PHASING REPORT

STUDIES ON THE LATEST DEVELOPMENTS IN ARPEGE/IFS

Mohamed Zied SASSI

NATIONAL INSTITUTE OF METEOROLOGY
TUNISIA

CNRM/GMAP
METEO-FRANCE

JANUARY – FEBRUARY 2014

CONTENTS

I. SET OF WORKING ENVIRONMENT VARIABLES

1. Beaufix: New calculation machine of Météo-France:

The new calculation machine of Météo-France, Beaufix, is a BULL supercomputer which was implemented in Météo-France center in Toulouse since few months. A similar machine was also implemented in Clement Ader Center in Toulouse.

The Beaufix machine is equipped with 1080 nodes. Every node is composed by 2 processors Intel® Xeon® E5-2600 v2 and 1866MHz of frequency.

Figure 1: BULL supercomputer of Météo-France (Clement Ader Center)

2. Set of environment variables on beaufix:

The first step was to set the environment variables of the GMKPACK tool in the file *.bash_profile* as follows :

```
# GMKPACK

export PACK_PREFIX=cy
export PACK_EXT=.pack
alias gmkrek='gmkpack -g "" -e "" -f/home/gmap/mrpm/khatib/rootpack'
alias gmkgco='gmkpack -g cy -e .pack -f/home/mf/dp/marp/martinezs/packs'
export REKHOME=/home/gmap/mrpm/khatib
export GCOHOME=/home/mf/dp/marp/martinezs
export HOMEREK=/home/gmap/mrpm/khatib
export HOMEGCO=/home/mf/dp/marp/martinezs/SAVE
export GMKROOT=$HOMEREK/public/bin/gmkpack
export ROOTPACK=$HOMEGCO/packs
export GMKFILE=IMPI411IFC1301.BFX
export GMKTMP=$TMP_LOC/gmktmp
export PATH=$GMKROOT/util:$PATH
export MANPATH=$MANPATH:$GMKROOT/man
```

Then, user has to set the Mitrailette tool environment variables:

```
# Config Mitraillette:

export STATION=beaufix
export SHOME=${HOME}/SAVE
export PMAHOME=/home/gmap/mrpm/marguina
export OPEHOME=/home/mf/dp/mxpt/mxpt001
```

In addition to these two main specifications, user can set more variables such as:

```
# User specific environment and startup programs :

echo "USER"
PATH=$PATH:$HOME/bin:.
export PATH
unset LD_LIBRARY_PATH
TMP_LOC=$(mktemp -u --tmpdir=/tmp/$LOGNAME)
mkdir -p $TMP_LOC

# gget  et gco in general :

export GGETPATH=$HOMEGCO/public/bin
export PATH=$PATH:$GGETPATH
```

II. Getting started with Beaufix

To get started with the new machine, I used to adapt some scripts according to the new specifications. This work was focused mainly on the update of paths and the set of the new headers. This task was applied over the e923, e927 and e001 configurations.

During this step, It was very useful to consider the technical report “Porting of ALADIN Algeria research scripts on the Météo-France BULL computer (beaufix)” realized by our Algerian colleague Djebbar Arab .

The following headers are examples of Beaufix parameters:

- In multi-processing:

```
#!/bin/bash
#SBATCH -p normal32
#SBATCH -J AG1T000
#SBATCH -N 16
#SBATCH -n 32
#SBATCH -c 12
#SBATCH --time "60"
#SBATCH --exclusiv
#SBATCH -o AG1T000.o%j
```

- In mono-processing:

```
#!/bin/bash
#SBATCH -p normal32
#SBATCH -J RMHLJ000
#SBATCH -N 1
#SBATCH -n 1
#SBATCH -c 24
#SBATCH --time "30"
#SBATCH --exclusiv
#SBATCH -o RMHLJ000.o%j
```

