PT "TERRA-NOVA"

Organization of control run for North-Western Russia: first results and proposals for further tests

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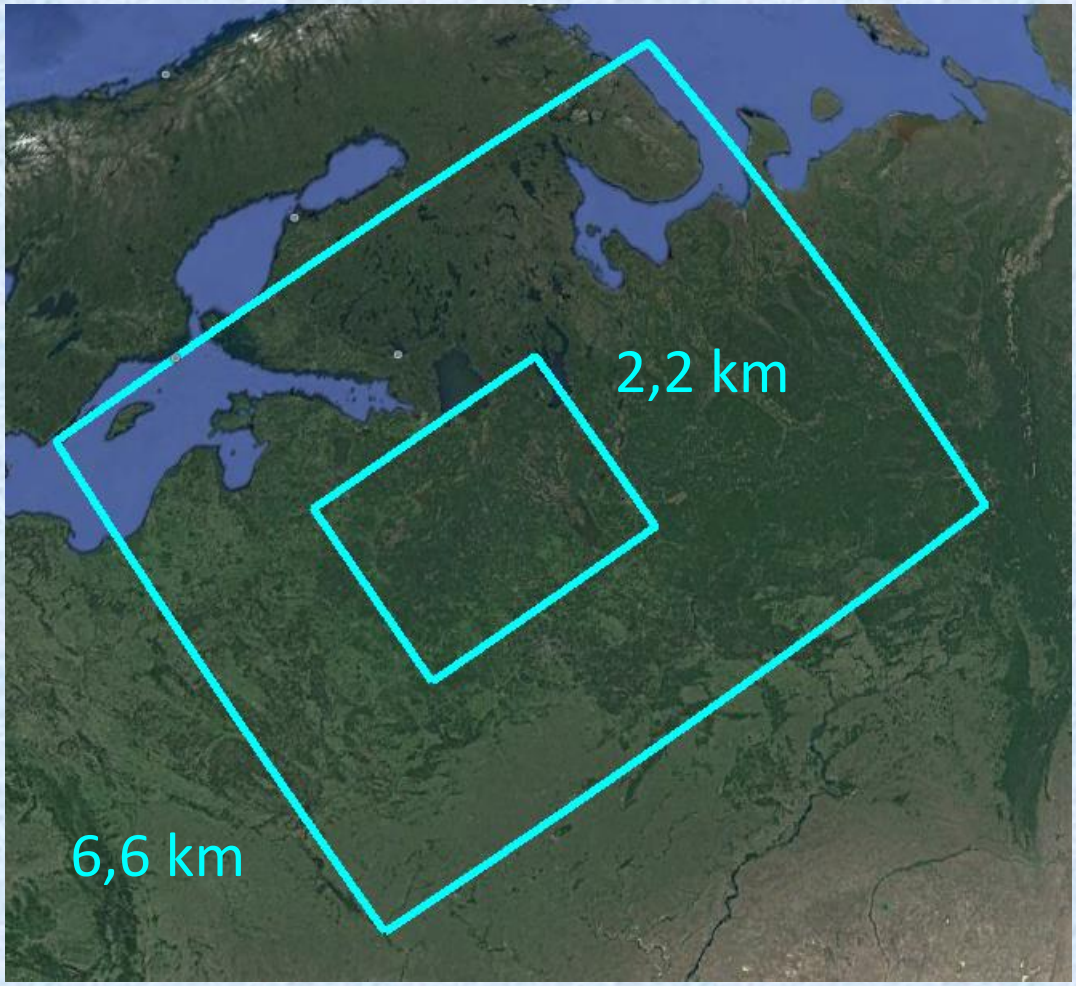
Control run of North-Western Russia

1) Organization of reference experiment
2) Examples of fields of meteorological variables
3) First results of verification



6,6 km – NWR domain (North-Western Russia)
2,2 km – FOR domain (Forest)

Organization of run for 6,6 and 2,2 km domain

	6,6	2,2
ie_tot	280	300
je_tot	220	230
ke_tot	40	50
pollat	25	
pollon	-90	
startlat_tot	-1	3
startlon_tot	-33	-29

List of surface variables (every hour):

'T_2M ', 'TD_2M ', 'RELHUM_2M', 'PMSL',
'U_10M ', 'V_10M ', 'VMAX_10M', 'TOT_PREC',
'ASHFL_S', 'SHFL_S', 'ALHFL_S', 'LHFL_S',
'ASOB_S', 'SOBS_RAD', 'ATHB_S', 'THBS_RAD',
'QVSFLX ', 'T_G ', 'T_S ', 'T_SO ',
'W_SO ', 'QV_S ', 'H_SNOW ', 'W_SNOW ',
'T_SNOW','T_ICE ','H_ICE '

List of flake variables (every 3 hours):

'T_B1_LK', 'H_B1_LK', 'T_WML_LK', 'T_MNW_LK', 'T_BOT_LK', 'C_T_LK ', 'H_ML_LK'

List of pressure variables (every 3 hours):

