

AROME scripts environment, How to run AROME ?

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(Météo-France CNRM/GMAP)

1st AROME training course

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- I. Generalities concerning scripts
- II. With acces to tora/cougar/andante at Météo-France
 - a) on already configurated domain
 - b) on a new domain
- III. Other ways or future ways
 - a) Ecmwf
 - b) Other
 - c) Via Olive
- IV. Post processing
- V. Expected progress

I. Script organisation

BEGIN

1. Header (machine dependant)
2. Users parameters initialisation (date, name of experiment ...)
3. Get namelist, executable, and files (initial, coupling or climato...)
4. Running executable (TIMEX commande)
5. Save model results
6. Final Cleaning

END

I. Script organisation

HEADER (VPP5000):

```
# @$-s /bin/ksh
```

```
# @$-eo -r ALDEXP1
```

```
# @$-lt 1190 -IT 1200
```

```
# @$-lM 600mb -lV 0mb
```

```
# @$-lP 1
```

I. Script organisation

timex :

```
timex MASTER -c${CONF} -vmeteo -maladin -e${EXP} -t  
$TSTEP -f$NSTOP -a$ADVEC $ZOPT > lola 2>&1
```

For example :

CONF=001

ZOPT="-Wl,-d100,-g250,-e1"

EXP=AL2D

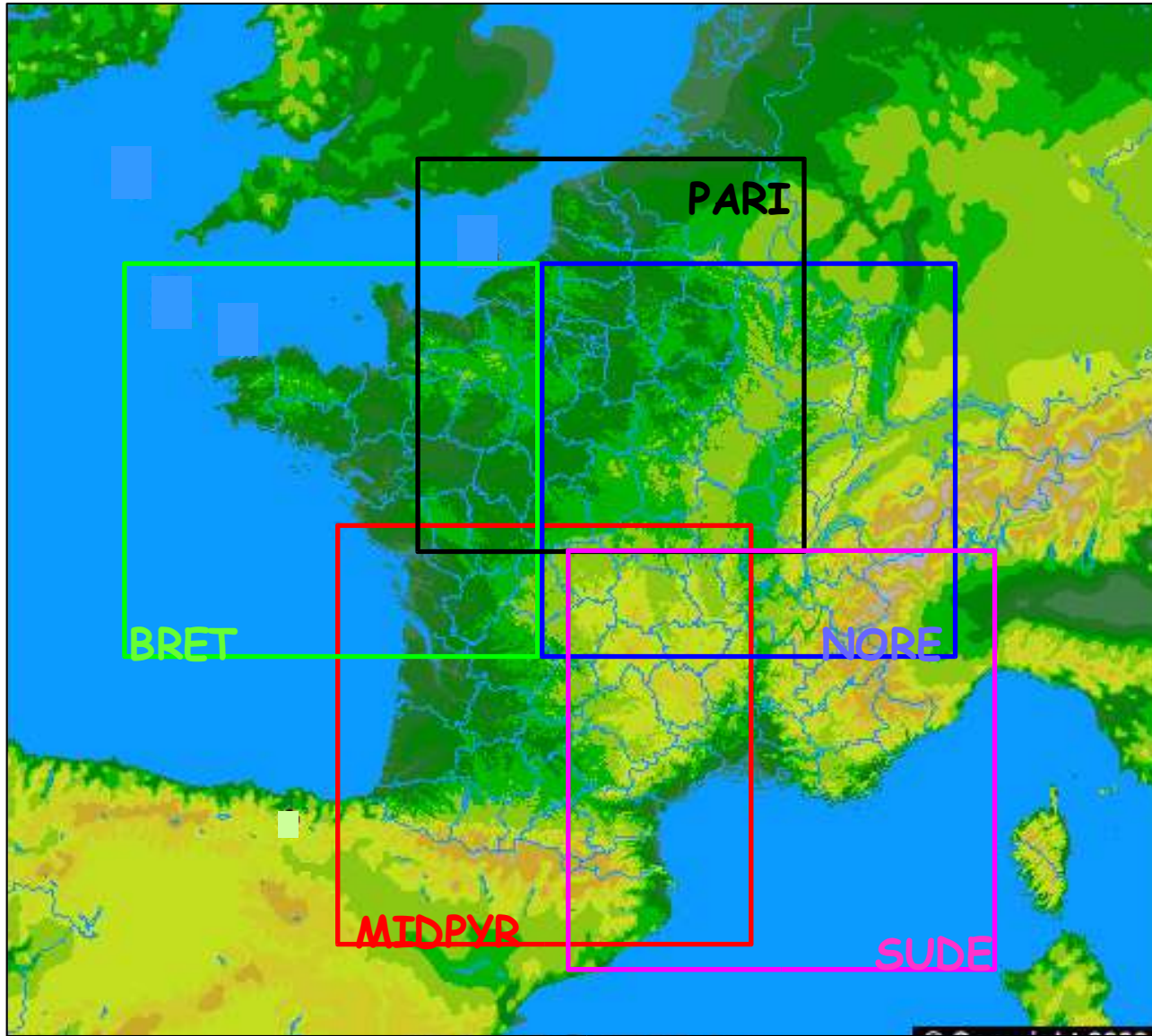
TSTEP=7.5

NSTOP=h8

ADVEC=sli

II. With acces to tora/cougar/andante

a) Already configurated domains over France :



II. With acces to tora/cougar/andante

a) Already configurated domains over France :