The job launch on Beaufix needs moreover some other BULL environment variables specification as follows:

export **OMP_STACKSIZE**=1G
export **KMP_STACKSIZE**=1G
export **KMP_MONITOR_STACKSIZE**=1G
export **EC_MPI_ATEXIT**=0
export **EC_PROFILE_HEAP**=0
export **MPIAUTOCONFIG**=mpiauto.TIME.conf
export **OMP_NUM_THREADS**=$SLURM_CPUS_PER_TASK
export **DR_HOOK**=0

```
export DR_HOOK_IGNORE_SIGNALS=-1
export DR_HOOK_SILENT=1
export DR_HOOK_OPT=prof
export MPL_MBX_SIZE=2048000000
export GRIB_SAMPLES_PATH=${REKHOME}/opt/i-13.1.4.183/grib_api/share/grib_api/
        ifs_samples/grib1
export GRIB_DEFINITION_PATH=${REKHOME}/opt/i-13.1.4.183/grib_api/share/grib_api/
        definitions
```

III. Add of AROME nesting Mitraillette job

This part consisted on adding a new Mitraillette test which enables the verification of the AROME nesting configuration ee927 in the AH9E job. This job tests the coupling of AROME files from the AROME FRANGP 2,5km domain to a 500m domain (pyr500). The input files of the new coupling job are the output files of the ARPEGE-AROME coupling job.

To perform this task, some namelist updates was necessary such as the set of the following variables:

```
&NAMAFN
  TFP_I%CLNAME='ICE_CRYSTAL',
  TFP_I%LLGP=.TRUE.,
  TFP_L%CLNAME='CLOUD_WATER',
  TFP_L%LLGP=.TRUE.,
  TFP_TKE%LLGP=.TRUE.,
  TFP_SN%LLGP=.TRUE.,
  TFP_RR%LLGP=.TRUE.,
  TFP_GR%LLGP=.TRUE.,
/
&NAMCT0
  LSPRT=.TRUE.,
/
&NAMFPC
  CFPDOM(1)='pyr500',
  LTRACEFP=.TRUE.,
  CFP3DF(7)='RAIN',
  CFP3DF(8)='ICE_CRYSTAL',
  CFP3DF(9)='SNOW',
  CFP3DF(10)='GRAUPEL',
  CFP3DF(11)='CLOUD_WATER',
  CFP3DF(12)='TKE',
/
&NAMFPD
  NLAT=640,
  NLON=1280,
  RLONC(1)=0.79000000000000004,
  RLATC(1)=42.759999999999998,
  RDELX(1)=500.0,
  RDELY(1)=500.0,
  NFPLUX=1269,
  NFPGUX=629,
/
&NAMFPG
  FPLAT0=42.759999999999998,
  FPLON0=0.79000000000000004,
  NFPMAX=319,
  NMFPMAX=639,
/
&NAMGFL
  YQ_NL%LGP=.TRUE.,
  YQ_NL%LSP=.FALSE.,
  YQ_NL%NREQIN=1,
```

```
  YI_NL%NREQIN=1,
  YL_NL%NREQIN=1,
  YS_NL%NREQIN=1,
  YR_NL%NREQIN=1,
  YG_NL%NREQIN=1,
  YTKE_NL%NREQIN=1,
/
```

In order to avoid system abort, the new fields set in NAMFPC (RAIN, ICE_CRYSTAL, SNOW, GRAUPEL, CLOUD_WATER and TKE) had to be deleted while setting NFPOS=2. In fact, the test NFPOS=2 needs more recent files and will be officially introduced in the next Mitraillette version (April 2014).

Some more updates have been done to Mitraillette files such as the add the new job to memtable and timetable files, the creation of the namelist and job files and the add of the climate files related to the new output domain.

A pack containing the new modified and created files is available on cougar under /home/m/mrpe/sassi/NESTAR.tar.gz .

After including the new AROME nesting test, the AH9E job is containing the following tasks:

```
000 : AH9E; Conf 001HYD E927-NFPOS2 COU; dmA1B1; 1 nd; 24 td;
001 : AH9E; Conf 001HYD E927 ARU; dmA1B1; 1 nd; 24 td;
002 : AH9E; Conf 001HYD E927 ARU; dmA1B1; 1 nd; 24 td;
003 : AH9E; Conf 001HYD EE927-NFPOS2 NES; dmA1B1; 1 nd; 24 td;
```

The test of the new job was successful on multi-processors run but for mono-processor run user should set the memory variable to *large128* in place of *normal32* in order to give sufficient virtual memory for the run.

