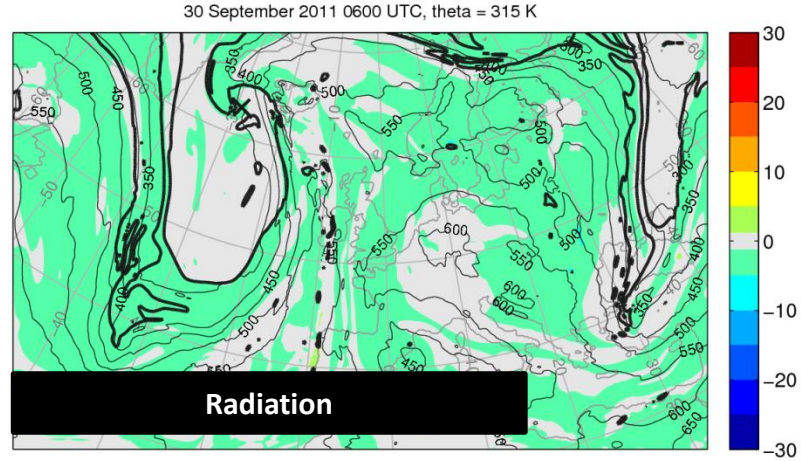
Diabatic theta

315 K



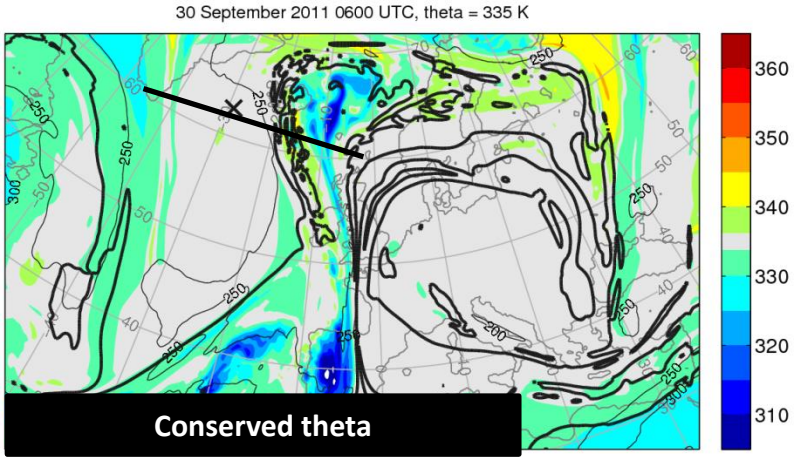


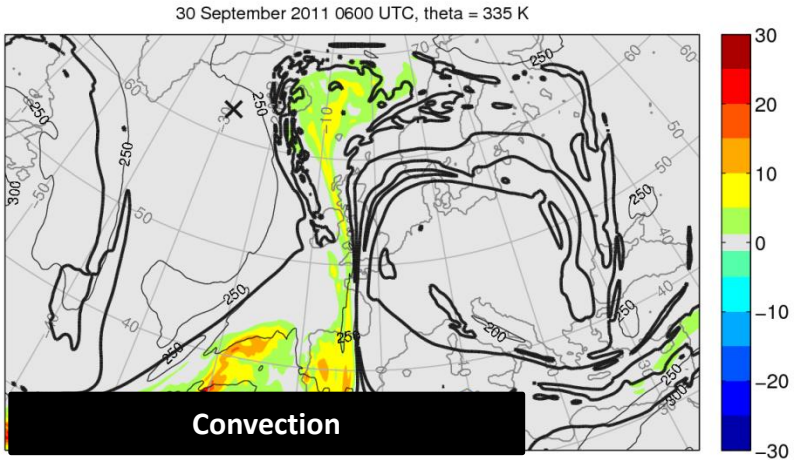


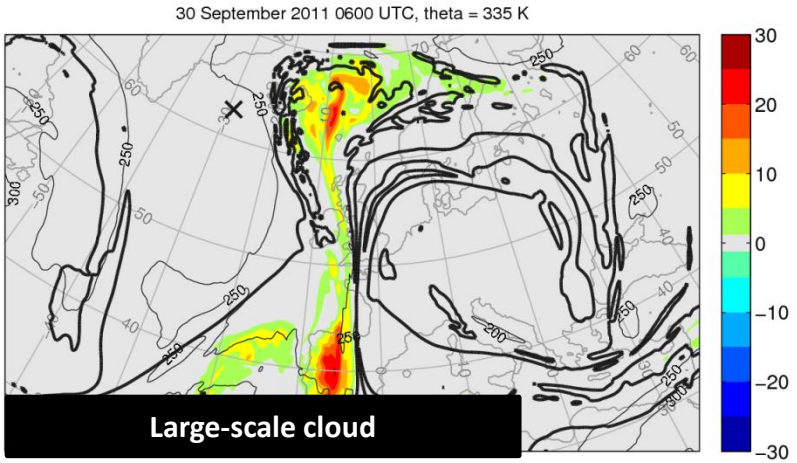


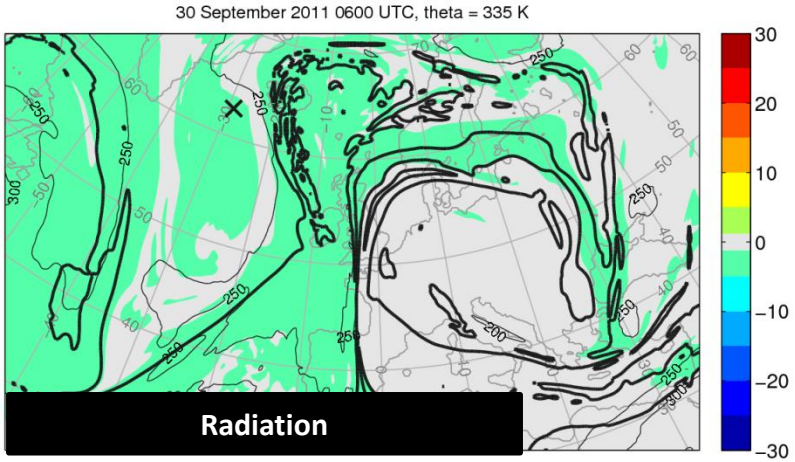
Diabatic theta

335 K









Diabatic potential temperature (Vertical structure)