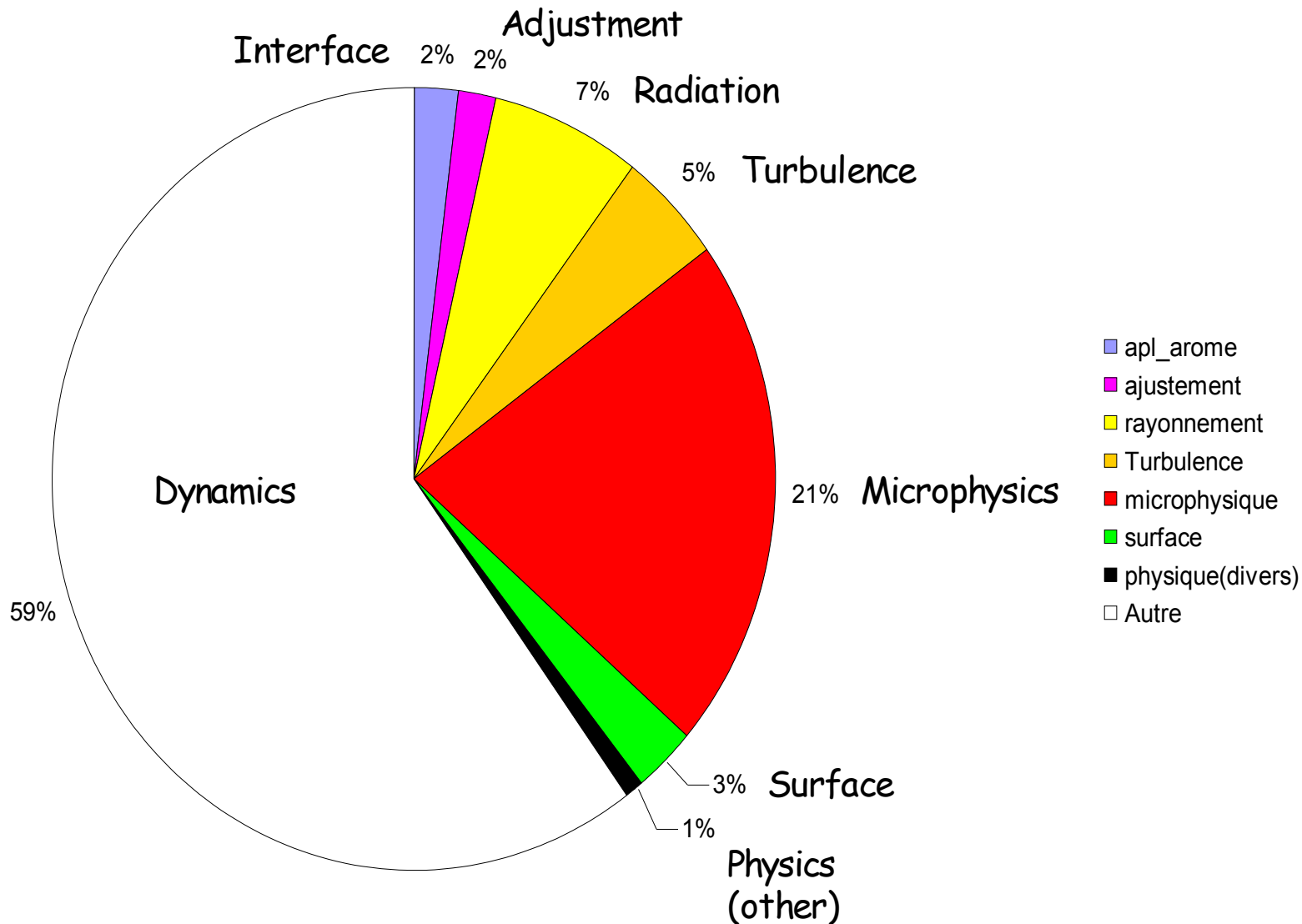
- 5 domains
- 240 x 240 points with 15 in E zone
- 41 vertical levels
- Coupled with oper Aladin France forecasts
- 24h forecasts cost 25000 CPU = 2h ellapse time on 4 VPP procs.

II. With acces to tora/cougar/andante

Some words about numerical cost of AROME
(Gard Case : 12h over a 240x240 domain)

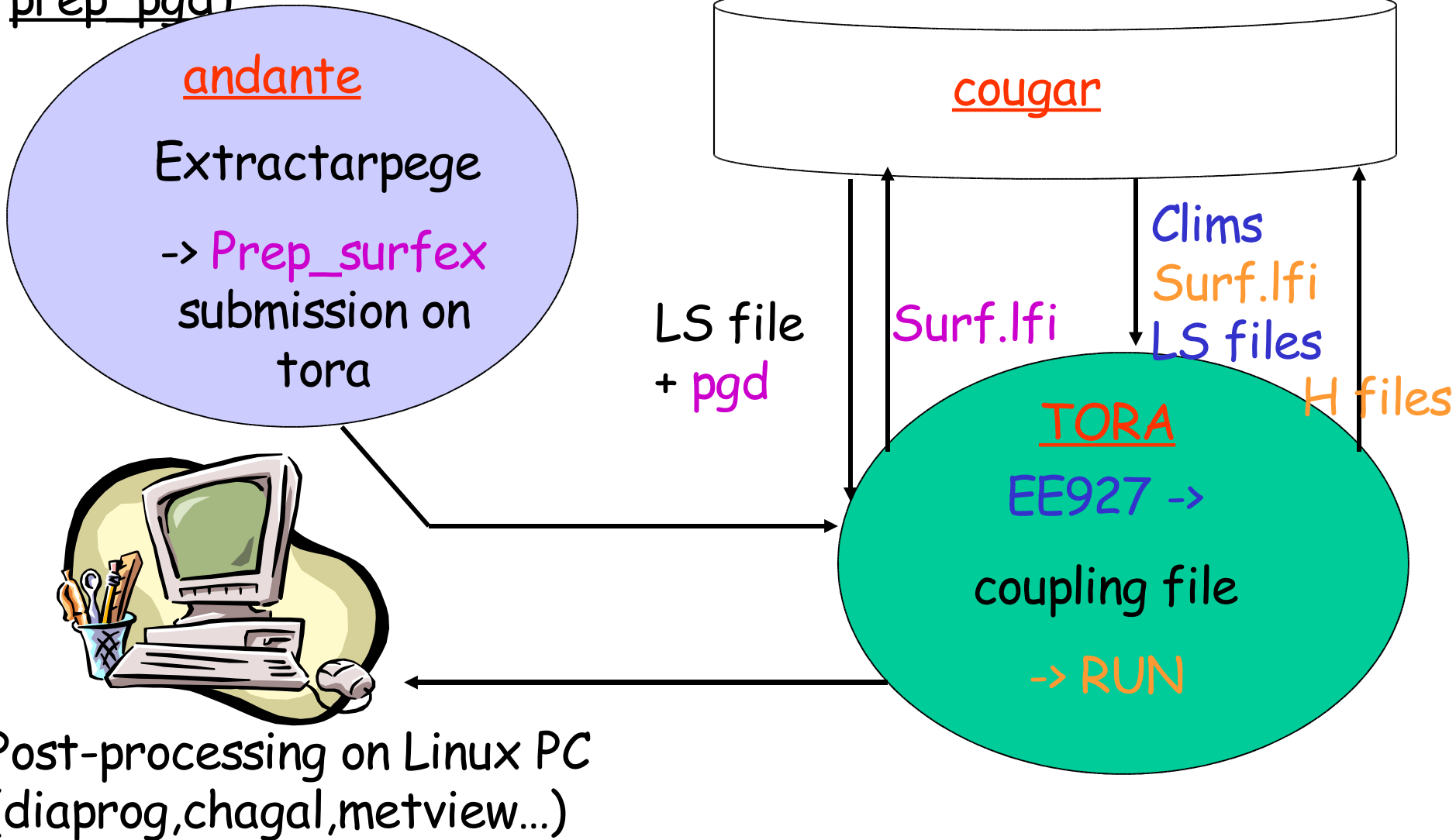
- MésoNH
 - TSTEP= 4s , CPU = 24h20
- AROME
 - TSTEP=15s, CPU = 9h
 - TSTEP=45s, CPU = 3h23
 - TSTEP=60s, CPU = 2h30