'T', 'RELHUM', 'U', 'V', 'FI', 'OMEGA',

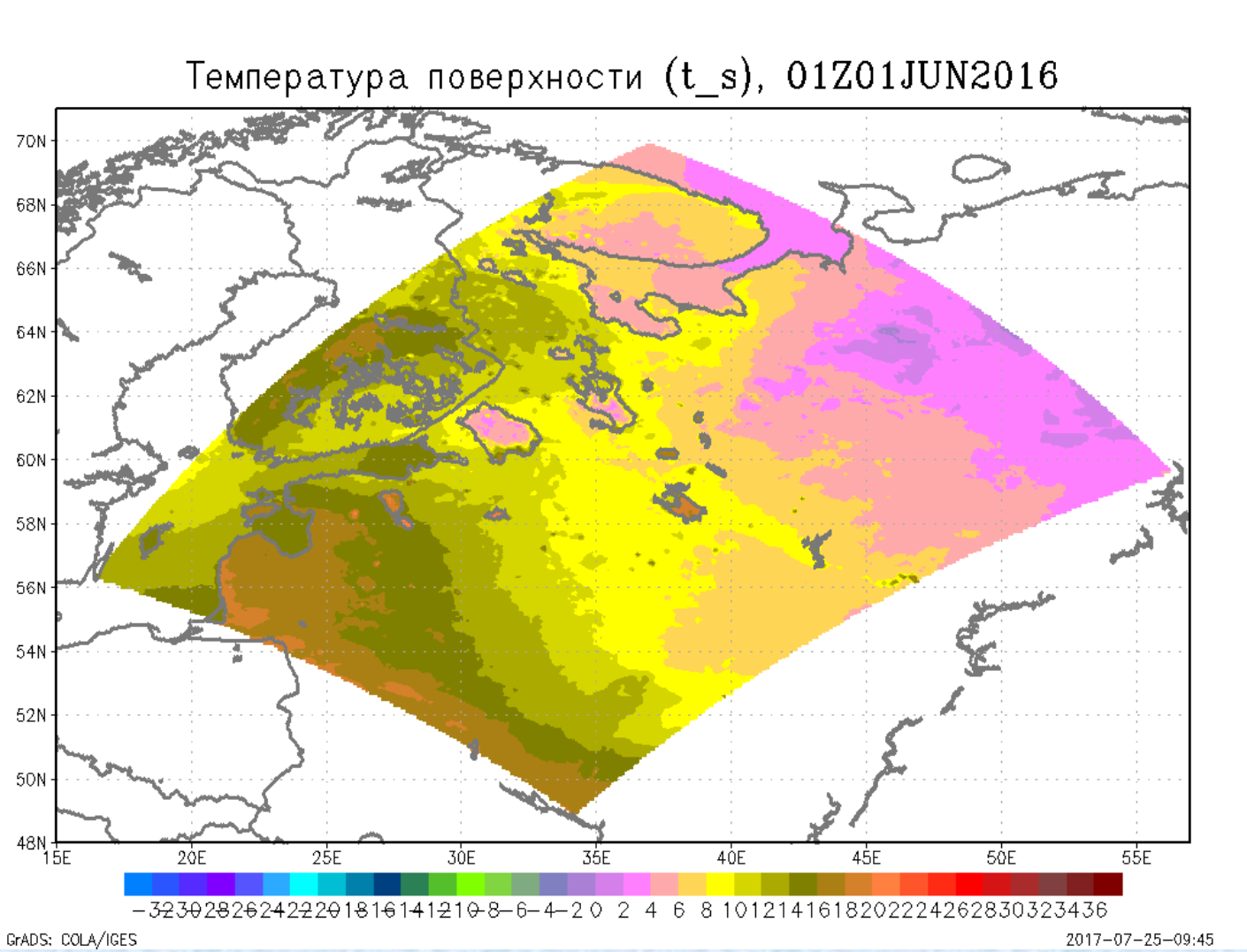
Organization of run for 6,6 and 2,2 km domain

- Operative version of COSMO-model (5.03)
- Initial and boundary conditions for NWR domain were obtained from operative forecasts of global ICON model, for FOR domain – from NWR domain
- Boundary conditions were updated every 3 hours
- Time of forecast – 24 hours
- Fields of soil temperature, soil moisture and lake variables were saved from day to day

