

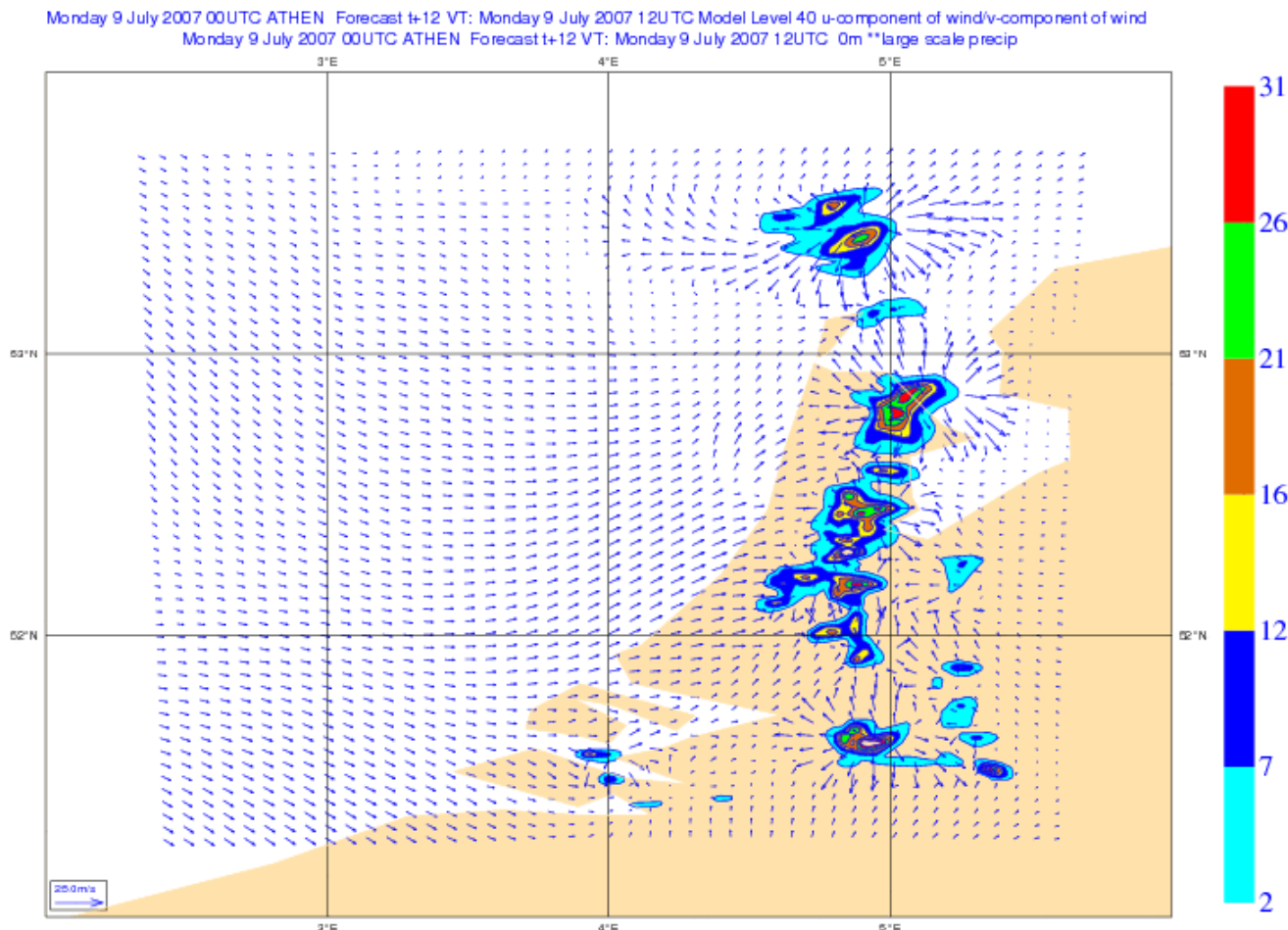
How to cure strong outflow behavior!

