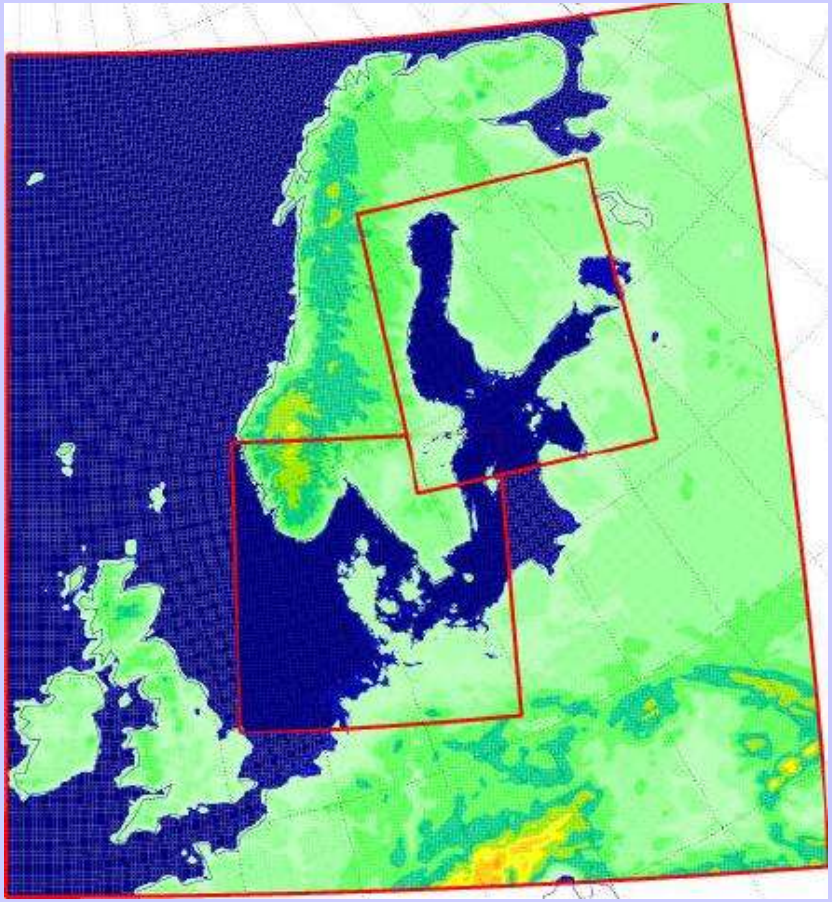
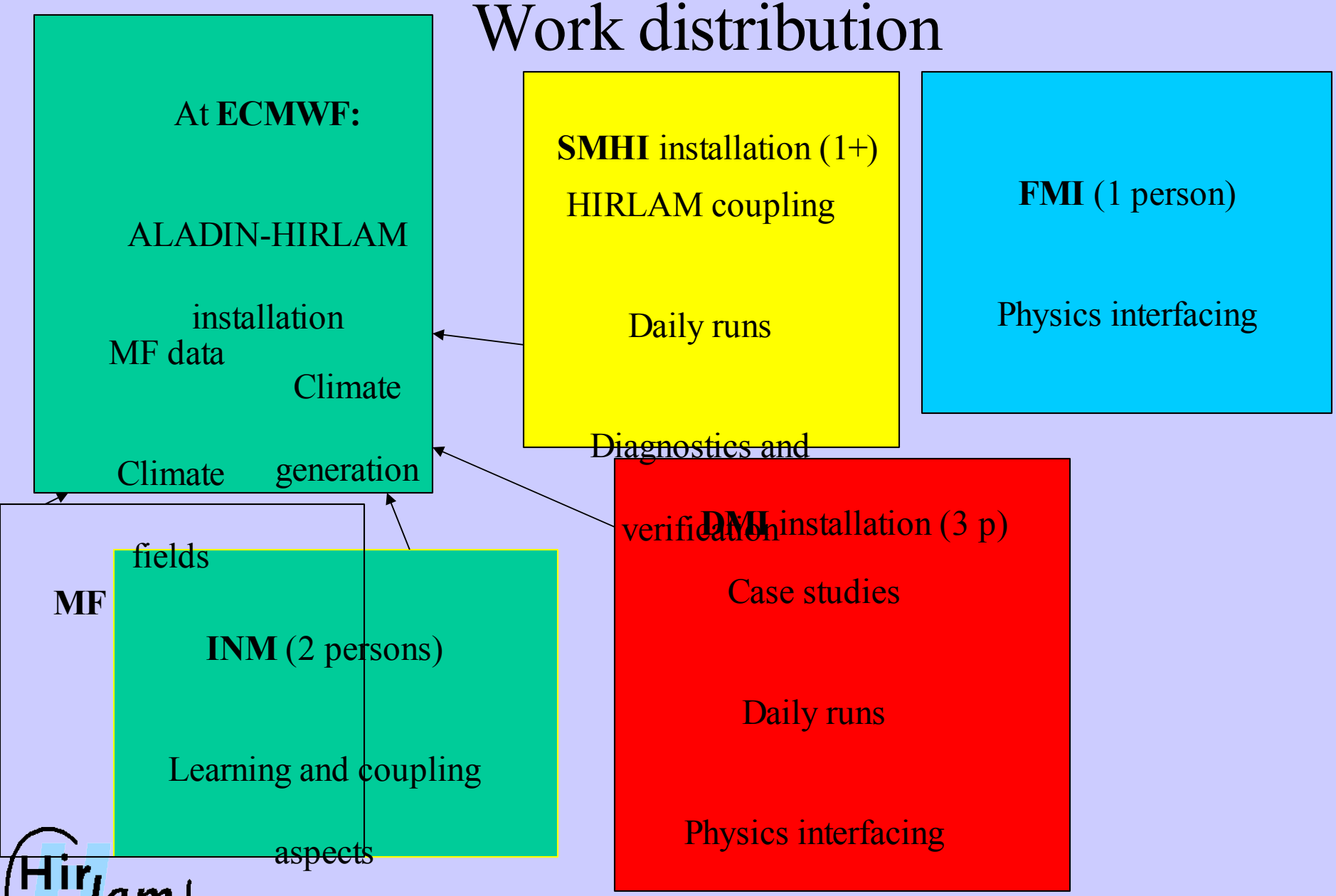
HIRLAM work with ALADIN in 2005

- Initial training
- Setup at ECMWF and learning the systems (2004)
- Experimentation at ECMWF
- Interface HIRLAM files – ALADIN coupling files
- Interface HIRLAM physics
- Set up daily runs at DMI, SMHI – H and NH ALADIN
- Diagnostics and verification
- Climate generation software available at ECMWF –



Work distribution



Computer performance

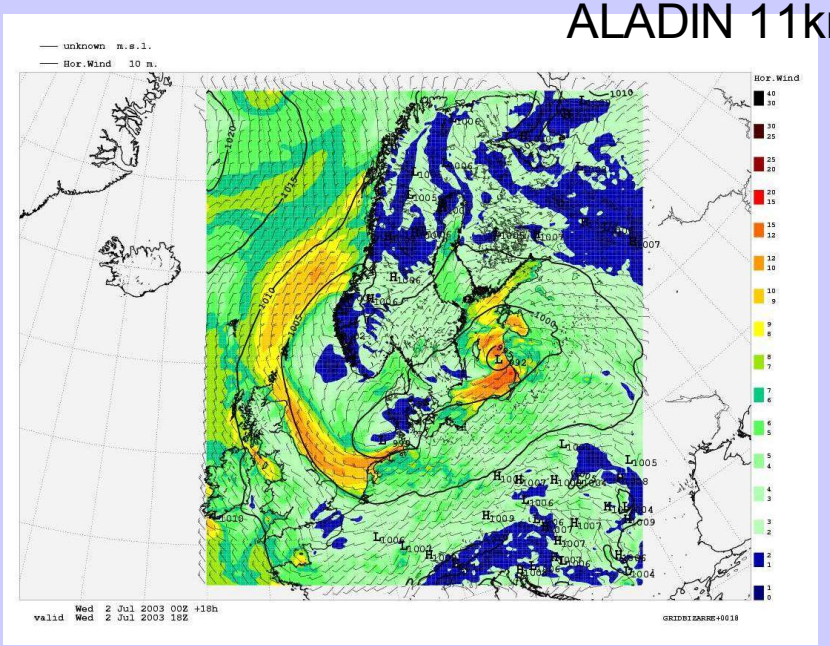
Achievements on work with ALADIN
mainly 2nd half of 2004

- Learning the model and the system
- Rotated-tilted Mercator projection (PB)
- Reference set up at ECMWF
  - Cy 28
  - Cy 29t2