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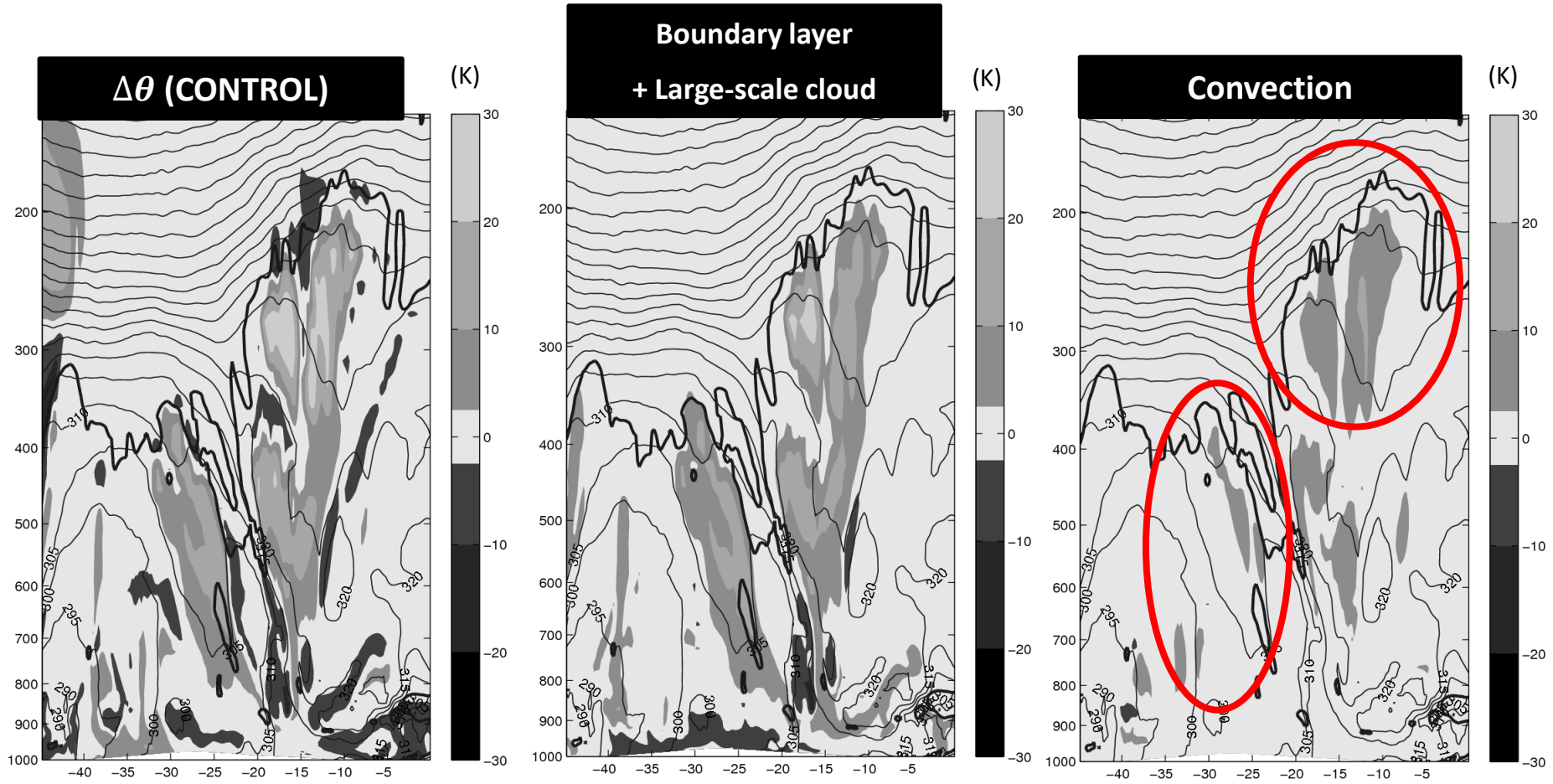
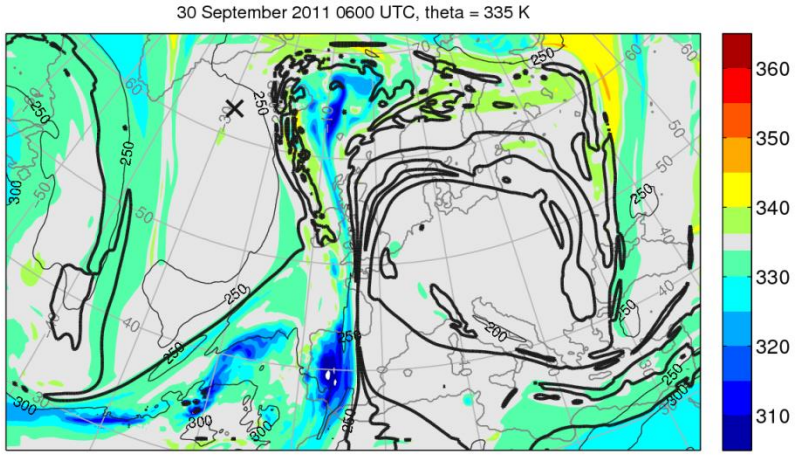
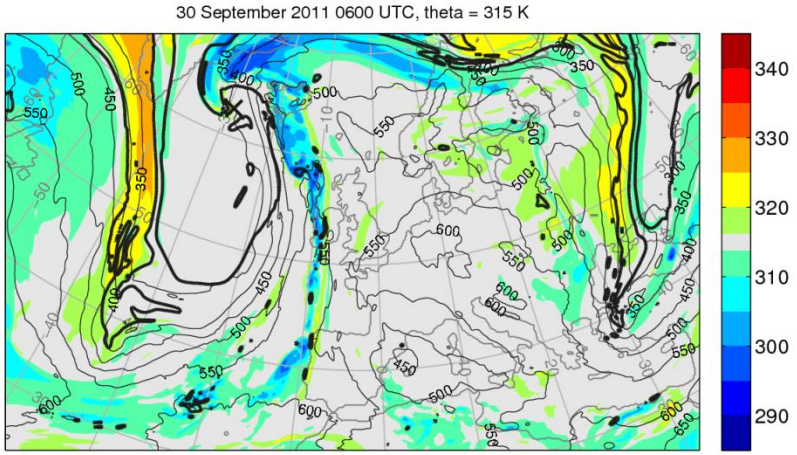


- **Bold black** lines represent the 2-PVU contour.
- Thin black lines represent equivalent potential temperature contours with a 5-K separation.