Jan Barkmeijer
KNMI

Météo-France, 24-26 November 2008

Case: forecast from 20070709 00UTC

- 33h1 with Hirlam as host model
- gridsize=2,5 km, time step=60 s, domain=120x100 (lat-lon)



Cure 1? Change horizontal diffusion

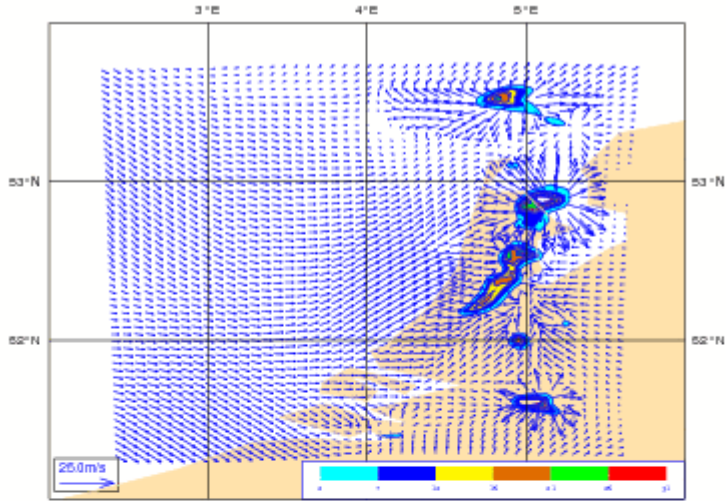
‘ 32h3’ 33h1 HIGH1 HIGH2

rdampvor	5	20	0,5	0,2
rdampdiv	1	20	0,5	0,2
rdampt	5	20	0,5	0,2
rdampq	5	20	0,5	0,2
rdampvd	1	20	0,5	0,2
rdamppd	5	200000	200000	200000