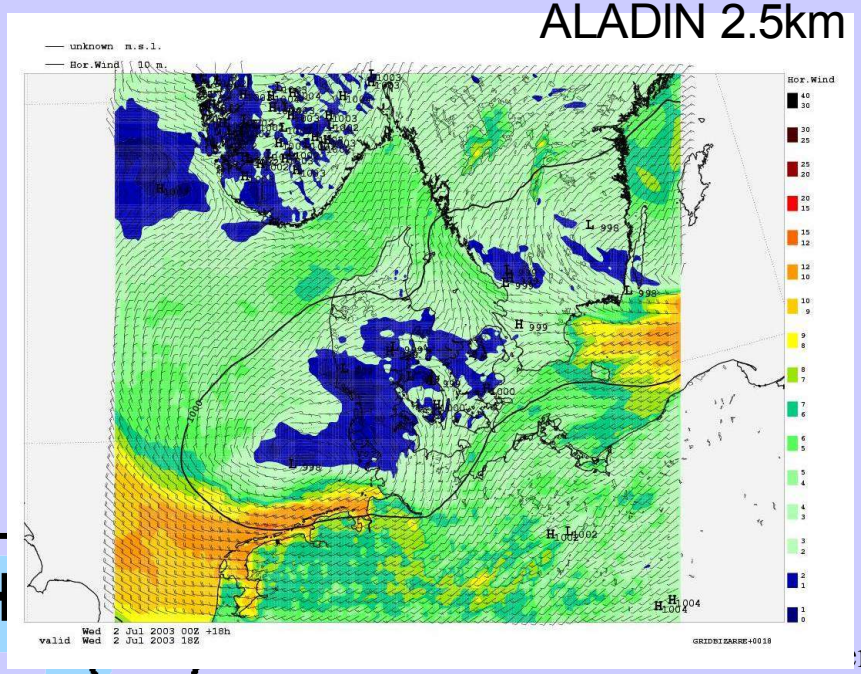
  Main work by MF and many interactions with HIRLAM
- Set up of double nested system
  - Around Scandinavia 11 km, two 2.5 km areas
  - Data from ARPEGE and climate data from MF
  - Experience, tests and comparisons July 2003