Organization of run for 6,6 and 2,2 km domain

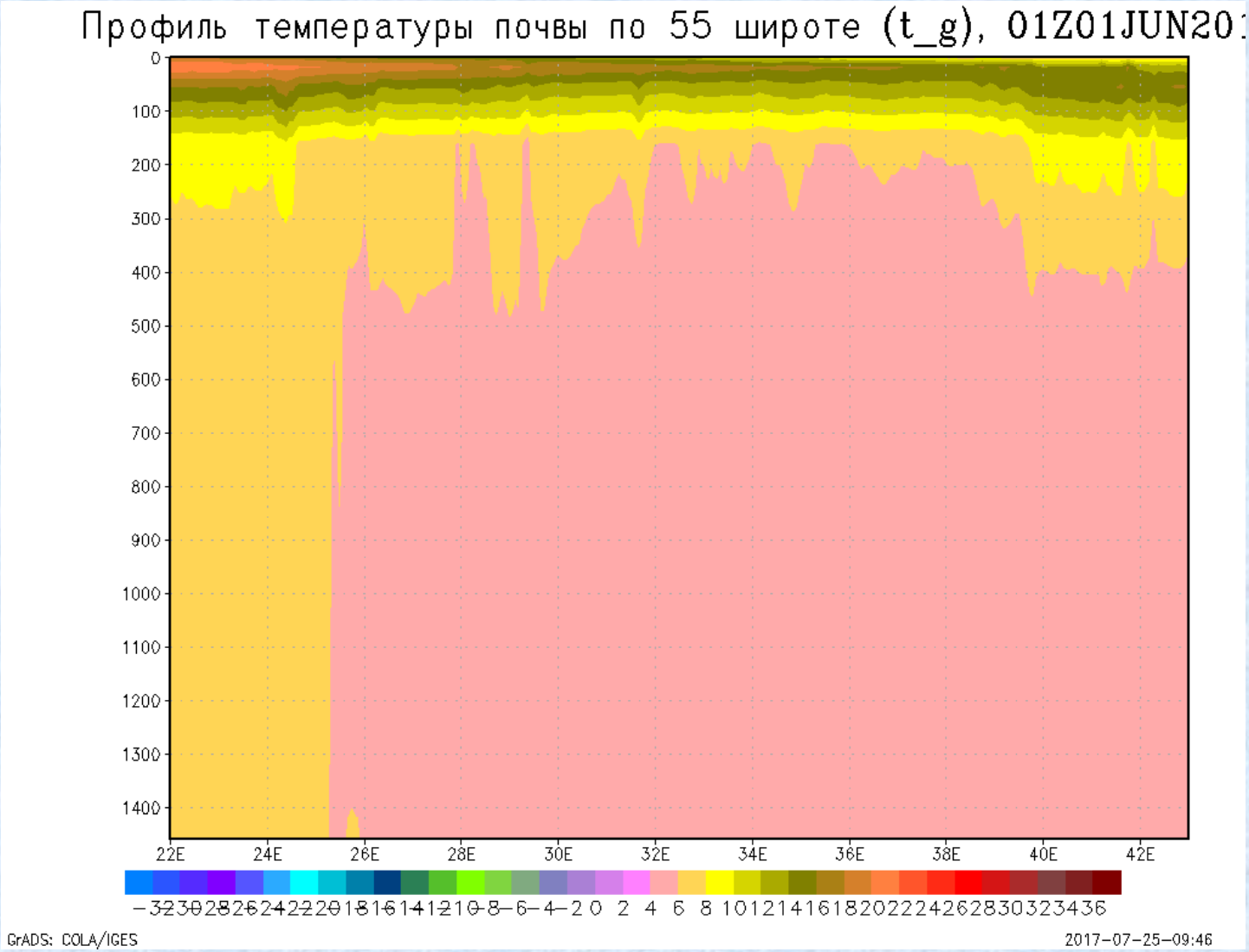
- Parameterizations of sea ice and fresh water lakes were activated (lseaice=.TRUE., llake=.TRUE.)
- Calculations were held from 1_{st} of November 2015 till 31_{st} of December 2016 for NWR (6,6 km) and from 25_{sr} of April till 31_{st} of October 2016 for FOR (2,2 km)
- Dates of beginning of model run were selected due to cold start of Flake parametrization

Results of run for 6,6 km domain



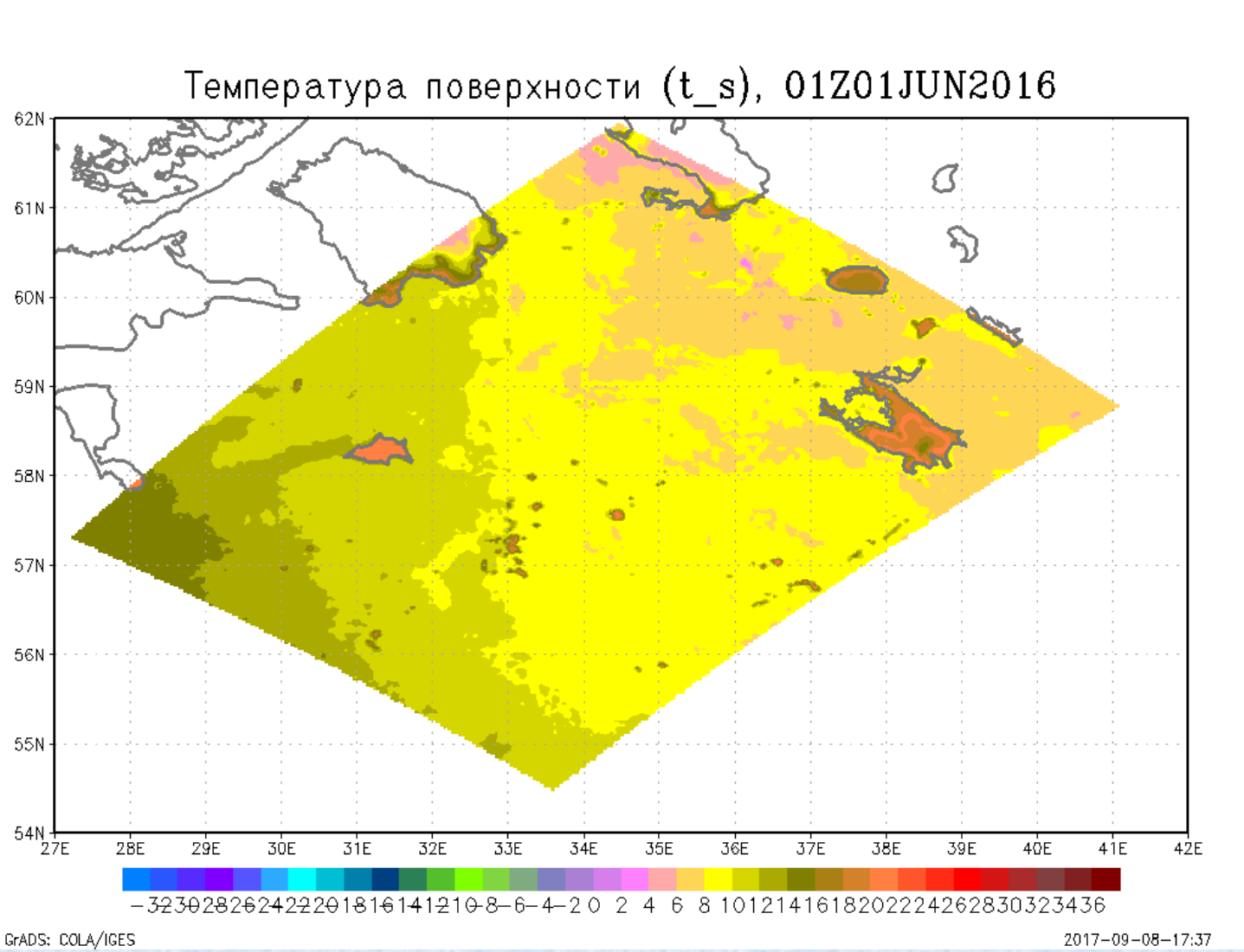
Temperature of the ground surface (1-5 June 2016)