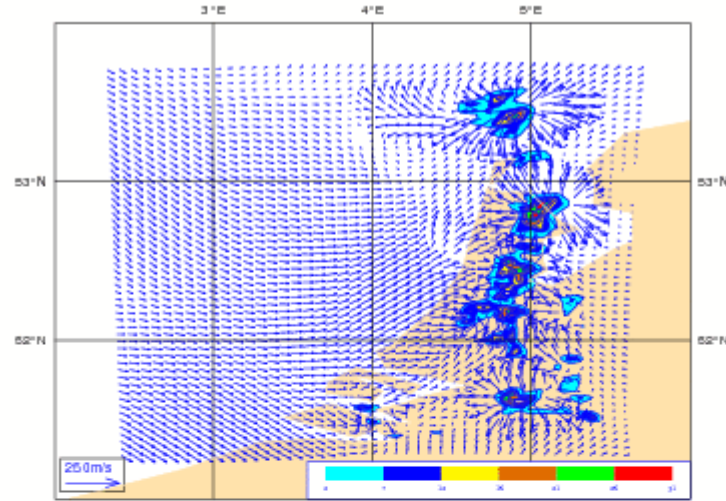
32h3

33h1

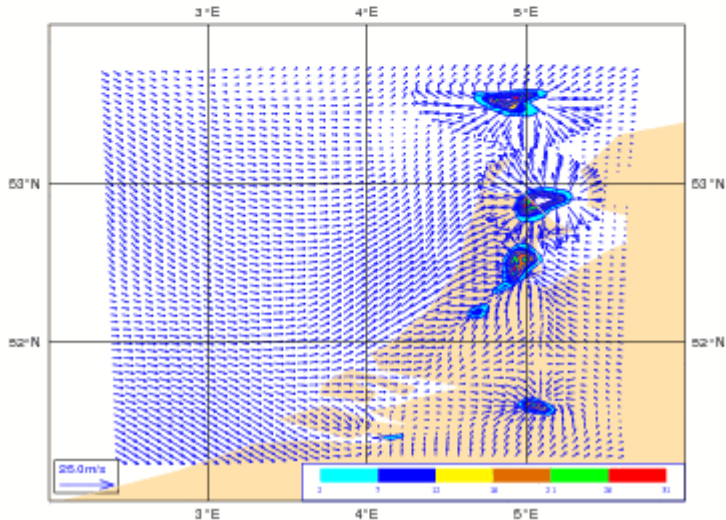
Monday 9 July 2007 00UTC ATHE N Forecast is 12 VT Monday 9 July 2007 00UTC Model Level 40 u-component of wind
Monday 9 July 2007 00UTC ATHE N Forecast