Aladin forecast 2nd of July 2003 18 UTC

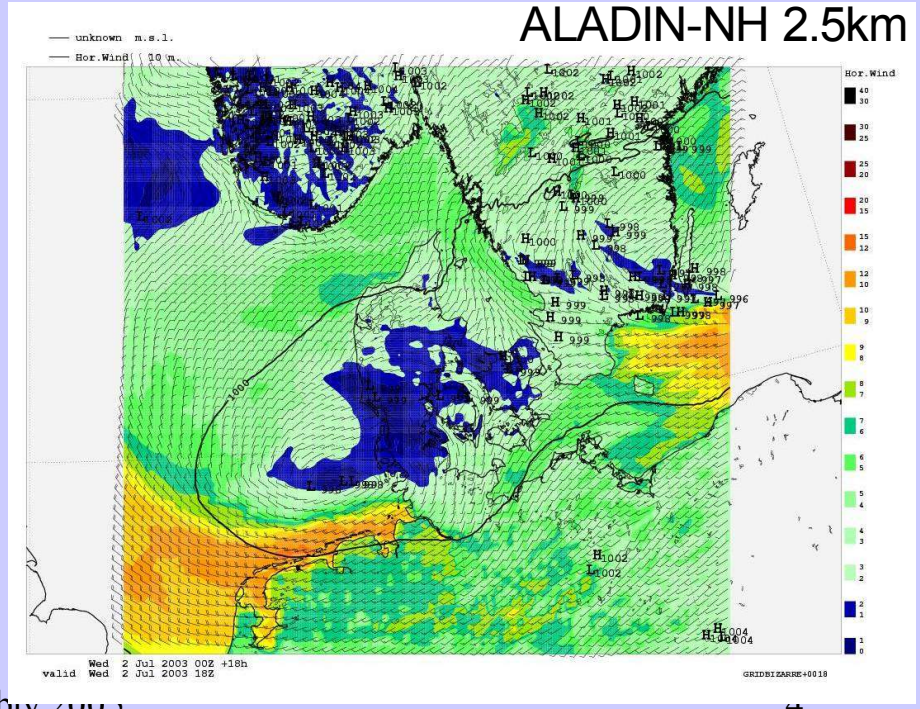
ALADIN 11km



ALADIN 2.5km

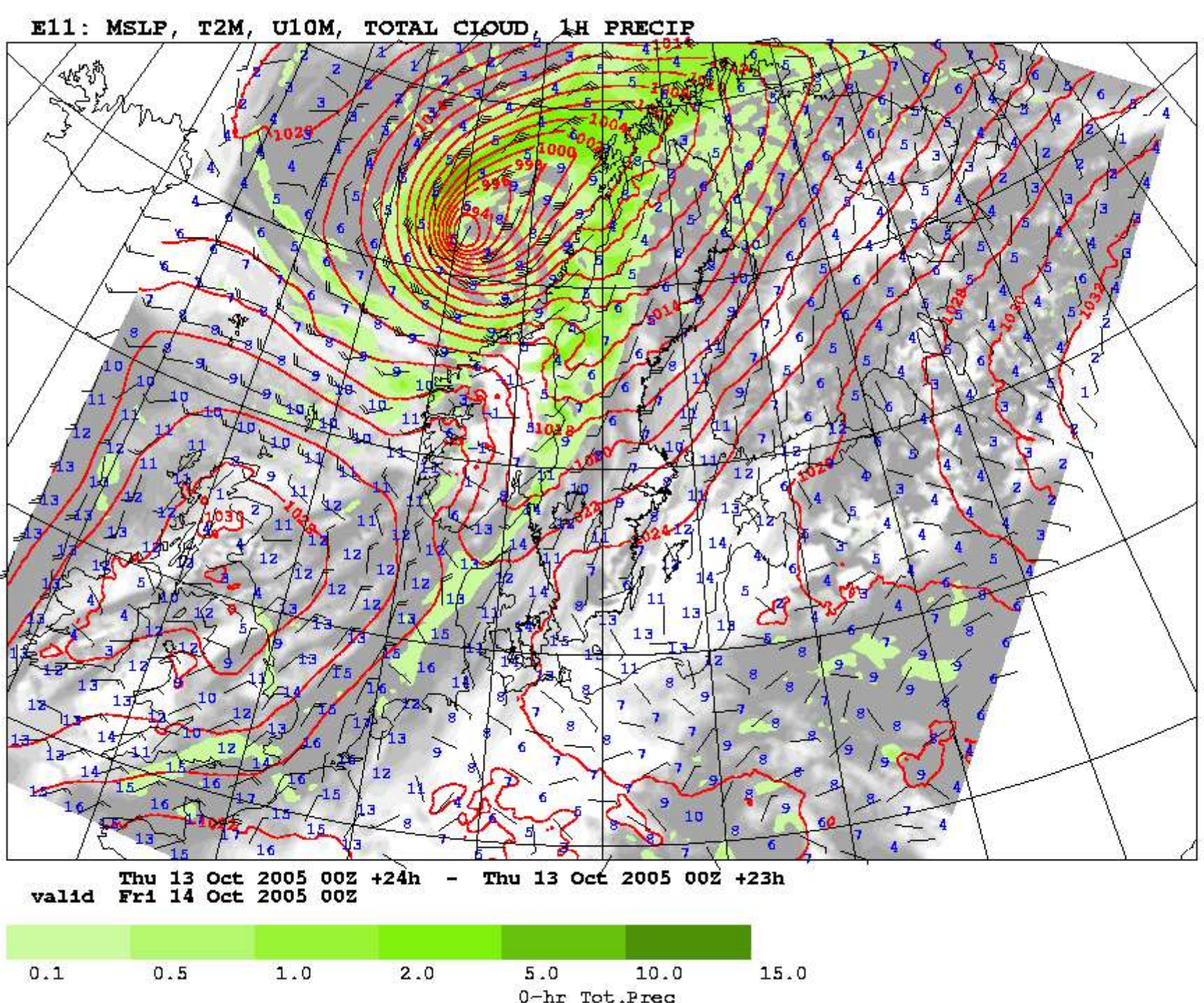


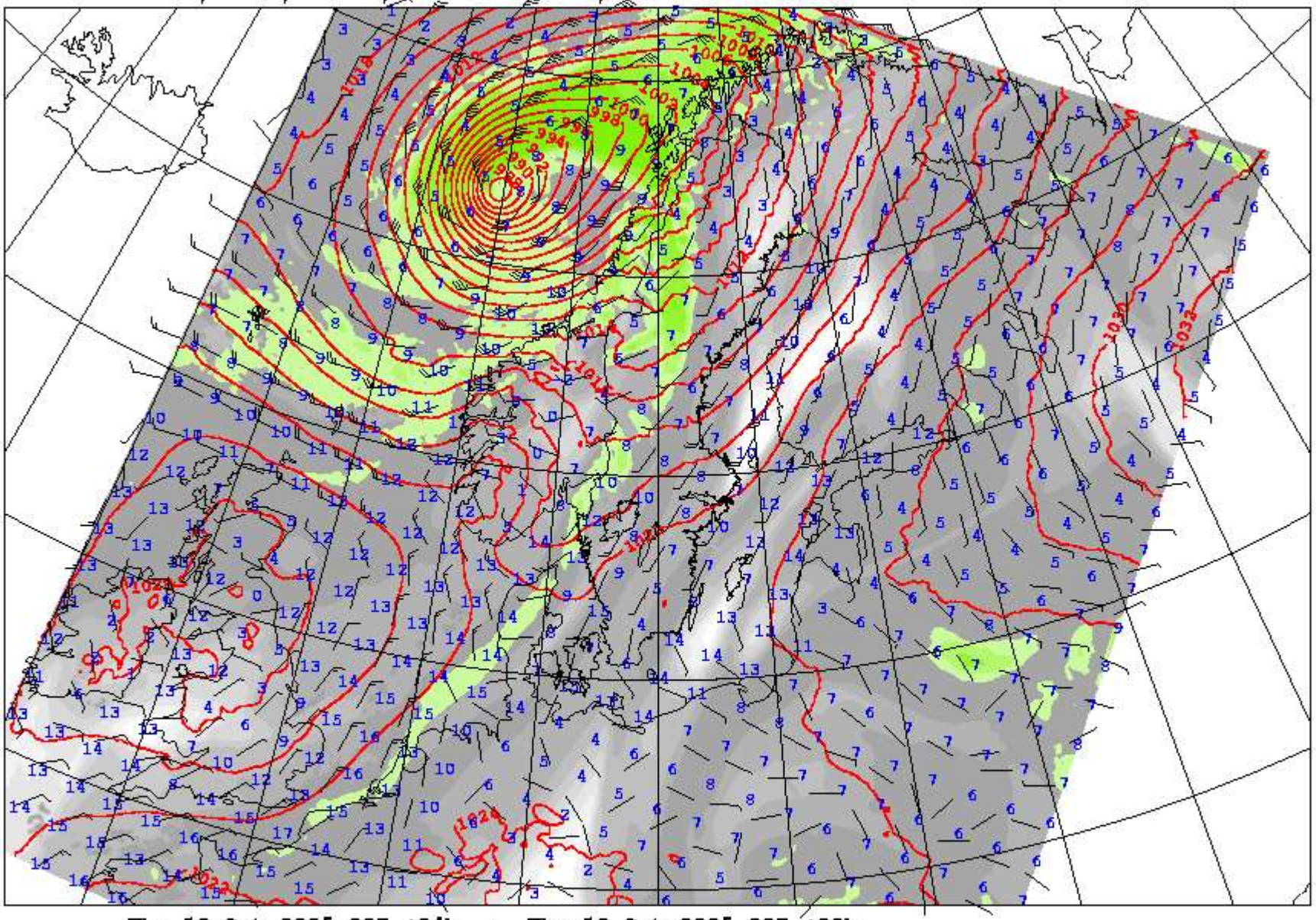
ALADIN-NH 2.5km



Achievements on work with ALADIN II

- Interface from HIRLAM files
  - Transform gp data to spectral to ALADIN files
    - Initial files
    - Coupling files
- Adapted HIRLAM plotting package and verifications to ALADIN files and geometry
- Set up reference at HIRLAM institutes
  - DMI, SMHI
- Test periods in April and during summer
- Daily runs from September
  - 11 km
  - 2.5 km areas (1 DMI, 2 SMHI)


