Verification working group

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Contents of talk

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- Why verification working group?
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Cooperation plans physics (1)

- Hirlam developments approach completion in Hirlam environment
- Hirlam physics partially implemented in Aladin environment, use same code in Hirlam and Hirald
- Gradual shift from work in Hirlam environment to work in Aladin/AROME environment, porting of Hirlam ideas to Aladin/AROME

Cooperation plans physics (2)

- Development of EDMF-scheme for AROME
- Stable boundary layer mixing
- Radiation for SURFEX/AROME
- Surface scheme ideas for SURFEX (snow/forest scheme, lake model)
- 1D mesoscale model development
- Verification working group (mesoscale)
- Verification and validation tools

Why validation/verification group?

- Hirlam-Aladin mini workshop in Oslo
- Working group searching for physics challenges
- Most models are tested against limited number of usually extreme cases
- Average day-to-day weather also important to forecast correctly, standard set of cases, sanity check for new models, challenge for physics
- Framework for model intercomparison, testing new models, learn from strengths of other models, baseline for new developments
- Analogous to MetOffice validation procedure

Members of WG

- Gwennaelle Hello (France, Aladin)
- Mariska Derkova (Slovakia, Aladin)
- Sander Tijm (Netherlands, Hirlam)
- Kalle Eerola (Finland, Hirlam)
- Doina Banciu (Romania, Aladin)
- Siham Sbii (Morocco, Aladin)
- Tamas Hirsch (Hungary, Aladin
- Francois Vinit (MF, Aladin)
- ..... (Norway, Hirlam)

Work plan (1)

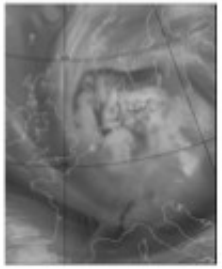
- set up a website:

  http://www.knmi.nl/~tijm/Verif/Verifworkg.html

- collect possible weather types, decision on order of importance-> discussion
- collect one case per weather type (describe general weather, importance for physics)
- Initially one case per person (8)
- decide what data to collect in the verification database and what format (minimum set, extension depending on case and available data)

Verification & Validation workinggroup

Cases | Data | Tools | Members



Validation and verification workinggroup

Mesoscale verification and validation workinggroup

Why a verification workinggroup?

During the Oslo HIRLAM-ALADIN mini-workshop on 12 and 13 December 2005 it was decided to start a small working group on the verification of special cases for physics development. The idea is to select a comprehensive set of representative test cases, covering the average weather types for which it is important for our models to perform well. This set can then be used for testing schemes in a more general way and for a larger variety of circumstances than is usually done in validation exercises.
Some possible phenomena that can be studied with these cases are (recently added cases in red):

- Onset of fog
- Persistent low clouds
- Orographic precipitation and precipitation shadows behind mountains
- Stable boundary layers, very low temperatures over snow in winter
- Rapid cyclogenesis
- Anticyclonic situations over Central Europe
- Onset of (severe) summer convection
- Squall line evolution
- Enhancement of convection over sea or the decrease of convection over land
- Cold fronts with heavy rainfall
- Mesoscale convective systems/complexes
- Sea breezes, possibly initiating deep convection, mountain and/or valley winds
- Wind in front of, over, between and behind mountains
- Shallow, fiar weather cumulus under high pressure conditions
- Coastal fronts
- Organised convection due to land/sea distribution

Note that the cases to be selected are not the most extreme ones, but rather average day to day weather that is also important to forecast correctly and that is sometimes overlooked in the testing and validation of new or updated schemes.

