ACCORD flat-rate stay report

Study of the radiation, cloud's microphysics and atmospheric precipitation sensitivity by taking into account the atmospheric aerosols impact using the AROME model.

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The scientific stay was part of task PH6 focused on cloud/aerosol/radiation (CAR) interactions included in the Rolling Work Plan 2023. The aim of my visit was to find source the problem of AROME model irreproducibility in comparison to the reference the branch CY46T1_bf7. The new branch includes developments suggested by Jan Masek, Daniel Martin, Laura Rontu and Ana Sljivic.

In the new pack, developments suggested by authors gives possibility to use three different sources of atmospheric aerosols in the ALARO and AROME model (Tegen climate files, monthly CAMS aerosol MMRs and near-real time CAMS forecast/analysis). Currently in operational forecast information about aerosol concentration comes from outdated data source - climatological files containing six Tegen aerosol types (sea salt; soil dust (1-10µm); soil dust (<1µm); sulfate (H_2SO_4); carbonaceous aerosol; black carbon). In addition to these, hardcoded background values for tropospheric and stratospheric AOD550 are assumed when preparing aerosol optical properties for the default radiation scheme. Stratospheric volcanic and sulfate aerosols are introduced in this way.

In aim to improve the quality of model forecast work was carried out to use updated climatological files (eleven CAMS aerosol MMRs) as well as daily analyses and forecasts of atmospheric aerosol (CAMS global near-real time). The AROME model validation and testing includes analysis of data transfer of aerosol MMRs in the model but also their impact on the forecast by using two different radiation schemes (ACRANEB2 and Foucault-Morcrette (radiation scheme from IFS CY25)).

The present report consists of seven sections. The first section describes list of modified routines in CY46T1_bf7 and namelist updates, the second section presents new climate fields. In the next section are presented domain details and configuration differences between AROME using ACRANEB2 and Foucault-Morcrette radiation schemes. In the fourth chapter are described experiments done with use of AROME model. In the fifth section is described current status of ALARO model regarding to aerosols modifications. The sixth section describes current status of preparation new climate files, and the last section presents the nearest tasks to complete.

At the end of the report are included ALARO and AROME namelists used in the study and variables which should be included in the namelist to run AROME model with near-real time aerosols.

1. List of modified routines:

Jan Masek and Ana Sljivic – scientific report of Ana Sljivic (1)

- *Structure which store aerosol optical properties read from NetCDF file*

arpifs/module/type_aero.F90

- *Module to import spectrally averaged optical properties*

arpifs/module/yomaero.F90

arpifs/module/model_physics_mf_mod.F90
arpifs/module/yomphy.F90

arpifs/namelist/namphy.nam.h
arpifs/namelist/namaero.nam.h

arpifs/phys_dmn/aplpar.F90
arpifs/phys_dmn/suphmf.F90
arpifs/phys_dmn/apl_arome.F90

- *The new subroutine called at every model timestep, which compute optical properties of the mixture from the mass mixing ratios of the individual CAMS aerosol types.*

arpifs/phys_radi/rad_aer_mmr.F90

arpifs/phys_radi/acraneb2.F90

- *The temporary subroutine that converts aerosol optical depth at 550 nm of the six Tegen aerosols to aerosol optical properties.*

arpifs/phys_radi/acraneb_aer_550.F90

arpifs/setup/su0phy.F90

- *Read inherent optical properties (IOPs) contained in the NetCDF file.*

arpifs/setup/suaero.F90

Daniel Martin: to use n.r.t. aerosol for cloud microphysics within the default ICE3 scheme

mpa/micro/externals/aro_rain_ice.F90
mpa/micro/externals/aro_aerosol.F90
mpa/micro/externals/aro_ccn.F90
mpa/micro/externals/aroini_aerosols.F90
mpa/micro/internals/rain_ice_old.F90
mpa/micro/internals/aermr_nc.F90
mpa/micro/internals/aerosol_process.F90
mpa/micro/internals/ini_aerosols_cams.F90
mpa/micro/module/modi_rain_ice_old.F90
mpa/micro/module/modd_aerosol_prop.F90
mpa/micro/module/modi_aermr_nc.F90
mpa/micro/module/modi_aerosol_process.F90
mpa/micro/module/modd_nrt_aerosols.F90
mpa/micro/interface/aro_aerosol.h
mpa/micro/interface/aro_ccn.h
mpa/micro/interface/aro_rain_ice.h
mpa/micro/interface/aroini_aerosols.h

Laura Rontu

Climate files generation:

aladin/c9xx/eincli9.F90
aladin/c9xx/eincli10.F90
aladin/c9xx/ebicli.F90
arpifs/c9xx/incli0.F90
arpifs/climate/updcli.F90
arpifs/control/cprep1.F90
arpifs/module/yomcli.F90

Transfer of the climatological MMR fields to ALP_AROME:

arpifs/fullpos/sufprfpbuf_clim.F90
arpifs/fullpos/sufptr2.F90
arpifs/fullpos/hpos.F90
arpifs/module/field_definitions.F90
arpifs/module/field_gfl_wrapper.F90
arpifs/module/yomafn.F90
arpifs/module/surface_fields_mix.F90
arpifs/module/yomphy.F90
utilities/addozoaer/addozoaer.F90
utilities/pearome/addpearp.F90

arpifs/setup/suafn1.F90
arpifs/setup/suafn2.F90
arpifs/setup/suafn3.F90
arpifs/setup/su_surf_flds.F90
ifsaux/programs/fahis2cpl.F90
arpifs/utility/updtim.F90

- *Reading aerosol inherent optical properties from text file RADAIOP.*

arpifs/module/yoaiop.F90
arpifs/setup/suaiop.F90
These are alternatives to yomaero,F90 and suaero.F90 that read AIOPs from netcdf files

- *Definition of variables for near real time aerosols.*

arpifs/module/yomnrtaer.F90

- *Initialization of parameters used with near-real time aerosols*

arpifs/phys_dmn/sunrtaer.F90

arpifs/phys_dmn/suphmf.F90
arpifs/phys_dmn/apl_arome.F90
arpifs/phys_dmn/mf_phys.F90
arpifs/phys_dmn/aplpar.F90

- Radiation

arpifs/phys_radi/radlsw.F90
arpifs/phys_radi/recmwf.F90
arpifs/phys_radi/suecrad.F90
arpifs/phys_radi/acradin.F90 *Replaces routine radaer.F90 – compute vertical distribution of aerosols using radaecmr.F90*
arpifs/phys_radi/radaecmr.F90

- *Computes weighted IOP's for aerosols radiative transfer – alternative to rad_aer_mmr.F90*

arpifs/phys_radi/aeropt.F90

- *1D model diagnostics*

arpifs/phys_dmn/writemuscar.F90

- *Misc updates*

arpifs/setup/su0phy.F90
arpifs/setup/suintflex.F90
arpifs/module/yoerad.F90
arpifs/module/yomlun.F90
aladin/programs/blend3.F90

Namelist variable updates

&namcli
NDATX=120,
NDATY=60,
NAEROF=2, ! <u>new variable</u>, determine source of atmospheric aerosols (Tegen or CAMS MMRs)

&naerad
NSW=6
NAER=1
NRADLP=2 - IFS radiation only, 4 can be used for n.r.t., 3 for climmrs

&namparar
RADSN = T1 default 0, h1 1
RADGR = T1 default 0, h1 0.5
NSWB_MNH = 6 same as NSW

&namphy
LAERONRT =.FALSE., ! new variable for use n.r.t. aerosols in radiation and microphysics
LAEROCMR = .FALSE., ! new variable for use CAMS MMRs in radiation and microphysics

&namgfl – n.r.t. aerosol and ezdiag, added at the end of the report (many variables)

&namnrtaer – only for n.r.t. aerosol (new block)
LCAMS_NRT=.TRUE., ! switch on the use of CAMS aerosols in HARMONIE-AROME
LMOCA_NRT=.FALSE., !switch to use MOCAGE aerosols in HARMONIE-AROME, not ready
LAEPHY=.TRUE., ! To activate the use of near real time aerosols in the microphysics
LAECCN2CLDR=.FALSE.,
LAEIFN=.FALSE., ! To activate Ice nuclei
LAERDRDEP=.FALSE., ! Activates the aerosol deposition
CCNMIN='10.0E6', ! Minimum number concentration of Cloud Condensation Nuclei (CCN) inside
! the cloud
SSMIN='0.05E-2', ! Supersaturation at surface level (default value 0.05%)
SSMAX='0.08E-2', Supersaturation over 100 m height (default value 0.08%)
CLDROPMIN='10.0E6', ! Minimum CDNC inside the cloud.