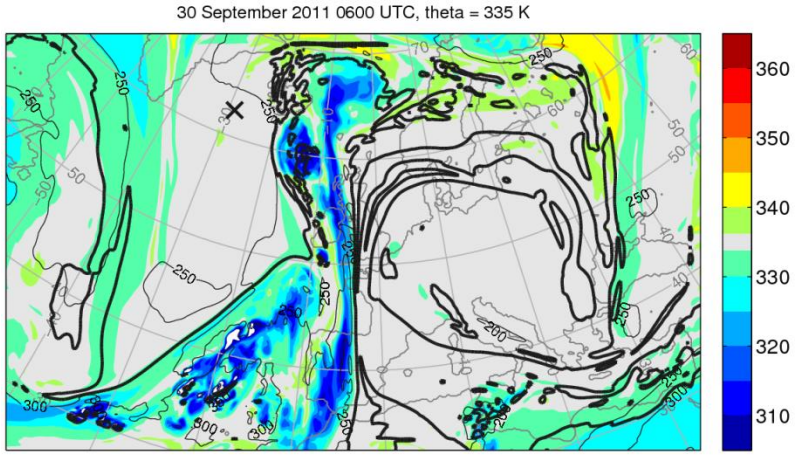
Sensitivity to convection parameterisation

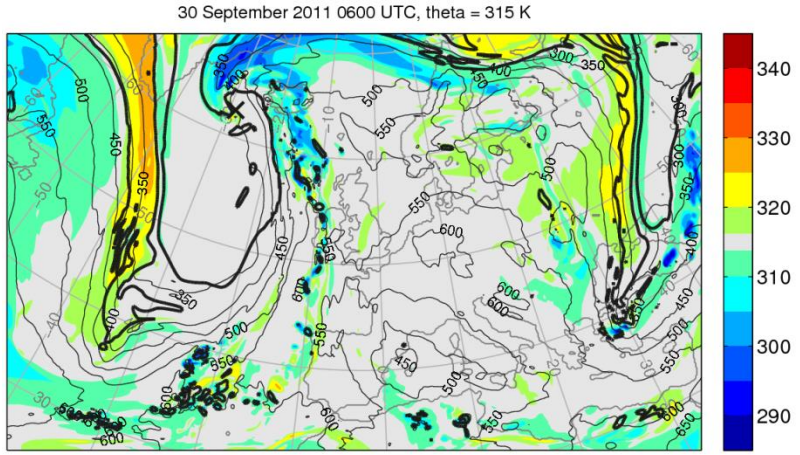
Standard convection parameterisation
CAPE closure timescale = 1800 s



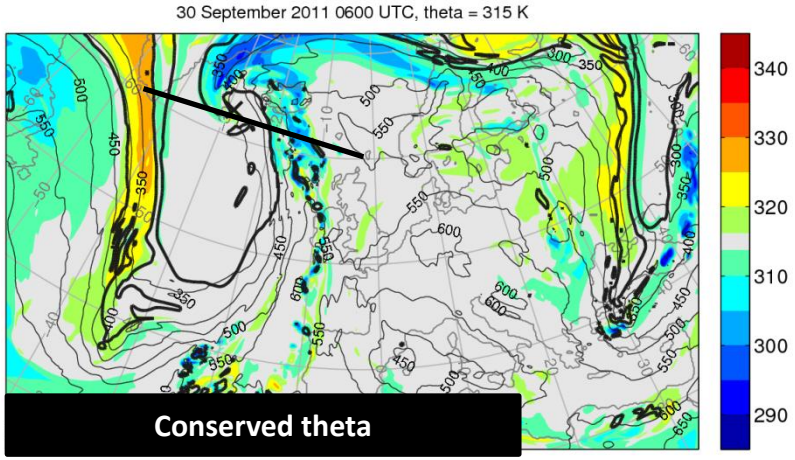


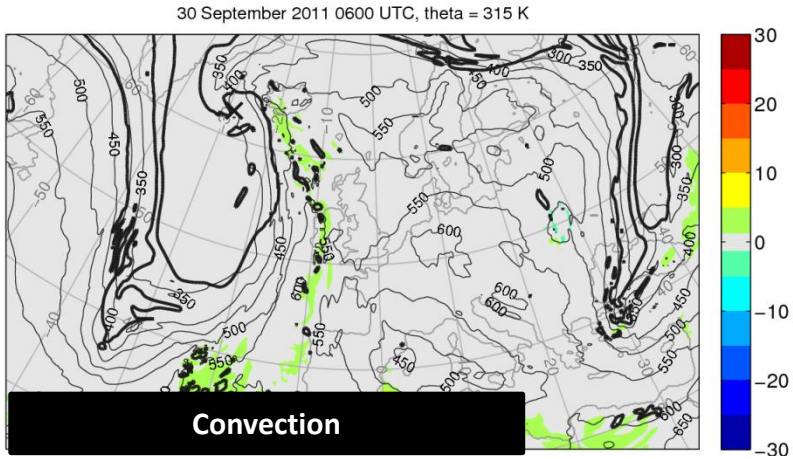
Reduced convection parameterisation
CAPE closure timescale = 15000 s