The new Mitraillette job was also successfully tested over nesting to a 1,3km AROME domain on both mono-processor and multi-processors run without need to change the memory parameter setting.

IV. Debugging of the pre_cy40t1.v3

The next part of my stay was about debugging the pre_cy40t1 of ARPEGE. Two tools were used during this part; MUSC 1D model and DDT debugger.

1. MUSC 1D model:

The use of the MUSC 1D model is an efficient tool to detect bugs in the model physics. It enables user to perform several tests and also practical printings.

The MUSC 1D model was run on local machine. User can import the considered cycle pack from the local address "webdav.cnrm.meteo.fr/public/gmap/store" or by performing the following commands (for the cy40t1.v03):

- catpack: To display available packs.
- getpack -r cy40 -b t1 -v 03 -l GFORTRAN451 -o x: To import the needed pack to the shared file source on local machine.

During this part, different errors were noticed such as too strong wind or not a number error as follows:

```
NORMS AT NSTEP CNT4    1
SPECTRAL NORMS -   LOG(PREHYDS)                    NaN
LEV     VORTICITY            DIVERGENCE          TEMPERATURE          KINETIC ENERGY
AVE 0.000000000000000E+00                NaN                NaN                NaN
GPNORM HUMI.SPECIFI        AVERAGE             MINIMUM             MAXIMUM
      AVE                  NaN 0.000000000000000E+00 0.180773708224911E+02
GPNORM LIQUID_WATER        AVERAGE             MINIMUM             MAXIMUM
      AVE                  NaN 0.000000000000000E+00 0.000000000000000E+00
```

```
NSTEP =     1 STEPO   0AAA00AAA
ABOR1 CALLED
!U WIND TOO STRONG, EXPLOSION!!!
```

These errors were found since the first time step and caused the abort of the run.

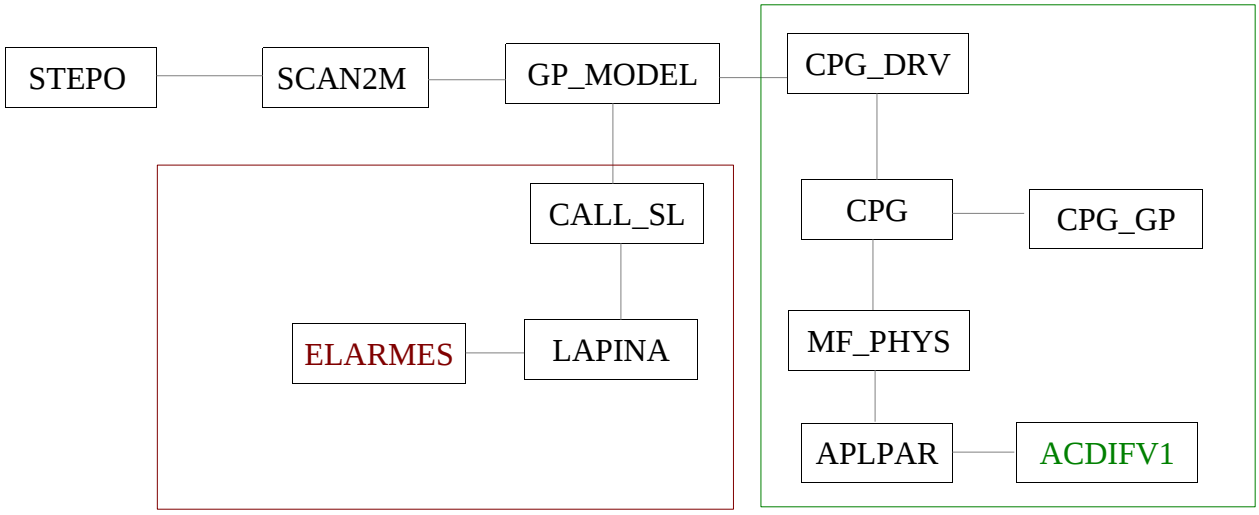


Figure 2: Architecture of investigated routines

The use of the printings in MUSC enabled to check the possible anomalies during the run. As an example, while checking the listing, I noticed that the model was not considering the surface forcing parameters as mentioned in the following error:

```
RDFA2GP: SURFALBEDO HISTO IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0001    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0002    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0003    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0004    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0005    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0006    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0007    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0008    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0009    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0010    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0011    IS MISSING; SET TO ZERO
RDFA2GP: SURFFORC0012    IS MISSING; SET TO ZERO
```