&namaero – only for ACRANEB2 scheme (new block)

CFAERO! NetCDF file name with aerosol optical properties (if path is not given, it is taken from ! the working directory)
RAERO_WEIGHT_SW! shortwave spectral weights
RAERO_WEIGHT_LW! longwave spectral weights
RAERO_MASK_SW! masks defining output shortwave bands
RAERO_MASK_LW! masks defining output longwave bands
MAP_AERO_GFL! aerosol mapping, array with maximum 25 elements containing aerosols to be ! used: if 0 - aerosol type will not be used, if > 0, this is hydrophobic aerosol type and if < 0, ! hydrophilic.

2. Preparation of input data

In aim to check different model configurations monthly climate fields of aerosol MMRs were added by using R package - library **Rfa**, function **FAenc**. Below are listed new fields of monthly aerosol species used in the ALADIN-HIRLAM system:

SURFAEROMMR.SS1 – sea salt 0.03-0.5µm
SURFAEROMMR.SS2 – sea salt 0.03-0.5µm
SURFAEROMMR.SS3 – sea salt 0.03-0.5µm
SURFAEROMMR.DD1 – dust 0.03-0.55µm
SURFAEROMMR.DD2 – dust 0.55-0.9µm
SURFAEROMMR.DD3 – dust 0.9-20µm
SURFAEROMMR.OM1 – hydrophilic organic matter
SURFAEROMMR.OM2 – hydrophobic organic matter
SURFAEROMMR.BC1 – hydrophilic black carbon
SURFAEROMMR.BC2 – hydrophobic black carbon
SURFAEROMMR.SU – sulphate

The new pack also contains modifications to E923 (climate generation) - reads climate files of aerosol MMRs (in text format) and writes them to climate files (**more details in section 6**).

3. Model domain and configuration

Validation and testing of AROME and ALARO model were done on the domain prepared by Jan Masek, the model domain was presented on Figure 1. Jan Masek has also prepared reference configuration of ALARO model (ACRANEB2 radiation scheme) and AROME model (radiation scheme ACRANEB2 or Foucault-Morcrette). In Table 1 are presented differences between two AROME model configurations.

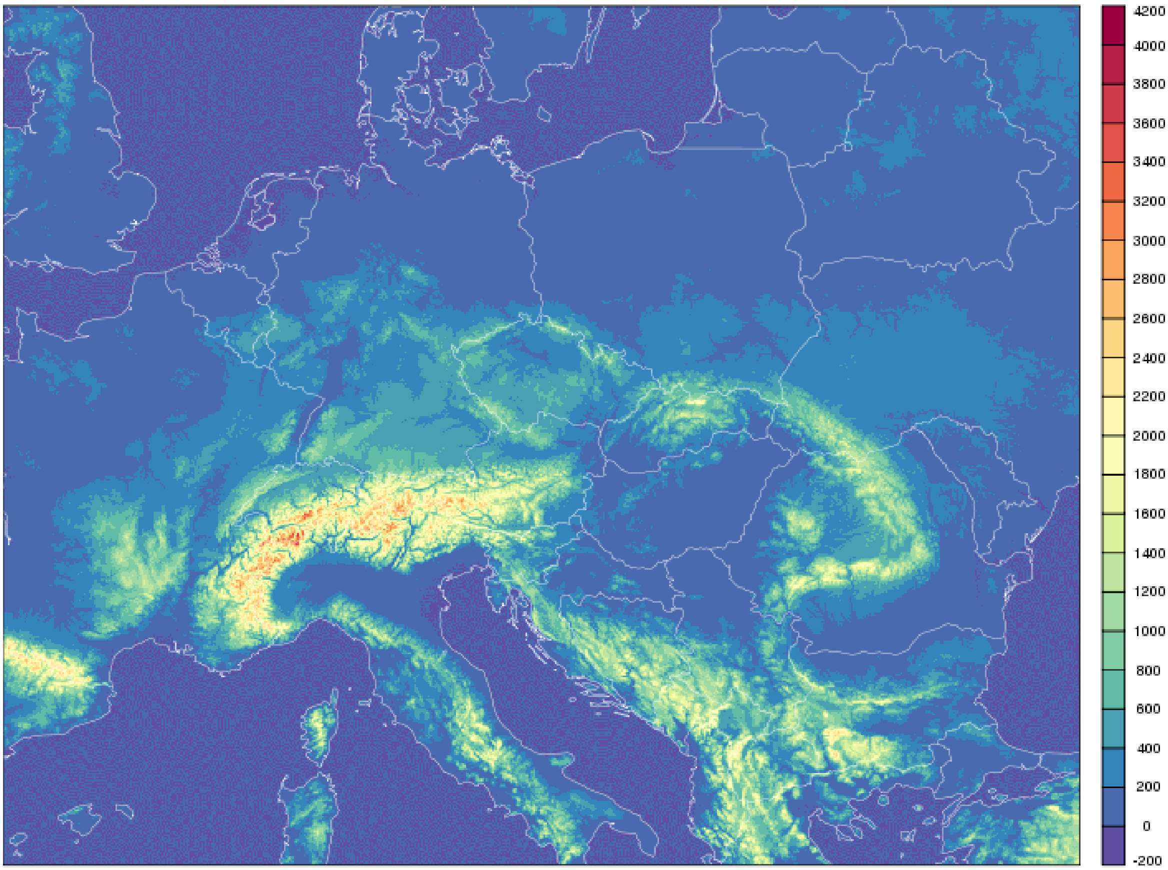


Figure 1. Topography map of domain with spatial resolution 2.3km used in the studies.

Table 1. Differences between AROME configuration using ACRANEB2 and Foucault-Morcrette scheme.

Foucault-Morcrette scheme	ACRANEB2 scheme
&NAERAD	
LRRTM=.T.,	LRRTM=.F.,
NICEOPT=3,	
NLIQOPT=3,	
NOVLP=6,	
NRADFR=18,	
NRADIP=3,	
NRADLP=2,	
NSW=6,	NSW=1 or 6
RLWINHF=1,	
RRE2DE=0.64952,	
RSWINHF=1,	
&NAMINTFLEX	
	LINTFLEX=.T.,
	LRADFLEX=.T.,
&NAMPARAR	
NSWB_MNH=1 or 6,	NSWB_MNH=1 or 6,

&NAMPHY	
	LCLSATUR=.T.,
	LRAY=.T.,
LRAYFM=.T.,	LRAYFM=.F.,
	LRNUMX=.T.,
	LRPROX=.T.,
	LRSTAER=.F.,
	LVFULL=.FALSE.,
	LVOIGT=.TRUE.,
	NRAUTOEV=3,
	NRAY=2,
	NSORAYFR=1,
	NTHRAYFR=1,
&NAMPHY3	
	FCM_NU_DI=0.,
	FCM_NU_DL=0.,
	RLAMB_SOLID=0.6,

In the current model branch, there are three possible options related to the atmospheric aerosols:

Default configuration – 6 Tegen species

&NAMPHY
LAERODES=.T.,
LAEROLAN=.T.,
LAEROSEA=.T.,
LAEROSOO=.T.,
LAEROCMR=.FALSE.,
LAERONRT=.FALSE.,

Monthly climate files – aerosol MMRs (for testing MMR fields are using Tegen dataflow to get into the model, therefore variables LAERODES LAEROLAN LAEROSEA LAEROSOO were set to TRUE with LAEROCMR equal to TRUE). It is worth to notice that in h-branch problem of MMR fields dataflow is solved (cy46h1), when LAEROCMR is set to TRUE, variables LAERODES LAEROLAN LAEROSEA LAEROSOO should be set to .FALSE.

&NAMPHY
LAERODES=.T.,
LAEROLAN=.T.,
LAEROSEA=.T.,
LAEROSOO=.T.,
LAEROCMR=.TRUE.,
LAERONRT=.FALSE.,

Near-real time aerosols – included at the end of the report.

This configuration was not yet tested due to some technical problems in AROME configuration with ACRANEB2 using CAMS MMRs.

4. Tests of AROME model

The main problem of new branch was AROME model irreproducibility for reference configuration using Tegen aerosol fields. Detailed analysis of the modified routines has showed that the problem of model irreproducibility was related to the differences in routine **APL_AROME** between HARMONIE-AROME and AROME models. Assigning the value 0 to the variable PEZDIAG in routine APL_AROME resulted in different forecast results for reference case when Tegen aerosols were used.