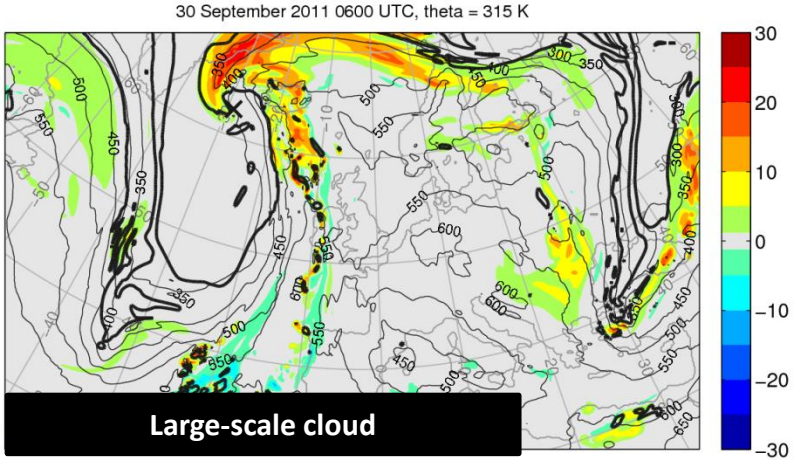


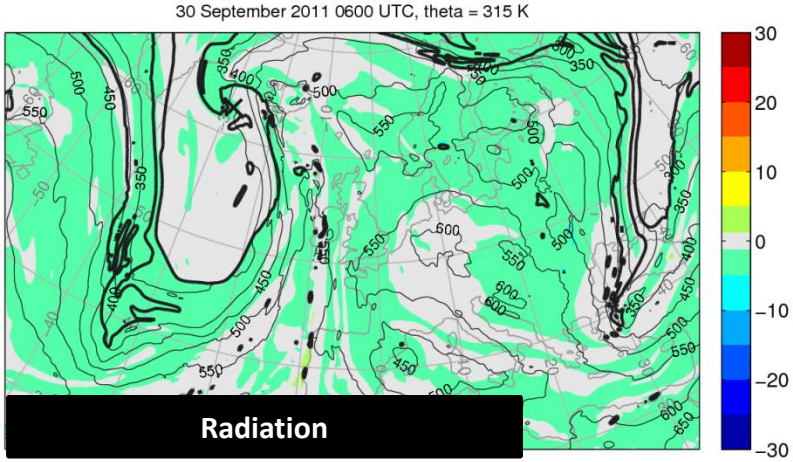


335 K



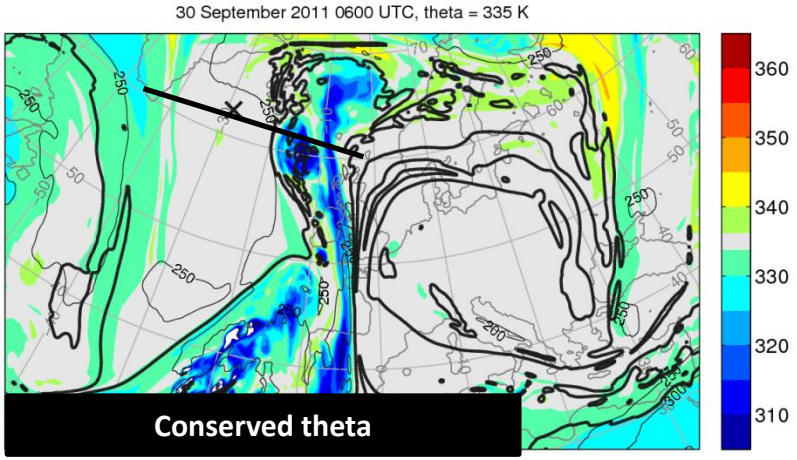


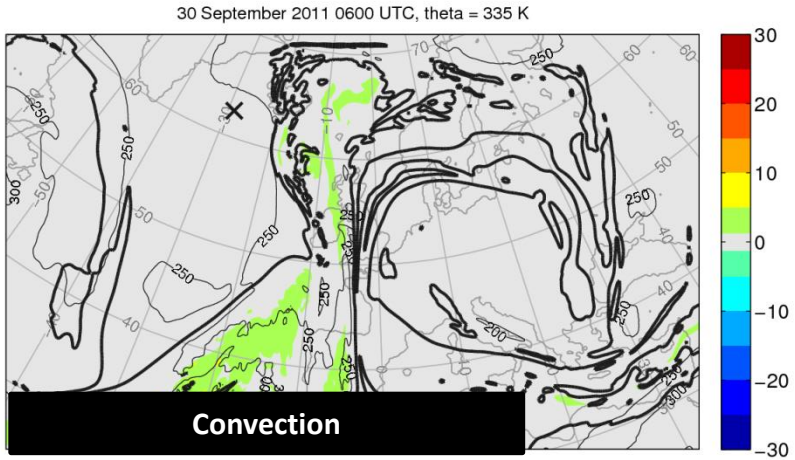