E11: MSLP, T2M, U10M, TOTAL CLOUD, 1H PRECIP
Thu 13 Oct 2005 00Z +24h - Thu 13 Oct 2005 00Z +23h
valid Fri 14 Oct 2005 00Z
0.1
0.5
1.0
2.0
5.0
10.0
15.0
0-hr Tot.Prec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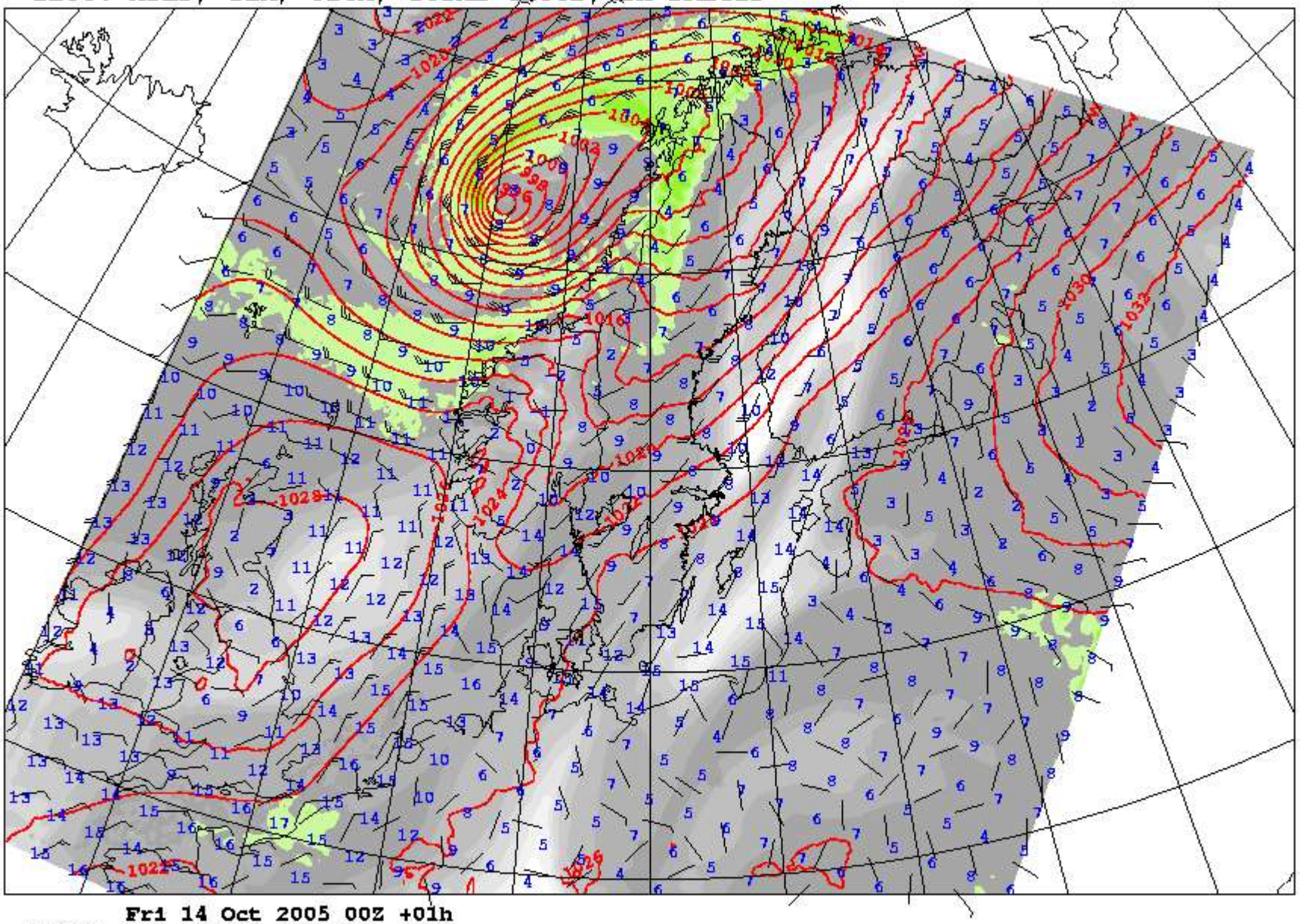
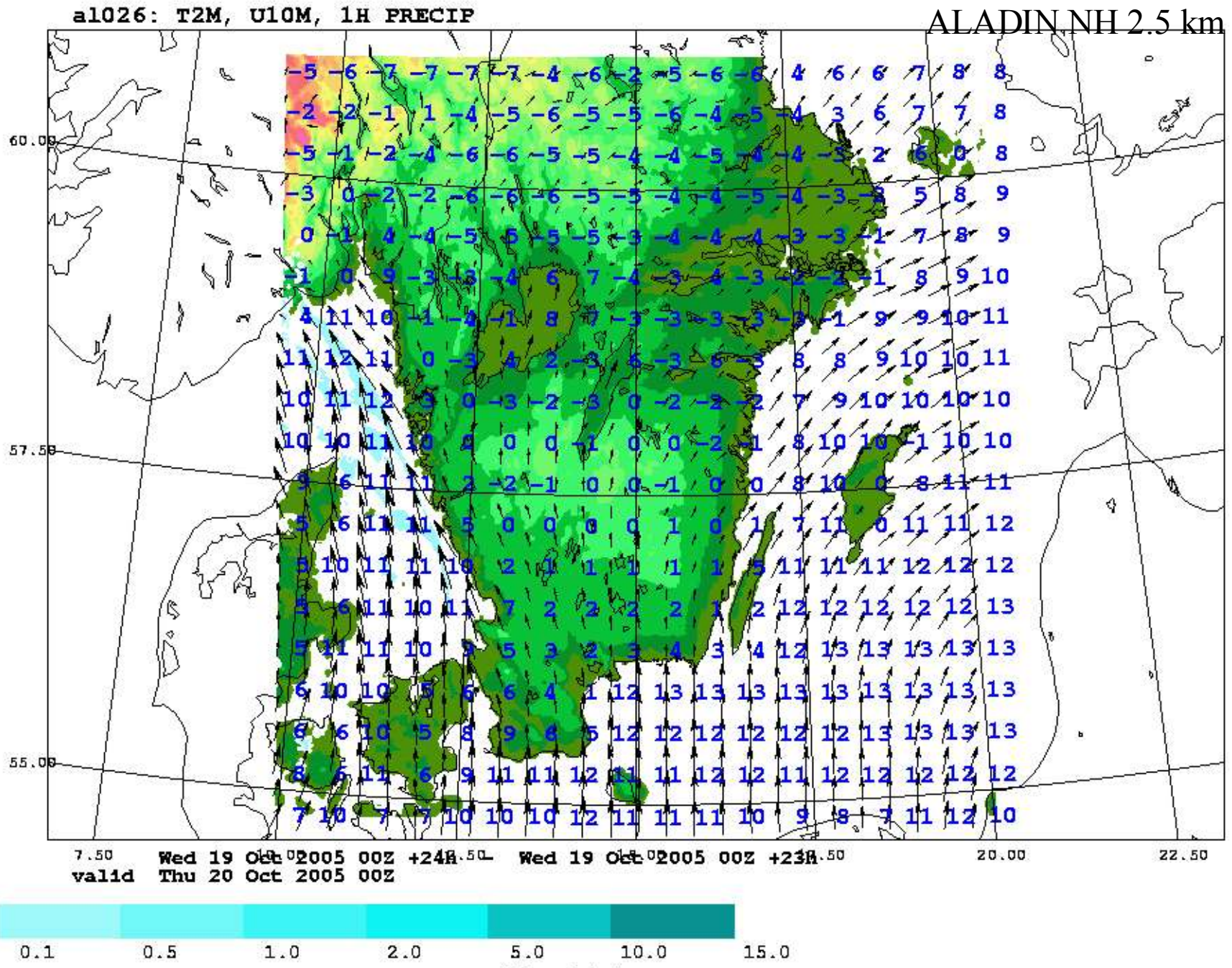
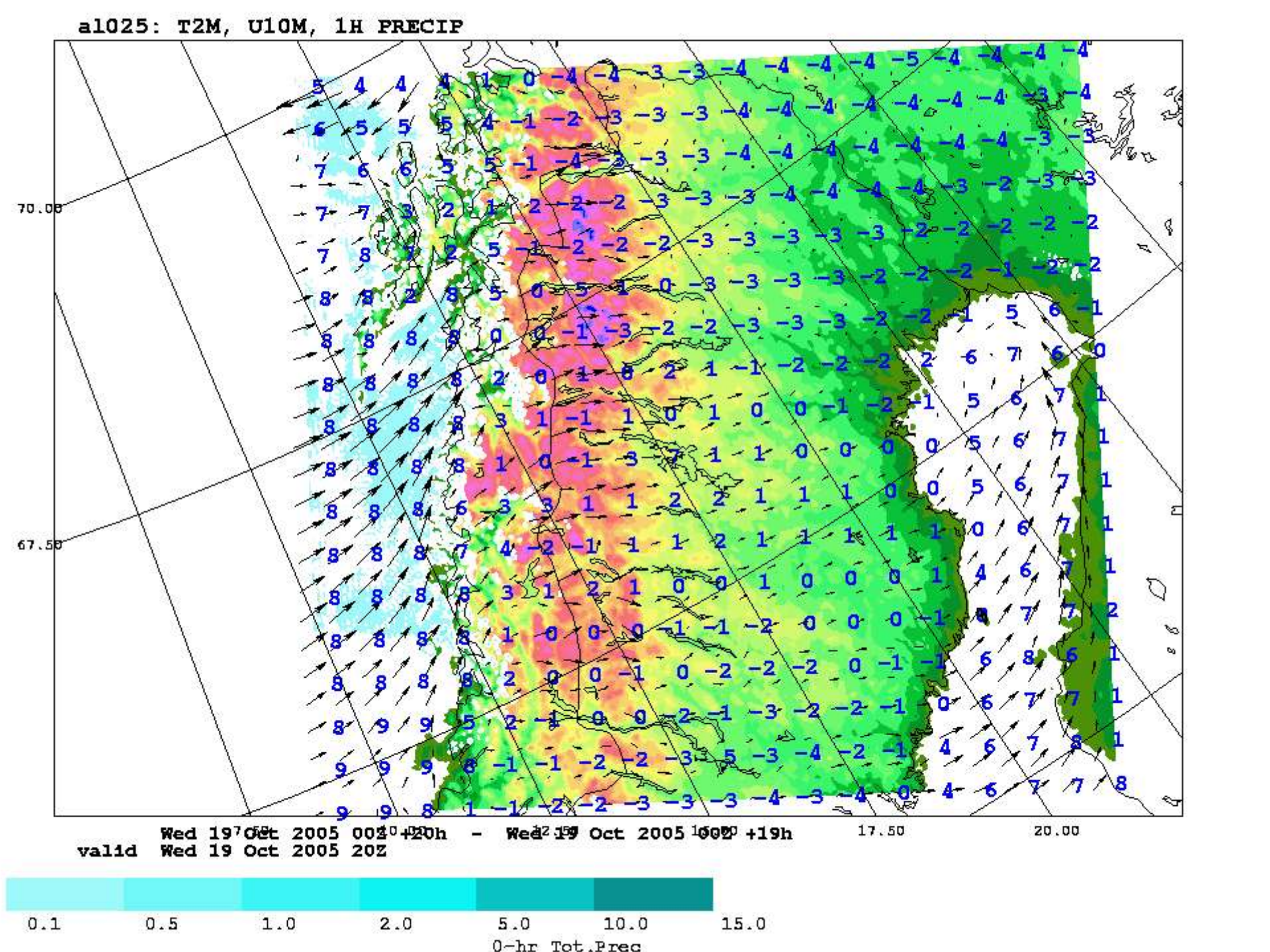
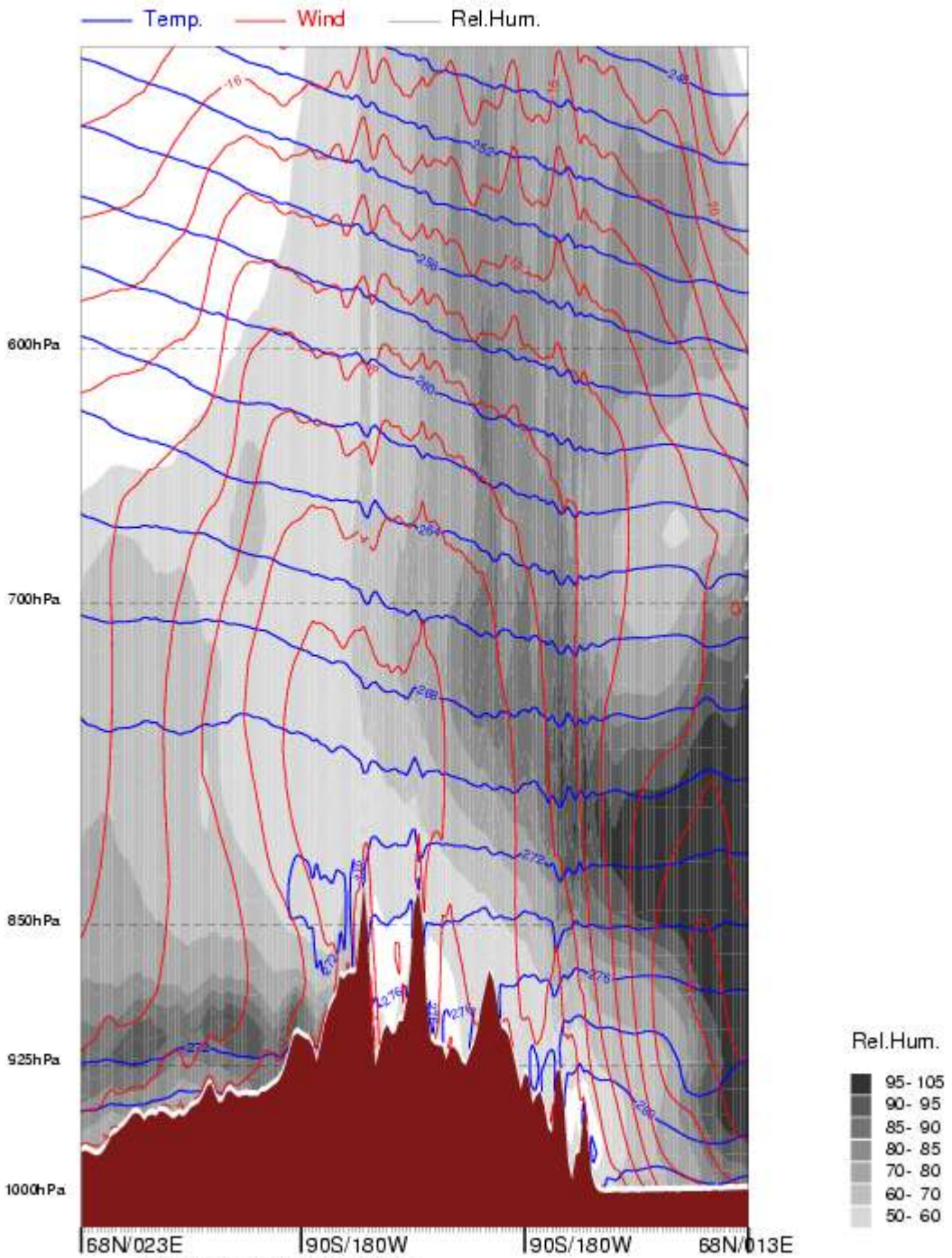
valid Fri 14 Oct 2005 00Z


al00: MSLP, T2M, U10M, TOTAL CLOUD, 1H PRECIP
Fri 14 Oct 2005 00Z +01h
valid Fri 14 Oct 2005 01Z


al026: T2M, U10M, 1H PRECIP
ALADIN NH 2.5 km
60.00
57.50
55.00
7.50
20.00
22.50
Wed 19 Oct 2005 00Z +24H
valid Thu 20 Oct 2005 00Z
Wed 19 Oct 2005 00Z +23H
0.1
0.5
1.0
2.0
5.0
10.0
15.0
0-hr Tot.Prec