Preliminary workplan

- set up a website where we collect the cases and their descriptions, together with a description of the verification data and where to find this data and a description of the working group.
- set up a verification data database (at ECMWF?)
- collect proposals for weather types that need to be validated/verified and decide on which weather types will be put on our

Weather types, phenomena (1)

- Onset and dissipation of fog
- Persistent low clouds
- Orographic precipitation and precipitation shadows behind mountains
- Stable boundary layers, very low temperatures over snow in winter
- Polar lows
- Rapid cyclogenesis
- Onset of (severe) summer convection
- Squall line evolution

Weather types, phenomena (2)

- Enhancement of convection over sea or the decrease of convection over land
- Cold fronts with heavy rainfall
- Mesoscale convective systems/complexes
- Sea breezes, mountain and/or valley winds
- Wind in mountainous areas
- Shallow, fair weather cumulus during anticyclonic situations over Europe
- Coastal fronts
- Organised convection due to land/sea distrib.

Work plan (2)

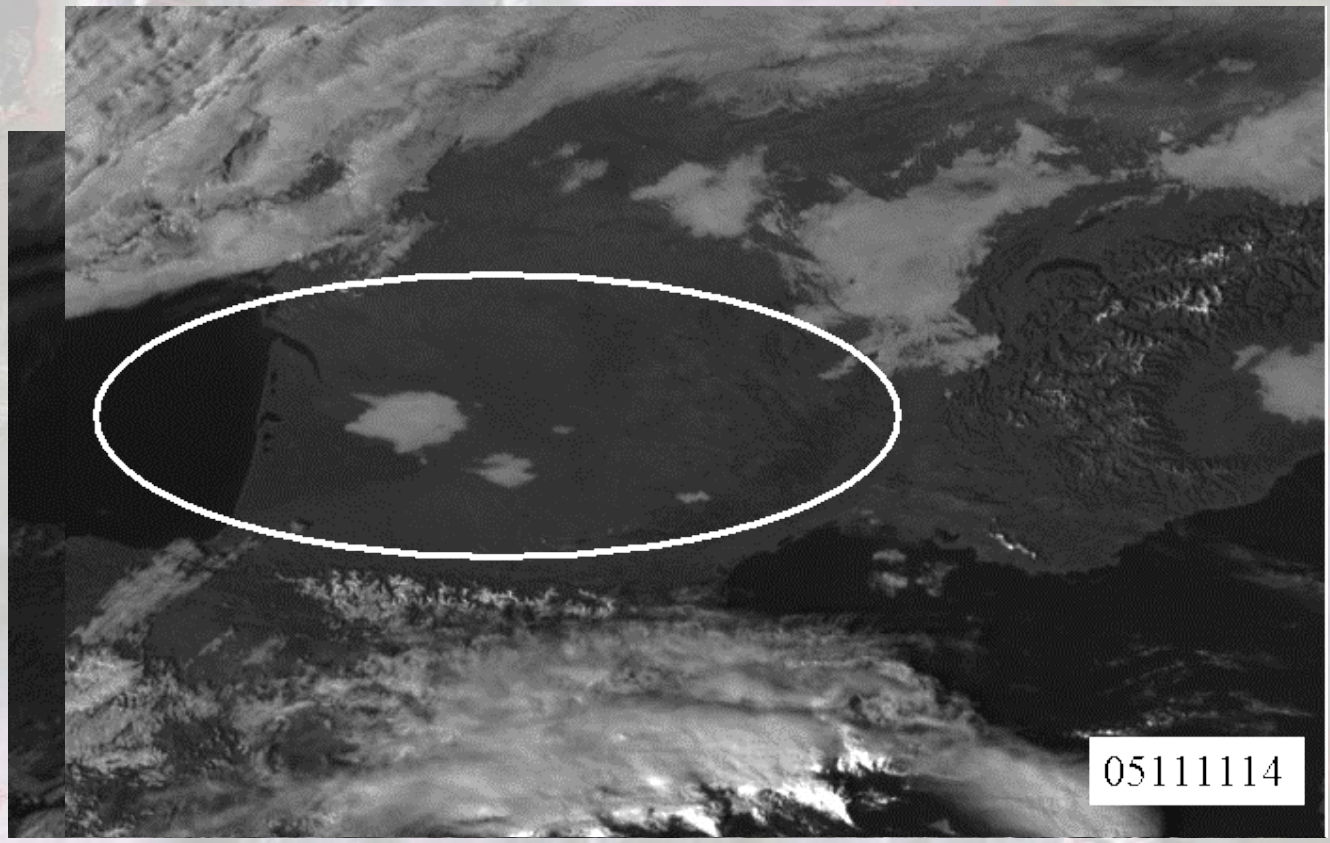
- set up a verification data database
- collect the verification data
- inventory of the validation/verification tools available
- validation/verification of the cases we propose with the different models plus model intercomparison