is 12 VT Monday 9 July 2007 00UTC On "big scale" precip



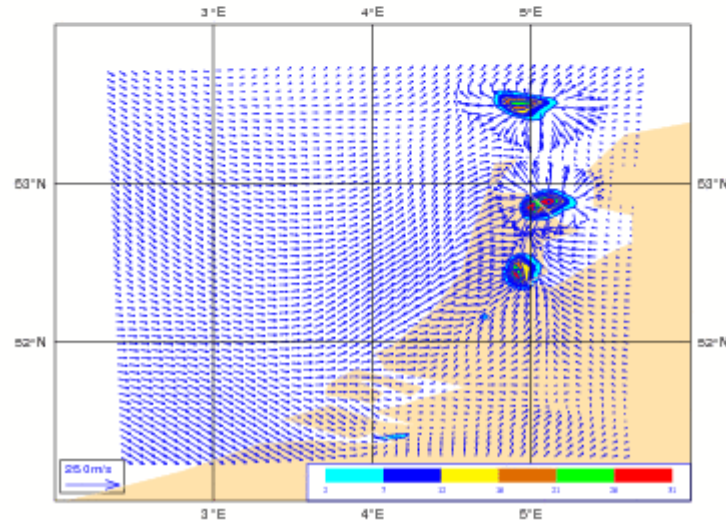
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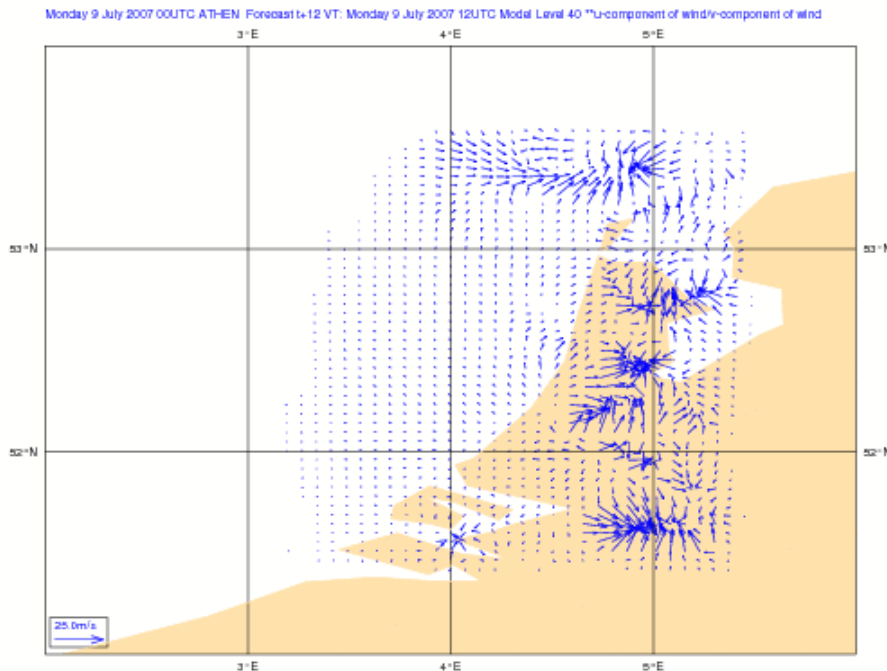
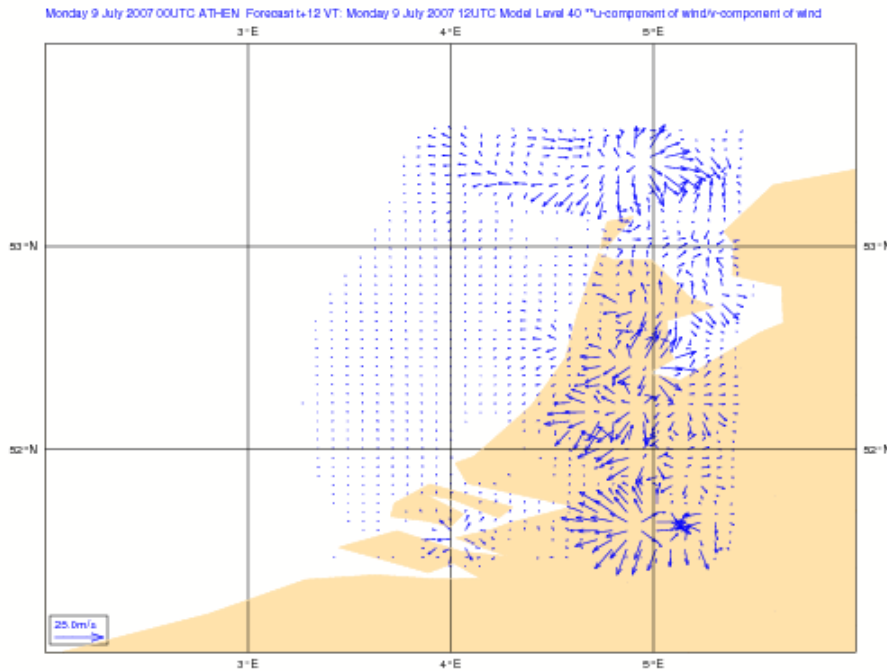
high1