Results of run for 6,6 km domain



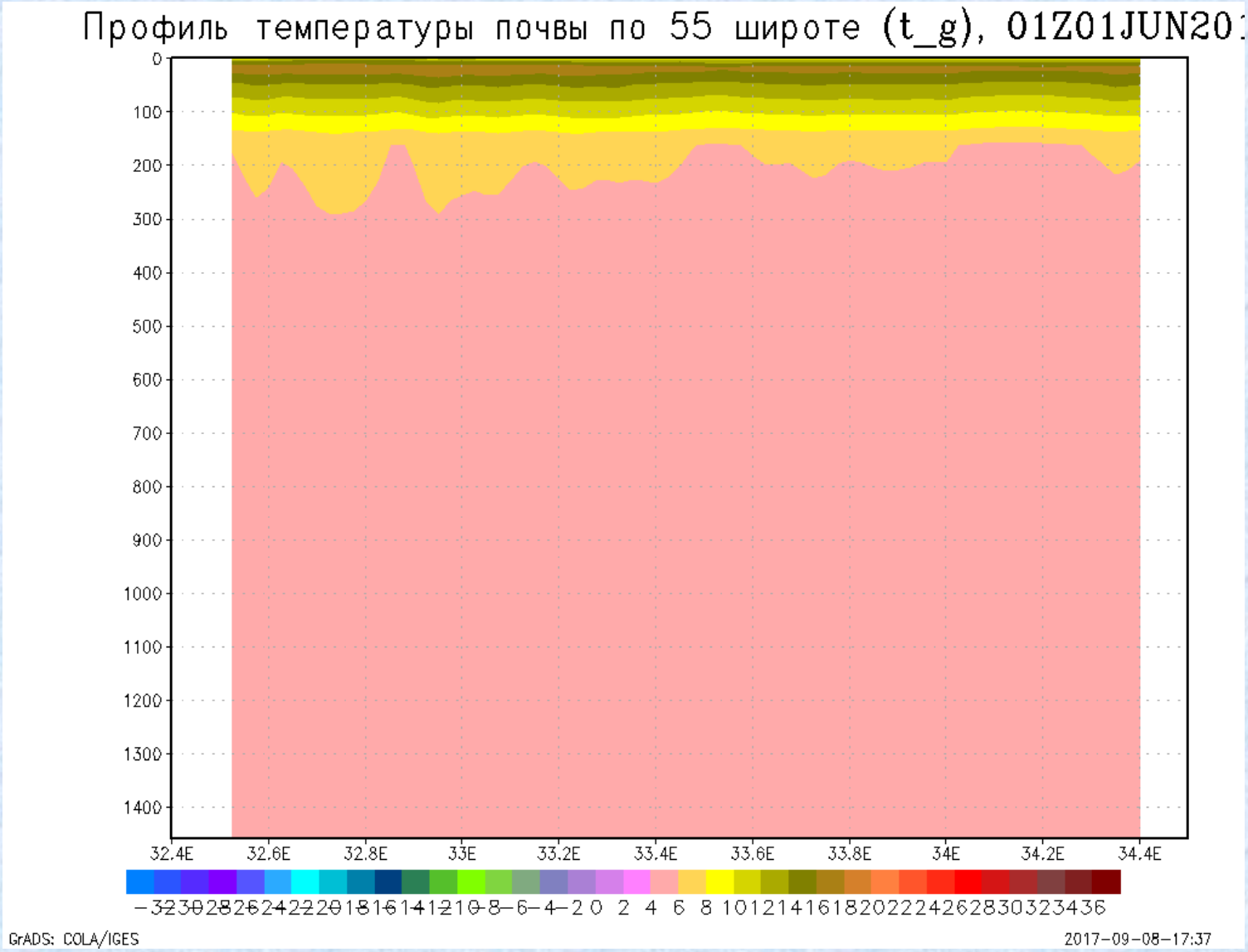
Profile of soil temperature on 55 latitued (1-30 June 2016, every 24 hours)

Results of run for 2,2 km domain



Temperature of the ground surface (1-5 June 2016)