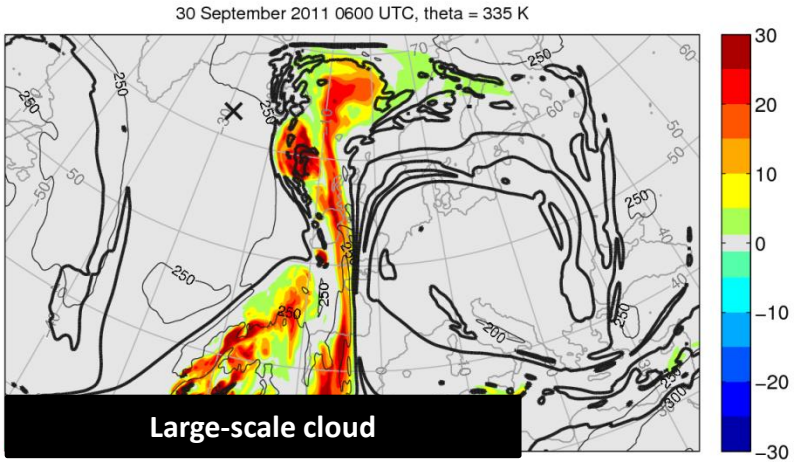


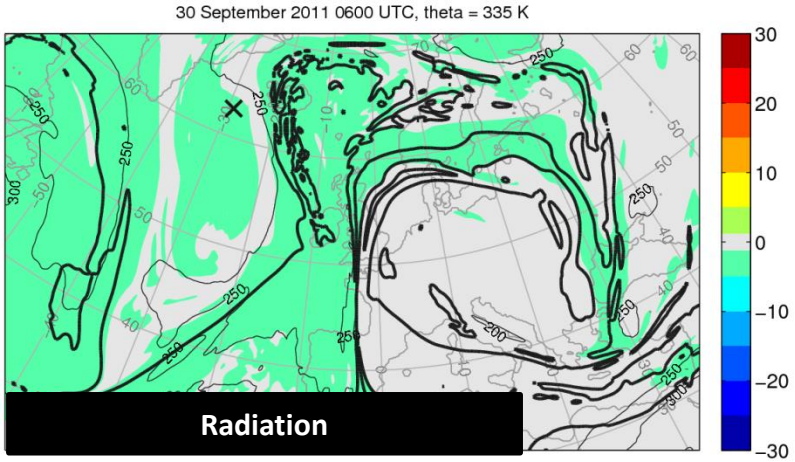
Reduced parameterised convection

335 K









Reduced parameterised convection

Diabatic potential temperature (Vertical structure)

