

NLNH euler, impact of diffusion to chimney formation

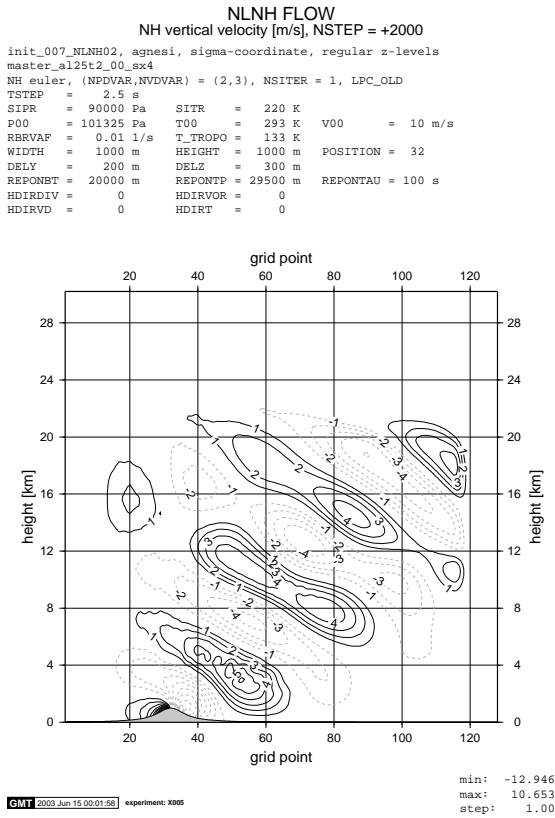


Fig. 1: No diffusion.

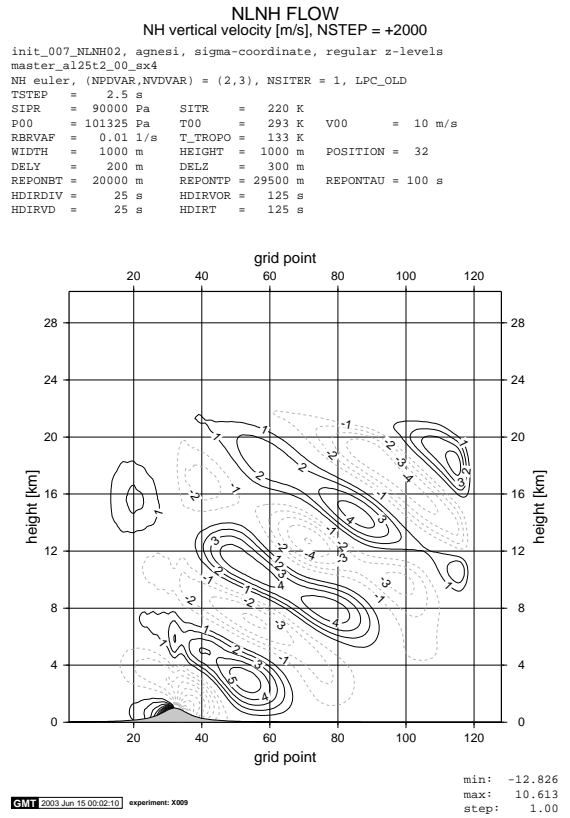


Fig. 2: Weak diffusion.

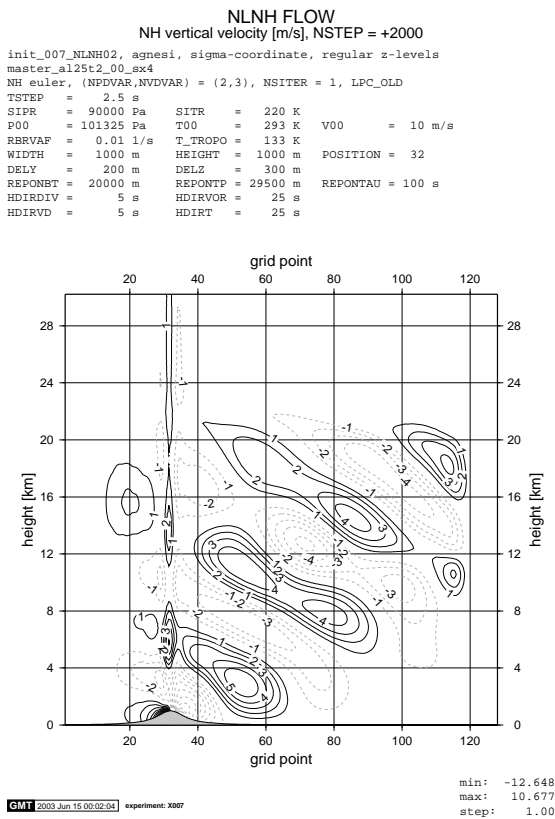


Fig. 3: Strong diffusion.