Once the source of the error had been identified, the next step was to test the AROME model with the new aerosol concentration data - eleven CAMS aerosol MMRs. In aim to check which aerosol fields are used in the forecast, Tegen and CAMS climatological fields were set to 0, separately. In case when Tegen fields were equal to 0 the results of the forecast where the same as those fields had non-zero values. The analysis has shown that AROME model with the IFS radiation is working properly with the new monthly climate fields. Comparison of the NODE files has shown that results are becoming different at zero-time step, e.g. fields: **SFX.RN_TEB**, **SFX.H_TEB**, **SFX.LE_TEB**, **SFX.GFLUX_TEB**, **SFX.RN**, **SFX.H**, **SFX.LE, SFX.LEI, SFX.GFLUX.** The differences of the results between reference experiment and new configuration are presented in Figure 2. The analysis of the obtained results indicated that the differences between new experiment and reference for predicted air temperature at 2 m a.g.l. relative humidity at 2 m a.g.l. and wind speed at 10 m a.g.l. are slight.

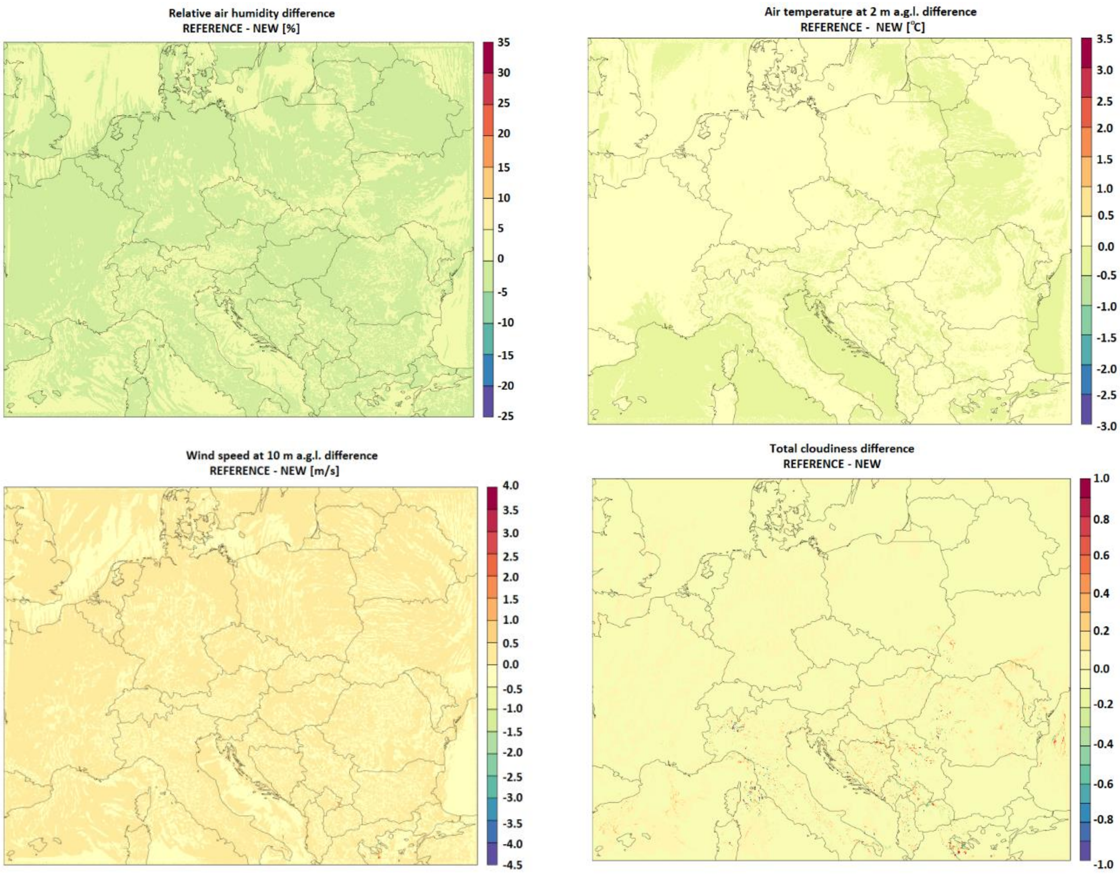


Figure 2. Forecast differences between AROME model with IFS radiation scheme using Tegen (reference) and CAMS MMRs climate files (new) at 16 UTC 20 Feb. 2021 (start of the forecast 0 UTC).

For the case when AROME is using ACRANEB2 radiation scheme some problem occurred in using new vertical profiles of aerosol runtime optical properties calculated by routine **aeropt.F90 (variable YLAERO_MIX)**. At the zero-time step **NaN** values occurs in some fields, e.g.: **X001TG1, X001TG2, SFX.RN_ISBA, SFX.T2M_ISBA**.

5. Tests of ALARO model

The modifications in ACRANEB2 radiation scheme suggested by Jan Masek and Ana Sljivic was tested by the authors in AROME and ALARO models by using 3 artificial mass mixing ration profiles decaying exponentially with height, with characteristic depth of 1, 2 and 3 km. The artificial profiles were defined in routine APL_AROME and APLPAR.

In model namelist is added new block **&NAMAERO** where variable **MAP_AERO_GFL2NC** determined which aerosol species are used:

Experiment named as 1A03:
&NAMAERO
MAP_AERO_GFL2NC=0,0,0,1,
! aerosols are off, since the non-trivial profiles 1, 2 and 3 are unused
/

Experiment named as 1A04:
MAP_AERO_GFL2NC=3,2,1,
! hydrophobic aerosols are used (three desert dust bins)

Experiment named as 1A05:
MAP_AERO_GFL2NC=-3,-2,-1,
! hydrophilic aerosols are used (three sea salt bins)

! common part of experiments 1A03 1A04 1A05
&NAMPHY
LAERODES=.T.,
LAEROLAN=.T.,
LAERONRT=.T., ! this variable will be changed, two possible variables **LAEROCMR** and **LAERONRT**
LAEROSEA=.T.,
LAEROSOO=.T.,

Experiment named as A110 (no aerosols, reference pack)

&NAMPHY
LAERODES=.F.,
LAEROLAN=.F.,
LAEROSEA=.F.,
LAEROSOO=.F.,

Jan Masek has prepared ALARO and AROME model namelists for those tests which were used in further studies of models validation and testing (included in the APPENDIX).

The original scripts are stored in BELENOS in directory:
/home/gmap/mrpm/masekj/m3d/exp/car/script/

The tests of ALARO model by using the branch which included also modifications suggested by Daniel Martin and Laura Rontu showed compliance with the results obtained by Jan Masek.

The next step in this task is to replace artificial profiles by GFL field with aerosol MMRs. Remaining tasks will be accommodation of CAMS climatological aerosols, and interfacing with ecRad scheme.

6. Tests of climate file generation – CLIMAKE system

Laura Rontu based on the HIRLAM system has proposed some modification which allows generation of aerosol MMRs fields. The tests were done by using CY46T1_bf7 on BELENOS supercomputer, detailed analysis has shown that in the pack were some bugs. In aim to create new aerosol climate fields some modifications of CLIMAKE system have to be done (modifications of the script **CLIMAKE/scripts/3_job_923**):

- Linking new text file containing aerosol mass mixing ratio (CAMS MMR) or aerosol optical depth (Tegen fields or CAMS AOD).
  Those fields are available on the hirlam wiki page:
  https://hirlam.org/trac/attachment/wiki/RWP21-PH6/E923_DATA_aero.tgz
- Modifying the fort.4 in the step 9 – aerosol loop (more details below)

The most user-friendly option would be possibility to choose aerosol source from domain configuration level.

There are three possible sources of monthly climate files: Tegen aerosol optical depth (AOD), CAMS AOD and CAMS MMRs (mass mixing ratio). The structure of three sources of data are different, below are included files details which have to be added to the namelist:

- Teged AOD

```
&NAMCLI
 NDATX=72,
 NDATY=45,
 NAEROF=0,
/
```

- CAMS AOD

```
&NAMCLI
 NDATX=120,
 NDATY=60,
 NAEROF=1,
/
```

- CAMS MMRs

```
&NAMCLI
NDATX=120,
NDATY=60,
NAEROF=2,
```

/

The analysis of aerosol fields has confirmed that CLIMAKE system is working properly. For these tests was used Czech domain with spatial resolution 2.3 km. The comparison of the aerosol fields was done with use of Const.Clim.02 files prepared by Laura Rontu (Figure 3) and Jan Masek (Figure 4).

