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Supplement of

Continuous high-resolution midlatitude-belt simulations for July–August 2013 with WRF

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1 namelist.input used for the WRF simulations

The following namelist.input was used for both simulations. For the LOWRES simulation, the time step, grid resolution, and number of grid cells need to be adjusted. In addition, `cu_physics` needs to be set to zero.

```
&time_control
 run_days                            = 0,
 run_hours                           = 0,
 run_minutes                         = 0,
 run_seconds                         = 0,
  start_year                         = 2013
 start_month                         = 07
  start_day                          = 01
  start_hour                         = 0
  start_minute                       = 0
  start_second                       = 0
 end_year                            = 2013
end_month                            = 09
end_day                              = 01
end_hour                             = 0
end_minute                           = 0
 end_second                          = 0
  interval_seconds                   = 21600,
  input_from_file                    = . true .
   history_interval                  = 30,
  frames_per_outfile                 = 1
  restart                            = . false .,
   restart_interval                  = 720,
   override_restart_timers           = . true .
 io_form_history                     = 11,
  io_form_restart                    = 11,
 io_form_input                       = 102,
io_form_boundary                     = 11,
io_form_auxinput1                    = 11,
debug_level                          = 0,
nocolons= . true .
 io_form_auxinput4                   = 11
auxinput4_inname                     = "wrflowinp_d<domain>"
 auxinput4_interval                  = 360
auxhist23_outname='wrfpress_d<domain>_<date>'
io_form_auxhist23  = 11
 auxhist23_interval   = 30,
frames_per_auxhist23  = 1
 diag_print =1,
auxhist2_outname='afwa_d<domain>_<date>'
io_form_auxhist2  = 11
 auxhist2_interval   = 15,
frames_per_auxhist2  = 1
 use_netcdf_classic =. true .
```

```
 /

&diags
p_lev_diags                         = 1
 num_press_levels                   = 7
  press_levels                      = 92500, 85000, 70000, 50000, 30000, 20000, 10000
 use_tot_or_hyd_p                   = 2
/
&domains
 time_step                          = 10
 time_step_fract_num                = 0
  time_step_fract_den               = 1
 max_dom                            = 1
 s_we                               = 1
 e_we                               = 12000
 s_sn                               = 1
 e_sn                               = 1500
  s_vert                            = 1
  e_vert                            = 57
 eta_levels  =   1.000,0.997,0.993,0.989,0.983,0.972,0.962,0.952
   ,0.942,0.932,0.917,0.903,0.889,0.875,0.852,0.826,0.799,0.771,
   0.748,0.725,0.7,0.678,0.653,0.628,0.590,0.557,0.515,0.480,
   0.445,0.410,0.375,0.340,0.305,0.280,0.25,0.219,0.191,0.174,
   0.157,0.142,0.128,0.114,0.102,0.091,0.080,0.070,0.061,0.052
   ,0.044,0.037,0.030,0.024,0.018,0.013,0.008,0.003,0.000,
 num_metgrid_levels                 = 138,
 p_top_requested                    = 1000,
 dx                                 = 3335.324,
 dy                                 = 3335.324,
  grid_id                           = 1,
 parent_id                          = 1,
  i_parent_start                    = 1,
  j_parent_start                    = 1,
  parent_grid_ratio                 = 1,
  parent_time_step_ratio            = 1,
 feedback                           = 1,
 smooth_option                      = 0,
 use_surface                        = .false.,
 sfcp_to_sfcp                       = .false.
 use_adaptive_time_step             = .false.
 step_to_output_time                = .true.
  target_cfl                        = 1.3,
 max_step_increase_pct              = 50,
  starting_time_step                = -1,
 max_time_step                      = 15,
 min_time_step                      = 1,
 /

&physics
```

```
 sst_update                          = 1,
mp_physics                           = 10
ra_lw_physics                        = 4
ra_sw_physics                        = 4
 radt                                = 3
 sf_sfclay_physics                   = 1
 sf_surface_physics                  = 2,
 bl_pbl_physics                      = 1,
 bldt                                = 0,
topo_wind                            = 1
cu_physics                           = 0,
cudt                                 = 0,
 kfeta_trigger                       = 2,
 isfflx                              = 1,
ifsnow                               = 1,
 icloud                              = 1,
 surface_input_source                = 1,
num_soil_layers                      = 4,
mp_zero_out                          = 0,
 sf_urban_physics                    = 0,
maxiens                              = 1,
maxens                               = 3,
maxens2                              = 3,
maxens3                              = 16,
ensdim                               = 144,
 slope_rad                           = 0,
topo_shading                         = 0,
num_land_cat                         = 21,
 iz0tlnd                             = 1,
shcu_physics                         = 3
 sf_ocean_physics                    = 0
usemonalb = . true .
 do_radar_ref  = 1,
 hail_opt        = 1,
 /

&afwa
afwa_diag_opt=1
afwa_severe_opt=1
afwa_ptype_opt=1
afwa_radar_opt=1
afwa_vis_opt=1
afwa_cloud_opt=1
/

&dynamics
 w_damping                           = 1,
 diff_opt                            = 1,
 km_opt                              = 4,
```

```
 gwd_opt                             = 0,
  diff_6th_opt                       = 2,
  diff_6th_factor                    = 0.12,
 base_temp                           = 290.
 damp_opt                            = 3,
 zdamp                               = 5000.,
 dampcoef                            = 0.2,
 khdif                               = 0,
 kvdif                               = 0,
  non_hydrostatic                    = .true.,
 moist_adv_opt                       = 1,
  scalar_adv_opt                     = 1,
 epssm                 = 0.5
 /


&bdy_control
 spec_bdy_width                      = 5,
 spec_zone                           = 1,
 relax_zone                          = 4,
  specified                          = .true.,
 nested                              = .false.,
 periodic_x                          = .true.
 /

&namelist_quilt
 nio_tasks_per_group = 0,
 nio_groups = 1,
 /
```