NLNH euler, impact of reformulated BBC

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +2000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_00_sx4
NH euler, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 2.5 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 0 HDIRVOR = 0
HDIRVD = 0 HDIRT = 0
    
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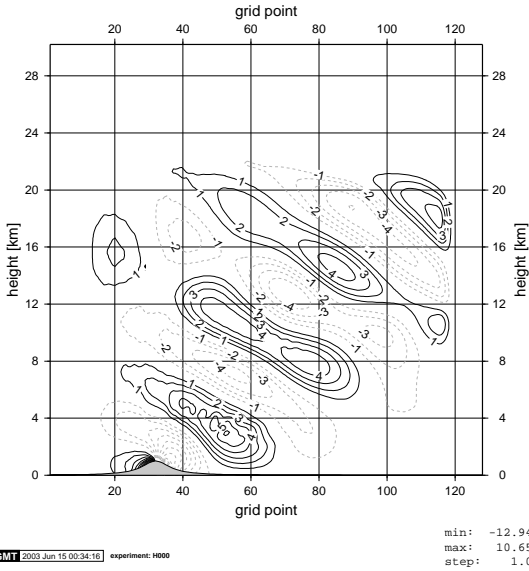


Fig. 5: Old BBC without diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +2000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_00_sx4
NH euler, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 2.5 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 5 s HDIRVOR = 0
HDIRVD = 5 s HDIRT = 0
    
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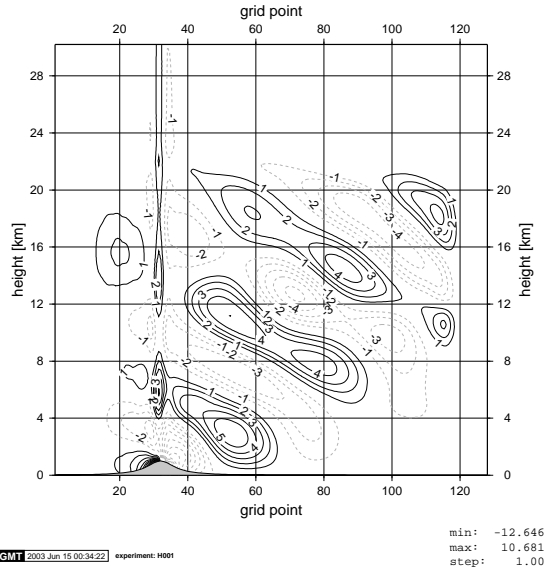


Fig. 6: Old BBC with diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +2000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_01_sx4
NH euler, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 2.5 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 0 HDIRVOR = 0
HDIRVD = 0 HDIRT = 0
    
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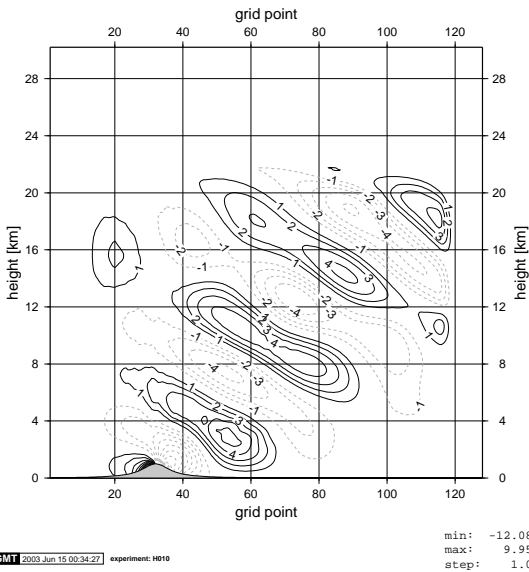


Fig. 7: New BBC without diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +2000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_01_sx4
NH euler, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 2.5 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 5 s HDIRVOR = 0
HDIRVD = 5 s HDIRT = 0
    