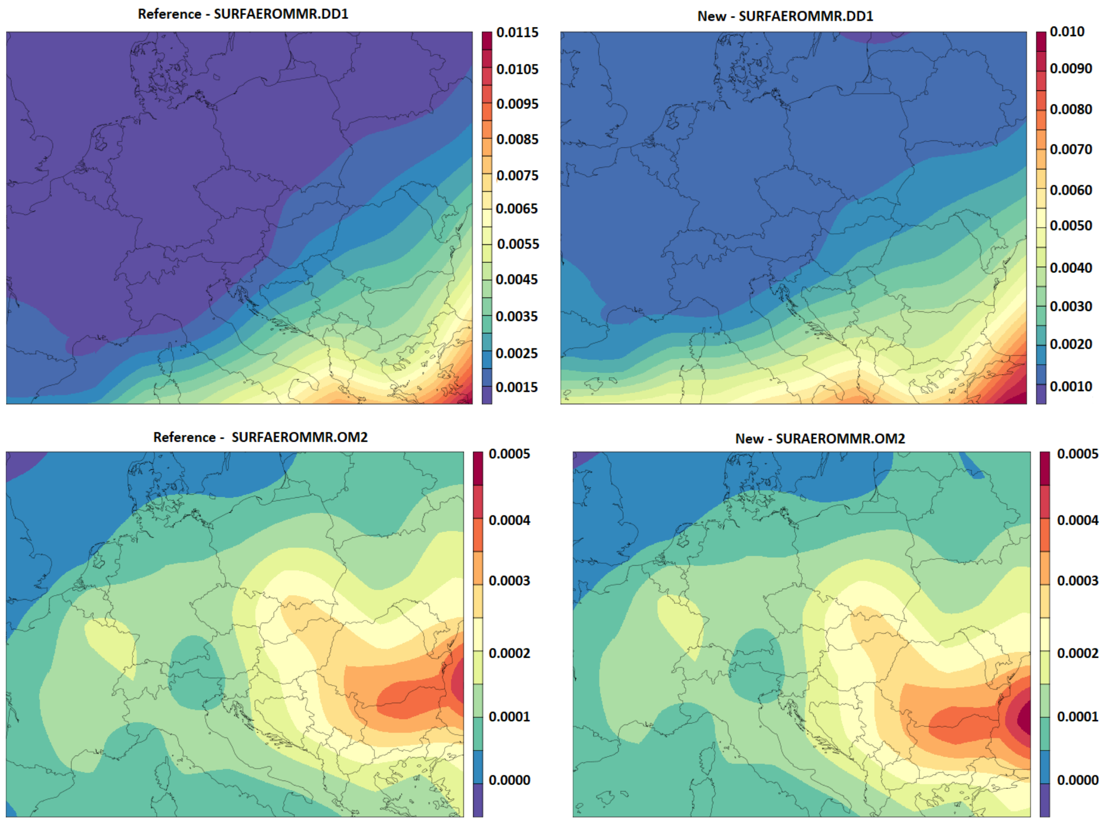
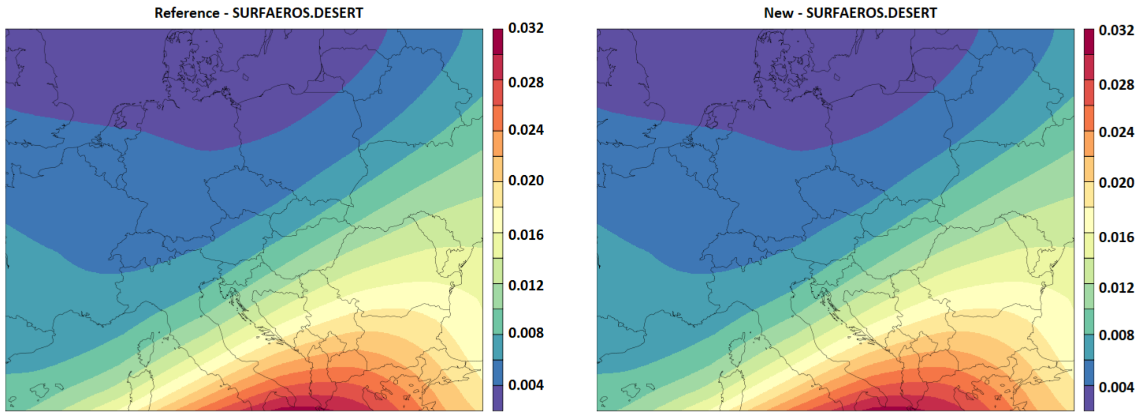


Figure 3. Comparison of selected CAMS MMR fields obtained by Laura Rontu using HARMONIE climate system and local pack with CAR modifications based on CY46T1bf7.



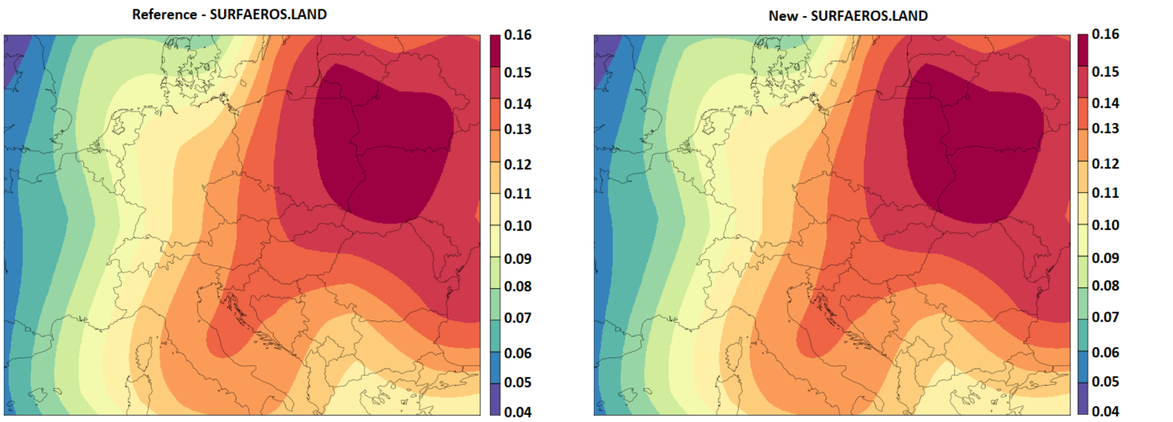


Figure 4. Comparison of selected Tegen fields prepared by Jan Masek (CY43T2_clim-op8.01) and obtained by using local pack with CAR modifications based on CY46T1bf7.

It's worth to mention that pack CY46T1_bf7 used in those tests is not optimized for climate files generation, there are some bugs which can be visible on the fields **PROFTEMPERATURE**, **SURFRESERV.NEIGE**, **SURFTEMPERATURE**. On the figure 5 are presented two fields obtained by using different 46 cycles.