II. With acces to tora/cougar/andante



II. With acces to tora/cougar/andante

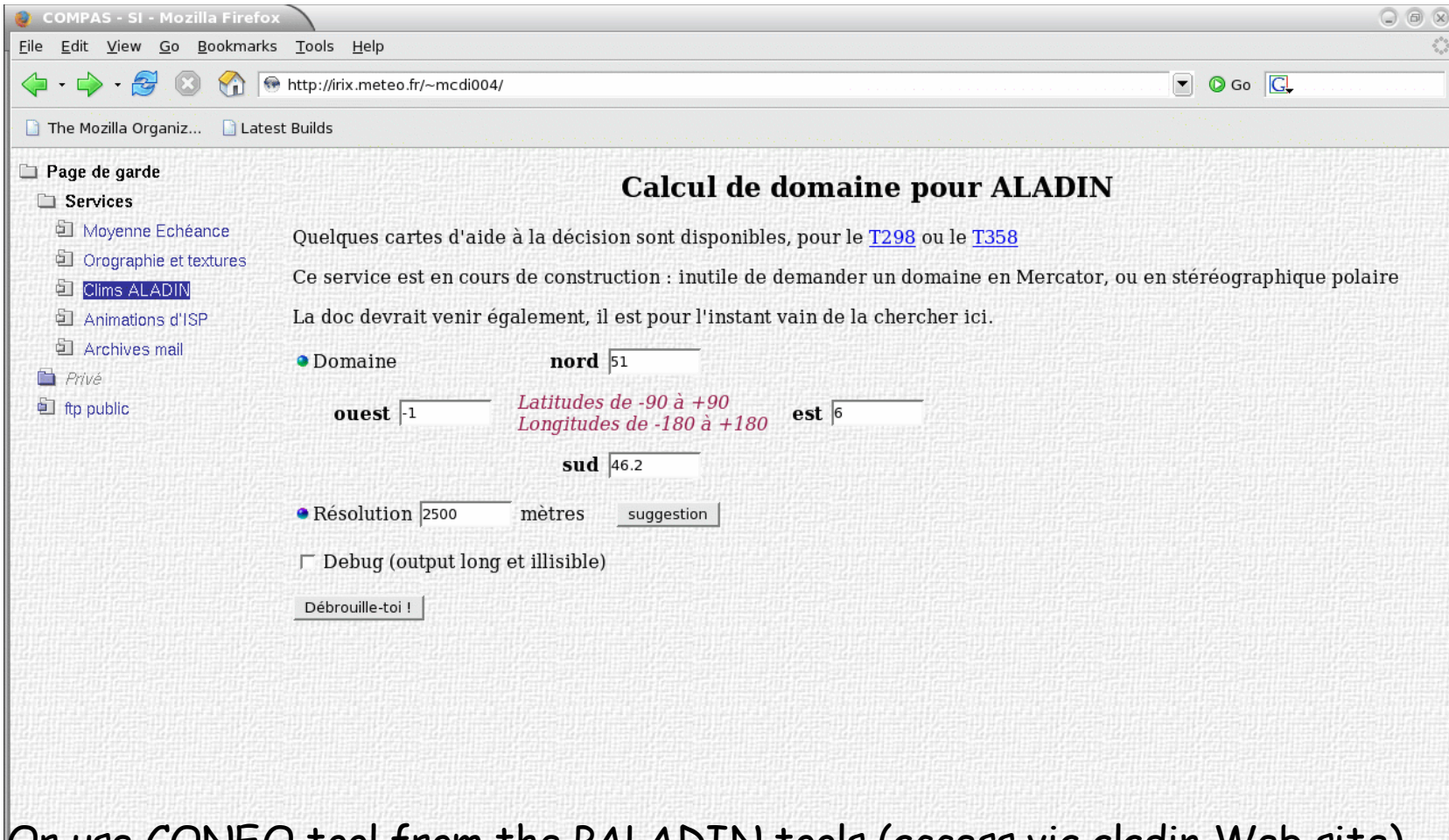
a) Already configurated domains over France : (no E923 nor prep pgd)



II. With acces to tora/cougar

b) Creating a new domain :

Web Compas : <http://irix.meteo.fr/~mcdi004/>



COMPAS - SI - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://irix.meteo.fr/~mcdi004/

The Mozilla Organiz... Latest Builds

Page de garde

- Services
 - Moyenne Echéance
 - Orographie et textures
 - Clims ALADIN
 - Animations d'ISP
 - Archives mail
- Privé
- ftp public

Calcul de domaine pour ALADIN

Quelques cartes d'aide à la décision sont disponibles, pour le [T298](#) ou le [T358](#)

Ce service est en cours de construction : inutile de demander un domaine en Mercator, ou en stéréographique polaire

La doc devrait venir également, il est pour l'instant vain de la chercher ici.