Results of run for 2,2 km domain



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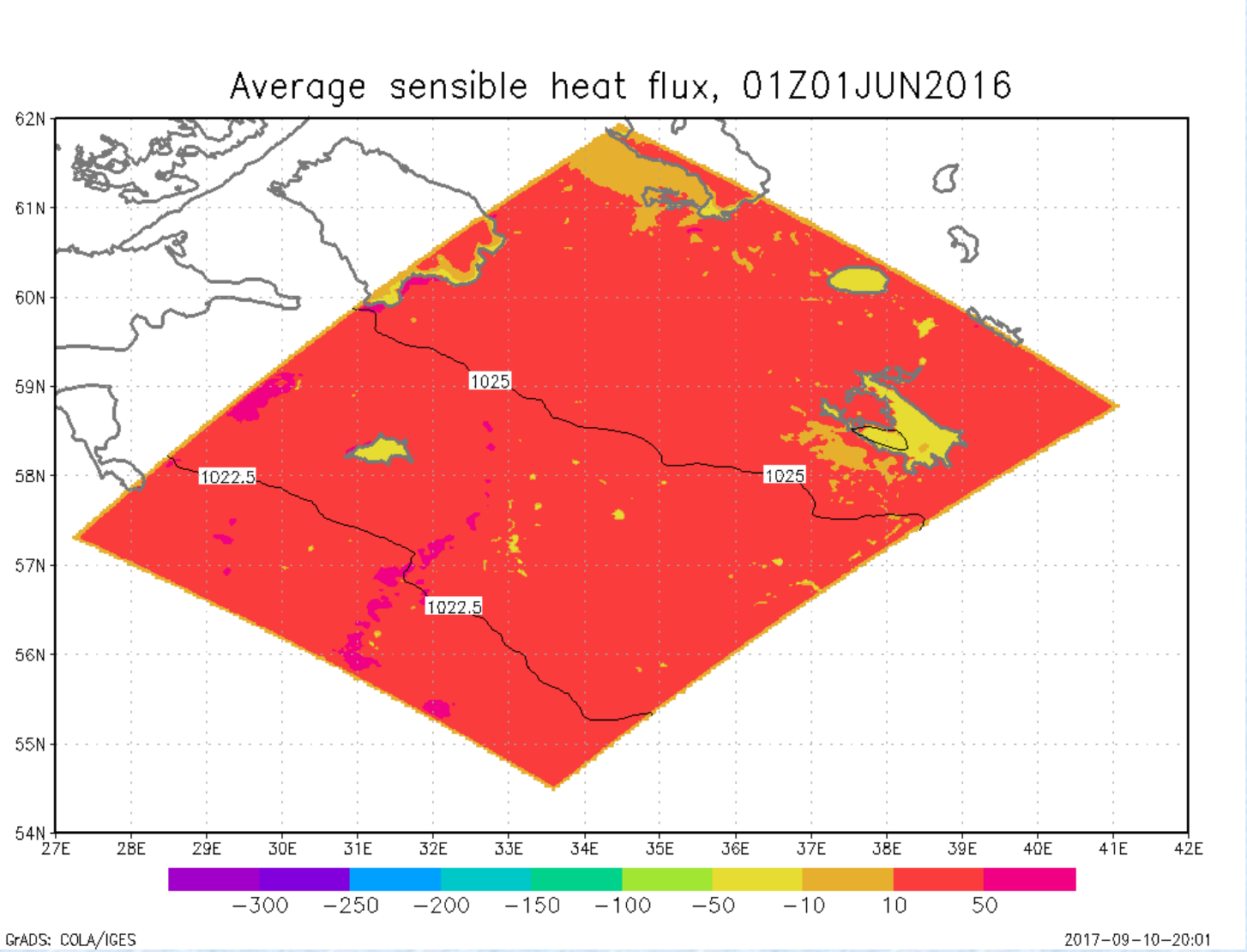
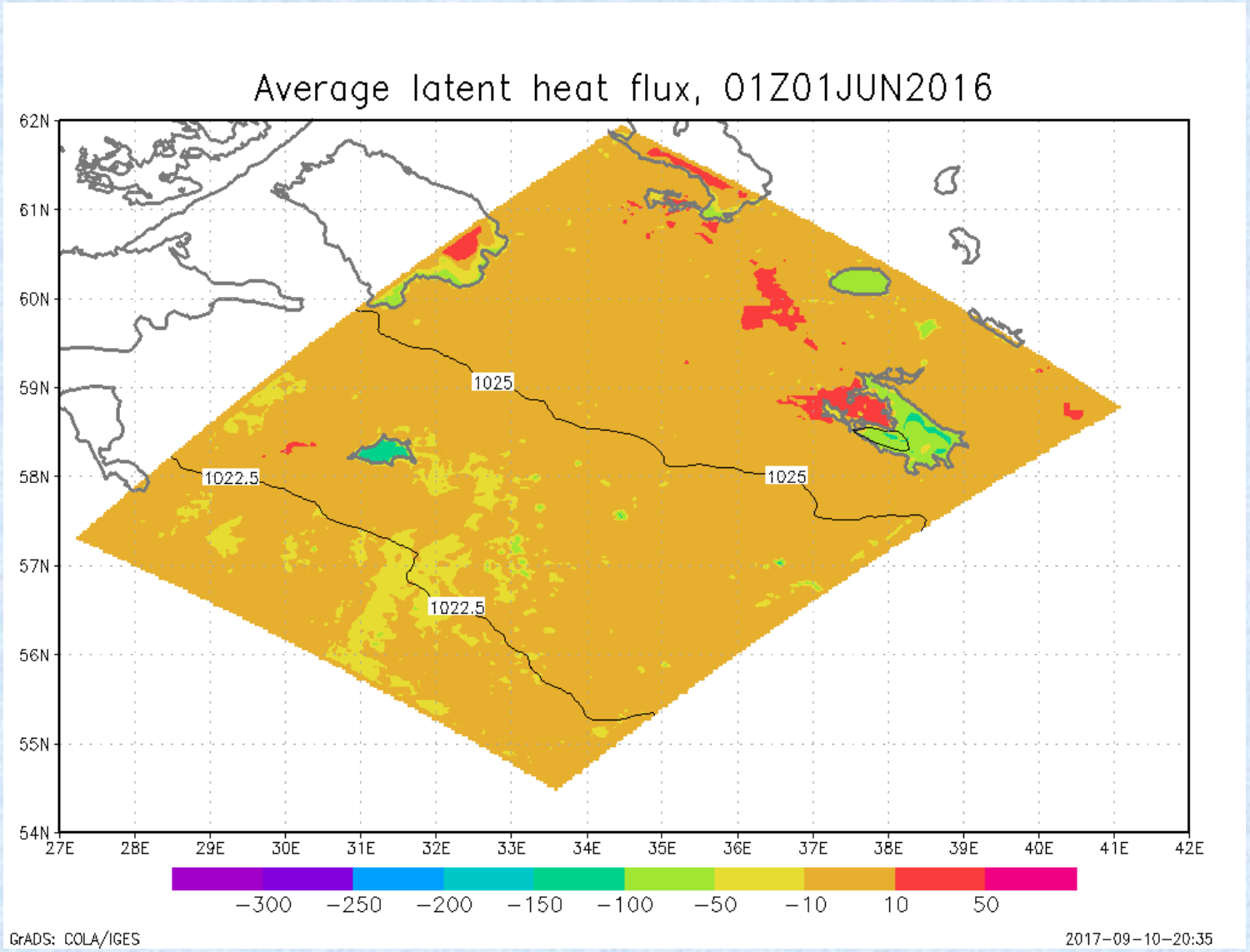