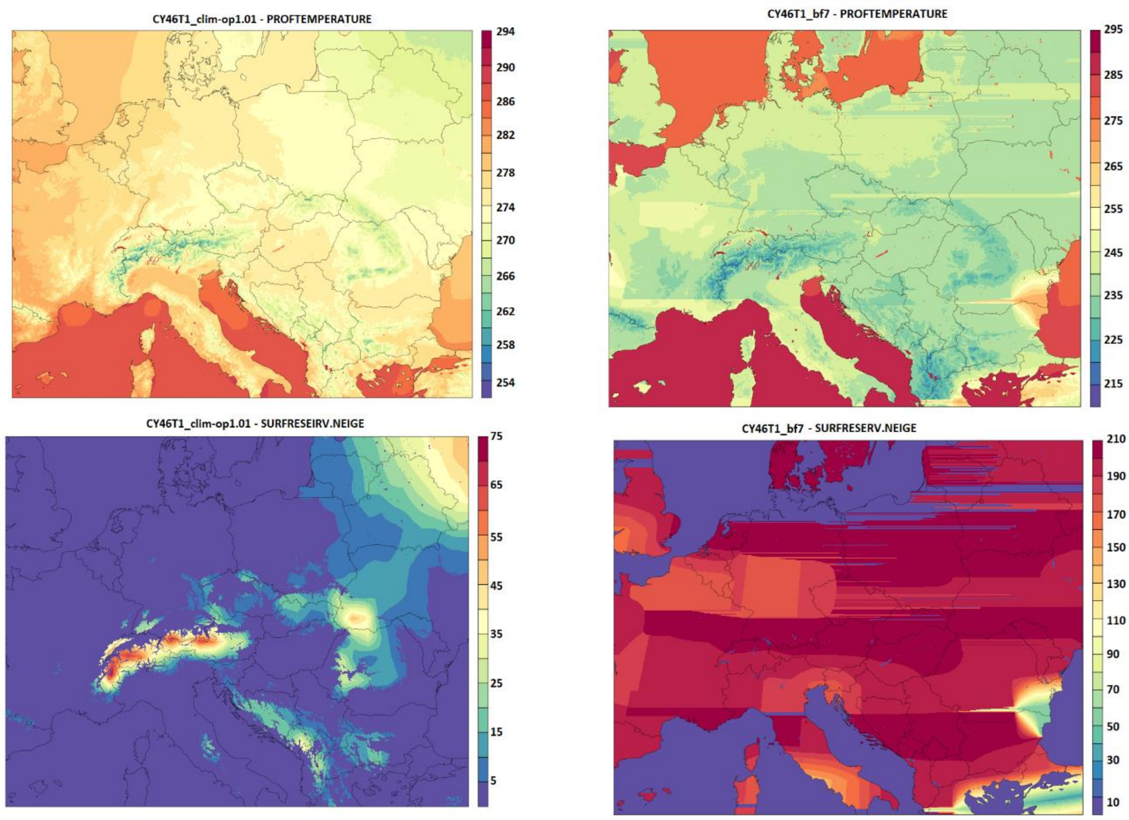


Figure 5. Comparison of selected climate fields obtained by using two different cycles: CY46T1_clim-op1.01 (left column) and CY46T1bf7 (right column).

7. Further plans and developments:

- Introduce monthly aerosol MMRs in APLPAR routine (ACRANEB2 scheme)
- Analysis of model forecast with use of near-real time aerosols – preparation of input and boundary files is developed by Yann Seity and Ryad El Khatib (2)

- Model sensitivity test based on selected periods e.g. dust intrusion, volcanic eruption by using near-real time aerosols.

References:

1. Ana Sljivic (2021), Interfacing near real-time aerosols with radiation schemes Access online: https://www.rclace.eu/media/files/Physics/2021/aerosols_report_2021_1_.pdf
2. Yann Seity, Ryad El Khatib (2023), E903 for daily CAMS Aerosols in AROME. Access online: https://hirlam.org/trac/attachment/wiki/RWP21-PH6/PH6_200323+rek.pdf

APPENDIX

Near-real time aerosols fields definition in AROME and HARMONIE-AROME model (not tested)

```
&NAMGFL
  NGFL_EZDIAG=13,
  NAERO=14,
  YAERO_NL(1)%CNAME='AEROMMR.SS1',
  YAERO_NL(1)%IGRBCODE=210001,
  YAERO_NL(1)%LADV=.TRUE.,
  YAERO_NL(1)%LGP=.TRUE.,
  YAERO_NL(1)%LQM=.TRUE.,
  YAERO_NL(1)%LREQOUT=.FALSE.,
  YAERO_NL(1)%LSP=.FALSE.,
  YAERO_NL(1)%NCOUPLING=1,
  YAERO_NL(1)%NREQIN=1,
  YAERO_NL(2)%CNAME='AEROMMR.SS2',
  YAERO_NL(2)%IGRBCODE=210002,
  YAERO_NL(2)%LADV=.TRUE.,
  YAERO_NL(2)%LGP=.TRUE.,
  YAERO_NL(2)%LQM=.TRUE.,
  YAERO_NL(2)%LREQOUT=.FALSE.,
  YAERO_NL(2)%LSP=.FALSE.,
  YAERO_NL(2)%NCOUPLING=1,
  YAERO_NL(2)%NREQIN=1,
  YAERO_NL(3)%CNAME='AEROMMR.SS3',
  YAERO_NL(3)%IGRBCODE=210003,
  YAERO_NL(3)%LADV=.TRUE.,
  YAERO_NL(3)%LGP=.TRUE.,
  YAERO_NL(3)%LQM=.TRUE.,
  YAERO_NL(3)%LREQOUT=.FALSE.,
  YAERO_NL(3)%LSP=.FALSE.,
  YAERO_NL(3)%NCOUPLING=1,
  YAERO_NL(3)%NREQIN=1,
  YAERO_NL(4)%CNAME='AEROMMR.DD1',
  YAERO_NL(4)%IGRBCODE=210004,
  YAERO_NL(4)%LADV=.TRUE.,
  YAERO_NL(4)%LGP=.TRUE.,
  YAERO_NL(4)%LQM=.TRUE.,
  YAERO_NL(4)%LREQOUT=.FALSE.,
```

```
YAERO_NL(4)%LSP=.FALSE.,
YAERO_NL(4)%NCOUPLING=1,
YAERO_NL(4)%NREQIN=1,
YAERO_NL(5)%CNAME='AEROMMR.DD2',
YAERO_NL(5)%IGRBCODE=210005,
YAERO_NL(5)%LADV=.TRUE.,
YAERO_NL(5)%LGP=.TRUE.,
YAERO_NL(5)%LQM=.TRUE.,
YAERO_NL(5)%LREQOUT=.FALSE.,
YAERO_NL(5)%LSP=.FALSE.,
YAERO_NL(5)%NCOUPLING=1,
YAERO_NL(5)%NREQIN=1,
YAERO_NL(6)%CNAME='AEROMMR.DD3',
YAERO_NL(6)%IGRBCODE=210006,
YAERO_NL(6)%LADV=.TRUE.,
YAERO_NL(6)%LGP=.TRUE.,
YAERO_NL(6)%LQM=.TRUE.,
YAERO_NL(6)%LREQOUT=.FALSE.,
YAERO_NL(6)%LSP=.FALSE.,
YAERO_NL(6)%NCOUPLING=1,
YAERO_NL(6)%NREQIN=1,
YAERO_NL(7)%CNAME='AEROMMR.OM1',
YAERO_NL(7)%IGRBCODE=210007,
YAERO_NL(7)%LADV=.TRUE.,
YAERO_NL(7)%LGP=.TRUE.,
YAERO_NL(7)%LQM=.TRUE.,
YAERO_NL(7)%LREQOUT=.FALSE.,
YAERO_NL(7)%LSP=.FALSE.,
YAERO_NL(7)%NCOUPLING=1,
YAERO_NL(7)%NREQIN=1,
YAERO_NL(8)%CNAME='AEROMMR.OM2',
YAERO_NL(8)%IGRBCODE=210008,
YAERO_NL(8)%LADV=.TRUE.,
YAERO_NL(8)%LGP=.TRUE.,
YAERO_NL(8)%LQM=.TRUE.,
YAERO_NL(8)%LREQOUT=.FALSE.,
YAERO_NL(8)%LSP=.FALSE.,
YAERO_NL(8)%NCOUPLING=1,
YAERO_NL(8)%NREQIN=1,
YAERO_NL(9)%CNAME='AEROMMR.BC1',
YAERO_NL(9)%IGRBCODE=210009,
YAERO_NL(9)%LADV=.TRUE.,
YAERO_NL(9)%LGP=.TRUE.,
YAERO_NL(9)%LQM=.TRUE.,
YAERO_NL(9)%LREQOUT=.FALSE.,
YAERO_NL(9)%LSP=.FALSE.,
YAERO_NL(9)%NCOUPLING=1,
YAERO_NL(9)%NREQIN=1,
YAERO_NL(10)%CNAME='AEROMMR.BC2',
YAERO_NL(10)%IGRBCODE=210010,
YAERO_NL(10)%LADV=.TRUE.,
```

```
YAERO_NL(10)%LGP=.TRUE.,
YAERO_NL(10)%LQM=.TRUE.,
YAERO_NL(10)%LREQOUT=.FALSE.,
YAERO_NL(10)%LSP=.FALSE.,
YAERO_NL(10)%NCOUPLING=1,
YAERO_NL(10)%NREQIN=1,
YAERO_NL(11)%CNAME='AEROMMR.SU',
YAERO_NL(11)%IGRBCODE=210011,
YAERO_NL(11)%LADV=.TRUE.,
YAERO_NL(11)%LGP=.TRUE.,
YAERO_NL(11)%LQM=.TRUE.,
YAERO_NL(11)%LREQOUT=.FALSE.,
YAERO_NL(11)%LSP=.FALSE.,
YAERO_NL(11)%NCOUPLING=1,
YAERO_NL(11)%NREQIN=1,
YAERO_NL(12)%CNAME='AEROMMR.NI1',
YAERO_NL(12)%IGRBCODE=210247,
YAERO_NL(12)%LADV=.TRUE.,
YAERO_NL(12)%LGP=.TRUE.,
YAERO_NL(12)%LQM=.TRUE.,
YAERO_NL(12)%LREQOUT=.FALSE.,
YAERO_NL(12)%LSP=.FALSE.,
YAERO_NL(12)%NCOUPLING=1,
YAERO_NL(12)%NREQIN=-1,
YAERO_NL(13)%CNAME='AEROMMR.NI2',
YAERO_NL(13)%IGRBCODE=210248,
YAERO_NL(13)%LADV=.TRUE.,
YAERO_NL(13)%LGP=.TRUE.,
YAERO_NL(13)%LQM=.TRUE.,
YAERO_NL(13)%LREQOUT=.FALSE.,
YAERO_NL(13)%LSP=.FALSE.,
YAERO_NL(13)%NCOUPLING=1,
YAERO_NL(13)%NREQIN=-1,
YAERO_NL(14)%CNAME='AEROMMR.AM',
YAERO_NL(14)%IGRBCODE=210249,
YAERO_NL(14)%LADV=.TRUE.,
YAERO_NL(14)%LGP=.TRUE.,
YAERO_NL(14)%LQM=.TRUE.,
YAERO_NL(14)%LREQOUT=.FALSE.,
YAERO_NL(14)%LSP=.FALSE.,
YAERO_NL(14)%NCOUPLING=1,
YAERO_NL(14)%NREQIN=-1,
```