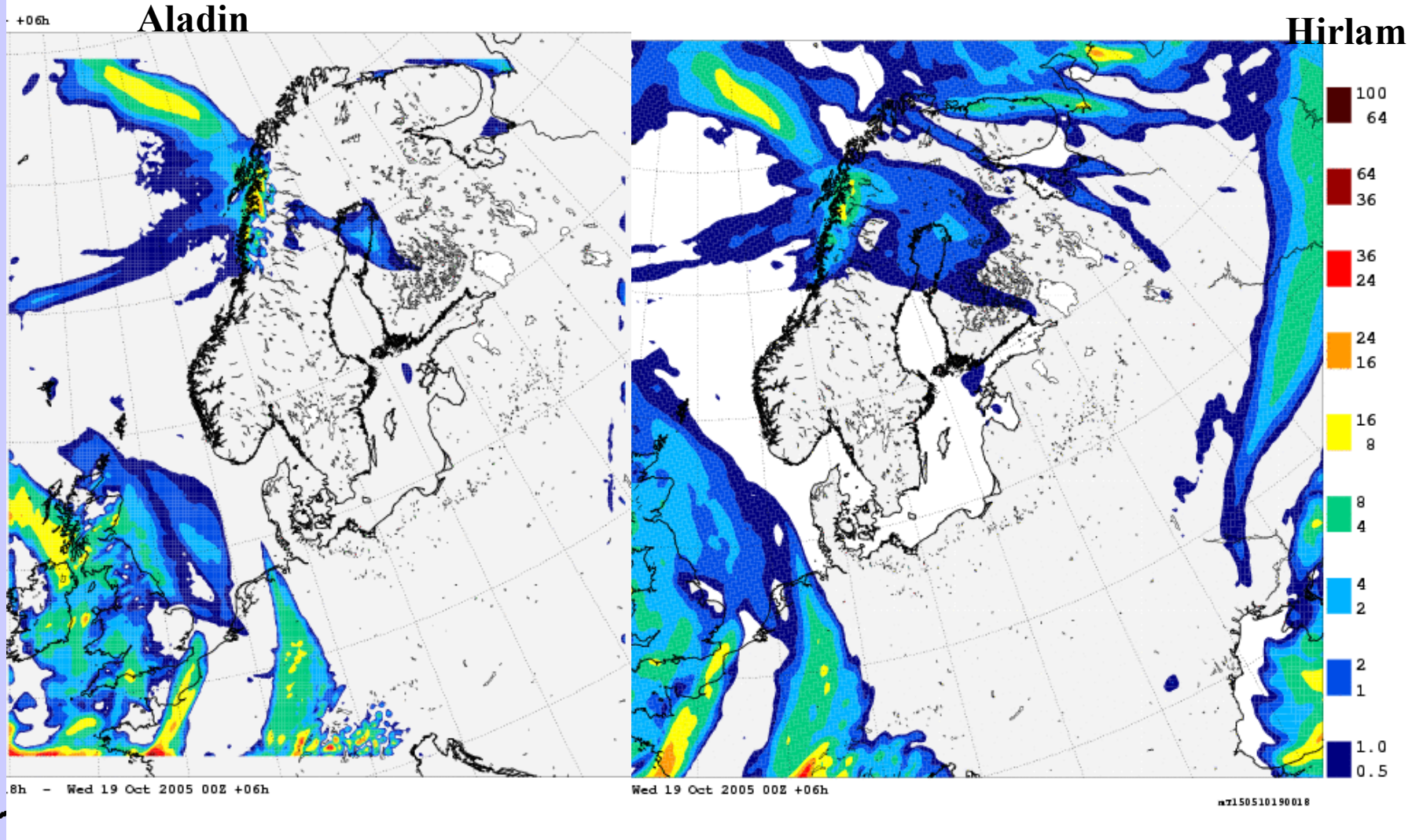

al025: T2M, U10M, 1H PRECIP
70.00
67.50
17.50
20.00
Wed 19 Oct 2005 00Z +20h - Wed 19 Oct 2005 00Z +19h
valid Wed 19 Oct 2005 20Z
0.1
0.5
1.0
2.0
5.0
10.0
15.0
0-hr Tot.Prec