RDFA2GP: SURFFORC0013 IS MISSING; SET TO ZERO

RDFA2GP: SURFFORC0014 IS MISSING; SET TO ZERO

This fact was caused by the change of numerical format which impacted the file names reading in the sudefo_gflattr.F90 setup routine. This error was fixed by changing the format of variable in “easy diag attributes” from I2.2 to I4.4 (Line 3003 of routine sudefo_gflattr.F90).

More analysis driving to ACDIFV1.F90 routine showed that it was necessary to set the LEDKFI key to FALSE in the setup routine su0phy.F90. This fix avoided the Not a Number error which occurred during the run.

After this fix, the run could finish successfully, but while comparing the spectral norms to reference (cy40), we noticed the non reproducibility of results. More investigation was necessary to explain this difference.

2. 3D model:

Mitraillette tests have been achieved and showed a non reproducibility for jobs with physics. The studied configurations are the following:

000 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA32B1; 16 nd; 12 td;
001 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA8B4; 16 nd; 12 td;
002 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=flt; dmA32B1; 16 nd; 12 td;
003 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=flt; dmA8B4; 16 nd; 12 td;
004 : MNLY; Conf 001NH sl2tl TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
005 : AHLH; Conf 001HYD sl2tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
006 : ANLY; Conf 001NH sl2tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;

The adiabatic jobs showed a numerical reproducibility of the cy40op1.02, while for jobs with physics, changes begin after the 10th digit as described in the following figures:

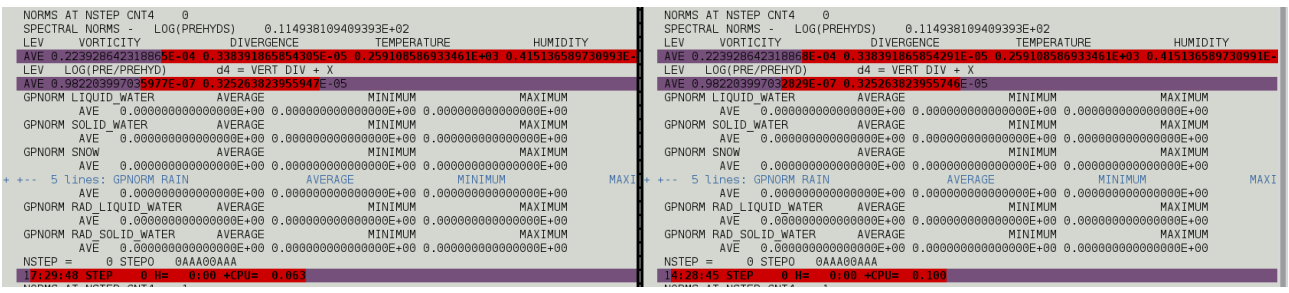
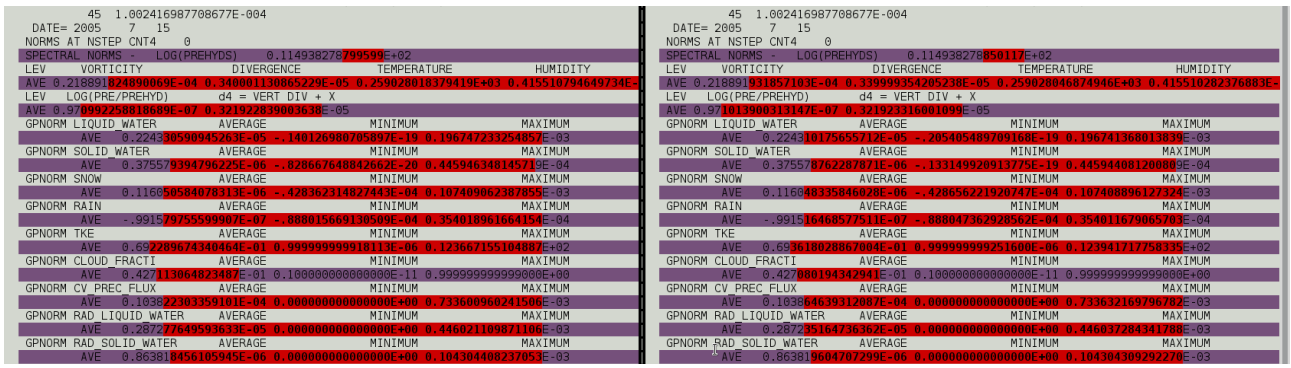