Table 2. Forecast namelist of AROME model with two radiation schemes used in the study and ALARO model with ACRANEB2 radiation scheme with artificial profile (experiment name 1A03) prepared by Jan Masek.

AROME with IFS radiation scheme	***AROME with ACRABEN2 radiation scheme***	***ALARO with ACRABEN2 radiation scheme (run 1A03)***

```
&NACIETEO
/
&NACOBS
/
&NACTAN
/
&NACTEX
/
&NACVEG
/
&NADOCK
/
&NAEAEM7
/
&NAEAER
/
&NAECOAPHY
/
&NAEPHLI
/
&NAEPHY
/
&NAERAD
  LRRTM=.T.,
  LSRTM=.F.,
  NAER=1,
  NICEOPT=3,
  NLIQOPT=3,
  NOVLP=6,
  NOZOCL=2,
  NRADFR=18,
  NRADIP=3,
  NRADLP=2,
  NSW=6,
  RLWINHF=1,
  RRE2DE=0.64952,
  RSWINHF=1,
/
&NAERCLI
/
&NAETLDIAG
/
&NAEVOL
/
```

```
&NACIETEO
/
&NACOBS
/
&NACTAN
/
&NACTEX
/
&NACVEG
/
&NADOCK
/
&NAEAEM7
/
&NAEAER
/
&NAECOAPHY
/
&NAEPHLI
/
&NAEPHY
/
&NAERAD
  LRRTM=.F.,
  LSRTM=.F.,
  NAER=1,
  NOZOCL=2,
  NSW=1,
/
&NAERCLI
/
&NAETLDIAG
/
&NAEVOL
/
&NAIMPO
/
&NALORI
/
&NAMACV
/
&NAMAFN
  GFP_SFIS%IBITS=16,
  GFP_ST%IANO=0,
```

```
&NACIETEO
/
&NACOBS
/
&NACTAN
/
&NACTEX
/
&NACVEG
/
&NADOCK
/
&NAEAEM7
/
&NAEAER
/
&NAECOAPHY
/
&NAEPHLI
/
&NAEPHY
/
&NAERAD
  LRRTM=.F.,
  LSRTM=.F.,
/
&NAERCLI
/
&NAETLDIAG
/
&NAEVOL
/
&NAIMPO
/
&NALORI
/
&NAMACV
/
&NAMAERDET
/
&NAMAERO
  MAP_AERO_GFL2NC=0,0,0,1,
/
&NAMAFN
```

```
&NAIMPO
/
&NALORI
/
&NAMACV
/
&NAMAFN
 GFP_SFIS%IBITS=16,
 GFP_ST%IANO=0,
 GFP_ST%IBITS=12,
 GFP_X10U%IANO=0,
 GFP_X10U%IBITS=12,
 GFP_X10V%IANO=0,
 GFP_X10V%IBITS=12,
 GFP_X2RH%IANO=0,
 GFP_X2RH%IBITS=12,
 GFP_X2T%IANO=1,

 GFP_X2TPW%IANO=0,
 GFP_XCCC%IBITS=8,
 GFP_XHCC%IBITS=8,
 GFP_XLCC%IBITS=8,
 GFP_XMCC%IBITS=8,
 GFP_XN2T%IBITS=12,
 GFP_XTCC%IBITS=8,

 GFP_XUGST%IANO=0,

 GFP_XUGST%IBITS=12,
 GFP_XVGST%IANO=0,

 GFP_XVGST%IBITS=12,
 GFP_XX2T%IBITS=12,

 GFP_XXDIAGH%IBITS=12,
 TFP_ABS%ZFK=32.,
 TFP_CLF%IBITS=6,
 TFP_EDR%IBITS=16,

 TFP_GR%IBITS=12,

 TFP_HL%IBITS=12,
GFP_ST%IBITS=12,
GFP_X10U%IANO=0,
GFP_X10U%IBITS=12,
GFP_X10V%IANO=0,
GFP_X10V%IBITS=12,
GFP_X2RH%IANO=0,
GFP_X2RH%IBITS=12,
GFP_X2T%IANO=1,
GFP_X2TPW%IANO=0,
GFP_XCCC%IBITS=8,
GFP_XHCC%IBITS=8,
GFP_XLCC%IBITS=8,
GFP_XMCC%IBITS=8,
GFP_XN2T%IBITS=12,
GFP_XTCC%IBITS=8,
GFP_XUGST%IANO=0,
GFP_XUGST%IBITS=12,

GFP_XVGST%IANO=0,
GFP_XVGST%IBITS=12,
GFP_XX2T%IBITS=12,
GFP_XXDIAGH%IBITS=12,
TFP_ABS%ZFK=32.,
TFP_CLF%IBITS=6,
TFP_EDR%IBITS=16,

TFP_GR%IBITS=12,

TFP_HL%IBITS=12,
TFP_HTB%IBITS=16,

TFP_HTB%LLGP=.T.,
TFP_HU%IBITS=12,

TFP_MSAT9C2%IBITS=12,
TFP_MSAT9C6%IBITS=12,
TFP_MSL%IBITS=12,
TFP_MSLNH%IBITS=12,

TFP_PV%ZFK=64.,

TFP_RCLS%IBITS=12,
 GFP_10U%IBITS=12,
 GFP_10V%IBITS=12,
 GFP_2T%IBITS=12,
 GFP_CAPE%IBITS=16,
 GFP_CCC%IBITS=16,
 GFP_CCP%IBITS=16,
 GFP_CCSF%IBITS=16,
 GFP_CLSP%IBITS=16,
 GFP_CLSS%IBITS=16,
 GFP_HCC%IBITS=8,
 GFP_LCC%IBITS=8,
 GFP_MCC%IBITS=8,
 GFP_TCC%IBITS=8,
 GFP_X10U%IBITS=12,
 GFP_X10V%IBITS=12,
 GFP_X2RH%IBITS=12,
 GFP_X2T%IBITS=12,

 GFP_XCAPE%IBITS=16,
 GFP_XCCC%IBITS=16,
 GFP_XCLPH%IBITS=12,
 GFP_XHCC%IBITS=8,
 GFP_XLCC%IBITS=8,
 GFP_XMCC%IBITS=8,
 GFP_XMOCO%IBITS=16,

GFP_XN2T%CLNAME='CLSMINI.H.
TEMPER',

 GFP_XN2T%IBITS=12,
 GFP_XTCC%IBITS=8,

 GFP_XUGST%IBITS=12,
 GFP_XVGST%IBITS=12,

GFP_XX2T%CLNAME='CLSMAXI.H.
TEMPER',
 GFP_XX2T%IBITS=12,
 TFP_ETH%IBITS=12,
 TFP_FGST%IBITS=12,

TFP_HCLP%CLNAME='CLPMHAUT.
MOD.XFU',

TFP_HU%CLNAME='HUMI_RELATI
VE',
```

```
  TFP_HTB%IBITS=16,

  TFP_HTB%LLGP=.T.,
  TFP_HU%IBITS=12,

  TFP_MSAT9C2%IBITS=12,

  TFP_MSAT9C6%IBITS=12,
  TFP_MSL%IBITS=12,

  TFP_MSLNH%IBITS=12,
  TFP_PV%ZFK=64.,

  TFP_RCLS%IBITS=12,
  TFP_RR%IBITS=12,

  TFP_SN%IBITS=12,
  TFP_T%IBITS=12,

  TFP_TCLS%IBITS=12,
  TFP_TH%IBITS=12,

  TFP_THPW%IBITS=12,
  TFP_THV%IBITS=12,
  TFP_TN%IBITS=12,
  TFP_TWV%IBITS=12,
  TFP_TX%IBITS=12,
  TFP_U%IBITS=12,
  TFP_V%IBITS=12,
  TFP_VOR%ZFK=32.,
  TFP_VV%ZFK=32.,
/
&NAMARG
  CNMEXP='$exp',
  LECMWF=.F.,
  LELAM=.T.,
  LSLAG=.T.,