ALADIN NH 2.5

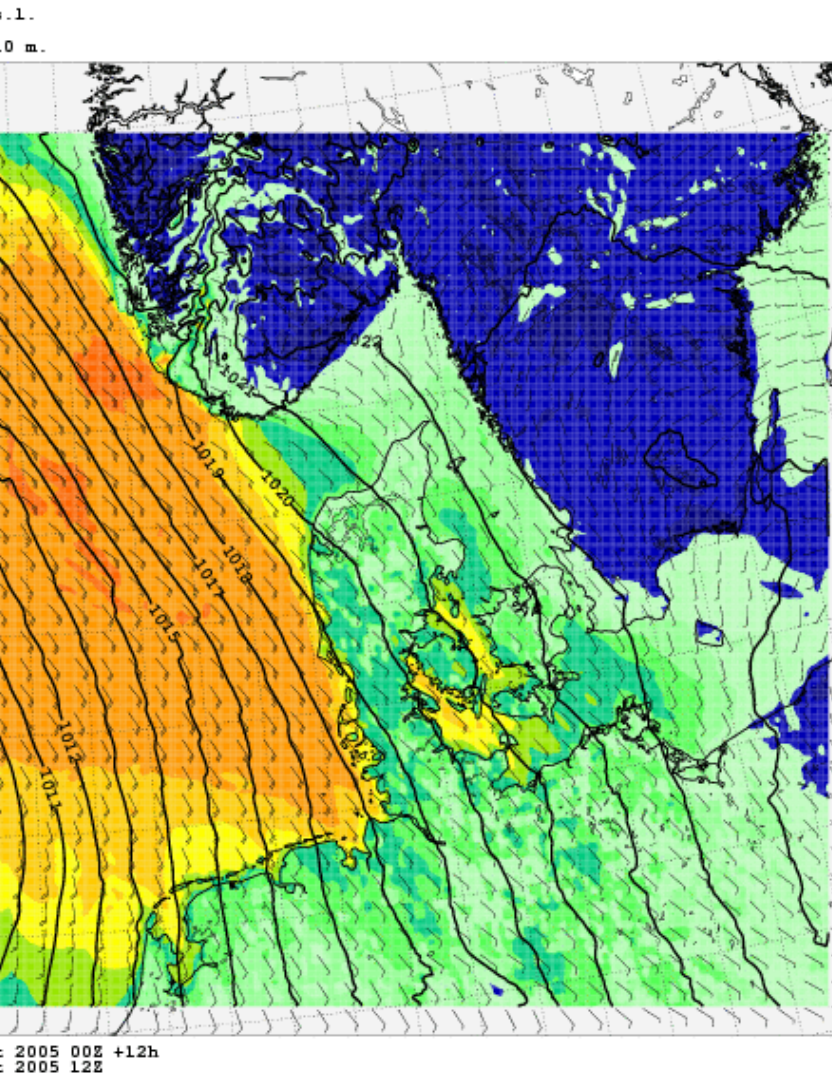
N Sweden-Norway

DMI Scandinavian area 11 km

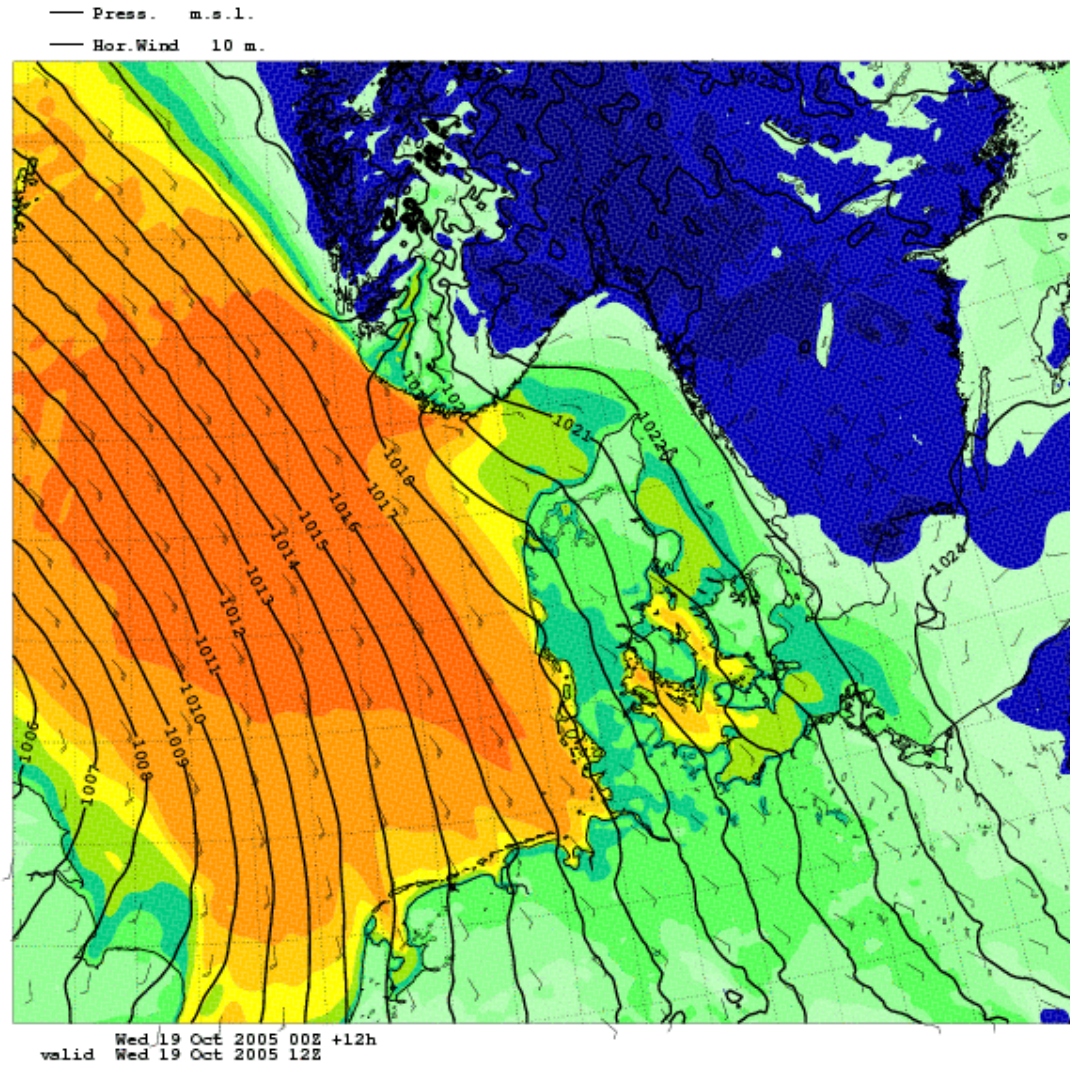


DMI Danish area

Aladin 2.5

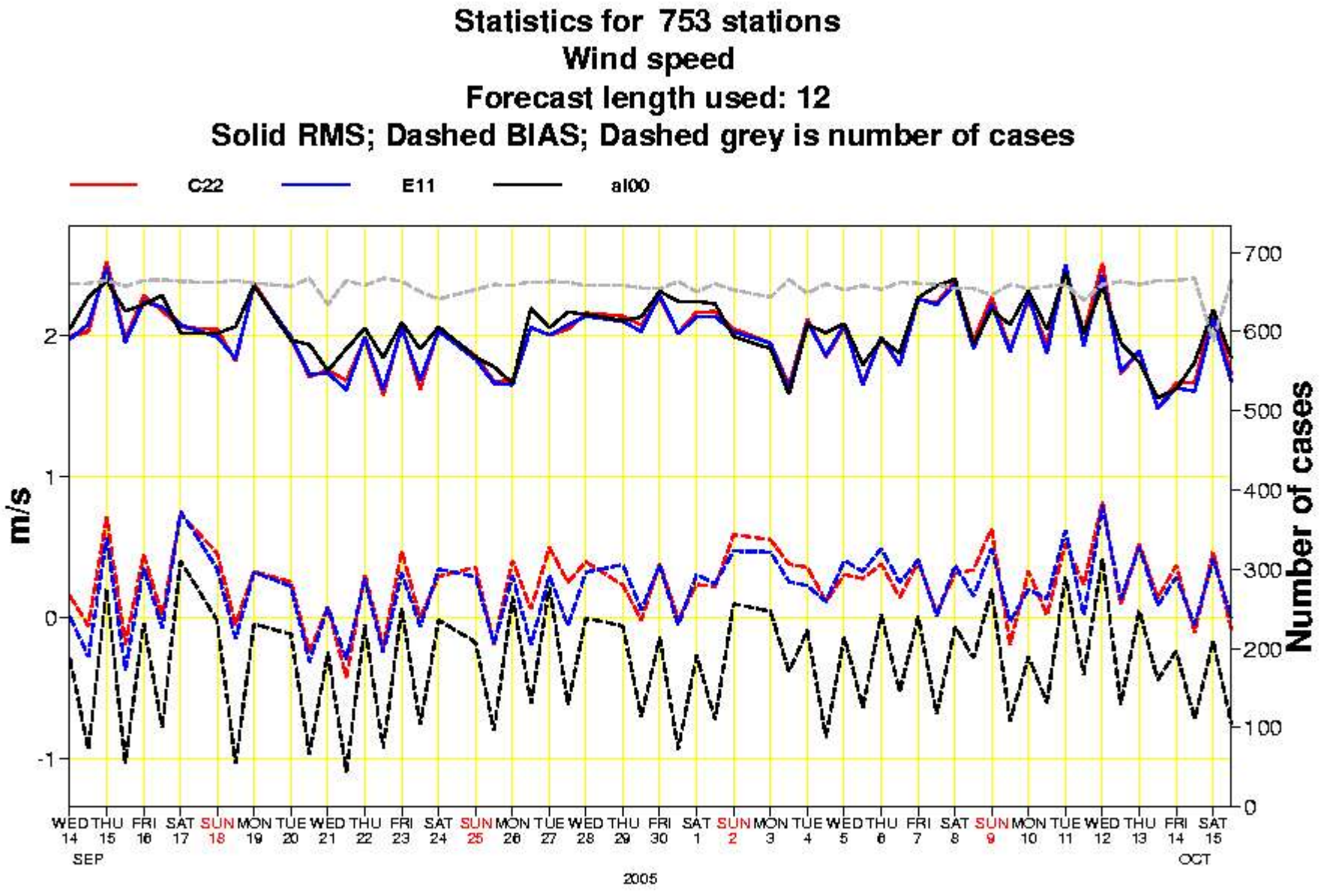


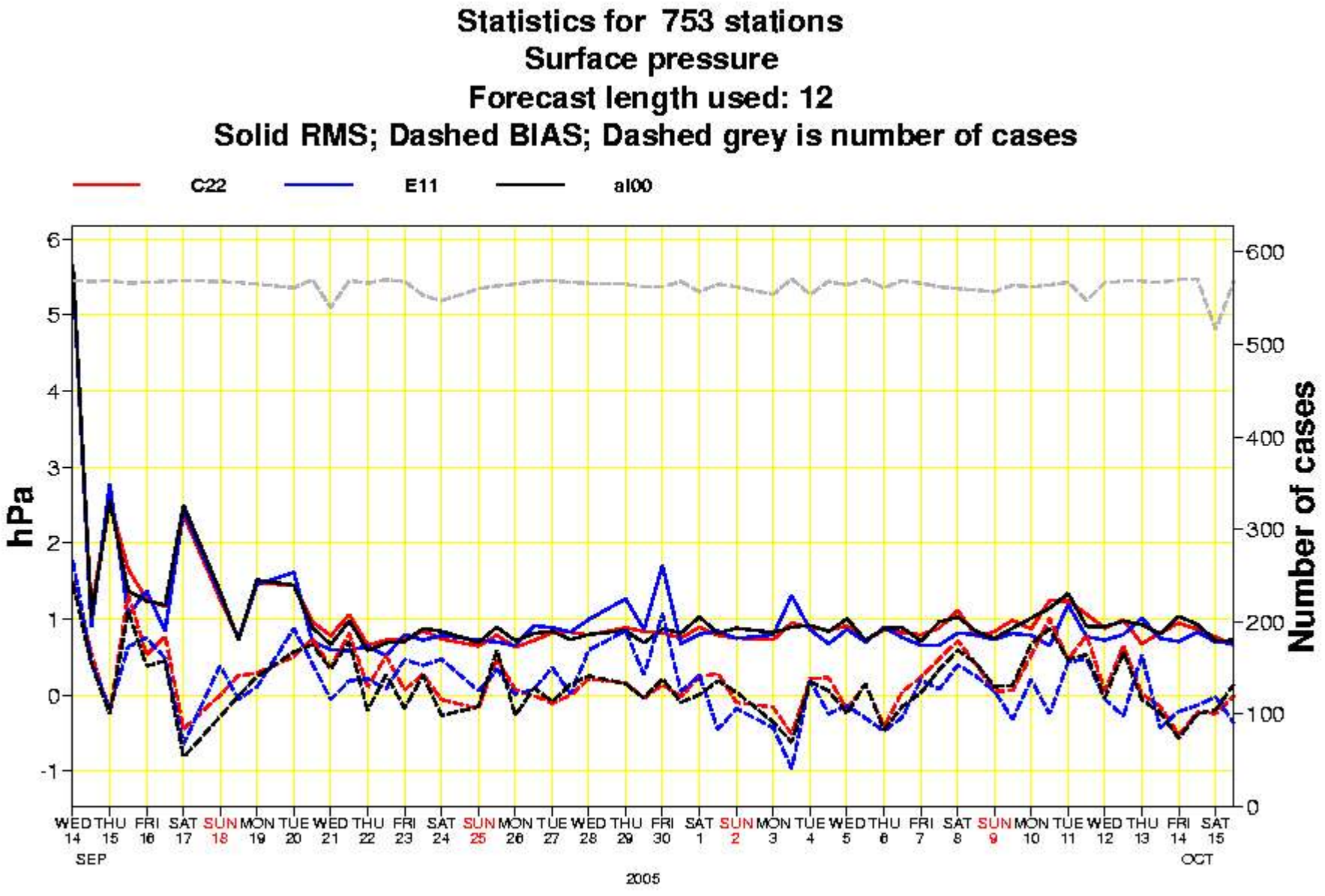
Hirlam 5



Achievements on work with ALADIN III

- Technical performance
  - Scaling (IBM, NEC and cluster)
- Diagnostics of meteorological performance
  - Solving bugs mainly in own setup – HIRLAM files
  - Preliminary verifications confirm stability and quality
- Interfacing HIRLAM physics
  - Convection, condensation, turbulence and radiation (not surface due to externalisation)
  - F90 and IFS conventions
  - ALADIN interfaces (fluxes)
  - New reference equations and pseudo-fluxes


Statistics for 753 stations
Wind speed
Forecast length used: 12
Solid RMS; Dashed BIAS; Dashed grey is number of cases
C22
E11
al00
m/s
Number of cases
2
1
0
-1
700
600
500
400
300
200
100
0
WED 14 SEP
THU 15
FRI 16
SAT 17
SUN 18
MON 19
TUE 20
WED 21
THU 22
FRI 23
SAT 24
SUN 25
MON 26
TUE 27
WED 28
THU 29
FRI 30
SAT 1 OCT
SUN 2
MON 3
TUE 4
WED 5
THU 6
FRI 7
SAT 8
SUN 9
MON 10
TUE 11
WED 12
THU 13
FRI 14
SAT 15
2005