high2

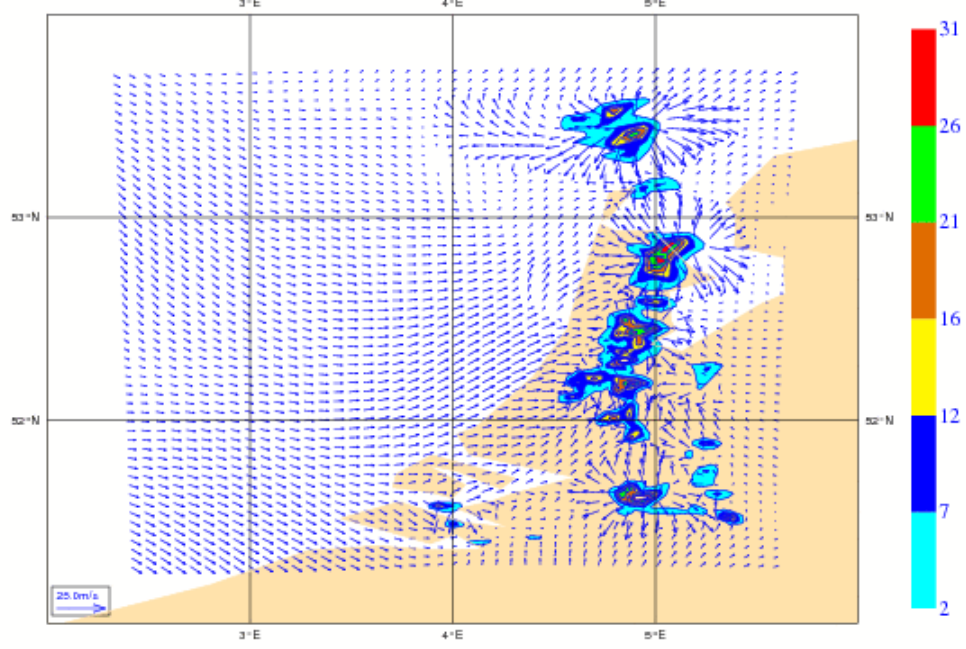
difference plot
L40 windvector

33h1 – 32h1

high1 - 32h1

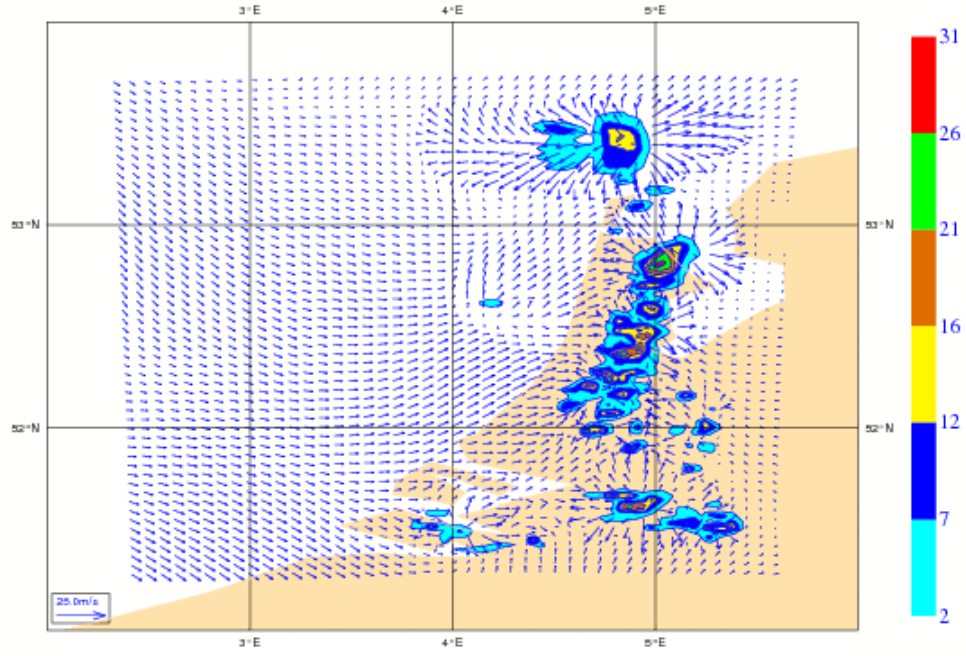


Monday 9 July 2007 00UTC ATHEN Forecast t-12 VT: Monday 9 July 2007 12UTC 0m **large scale precip