Domaine

nord

ouest *Latitudes de -90 à +90*
Longitudes de -180 à +180 est

sud

Résolution mètres

Debug (output long et illisible)

Or use CONEO tool from the PALADIN tools (access via aladin Web site)

II. With acces to tora/cougar

b) Creating a new domain :

Lance_exp config_file

```
&NAMDIM
NDLUXG=225,
NDGUXG=225,
NDGLG=240, NDLON=240,
NSMAX=119, NMSMAX=119,
/
&NEMDIM
NBZONL=8, NBZONG=8,
/
&NEMGEO
ELATO=48.625223983268750,
ELONO=2.4999999999999967,
ELATC=48.62522451038397,
ELONC=2.500000027792014,
EDELX=2544.420969870485,
EDELX=2544.420969870480,
EPPK=0.7504021495068124,
```

~mrpe602/Assist/lancement.tar

II. With acces to tora/cougar

b) Creating a new domain :

Now enter enter date

-> annee/year AAAA :2005

-> mois/MONTH MM :09

-> jour/day JJ:21

-> reseau R: 0

date will be 2005 09 21 r0

Now enter Echeance ex 00 24 step 03

-> echeance first depart HH: 00

-> echeance end fin HH: 24

-> echeance step pas HH: 3

echeances will be 00 24 3

II. With acces to tora/cougar

enter number menu for INPUT DATA

1) aladin

2) arpege

3) other

4) fin

#? 1

ALADIN

Now enter directory address OUTPUT FILES

prefixe domain clim name ex : clim_gard.7.5km

-> clim name : **Clim_Pari_2.5km**

final name will be Clim_Pari_2.5km.tegen.09

Now enter on gagarine archiv repertory ex Arome/gard/7.5km

-> gagarine archiv : **AROME/Assinew**

Now enter on vpp execution directory ex: testgard

-> execution directory : **testpari**

II. With acces to tora/cougar

Now enter your age ex: 27

-> your age : 28

You seem younger

It is only a joke

....

wait a second

your storage typing data is on storage0922_0933

execute :

cd testpari

and after

qsub c923

II. With acces to tora/cougar

- c923 (clim file preparation)
- c927 (coupling files preparation)
- c927surf (extractarpege)
- cesurf (prep_pgd+prep_real_case)
- carome (forecast run)

II. With acces to tora/cougar

c923 (clim file preparation) : with an al29t2 binary

- 3 stages : a) orography preparation on quadratic grid
b) other fields on linear grid
c) add ozone and aerosols clim fields (CLIMAER='tegen' or 'tanre')

Namelist parameters (quad. and lin.):

```
&NAMCLA
  FACZ0=0.53, FENVN=0.,
  LKEYF=.TRUE., LNEWORO=.TRUE.,
  LNEWORO2=.FALSE., LNORO=.FALSE.,
/
&NAMDIM
  NDGLG=240, NDGUXG=225,
  NDLON=240, NDLUXG=225,
  NFLEVG=1,
  NMSMAX=79, NSMAX=79,
/
```

```
&NAMCLA
  FACZ0=0.53, FENVN=0.,
  LKEYF=.TRUE., LNEWORO=.TRUE.,
  LNEWORO2=.FALSE., LNORO=.TRUE.,
  NLISSP=1,
/
&NAMDIM
  NDGLG=240, NDGUXG=225,
  NDLON=240, NDLUXG=225,
  NFLEVG=1,
  NMSMAX=119, NSMAX=119,
/
```

II. With acces to tora/cougar

c927 (coupling files preparation)

- Loop on the number of coupling files
- Al29t2_main binary
- main namelist parameters :

```
&NAMAFN
TFP_U%CLNAME='WIND.U.PHYS',
TFP_V%CLNAME='WIND.V.PHYS',
TFP_Q%LLGP=.TRUE.,
TFP_S%CLNAME='ICE_CRYSTAL',
TFP_S%LLGP=.TRUE.,
TFP_CLF%CLNAME=' CLOUD FRACTION',
TFP_CLF%LLGP=.TRUE.,
TFP_W%CLNAME='CLOUD_WATER',
TFP_W%LLGP=.TRUE., TFP_TKE%LLGP=.TRUE
TFP_SN%LLGP=.TRUE.,
TFP_RR%LLGP=.TRUE., TFP_GR%LLGP=.TRUE
TFP_FUA(1)%CLNAME='SRC',
TFP_FUA(1)%LLGP=.TRUE.
```

ClimALA (E923)
ClimALA (Oper)

ICMSHALAD+000

↓ mv

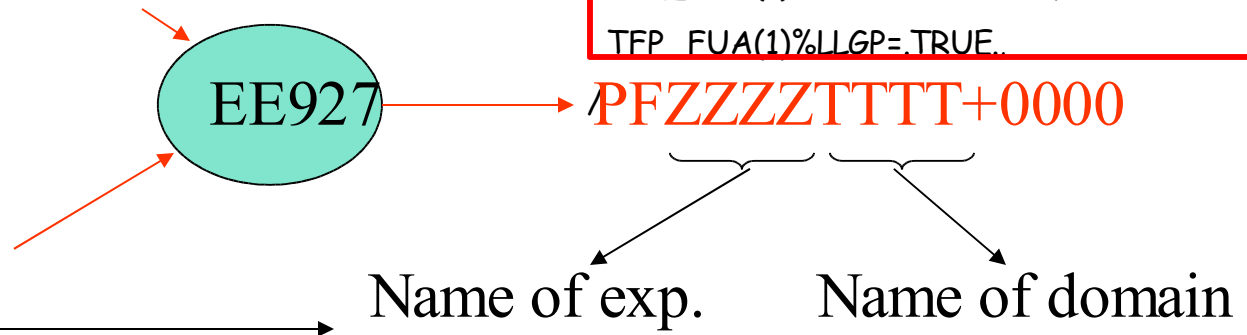
ICMSHZZZZINIT

EE927

PFZZZZTTTT+0000

Name of exp.