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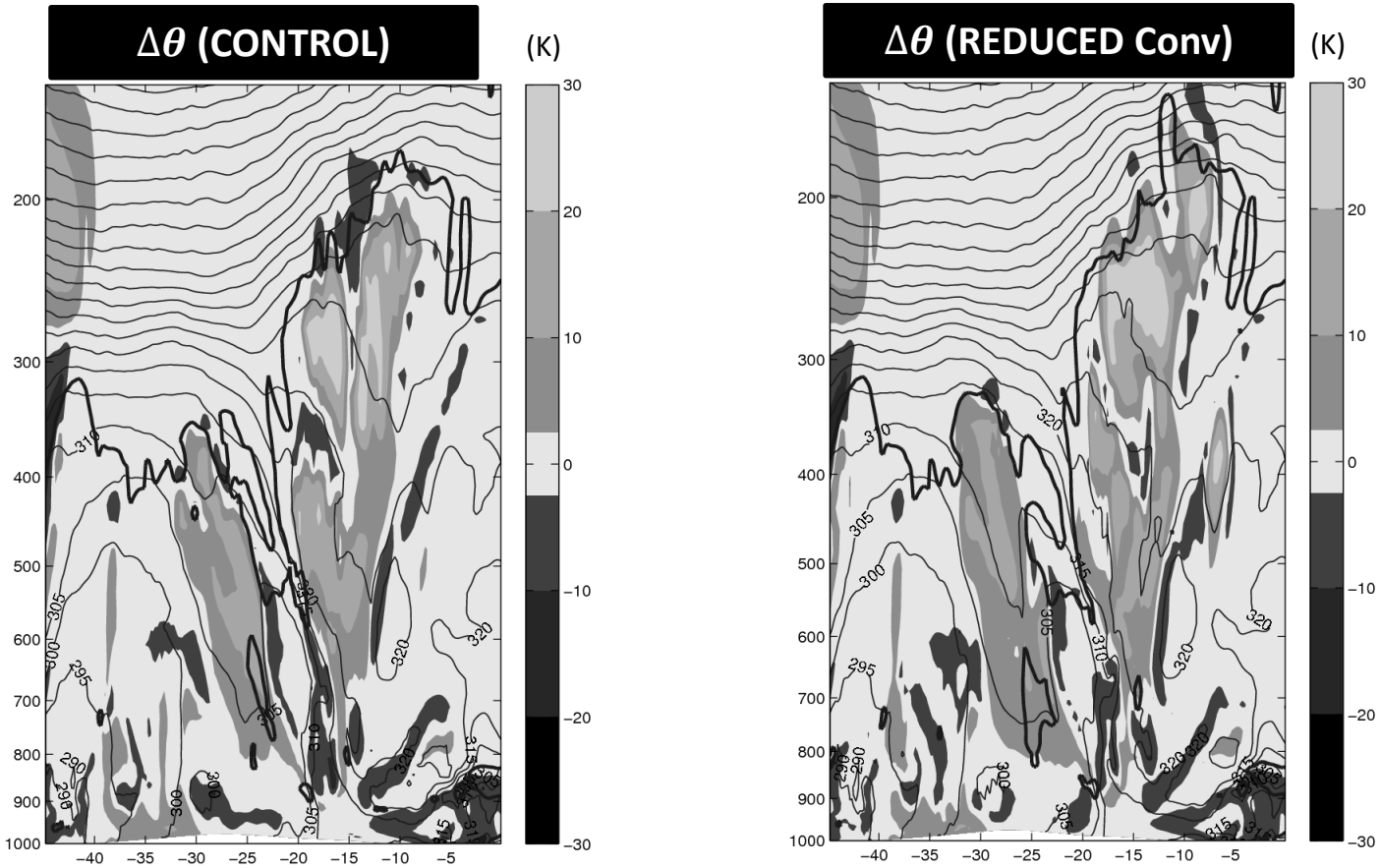

- **Bold black** lines represent the 2-PVU contour.
- Thin black lines represent equivalent potential temperature contours with a 5-K separation.