Statistics for 753 stations
Surface pressure
Forecast length used: 12
Solid RMS; Dashed BIAS; Dashed grey is number of cases
C22
E11
al00
hPa
Number of cases
6
5
4
3
2
1
0
-1
600
500
400
300
200
100
0
WED 14 SEP
THU 15
FRI 16
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SUN 18
MON 19
TUE 20
WED 21
THU 22
FRI 23
SAT 24
SUN 25
MON 26
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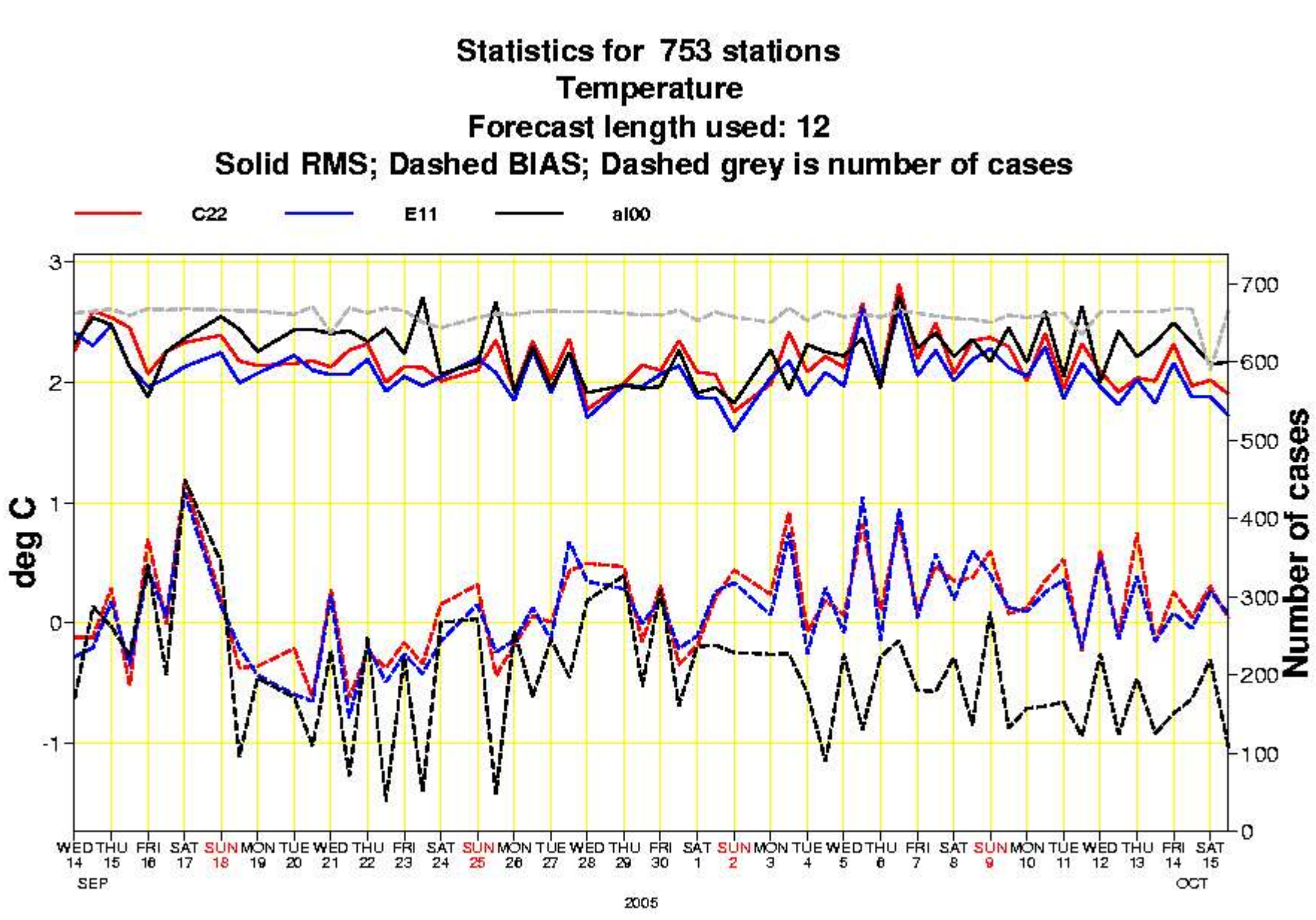
2005


Statistics for 753 stations
Temperature
Forecast length used: 12
Solid RMS; Dashed BIAS; Dashed grey is number of cases
C22
E11
al00
deg C
Number of cases
3
2
1
0
-1
700
600
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300
200
100
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WED 14 SEP
THU 15
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SAT 1 OCT
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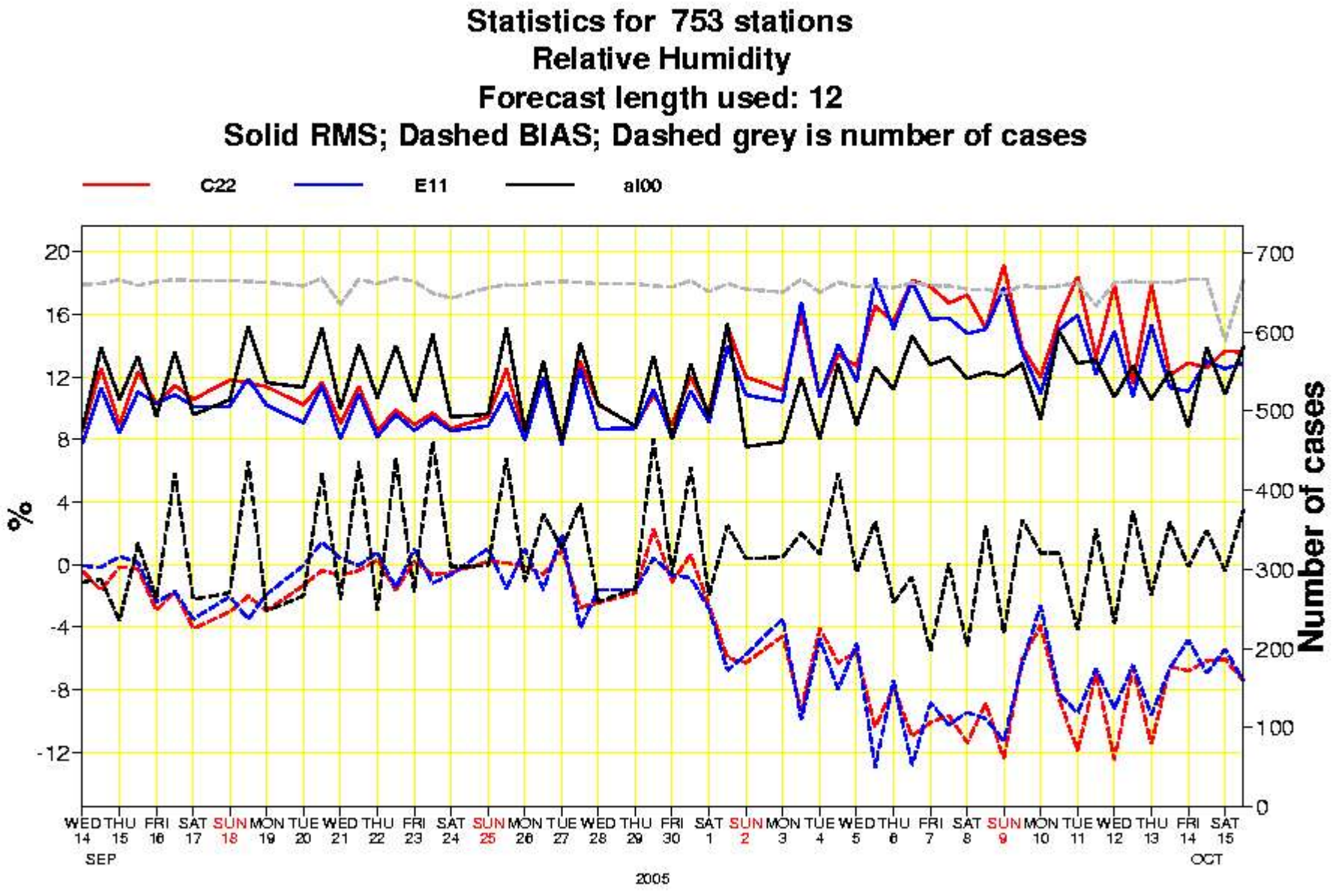
SAT 15
2005