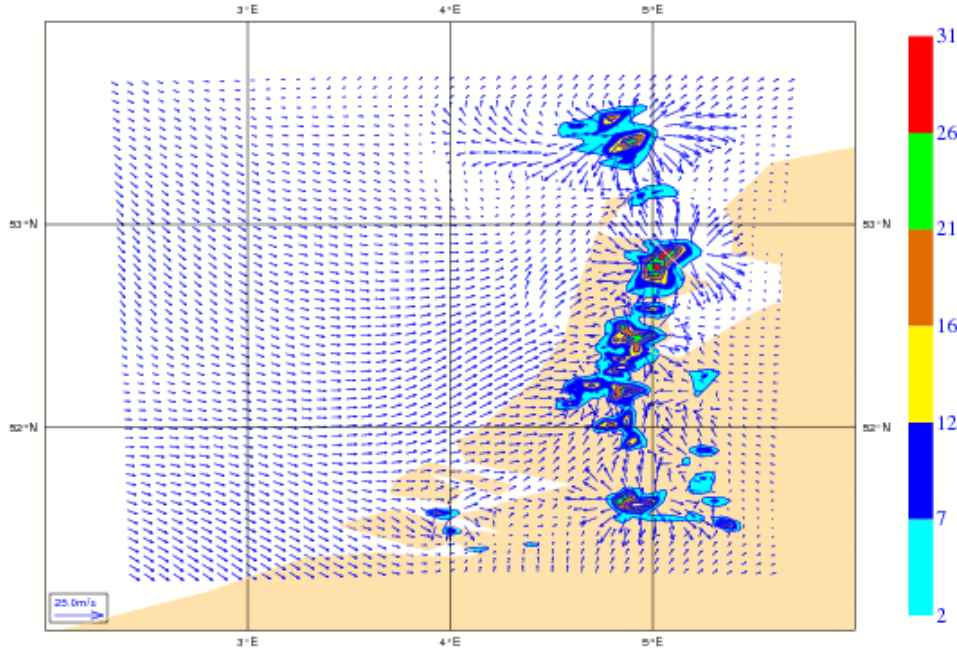


33h1

Monday 9 July 2007 00UTC ATHEN Forecast t-12 VT: Monday 9 July 2007 12UTC Modal Level 40 u-component of wind
Monday 9 July 2007 00UTC ATHEN Forecast t-12 VT: Monday 9 July 2007 12UTC 0m **large scale precip



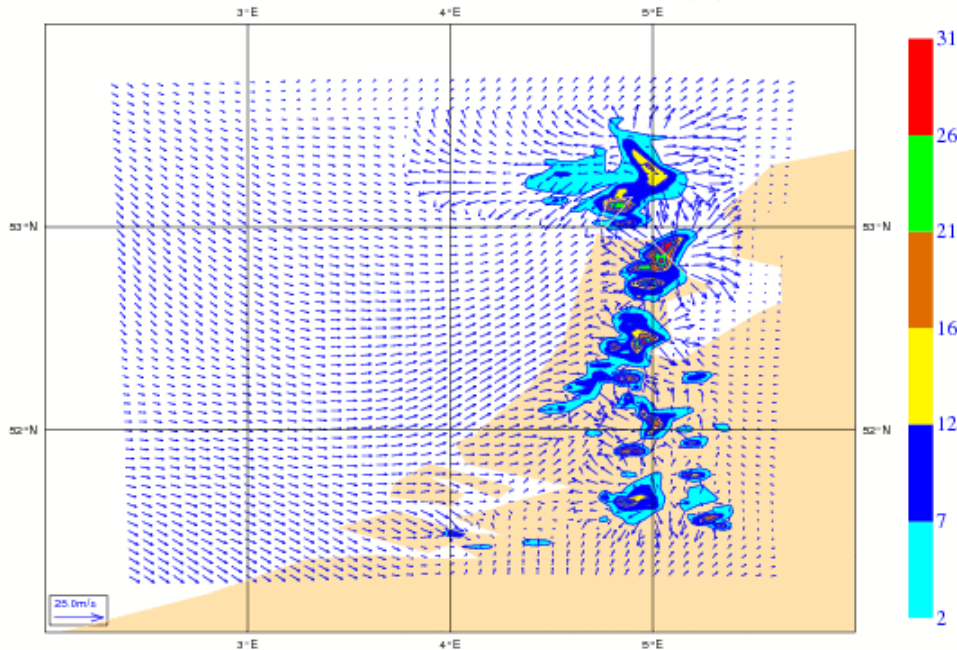
rdamp*=200000



Cure 2 ?