  NCONF=1,
```

```
  TFP_RR%IBITS=12,

  TFP_SN%IBITS=12,
  TFP_T%IBITS=12,

  TFP_TCLS%IBITS=12,

  TFP_TH%IBITS=12,
  TFP_THPW%IBITS=12,

  TFP_THV%IBITS=12,
  TFP_TN%IBITS=12,

  TFP_TWV%IBITS=12,
  TFP_TX%IBITS=12,

  TFP_U%IBITS=12,
  TFP_V%IBITS=12,

  TFP_VOR%ZFK=32.,
  TFP_VV%ZFK=32.,

/
&NAMARG
  CNMEXP='$exp',
  LECMWF=.F.,
  LELAM=.T.,
  LSLAG=.T.,
  NCONF=1,
  NSUPERSEDE=1,
/
&NAMARPHY
  LKFBCONV=.F.,
  LKFBD=.F.,
  LKFBS=.F.,
  LMFSHAL=.T.,
  LMICRO=.T.,
  LMPA=.T.,
```

```
  TFP_HU%IBITS=12,

TFP_MSL%CLNAME='MSLPRESSUR
E',
  TFP_MSL%IBITS=12,

  TFP_PV%IBITS=16,

TFP_T%CLNAME='TEMPERATURE',
  TFP_T%IBITS=12,

TFP_THPW%CLNAME='THETA_P_
W',
  TFP_THPW%IBITS=12,

TFP_U%CLNAME='WIND_U_COM
PONENT',
  TFP_U%IBITS=12,

TFP_V%CLNAME='WIND_V_COMP
ONENT',
  TFP_V%IBITS=12,

TFP_VV%CLNAME='VITESSE_VERTI
CALE',
  TFP_VV%IBITS=16,

TFP_Z%CLNAME='GEOPOTENTIEL',
  TFP_Z%IBITS=16,
/
&NAMARG
  CNMEXP='$exp',
  LECMWF=.F.,
  LELAM=.T.,
  LSLAG=.T.,
  NCONF=1,
  NSUPERSEDE=1,
/
&NAMARPHY
/
&NAMCA
/
&NAMCAPE
```

```
  NSUPERSEDE=1,
/
&NAMARPHY
  LKFBCONV=.F.,
  LKFBD=.F.,
  LKFBS=.F.,
  LMFSHAL=.T.,
  LMICRO=.T.,
  LMPA=.T.,
  LMSE=.T.,
  LTURB=.T.,
/
&NAMCA
/
&NAMCAPE
/
&NAMCFU
  LCUMFU=.T.,
  LFPLS=.T.,
  LFPLSG=.T.,
  LFR=.T.,
  LFRRC=.T.,
  LFSF=.T.,
  LNEBPAR=.T.,
  LNEBTT=.T.,
  LRAYD=.T.,
  LRAYS=.T.,
/
&NAMCHEM
/
&NAMCHET
/
&NAMCHK
/
&NAMCLA
/
&NAMCLDP
/
&NAMCLI
/
&NAMCLOP15
/
&NAMCLTC
/
&NAMCOK
/
  LMSE=.T.,
  LTURB=.T.,
/
&NAMCA
/
&NAMCAPE
/
&NAMCFU
  LCUMFU=.T.,
  LFPLS=.T.,
  LFPLSG=.T.,
  LFR=.T.,
  LFRRC=.T.,
  LFSF=.T.,
  LNEBPAR=.T.,
  LNEBTT=.T.,
  LRAYD=.T.,
  LRAYS=.T.,
/
&NAMCHEM
/
&NAMCHET
/
&NAMCHK
/
&NAMCLA
/
&NAMCLDP
/
&NAMCLI
/
&NAMCLOP15
/
&NAMCLTC
/
&NAMCOK
/
&NAMCOM
/
&NAMCOSJO
/
&NAMCOUPLO4
/
&NAMCT0
  CFPNCF='ECHFP',
  CNPPATH='.',
/
&NAMCFU
  LCUMFU=.T.,
  LFPLC=.T.,
  LFPLS=.T.,
  LFR=.T.,
  LFSF=.T.,
  LRAYD=.T.,
  LRAYS=.T.,
  LSTRD=.T.,
  LSTRT=.T.,
/
&NAMCHEM
/
&NAMCHET
/
&NAMCHK
/
&NAMCLA
/
&NAMCLDDET
/
&NAMCLDP
/
&NAMCLI
/
&NAMCLOP15
/
&NAMCLTC
/
&NAMCOK
/
&NAMCOM
/
&NAMCOMPO
/
&NAMCOSJO
/
&NAMCT0
  LALLOPR=.F.,
  LFBDAP=.T.,
  LGRIB_API=.F.,
  LNHEE=.T.,
  LREGETA=.F.,
  LRPLANE=.T.,
  LSPRT=.T.,
```

```
&NAMCOM
/
&NAMCOSJO
/
&NAMCOUPLO4
/
&NAMCT0
  CFPNCF='ECHFP',
  CNPPATH='.',
```

```
CSCRIPT_LAMRTC='./atcp.alad'
,
  LAROME=.T.,
  LNHEE=.T.,
  LSCREEN_OPENMP=.F.,
  LSPRT=.T.,
  LTWOTL=.T.,
  NFPOS=0,
  NFRHIS=1,
  NFRPOS=1,
```

```
  LTWOTL=.T.,
  LVFE_REGETA=.F.,
  NDHFDTS=$nhists,
  NFRDHFD=1,
  NFRGDI=5,
  NFRHIS=1,
  NFRPOS=1,
  NFRSDI=1,
  NHISTS=$nhists,
```

```
CSCRIPT_LAMRTC='./atcp.alad'
,
  LAROME=.T.,
  LNHEE=.T.,
```

```
  NFRSDI=1,
  NHISTS=$nhists,
  NPOSTS=$nhists,
```

```
  NPOSTS=$nhists,
  NSPPR=0,
/
```

```
  LSCREEN_OPENMP=.F.,
  LSPRT=.T.,
  LTWOTL=.T.,
  NFPOS=0,
  NFRHIS=1,
  NFRPOS=1,
  NFRSDI=1,
  NHISTS=$nhists,
  NPOSTS=$nhists,
  NSFXHISTS=$nhists,
/
&NAMCT1
  LRFILAF=.F.,
  N1HIS=1,
  N1POS=1,
  N1RES=0,
  N1SDI=1,
  N1SFXHIS=1,
/
&NAMCUMF
/
&NAMCUMFS
/
&NAMCVER
/
&NAMCVMNH
/
&NAMDDH
```

```
  NSFXHISTS=$nhists,
/
&NAMCT1
  LRFILAF=.F.,
  N1HIS=1,
  N1POS=1,
  N1RES=0,
  N1SDI=1,
  N1SFXHIS=1,
/
&NAMCUMF
/
&NAMCUMFS
/
&NAMCVER
/
&NAMCVMNH
/
&NAMDDH
/
&NAMDFI
/
&NAMDIM
  NPROMA=$NPROMA,
/
&NAMDIMO
/
&NAMDIM_TRAJ
```

```
&NAMCT1
  LRFILAF=.F.,
  N1RES=0,
/
&NAMCUMF
/
&NAMCUMFS
/
&NAMCVER
  LVERTFE=.F.,
/
&NAMCVMNH
/
&NAMDDH
  BDEDDH(1,1)=3.,
  BDEDDH(2,1)=1.,
  BDEDDH(3,1)=5.0,
  BDEDDH(4,1)=55.0,
  BDEDDH(5,1)=27.5,
  BDEDDH(6,1)=42.5,
  LFLEXDIA=.F.,
  LHDCDPI=.F.,
  LHDDOP=.T.,
  LHDEFD=.T.,
  LHDHKS=.T.,
  LHDLIST=.F.,
  LHDORIGP=.F.,
  LONLYVAR=.F.,
```

```
/
&NAMDFI
/
&NAMDIM
  NPROMA=$NPROMA,
/
&NAMDIMO
/
&NAMDIM_TRAJ
/
&NAMDPHY
/
&NAMDPRECIPS
/
&NAMDVISI
  HVISI=5.,
/
&NAMDYN
  LADVF=.T.,
  LQMPD=.F.,
  LQMT=.F.,
  LQMVD=.F.,

  LRHDI_LASTITERPC=.T.,