Name of domain



II. With acces to tora/cougar

c927 (coupling files preparation)

```
&NAMFPC
LTRACEFP=.TRUE.,
CFPFMT='LELAM',
CFPDOM(1)='DOM',
CFP3DF(1)='TEMPERATURE',
CFP3DF(2)='WIND.U.PHYS',
CFP3DF(3)='WIND.V.PHYS',
CFP3DF(4)='HUMI.SPECIFIQUE',
CFP3DF(5)='PRESS.DEPART',
CFP3DF(6)='VERTIC.DIVER',
CFP3DF(7)='RAIN',
CFP3DF(8)='ICE_CRYSTAL',
CFP3DF(9)='SNOW',
CFP3DF(10)='CLOUD FRACTION',
CFP3DF(11)='GRAUPEL',
CFP3DF(12)='CLOUD_WATER',
CFP3DF(13)='TKE',
CFP3DF(14)='SRC'
```

```
CFP2DF(1)='SURFPRESSION',
CFP2DF(2)='SPECSURFGEOPOTENTIEL',
CFPPHY(1)='SURFTEMPERATURE',
CFPPHY(2)='PROFTEMPERATURE',
...
CFPPHY(25)='SURFA.OF.OZONE',
CFPPHY(26)='SURFB.OF.OZONE',
CFPPHY(27)='SURFC.OF.OZONE',
CFPPHY(28)='SURFAEROS.SEA',
CFPPHY(29)='SURFAEROS.LAND',
CFPPHY(30)='SURFAEROS.SOOT',
CFPPHY(31)='SURFAEROS.DESERT',

NRFP3S=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23
,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,
NFPCLI=3,
LFPQ=.FALSE.,
LFPSPEC=.TRUE.,
```

II. With acces to tora/cougar

c927surf (extractarpege) :

- Fullpos of aladin file with an al28t2 binary
- Convert into a grib file (GRIBEX)

```
&NAMAFN
```

```
TFP_Q%LLGP=.TRUE.,  
TFP_SP%LLGP=.TRUE.,  
TFP_U%LLGP=.TRUE.,  
TFP_V%LLGP=.TRUE.,  
TFP_T%LLGP=.TRUE.,
```

```
&NAMFPC
```

```
LTRACEFP=.TRUE.,  
CFPFMT='LELAM',  
CFPDOM(1)='FRAN',  
CFP3DF(1)='TEMPERATURE',  
CFP3DF(2)='VENT_ZONAL',  
CFP3DF(3)='VENT_MERIDIEN',  
CFP3DF(4)='HUMI.SPECIFIQUE',  
CFP2DF(1)='SURFPRESSION',  
CFPPHY(1)='SURFGEOPOTENTIEL',  
CFPPHY(2)='SURFIND.TERREMER',  
CFPPHY(3)='SURFTEMPERATURE',  
CFPPHY(4)='PROFTEMPERATURE',  
CFPPHY(5)='PROFRESERV.EAU',  
CFPPHY(6)='SURFRESERV.EAU',  
CFPPHY(7)='SURFRESERV.NEIGE',  
CFPPHY(8)='SURFPROP.ARGILE',  
CFPPHY(9)='SURFPROP.SABLE',  
CFPPHY(10)='SURFEPAIS.SOL',  
CFPPHY(11)='PROFRESERV.GLACE',  
CFPPHY(12)='SURFRESERV.GLACE',  
NRFP3S=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,  
7,28,29,30,31,32,33,34,35,36,37,38,39,40,41  
NFPCLI=0,  
LFPQ=.FALSE.,
```

II. With acces to tora/cougar

cesurf (prep pgd) in Masdev 45 :

PRE_PGD1.nam

```
&NAM_PROJ
  XLAT0=45.770092675033787,
  XLON0=9.9000000000000021,
  XRPK=0.71654661836625966,
  XBETA=0
/
&NAM_PGD_DOM
  ZPGDLATCEN=45.77009080369814,
  ZPGDLONCEN=9.8999999958239,
  NPGDIMAX=225,
  NPGDJMAX=225,
  ZPGDDXHAT=2544.529360331206 ,
  ZPGDDYHAT=2544.529360253696/
&NAM_PGDMESONH YPGDMESONH='PGDTIST45', IMONTH_FOR_SHOW_ONLY=2 /
&NAM_COVER   YCOVER='ecoclimats_v2', YFILETYPE='DIRECT' /
&NAM_NOCLASS_PGD /
&NAM_ZS     YZS='gtopo30', YFILETYPE='DIRECT' /
&NAM_CLAY   YCLAY='clay_fao', YFILETYPE='DIRECT' /
&NAM_SAND   YSAND='sand_fao', YFILETYPE='DIRECT' /
&NAM_SST    YSST='' /
&NAM_DUMMY_PGD /
&NAM_BLANK /
```