Validation data

- Minimum set:
  - synops
  - radiosondes
  - precipitation data, radar (if relevant)
  - boudary layer data
- Possible additions
  - cloud radar
  - satellite data (radiative fluxes)
  - SOP
  - .....

Examples (1)

- Fog case over S-France



Examples (1)

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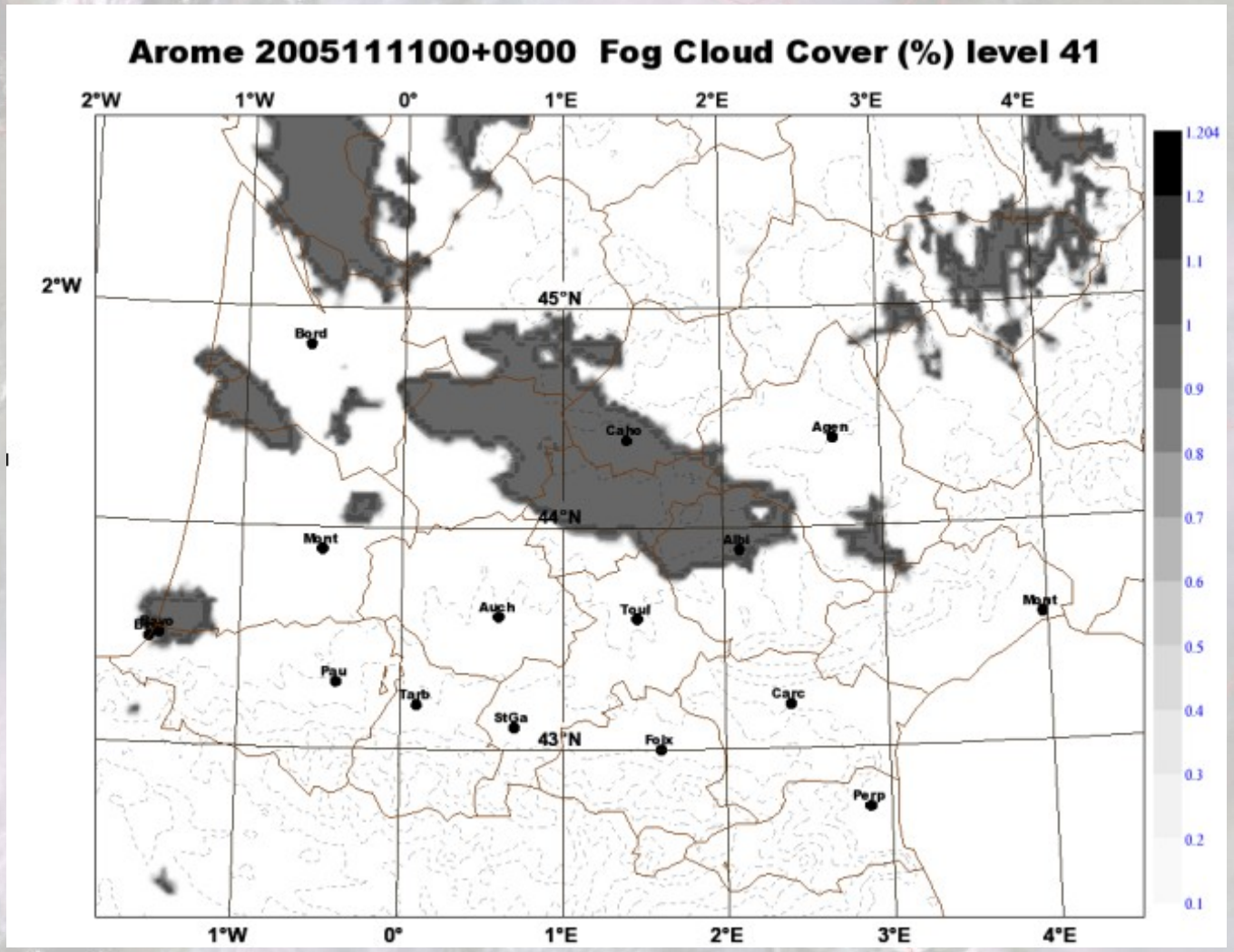
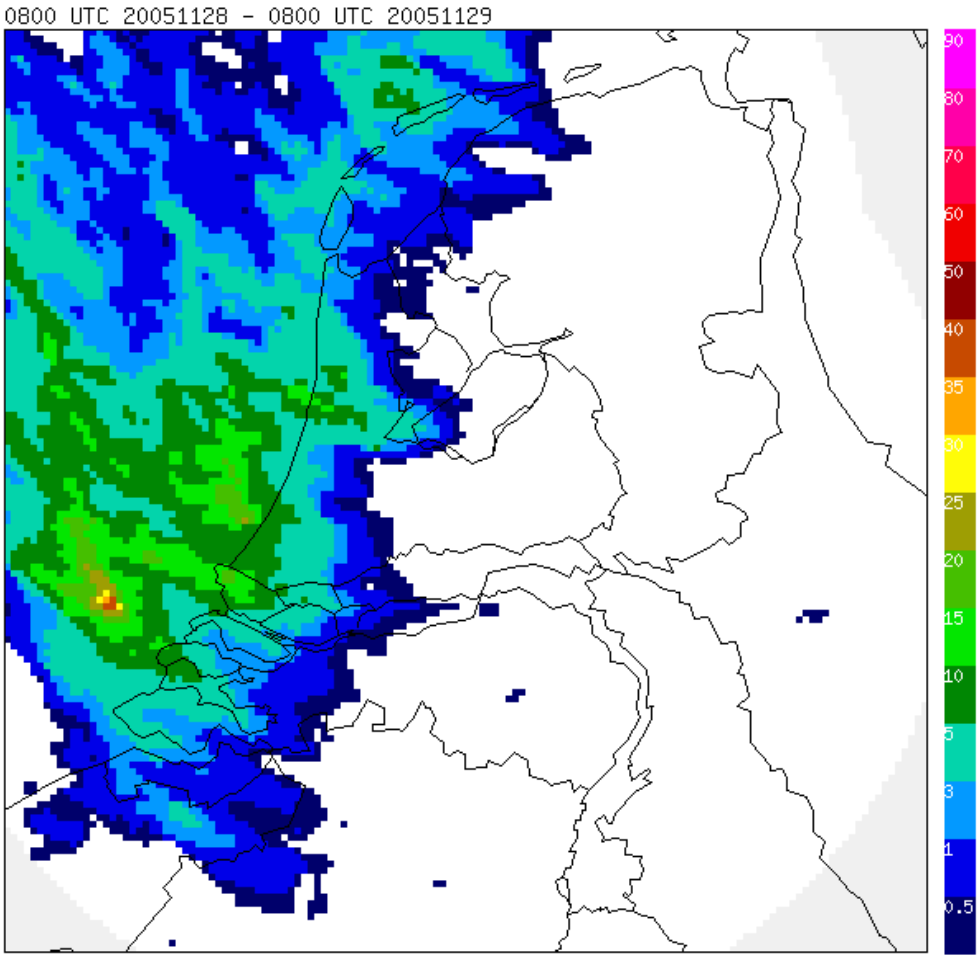