  NITMP=4,
  NSITER=1,
  NSPDLAG=3,
  NSVDLAG=3,
  NTLAG=3,
  NVLAG=3,
  NWLAG=3,
  RDAMPDIV=20.,
  RDAMPPD=20.,
  RDAMPQ=0.,
  RDAMPT=0.,
  RDAMPVD=20.,
  RDAMPVOR=20.,
  REPS1=0.,
  REPS2=0.,
  REPSM1=0.,
  REPSM2=0.,
  REPSP1=0.,
  SDRED=1.,
  SIPR=90000.,
  SITR=350.,
  SITRA=100.,
```

```
/
&NAMDPHY
/
&NAMDPRECIPS
/
&NAMDVISI
  HVISI=5.,
/
&NAMDYN
  LADVF=.T.,
  LQMPD=.F.,
  LQMT=.F.,
  LQMVD=.F.,
  LRHDI_LASTITERPC=.T.,
  NITMP=4,
  NSITER=1,
  NSPDLAG=3,
  NSVDLAG=3,
  NTLAG=3,
  NVLAG=3,
  NWLAG=3,
  RDAMPDIV=20.,

  RDAMPPD=20.,
  RDAMPQ=0.,
  RDAMPT=0.,
  RDAMPVD=20.,
  RDAMPVOR=20.,
  REPS1=0.,
  REPS2=0.,
  REPSM1=0.,
  REPSM2=0.,
  REPSP1=0.,
  SDRED=1.,
  SIPR=90000.,
  SITR=350.,
  SITRA=100.,
  SLHDA0=0.25,
  SLHDD00=0.000065,
  VESL=0.05,
  XIDT=0.,
  ZSLHDP1=1.7,
  ZSLHDP3=0.6,
/
&NAMDYNA
  LCOMADH=.T.,
```

```
/
&NAMDFI
/
&NAMDIM
  NPROMA=$NPROMA,
/
&NAMDIMO
/
&NAMDIM_TRAJ
/
&NAMDPHY
/
&NAMDVISI
/
&NAMDYN
  LADVF=.T.,
  LQMHT=.F.,
  LQMHW=.F.,
  LQMP=.F.,
  NITMP=4,
  NSITER=1,
  NSPDLAG=3,

  NSVDLAG=3,
  NTLAG=3,
  NVLAG=3,
  NWLAG=3,
  RDAMPDIV=5.,
  RDAMPDIVS=10.,
  RDAMPPD=5.,
  RDAMPQ=20.,
  RDAMPT=20.,
  RDAMPVD=20.,
  RDAMPVDS=15.,
  RDAMPVOR=5.,
  RDAMPVORS=10.,
  REPS1=0.,
  REPS2=0.,
  REPSM1=0.,
  REPSM2=0.,
  REPSP1=0.,
  REXPDH=2.,
  SDRED=1.,
  SIPR=90000.,
  SITR=350.,
  SITRA=100.,
```

```
 SLHDA0=0.25,
 SLHDD00=0.000065,
 VESL=0.05,
 XIDT=0.,
 ZSLHDP1=1.7,
 ZSLHDP3=0.6,
/
&NAMDYNA
 LCOMADH=.T.,
 LCOMADV=.F.,
 LCOMAD_GFL=.T.,
 LCOMAD_SP=.T.,
 LCOMAD_SPD=.T.,
 LCOMAD_SVD=.T.,
 LCOMAD_T=.T.,
 LCOMAD_W=.T.,
 LGWADV=.T.,
 LNESC=.T.,
 LPC_CHEAP=.T.,
 LPC_FULL=.T.,
 LRDBBC=.F.,
 LSETTLS=.F.,
 LSETTLST=.T.,
 LSLHD_GFL=.F.,
 LSLHD_OLD=.F.,
 LSLHD_SPD=.F.,
 LSLHD_SVD=.F.,
 LSLHD_T=.F.,
 LSLHD_W=.F.,
 ND4SYS=2,
 NDLNPR=1,
 NPDVAR=2,
 NVDVAR=4,
 SLHDEPSH=0.08,
 SLHDKMAX=6,
/
&NAMDYNCORE
/
&NAMEMIS_CONF
/
&NAMENKF
/
&NAMENSCOV
/
&NAMFA
 NBITCS=-1,
 LCOMADV=.F.,
 LCOMAD_GFL=.T.,
 LCOMAD_SP=.T.,
 LCOMAD_SPD=.T.,
 LCOMAD_SVD=.T.,
 LCOMAD_T=.T.,
 LCOMAD_W=.T.,
 LGWADV=.T.,
 LNESC=.T.,
 LPC_CHEAP=.T.,
 LPC_FULL=.T.,
 LRDBBC=.F.,
 LSETTLS=.F.,
 LSETTLST=.T.,
 LSLHD_GFL=.F.,
 LSLHD_OLD=.F.,
 LSLHD_SPD=.F.,
 LSLHD_SVD=.F.,
 LSLHD_T=.F.,
 LSLHD_W=.F.,
 ND4SYS=2,
 NDLNPR=1,
 NPDVAR=2,
 NVDVAR=4,
 SLHDEPSH=0.08,
 SLHDKMAX=6,
/
&NAMDYNCORE
/
&NAMEMIS_CONF
/
&NAMENKF
/
&NAMENSCOV
/
&NAMFA
 NBITCS=-1,
 NBITPG=-1,
 NSTRON=-1,
/
&NAMFPC
/
&NAMFPD
/
&NAMFPDY2
/
 SLEVDH=0.5,
 SLEVDHS=1.,
 SLHDA0=0.25,
 SLHDB=4.,
 SLHDD00=6.5E-05,
 VESL=0.,
 VMAX2=280.,
 XIDT=0.0,
 ZSLHDP1=1.7,
 ZSLHDP3=0.6,
/
&NAMDYNA
 LGWADV=.T.,
 LNESC=.T.,
 LNESCT=.F.,
 LNESCV=.F.,
 LPC_CHEAP=.T.,
 LPC_FULL=.T.,
 LRDBBC=.F.,
 LSETTLS=.F.,
 LSETTLST=.T.,
 LSETTLSV=.T.,
 LSLHD_GFL=.T.,
 LSLHD_OLD=.F.,
 LSLHD_SPD=.T.,
 LSLHD_SVD=.T.,
 LSLHD_T=.T.,
 LSLHD_W=.T.,
 ND4SYS=1,
 NDLNPR=1,
 NPDVAR=2,
 NVDVAR=4,
 SLHDEPSH=0.016,
 SLHDEPSV=0.0,
 SLHDKMAX=6.,
 SLHDKMIN=-0.6,
/
&NAMDYNCORE
/
&NAMEMIS_CONF
/
&NAMENKF
/
&NAMENSCOV
/
&NAMFA
```

NBITPG=-1,	&NAMFPDYF	NBITCS=-1,
NSTRON=-1,	/	NBITPG=-1,
/	&NAMFPDYH	NSTRON=-1,
&NAMFPC	/	/
/	&NAMFPDYI	&NAMFAINIT
&NAMFPD	/	/
/	&NAMFPDYP	&NAMFPC
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/	&NAMFPDYV	&NAMFPDYF
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/	&NAMFPG	&NAMFPDYI
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/	&NAMFPIOS	&NAMFPDYP
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/	&NAMFPMOVE	&NAMFPDYS
&NAMFPDYV	/	/
/	&NAMFPOBJ	&NAMFPDYT
&NAMFPF	/	/
/	&NAMFPPHY	&NAMFPDYV
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&NAMFPIOS	/	/
/	&NAMFPSC2_DEP	&NAMFPG
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/	&NAMGEM	&NAMFPIOS
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/	YEZDIAG_NL(2)%CNAME='EZDIAG02',	/
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