II. With acces to tora/cougar

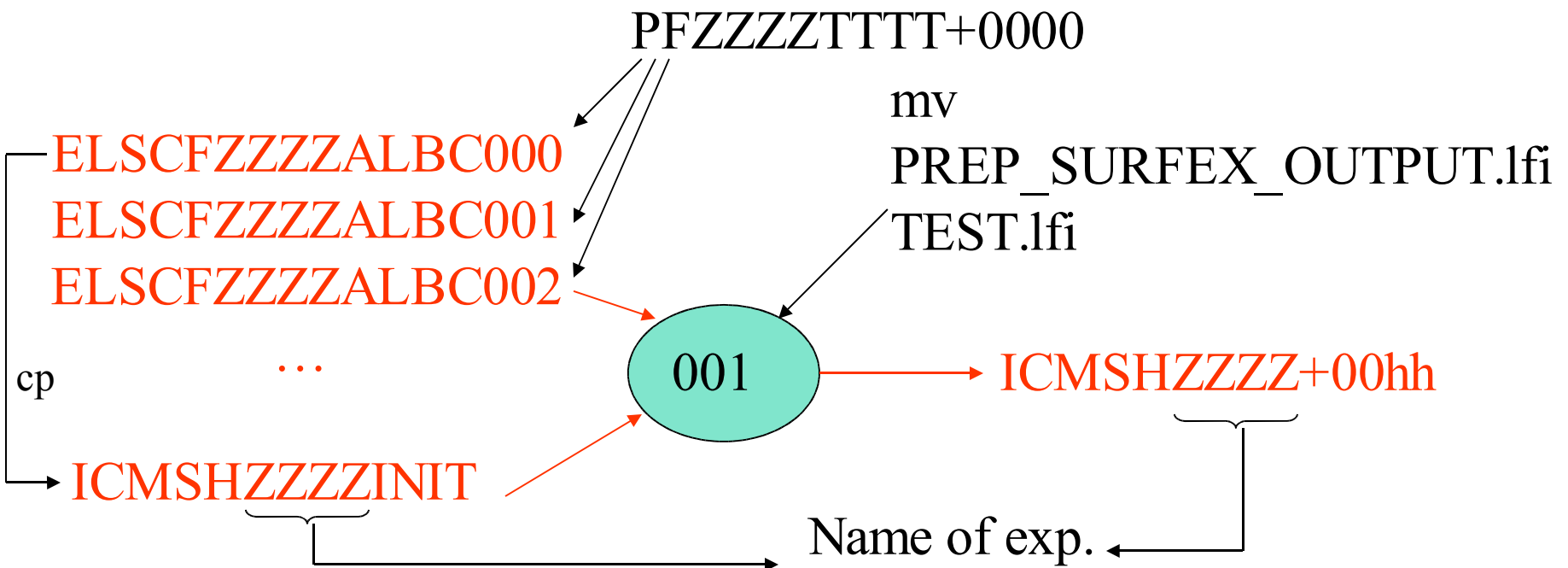
cesurf (prep real case) in Masdev 45:

PRE_REAL1.nam

```
&NAM_FILE_NAMES ,  
    HATMFILETYPE='GRIBEX',  
    HPGDFILE='PGDTIST45',  
    CINIFILE='PREP_SURFEX_OUTPUT' /  
&NAM_REAL_CONF CEQNSYS = 'DUR',  
    NVERB = 5 /  
&NAM_MESONH_DOM /  
&NAM_VER_GRID NKMAX = 40/  
&NAM_BLANK /
```

II. With acces to tora/cougar

carome (forecast run) : Files involved



II. With acces to tora/cougar

carome (forecast run) with al29t2 arome-main binary :

main namelists keys :

high Level control keys :

```
&NEMCTO
  NBICOP=2,
  NBICOQ=2,
  NBICOT=2,
  NBICOU=2,
  NBICPD=2,
  NBICVD=2,
  NECRIPL=1,
/
&NEMDYN
  TEFRCL=10800.,
/
```

```
&NAMCTO
  CFPATH='ICMSH',
  LFPOS=.FALSE.,
  LTWOTL=.TRUE.,
  NFRHIS=1,
  NFRISP=2,
  NFRSDI=15,
  NHISTS(0)=-25,
  NHISTS(1)=-0,
  NHISTS(2)=-1,
  (...)
  NHISTS(24)=-23,
  NHISTS(25)=-24,
  NPISPS(0)=0,
  LNHDYN=.TRUE.,
  LPC_OLD=.FALSE.,
  LPC_FULL=.TRUE.,
  LPC_NESC=.TRUE.,
  LSPRT=.TRUE
  LAROME=.TRUE.,
```

II. With acces to tora/cougar

carome (forecast run) with al29t2 arome-main binary :

main namelists keys :

Dynamics :

```
&NAMDYNA  
NVDVAR=4,  
ND4SYS=2,  
LGWADV=.FALSE.,  
NPDVAR=2,  
/  

```

```
&NAMDDYN  
LADV=.TRUE.,  
LSETTLES=.FALSE.,  
NTLAG=3,  
NVLG=3,  
NWLG=3,  
NSVDLAG=3, NSPDLG=3,  
REPS1=0., REPS2=0., REPSM1=0., REPSM2=0., REPS1=0.,  
VESL=0.,  
XIDT=0.0,  
NDLNPR=1,  
NSITER=1,  
SIPR=101325.,  
SITRA=50.,  
SITR=350,  
LADVAMV=.TRUE.,  
LQMPD=.FALSE., LQMT=.FALSE., LQMVD=.FALSE.,  
LQMQ=.FALSE., LQMV=.FALSE.,  
RCMSLPO=0.0,
```

II. With acces to tora/cougar

carome (forecast run) with al29t2_ arome-main binary :

main namelists keys :

AROME specific namelists :

```
&NAMPARAR
  NPTP=1,
  NDIAGFR=60,
  NPRINTFR=10000,
  LOSUBG_COND=.FALSE.,
  LOSUBG_AUCV=.FALSE.,
  LOSIGMAS=.FALSE.,
/
&NAMARPHY
  LARPHY=.TRUE.,
  LMICRO=.TRUE.,
  LTURB=.TRUE.,
  LGROUND=.TRUE.,
  LKFBCONV=.FALSE.,
  LKFBD=.FALSE.,
  LKFBS=.FALSE.,
```

II. With acces to tora/cougar

carome (forecast run) with al29t2_ arome-main binary :

main namelists keys :

radiation scheme :

```
&NAERAD
  LRRTM=.TRUE.,
  NAER=1,
  NOZOCL=2,
  NRADFR=15,
  NSW=6,
/
&NAMDPHY
  NVCLIA=4,
/
&NAMPHY
  LO3ABC=.TRUE.,
  LRAYFM=.TRUE.,
/
```

II. With acces to tora/cougar

carome (forecast run) with al29t2_ arome-main binary :

main namelists keys :

others :

&NAMPHY

LMPHYS=.TRUE.,
LO3ABC=.TRUE.,
LRAYFM=.TRUE.,
LCVRA=.FALSE.,
(...)