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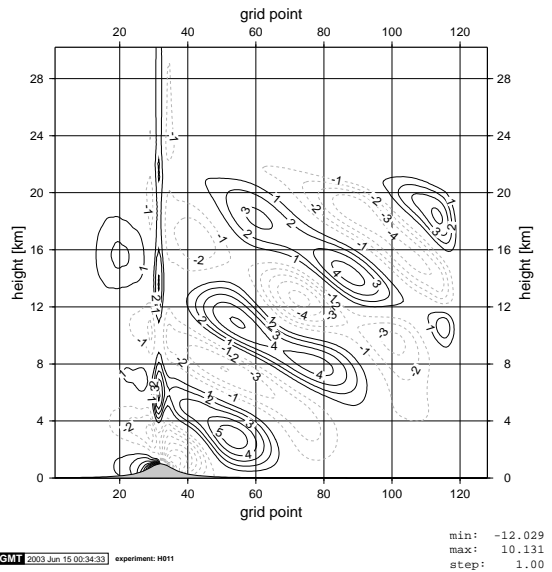


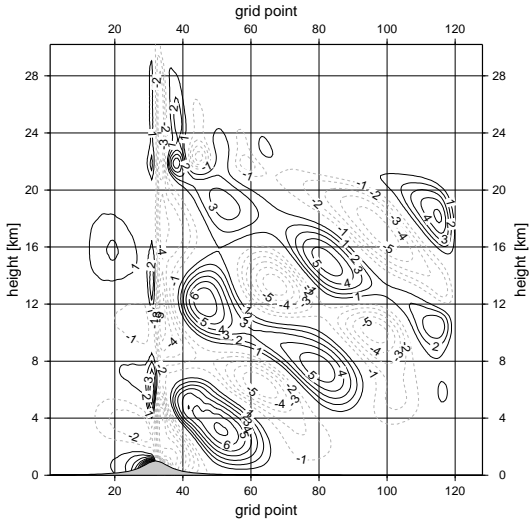
Fig. 8: New BBC with diffusion.

NLNH sl3tl, impact of reformulated BBC

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +1000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_00_sx4
NH sl3tl, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 5.0 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 0 HDIRVOR = 0
HDIRVD = 0 HDIRT = 0
    
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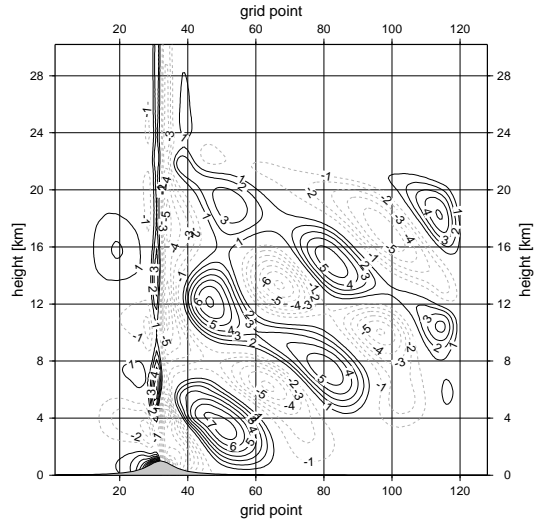
GMT 2003 Jun 15 00:34:52 experiment: H100
min: -13.149
max: 11.046
step: 1.00

Fig. 9: Old BBC without diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +1000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_00_sx4
NH sl3tl, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 5.0 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 5 s HDIRVOR = 0
HDIRVD = 5 s HDIRT = 0
    
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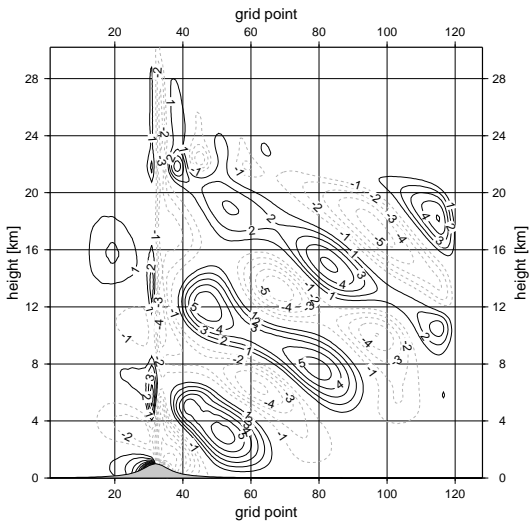
GMT 2003 Jun 15 00:34:57 experiment: H101
min: -13.066
max: 11.295
step: 1.00