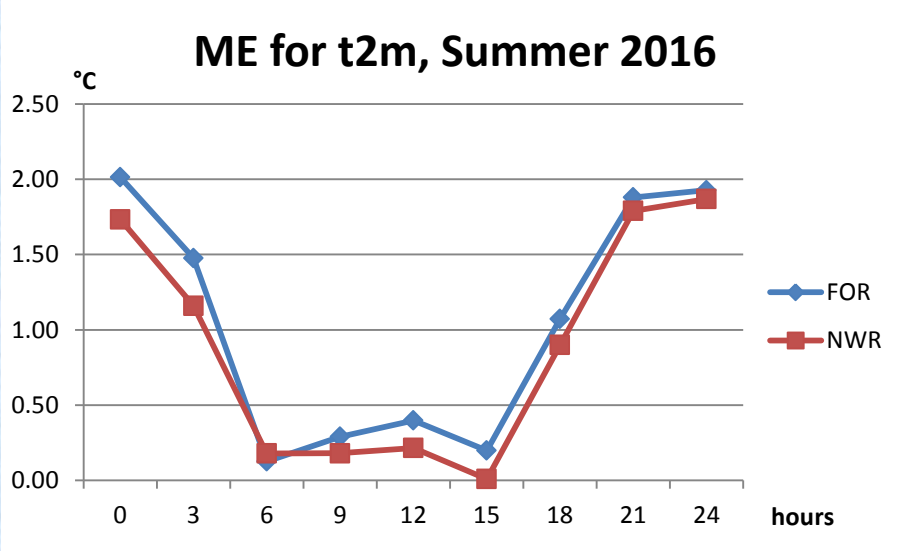
Averaged surface sensible heat flux [W/m2] (1-5 June 2016)