&NAMPARO

NPROC=6,
NPRGPNS=6,
NPRGPEW=1,

&NAMGFL

YQ_NL%LGP=.TRUE.,
YQ_NL%LSP=.FALSE.,
YQ_NL%LREQIN=.TRUE.,
YQ_NL%LCOUPPING=.TRUE.,
YQ_NL%LPT=.TRUE.,
YL_NL%LADV=.TRUE.,
YL_NL%LREQIN=.TRUE.,
YL_NL%LGPIINGP=.TRUE.,
YL_NL%LGP=.TRUE.,
YL_NL%LSP=.FALSE.,
YL_NL%LCDERS=.FALSE.,
YL_NL%LT9=.FALSE.,
YL_NL%LT1=.TRUE.,
YL_NL%LT5=.FALSE.,
YL_NL%LSLP=.FALSE.,
YL_NL%LCOUPPING=.TRUE.,
(...)

II. With acces to tora/cougar

carome (forecast run) with al29t2_ arome-main binary :

Modifications in the namelist :

LRDBBC+SLHD

Shallow convection

Subgrid scale condensation

...

III. Without acces to tora/cougar

-On ECMWF IBM hpcd :

AROME CY29T2 installed. Runs if files transferred.
Extractarpege with IFS, prep_pgd and prep_real_case available.

E923 not available,

EE927 if input Aladin files transferred.

-On Linux PC :

Version in preparation (Ryad El Kahtib)

Only compilation for the time being.

-Via Olive web interface :

In preparation (Eric Sevault, Météo-France)

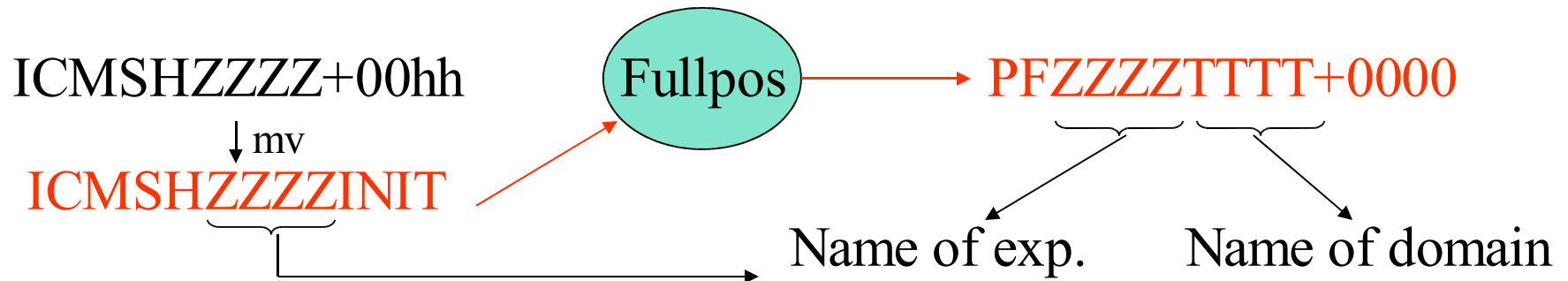
IV. Post Processing of Arome files

- Via Fullpos :

Like in Aladin.

Compute w for example

fields on Z or P levels

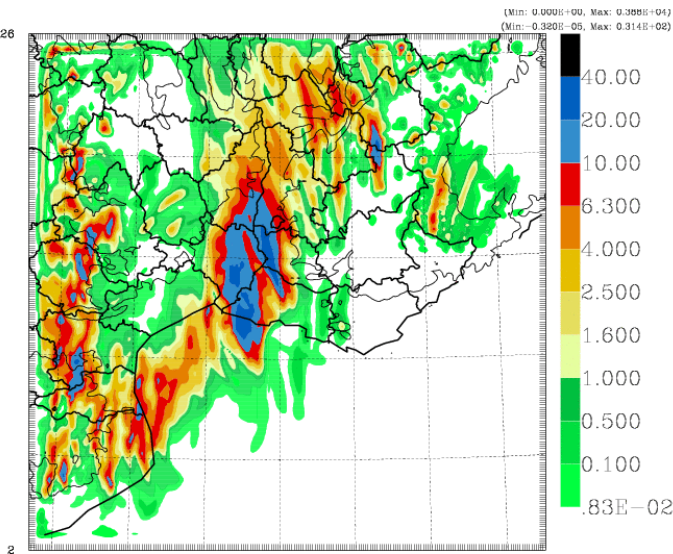


<http://www.cnrm.meteo.fr/gmapdoc/modeles/Diagnostics/fullpos/index.html>

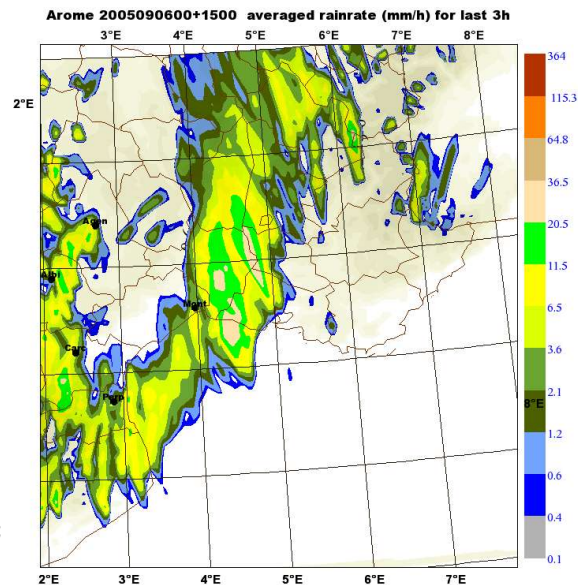
IV. Post Processing of Arome files

-Plotting :