Fig. 10: Old BBC with diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +1000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_01_sx4
NH sl3tl, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 5.0 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 0 HDIRVOR = 0
HDIRVD = 0 HDIRT = 0
    
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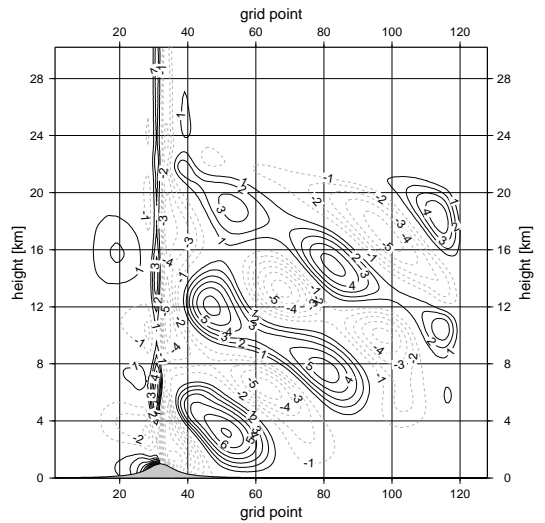
GMT 2003 Jun 15 00:35:01 experiment: H110
min: -12.326
max: 10.353
step: 1.00

Fig. 11: New BBC without diffusion.

NLNH FLOW
NH vertical velocity [m/s], NSTEP = +1000

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init_007_NLNH02, agnesi, sigma-coordinate, regular z-levels
master_al25t2_01_sx4
NH sl3tl, (NPDVAR,NVDVAR) = (2,3), NSITER = 1, LPC_OLD
TSTEP = 5.0 s
SIPR = 90000 Pa SITR = 220 K
P00 = 101325 Pa T00 = 293 K V00 = 10 m/s
RBRVAF = 0.01 1/s T_TROPO = 133 K
WIDTH = 1000 m HEIGHT = 1000 m POSITION = 32
DELY = 200 m DELZ = 300 m
REPONBT = 20000 m REPONTP = 29500 m REPONTAU = 100 s
HDIRDIV = 5 s HDIRVOR = 0
HDIRVD = 5 s HDIRT = 0
    