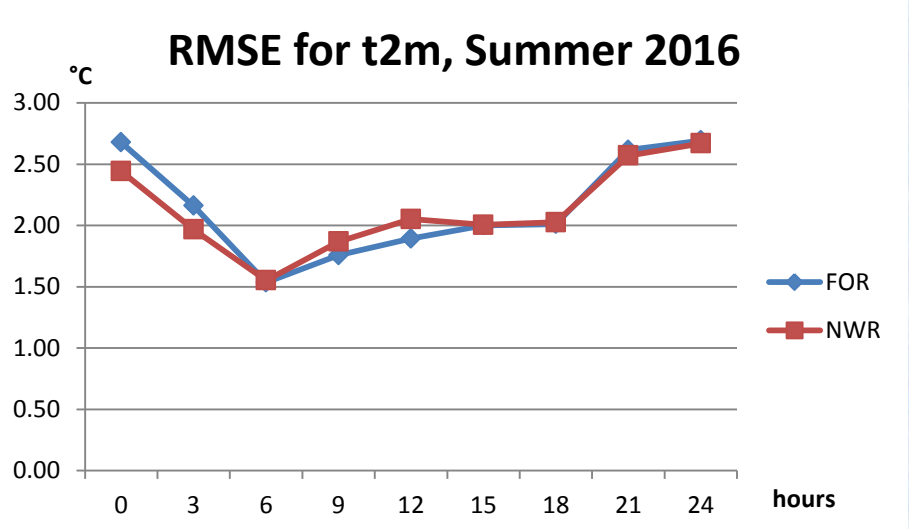
Results of run for 2,2 km domain

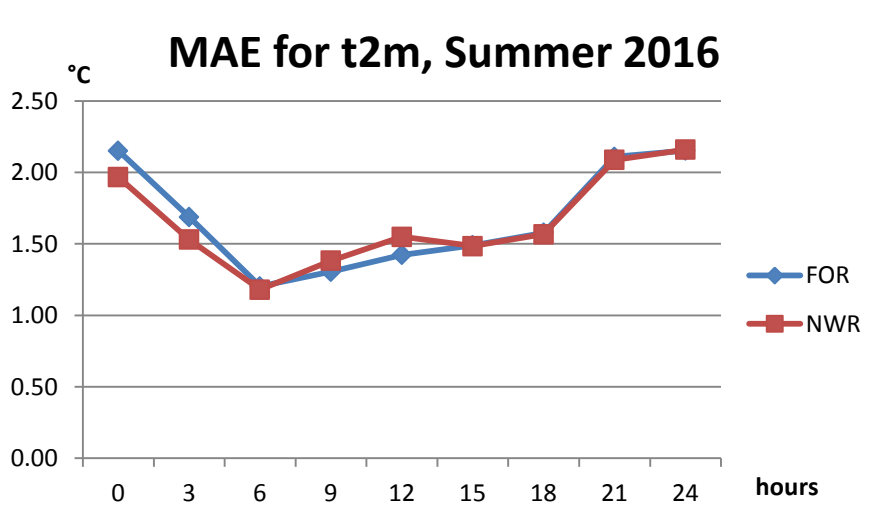


Averaged surface latent heat flux [W/m2] (1-5 June 2016)

Verification of temperature at 2 m



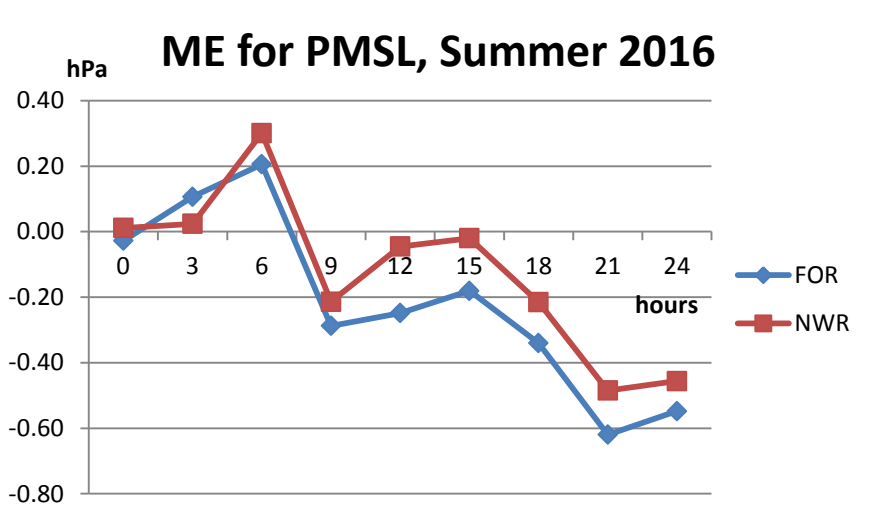


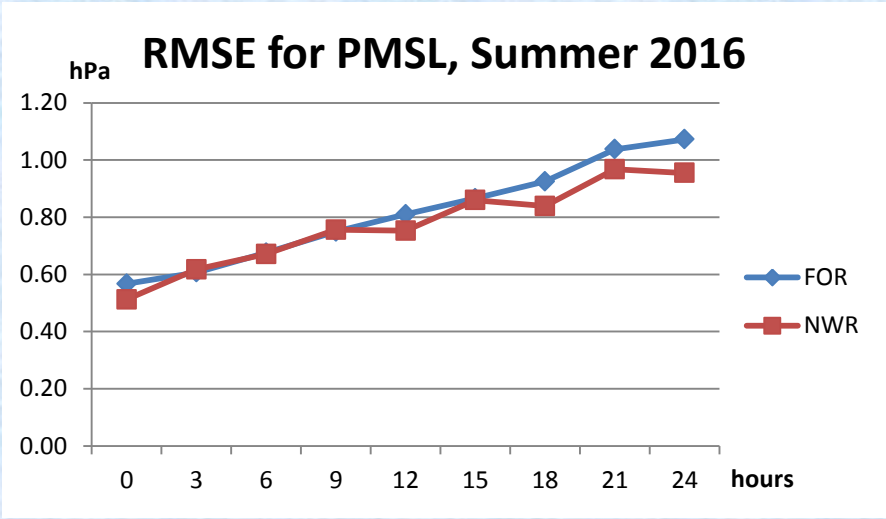


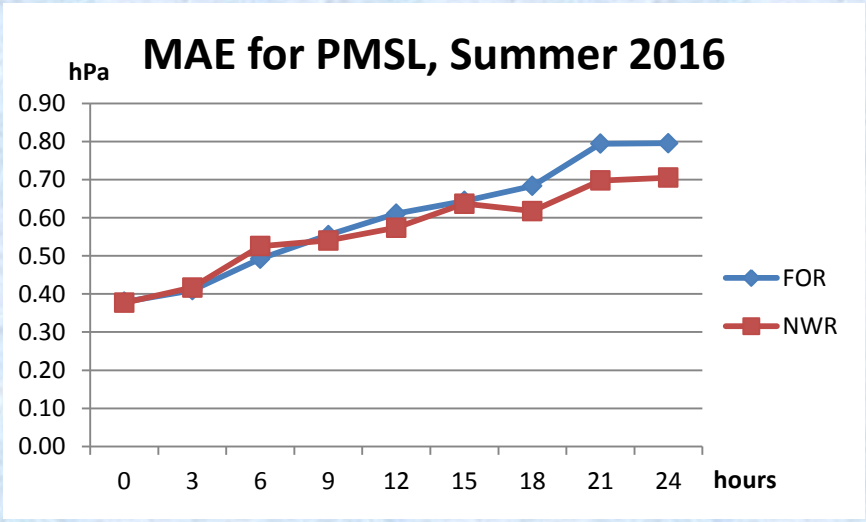
Blue – 2,2 km domain (FOR)