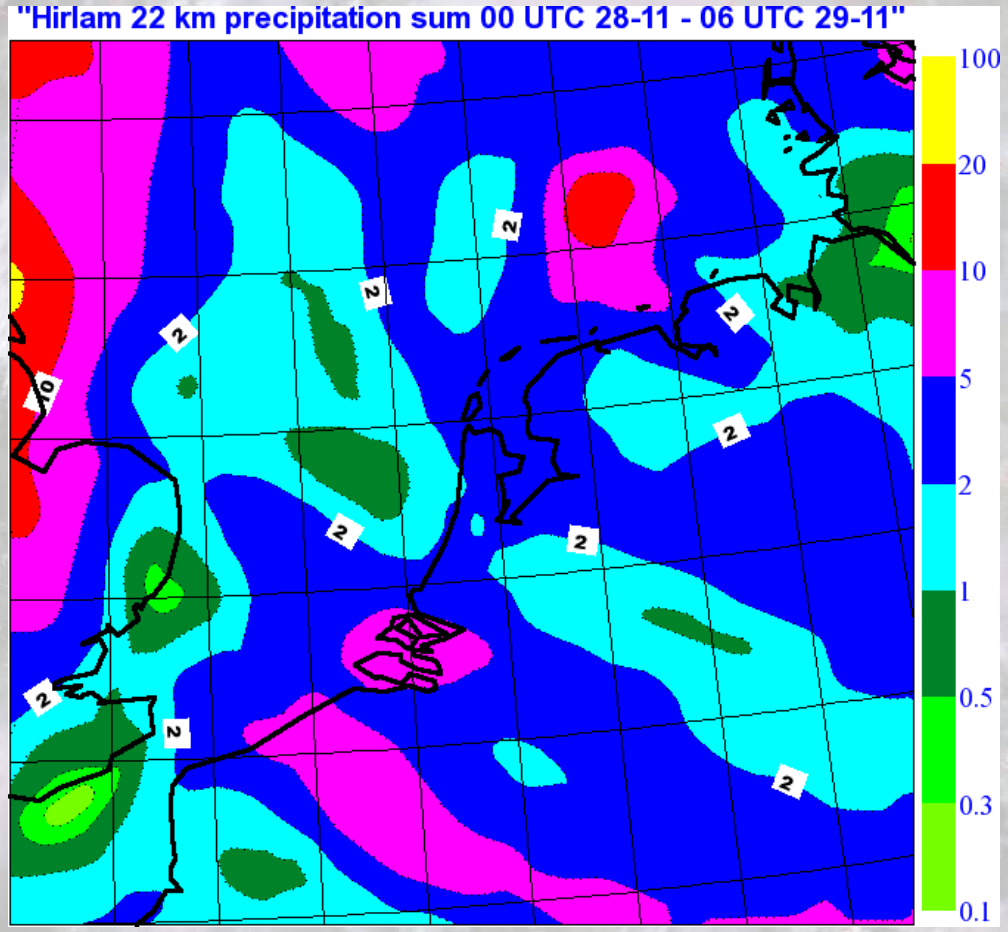
Examples (2)