```



GMT 2003 Jun 15 00:35:06 experiment: H111
min: -12.478
max: 10.722
step: 1.00

Fig. 12: New BBC with diffusion.

NLNH sl2tl, impact of reformulated BBC

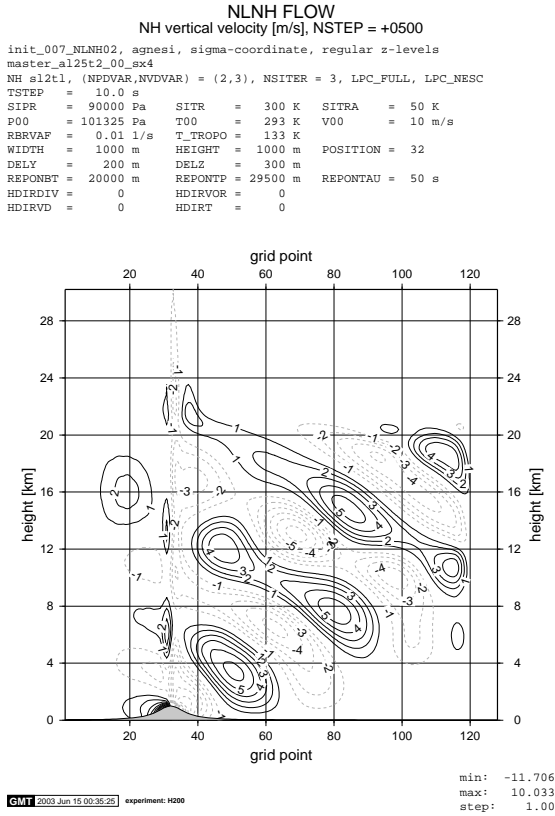


Fig. 13: Old BBC without diffusion.

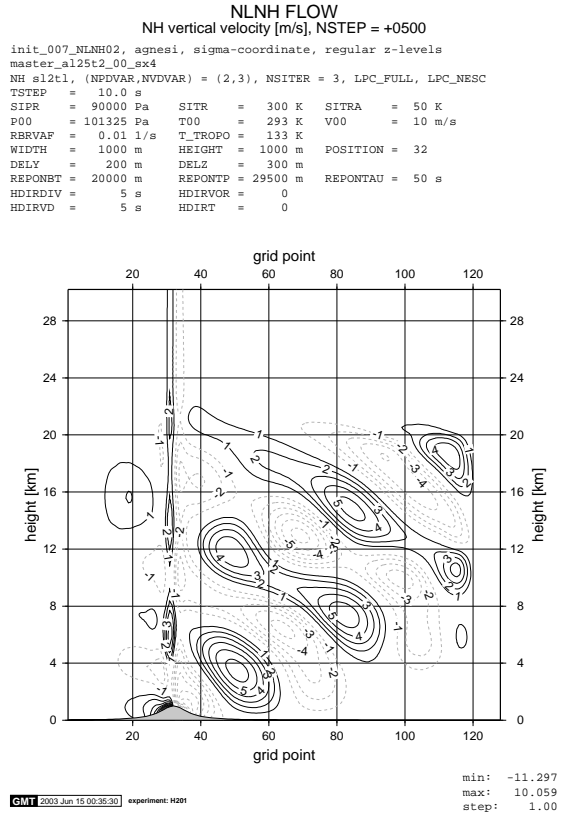


Fig. 14: Old BBC with diffusion.

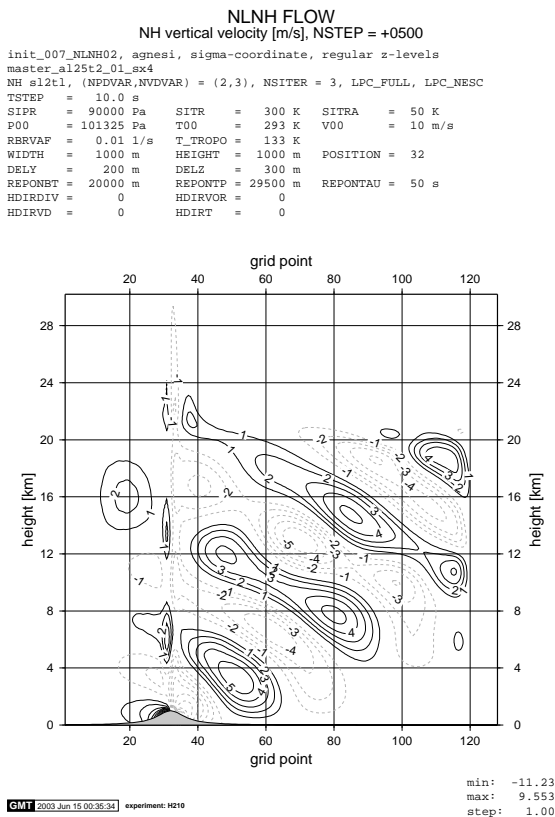


Fig. 15: New BBC without diffusion.

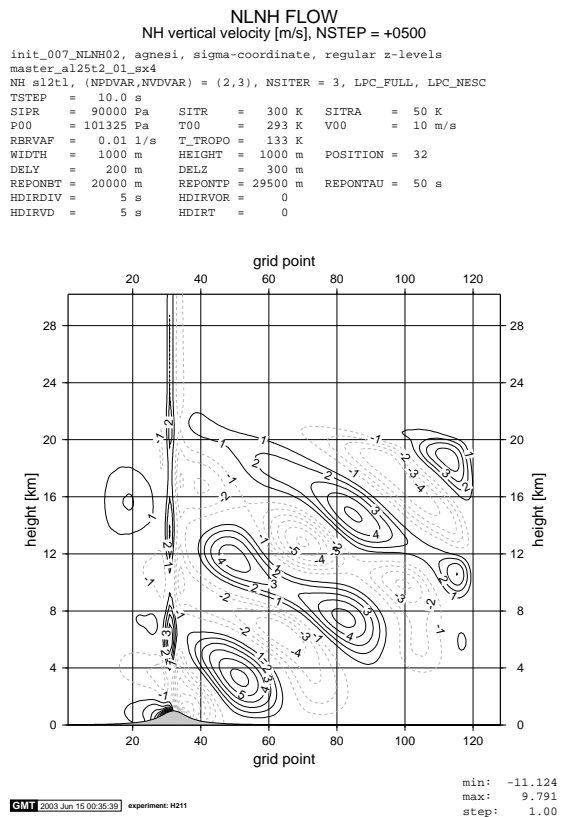


Fig. 16: New BBC with diffusion.