“mesoNH physics should be run with small time steps”

33h1 with $\Delta t=60$ s



33h1 with $\Delta t=10$ s

gridsize=1 km: no impact

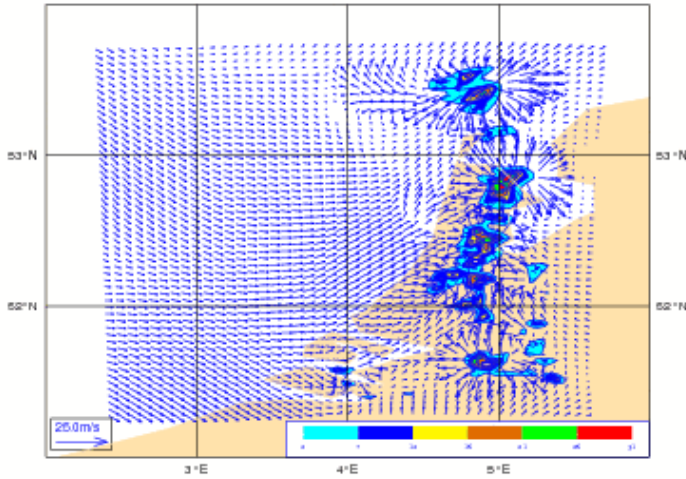
cure 3? Change evaporation

evap/10

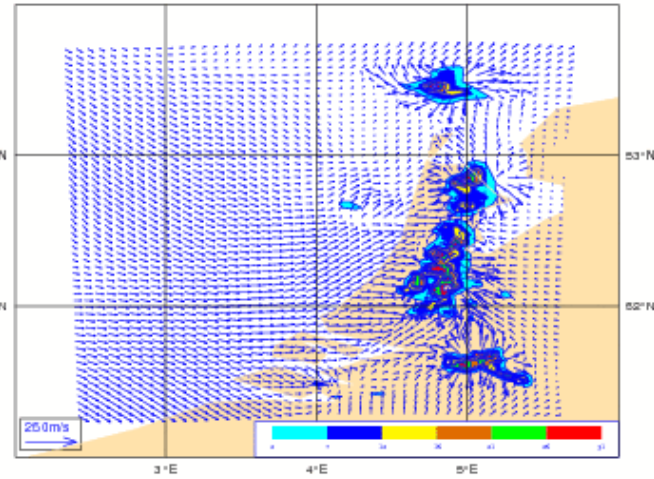
33h1



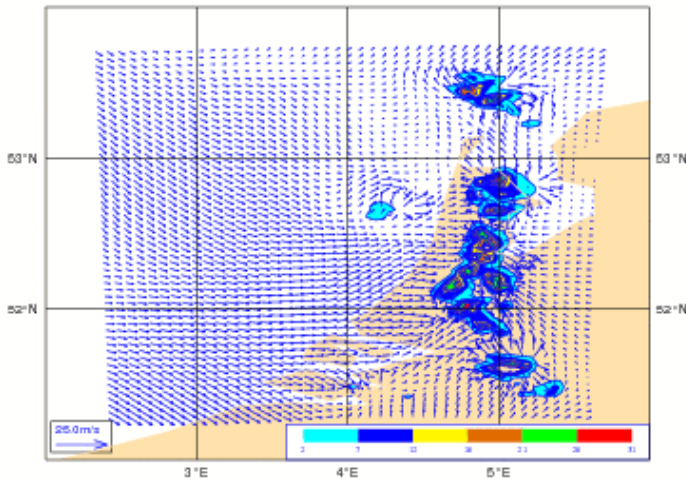
Monday 9 July 2009 00UTC ATHEN: H. Forecast to 12 VT. Monday 9 July 2009 00UTC Block Level 40 u component of wind
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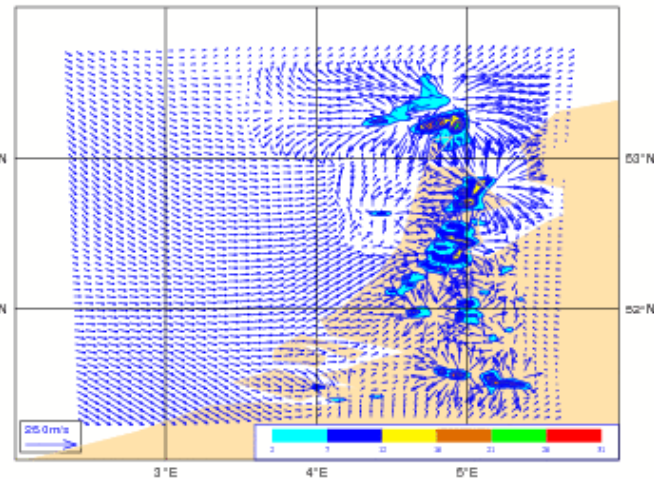
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evap=0