- Convection dying down inland



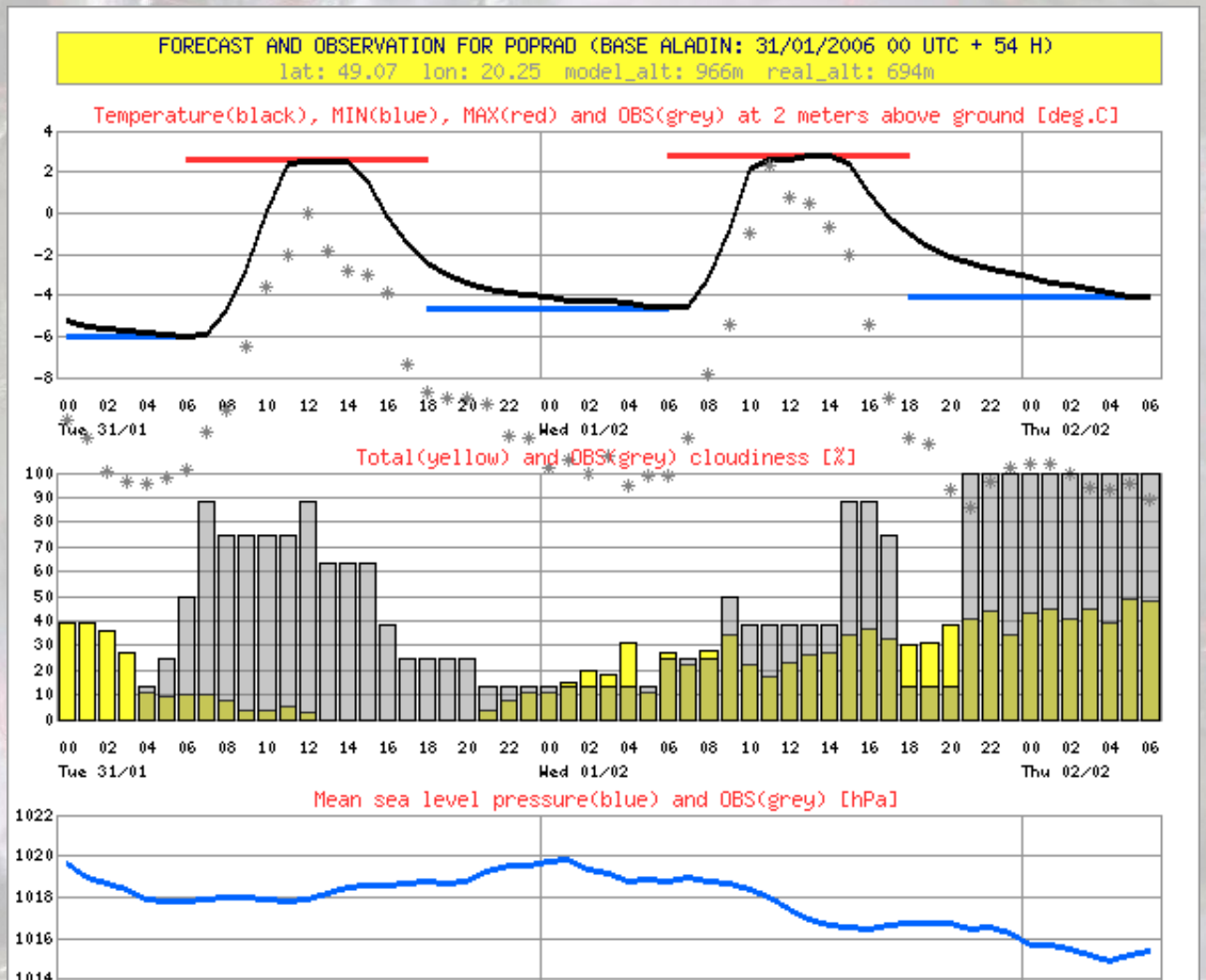
Examples (2)

- Convection dying down inland



Examples (3)

- (Very) stable boundary layer



Examples (4)