Statistics for 753 stations
Relative Humidity
Forecast length used: 12
Solid RMS; Dashed BIAS; Dashed grey is number of cases
C22
E11
al00
%
Number of cases
20
16
12
8
4
0
-4
-8
-12
700
600
500
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100
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WED 14 SEP
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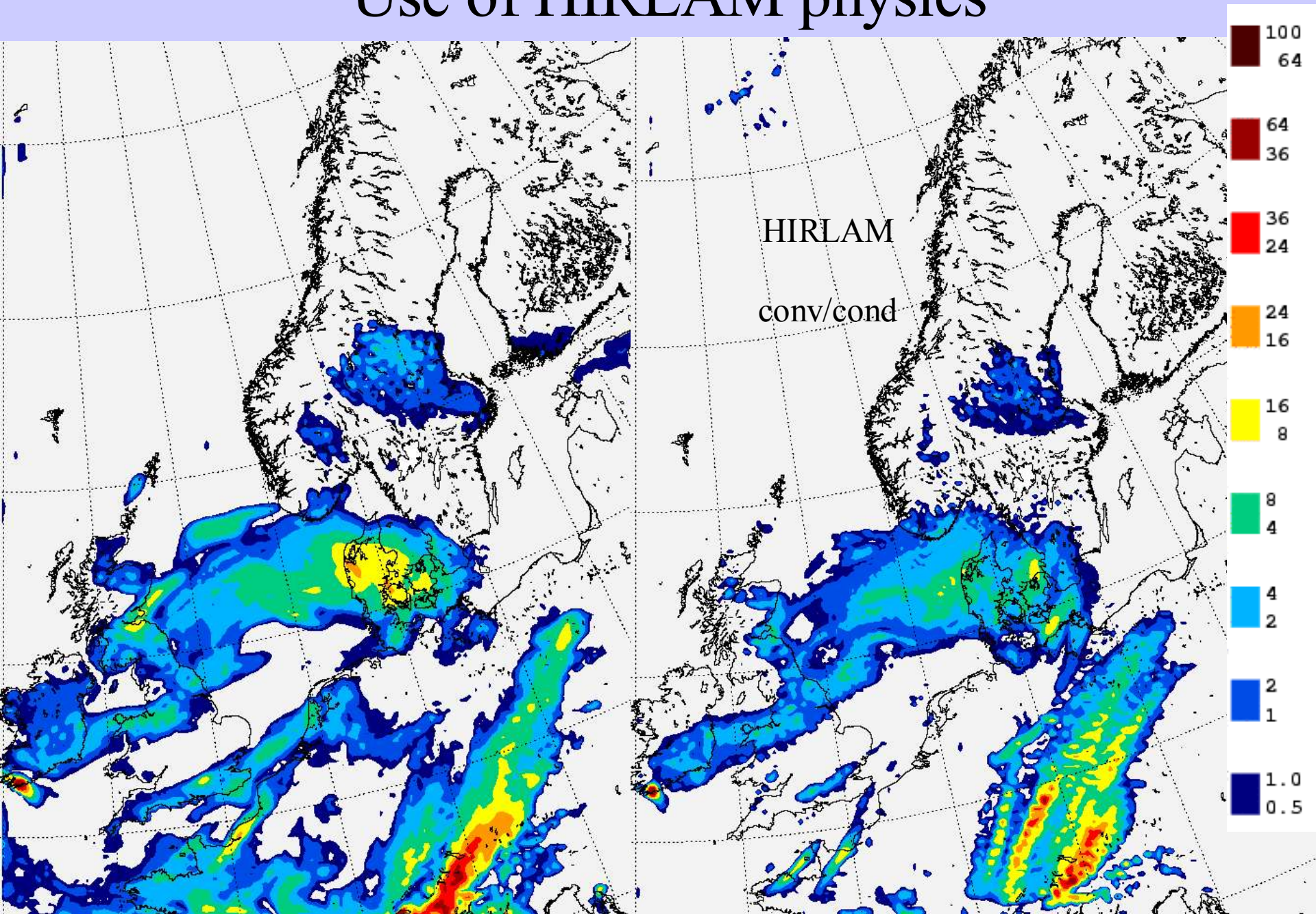
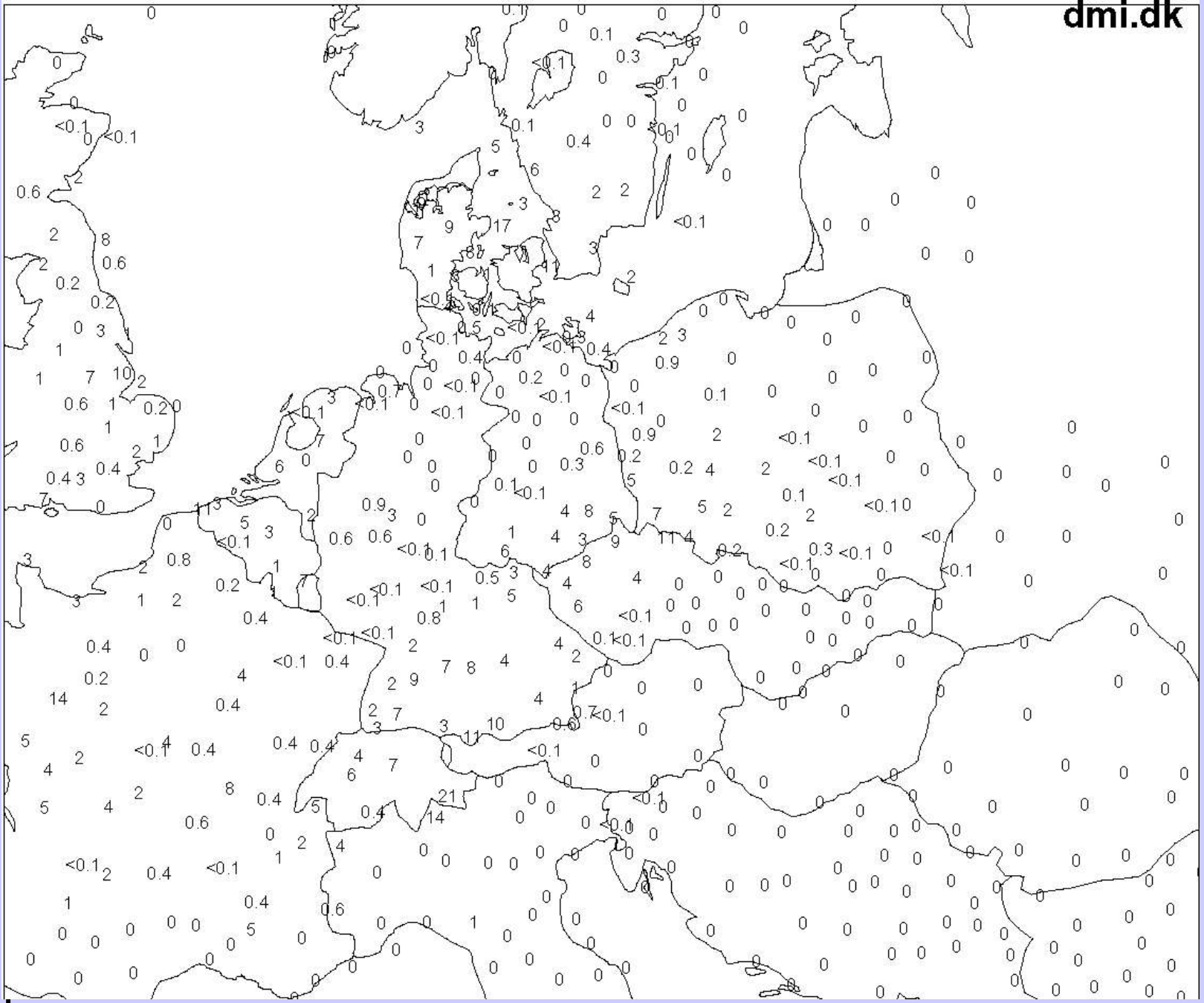
2005

Use of HIRLAM physics




dmi.dk

Ten persons from the HIRLAM community started to study the the IFS/ALADIN model system. Seven persons remained active contributors through the project period. The names are

Ulf Andrae [SMHI]
(Work: study of IFS/ALADIN, technical work, boundary forcing, Climate generation)

Sami Niemela [FMI]
(Work: study of IFS/ALADIN, recoding of radiation scheme, physics test)

Isabel Martinez [INM]
(Work: study of IFS/ALADIN, boundary forcing)

Ana Belen Morata [INM]
(Work: study of IFS/ALADIN, boundary forcing)

Bjarne S. Andersen [DMI]
(Work: study of IFS/ALADIN, technical work)

Karina Lindberg [DMI]
(Work: study of IFS/ALADIN , coordinate transformations, technical work.

Bent H. Sass (coordinatorr of mesoscale activities), [DMI]
(Work: Study of IFS/ALADIN, physics interface, HIRLAM physics recoding)

The following meetings are directly connected to the meso-scale project with participation of people from the HIRALD group:

- 15-19 March 2004:
  Mesoscale course at Météo France (Sass, 2004b)
- 10-14 July 2004:
  Working Meeting at DMI (first HIRALD setup at ECMWF established)
- 22-26 November 2004:
  Aladin workshop on physics interface, coding and numerical issues related to ALADIN/ALARO/AROME (in Prague).
- 14-17 February 2005:
  Working meeting at DMI (Evolution of HIRALD setup , planning of future activities)
- 5-9 June 2005: ALADIN workshop in Bratislava including detailed planning activity with key persons of ALADIN and Météto-France.
- 31 October -1 November 2005: Working visit of Ulf Andrae to DMI.
- 14-18 November 2005:
  Coding principles of IFS/ALADIN seen in HIRLAM collaboration perspective, and data-assimilation planning meeting (in Budapest).
- 21-25 November 2005:
  AROME course in Romania.
- 12-14 December 2005:
  Physics planning meeting for collaboration between HIRLAM and ALADIN/Meteo-France (in Oslo)

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Sass, B. H., Andersen, B. S., Lindberg, K., Andrae, U., Niemela, S., Martinez, I., and Morata, A. B. (2005a). The HIRALD working group and some preliminary results. Hirlam-6 web presentation, HIRALD.

Sass, B. H., Lindberg, K., and Andersen, B. S. (2005b). The HIRALD setup. ALADIN newsletter 27, HIRALD.

Web pages:

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www.dmi.sk/science/hirald

www.smhi.se/sgn0106/if/hirald/Webgraf

Conclusions

- Active work to
  - Learn
  - Set up
  - Run and get experience with ALADIN
- Worked on interface from HIRLAM
  - And tools for diagnostics and plotting
- Worked on interfacing HIRLAM physics
- Computational studies
- Planning for future and common research