Red – 6,6 km domain (NWR)

Verification of pressure, reduced to mean sea level







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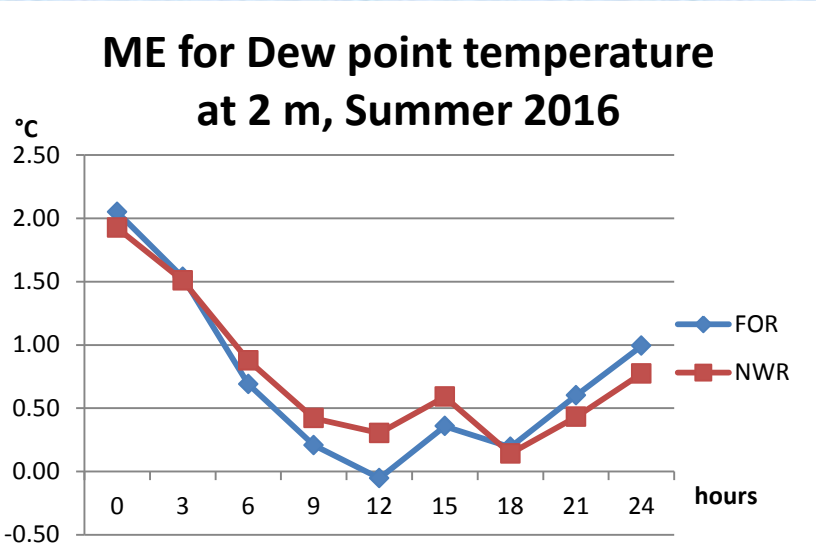
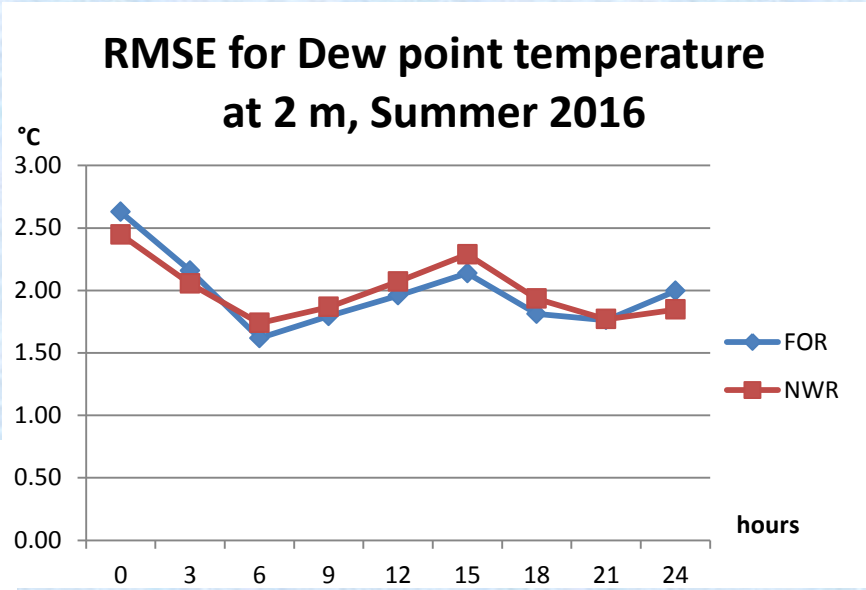
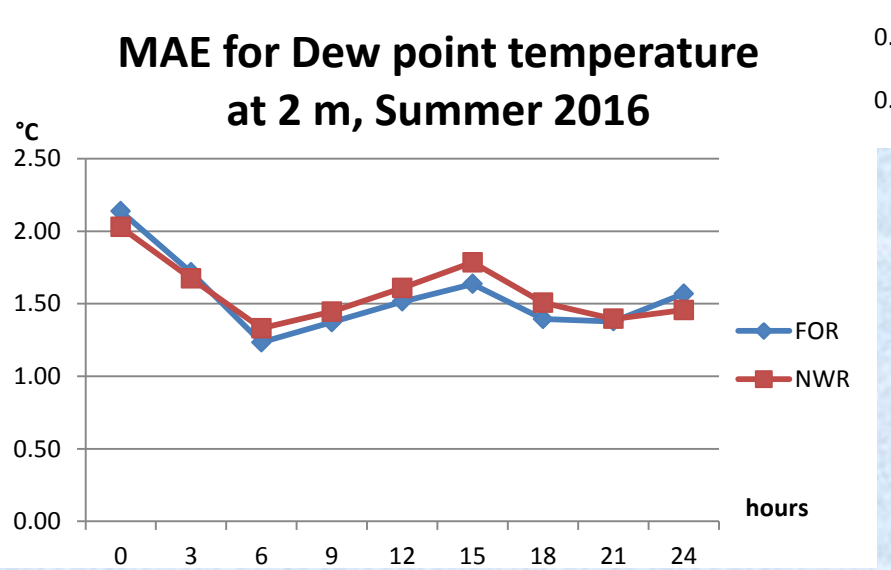
Red – 6,6 km domain (NWR)

Verification of dew point temperature at 2 m







Blue – 2,2 km domain (FOR)

Red – 6,6 km domain (NWR)

Future plans

1) Organization of experiments with different versions of TERRA parametrization
2) Analyzes of fields of meteorological variables (fluxes of sensitive and latent heat, precipitations, surface temperature)
3) Further verifications of meteorological variables
4) Any suggestions?