- Daily cycle of spring or summer convection

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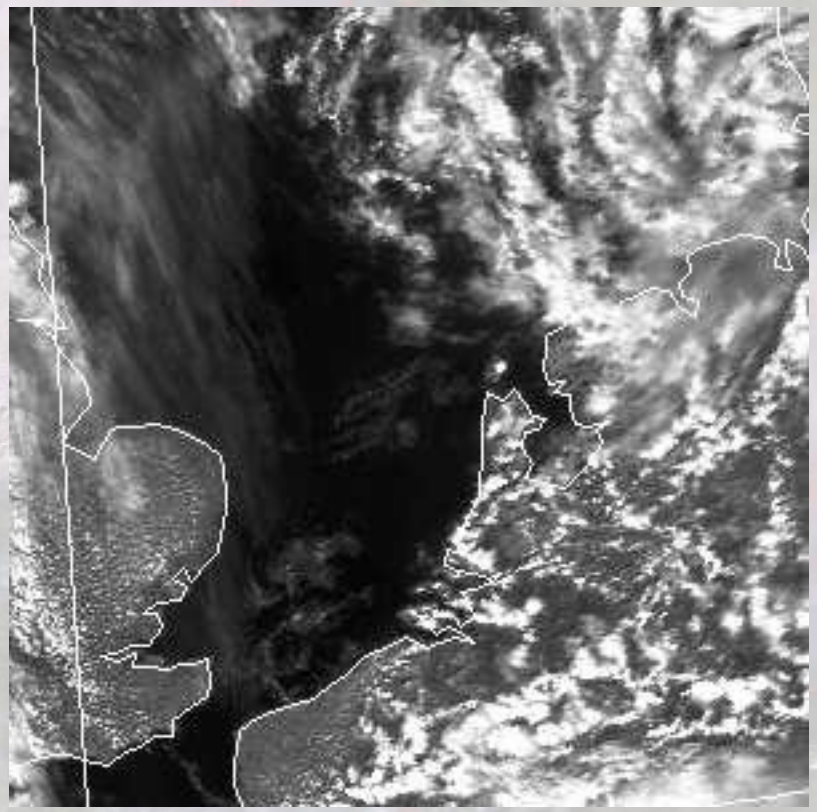
- Daily cycle of spring or summer convection



11.28 UTC 13.32 UTC

COMMON VERIFICATION, VISUALISATION, VALIDATION TOOLS

- For common visualisation tools common standard format of postprocessed fields needed (harmonisation by REK & XY); important for GLAMEPS as well
- XII/2005, Oslo: HIRLAM-ALADIN workshop on physics and diagnostics tools
  - **1D model**: coded, works for AROME and ARPEGE/ALADIN physics; ready to enter official cycle
  - 3D **model intercomparison** (dedicated talk by S. Tijm

- Working group established via e-mail correspondence
- Web site @knmi + proposal for cases
- Collection of data (various measurements) necessary
- Few cases prepared, but in general response rather low
- ➔ CSSI+HGM think that it is an interesting initiative & to go further we need concrete commitments & work.
  - Sander , Marishka & Gwen to find a way out during this meeting

Mini-group proposal (following HMG/CSSI recommendations

1. Get the thematic area from the first proposal (convection, fog, …) & add names. (one name by area) **DL=now**
2. People will then have the responsibility to document a case on the area they have chosen **DL = July the first**
3. A minimum set of diag will be required (list by Sander such as T2M, Precipitation, cloudiness, some profiles, …) The additional diags will be proposed by the « documentalist » himself (case-to-case dependent)
4. Then the idea is to run several models on the same geographical area. It will be required to first verify the differences that could exist in the IC but it will not be required to use the same IC (too tricky). **DL ?**

Discussion

- Do you agree with the proposed plan?

Discussion, which cases?

1) Onset and dissipation of fog*
2) Persistent low clouds*
3) Orographic precipitation and precipitation shadows behind mountains*
4) Stable boundary layers, very low temperatures over snow in winter*
5) Rapid cyclogenesis
6) Onset of (severe) summer convection*
7) Squall line evolution
8) Cold fronts with heavy rainfall
9) Convection: Enhancement over sea, decrease over land
10) Mesoscale convective systems/complexes
11) Sea breezes, mountain and/or valley winds
12) Wind in mountainous areas
13) Shallow, fair weather cumulus
14) Coastal fronts
15) Organised convection due to land/sea distrib.
16) Polar lows

Numbers have no meaning yet!

Discussion

- What is a minimum set for the ‘sanity check’ of future models?

Discussion

- What are the important weather types for participating countries?

Discussion

- How can we show additional value of mesoscale model?

Discussion

- What data can we use in the validation & verification of current and future models?

Discussion

- Which cases are really mesoscale?

Discussion

- What new tools/output do we need to make good/optimal use of mesoscale model?