evap*10

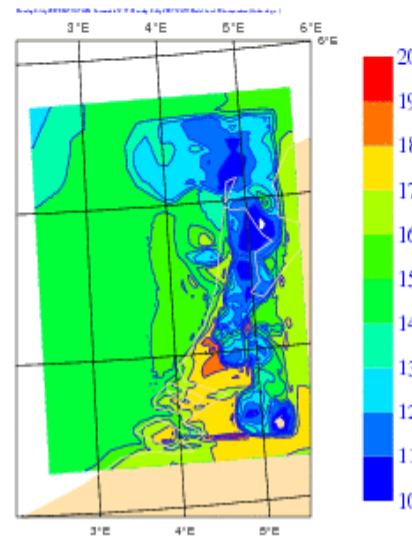
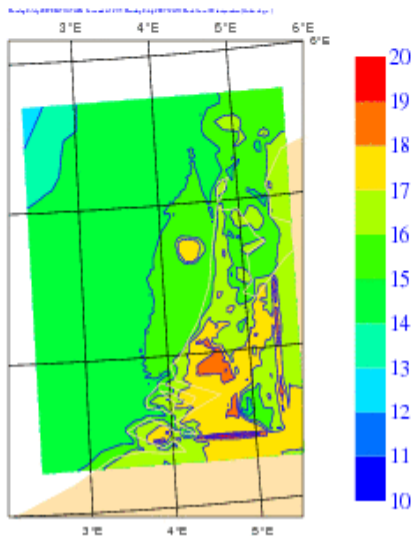
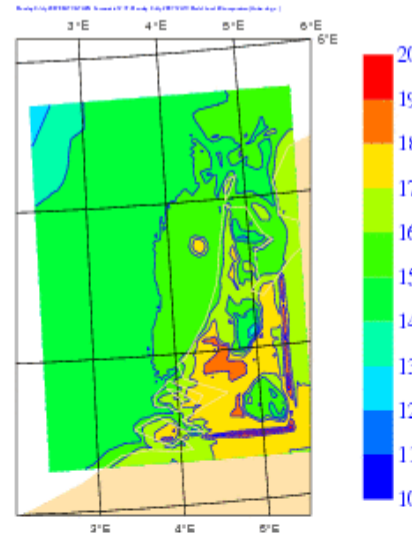
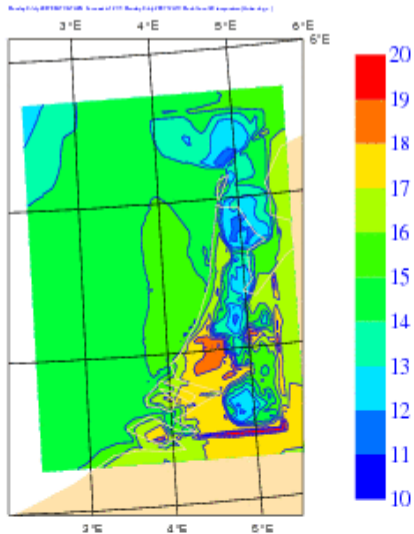
cure 3? Change evaporation

evap/10



33h1

L40
temperature



evap=0

evap*10

REMARKS

- changing diffusion results in behaviour as one would expect:
stronger (weaker) diffusion → weaker (stronger) outflow
- role of timestep in microphysics unclear
- changes to evaporation strongly impact on the outflow:
lower (higher) evaporation → weaker (stronger) outflow