Trajectory analysis

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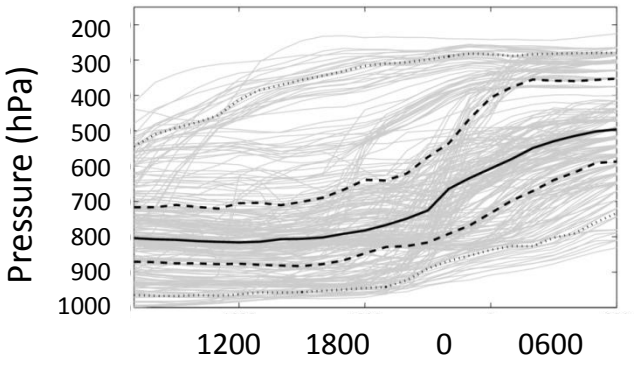
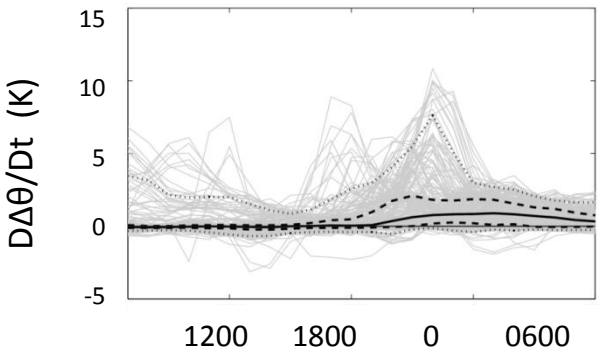
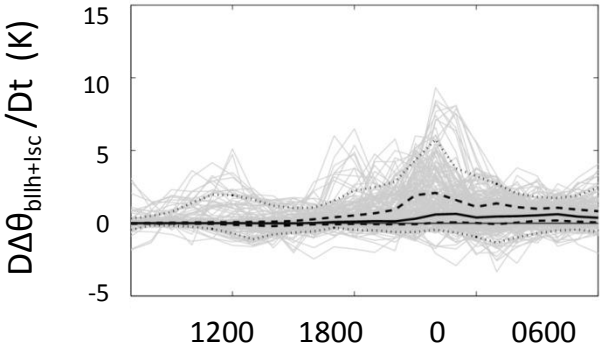
- Evolution along trajectories that have strong accumulated heating.
- Solid lines represent the median
- Dashed lines represent the 25th and 75th percentiles
- Dotted lines represent the 5th and 95th percentiles of the trajectory ensemble
- Grey lines represent individual trajectories.

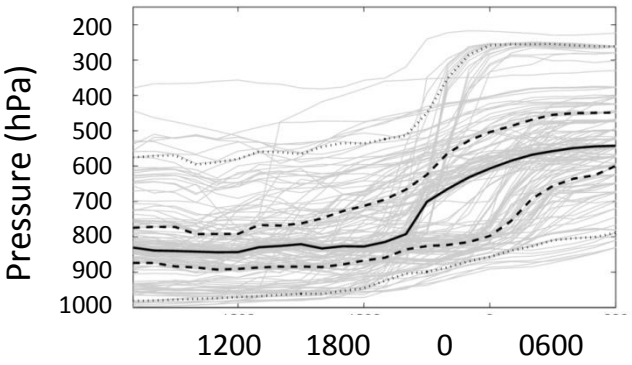
CONTROL

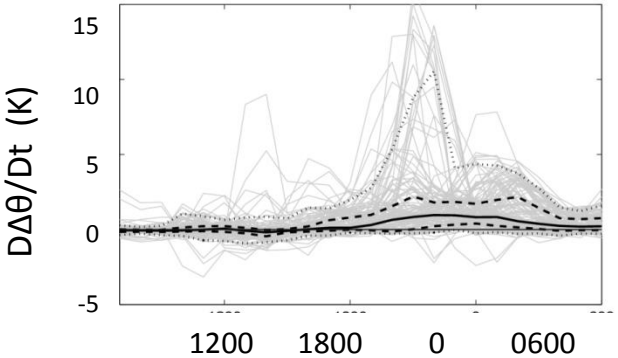


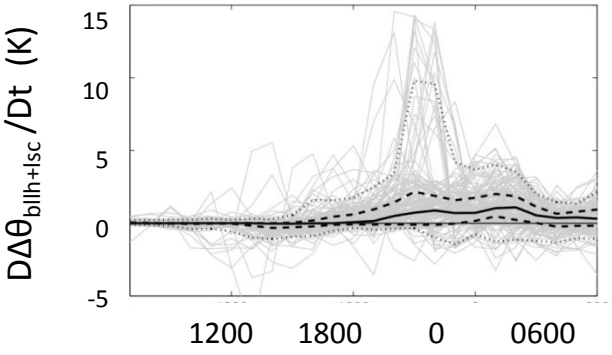




REDUCED Conv







Convective–large-scale precipitation split

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Rain rate averaged over an area of 1500-km radius centred on the low pressure centre, showing the contributions from convective (cvrain) and large-scale rain (lsrain) to the total precipitation (total) for CONTROL and REDUCED Conv.