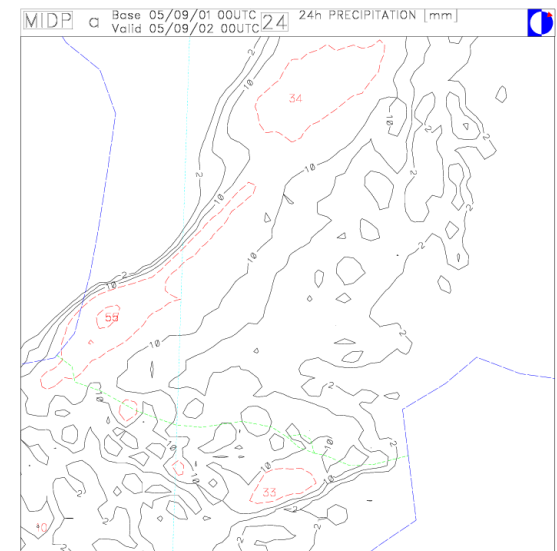
with diaprog for Ifi files
(NCAR mesoNH tool)



with Metview (Ifi and fa files,
using intermediate grib files)



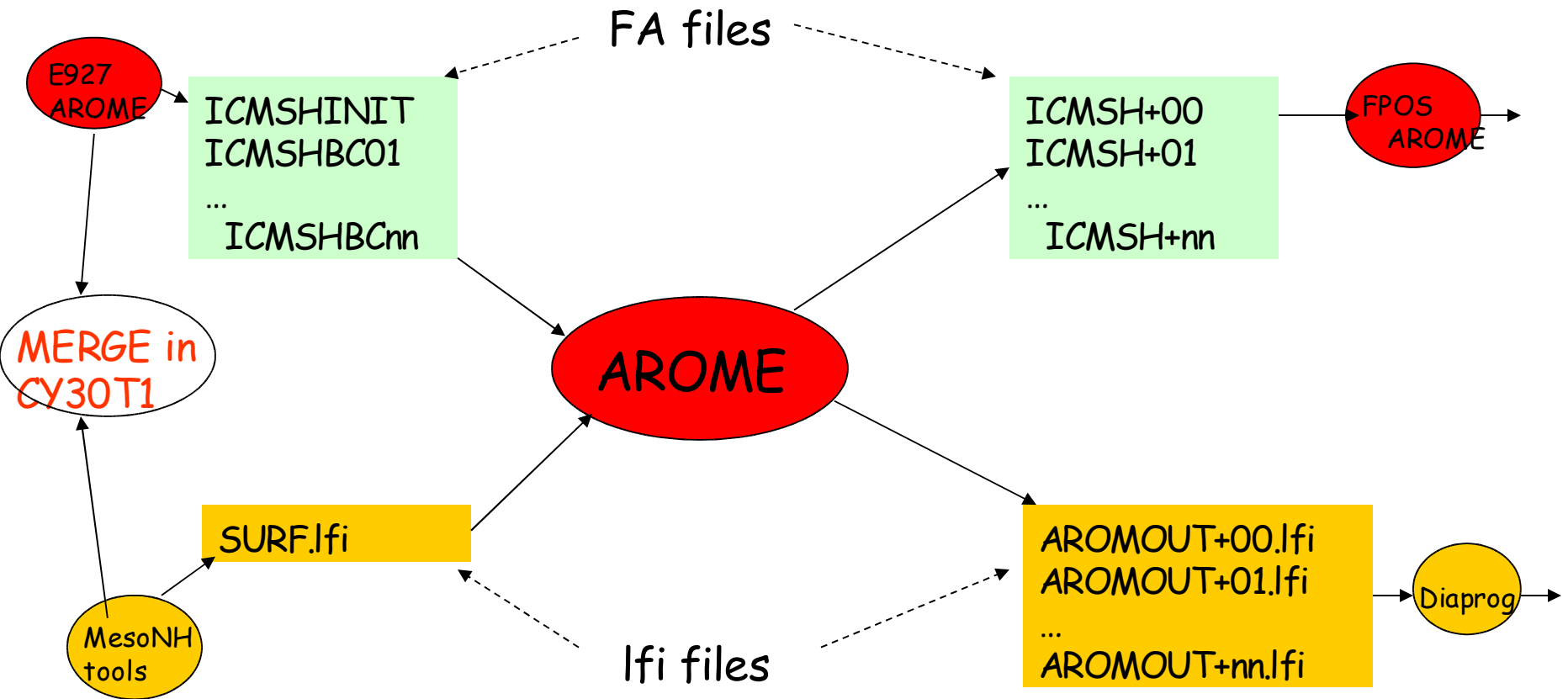
with chagal for FA files (NCAR
Aladin tool)



Tools for conversion of FA2Ifi and Ifi2FA files also exists (arotools)

V. Recent progress

- Improve Init (CY30T1):



- will allow preparation of coupling and lfi files at ecmwf IBM (if pgd,ald and clim files transferred) No use of extractarpage nor prep_real_case/surfex

V. Expected progress

- MesoNH Chemistry scheme in AROME (LUSECHEM=T in namarphy) in CY30T1 with aerosols and dust modules (LORILAM and LRDUST) but still under tests
- Replace prep_real_case by prep_surfex in Jean-Marc's procedure
- Put back Surface inside NPROMA loop (CY??)
- Add diagnostics in AROME (CY??)
- Merging assimilation part in 2006
- Merging prep_pgd with E923
- Plotting with Synergie
- scores