Figure 3: Spectral norms comparison for the adiabatic NH test ANLY between the cy40T1.03 (left) and the cy40OP1.02 (right)



```
          45  1.002416987708677E-004
  DATE= 2005    7   15
 NORMS AT NSTEP CNT4    0
 SPECTRAL NORMS -   LOG(PREHYDS)    0.114938278799599E+02
 LEV     VORTICITY              DIVERGENCE            TEMPERATURE            HUMIDITY
 AVE 0.218891824890069E-04 0.340001130865229E-05 0.259028018379419E+03 0.415510794649734E-
 LEV   LOG(PRE/PREHYD)       d4 = VERT DIV + X
 AVE 0.970992258818689E-07 0.321922839003638E-05
 GPNORM LIQUID_WATER          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.224330590945263E-05 -.140126980705897E-19 0.196747233254857E-03
 GPNORM SOLID_WATER           AVERAGE                MINIMUM                MAXIMUM
        AVE   0.375579394796225E-06 -.828667648842662E-20 0.445946348145719E-04
 GPNORM SNOW                  AVERAGE                MINIMUM                MAXIMUM
        AVE   0.116050584078313E-06 -.428362314827443E-04 0.107409062387859E-03
 GPNORM RAIN                  AVERAGE                MINIMUM                MAXIMUM
        AVE   -.991579755599907E-07 -.888015669130509E-04 0.354018961664157E-04
 GPNORM TKE                   AVERAGE                MINIMUM                MAXIMUM
        AVE   0.692289674340464E-01 0.999999999918113E-06 0.123667155104887E+02
 GPNORM CLOUD_FRACTI          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.427113064823407E-01 0.100000000000000E-11 0.999999999999000E+00
 GPNORM CV_PREC_FLUX          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.103822730335910IE-04 0.000000000000000E+00 0.733600960241500E-03
 GPNORM RAD_LIQUID_WATER      AVERAGE                MINIMUM                MAXIMUM
        AVE   0.287277649593633E-05 0.000000000000000E+00 0.446021109871100E-03
 GPNORM RAD_SOLID_WATER       AVERAGE                MINIMUM                MAXIMUM
        AVE   0.863818456105945E-06 0.000000000000000E+00 0.104304408237053E-03
```

```
          45  1.002416987708677E-004
  DATE= 2005    7   15
 NORMS AT NSTEP CNT4    0
 SPECTRAL NORMS -   LOG(PREHYDS)    0.114938278850117E+02
 LEV     VORTICITY              DIVERGENCE            TEMPERATURE            HUMIDITY
 AVE 0.218891931857103E-04 0.339999354205238E-05 0.259028046874946E+03 0.415510282376883E-
 LEV   LOG(PRE/PREHYD)       d4 = VERT DIV + X
 AVE 0.971013900313147E-07 0.321923316001099E-05
 GPNORM LIQUID_WATER          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.224310175655712E-05 -.205405489709168E-19 0.196741368013839E-03
 GPNORM SOLID_WATER           AVERAGE                MINIMUM                MAXIMUM
        AVE   0.375578762287871E-06 -.133149920913775E-19 0.445944081200809E-04
 GPNORM SNOW                  AVERAGE                MINIMUM                MAXIMUM
        AVE   0.116048335846028E-06 -.428656221920747E-04 0.107408896127324E-03
 GPNORM RAIN                  AVERAGE                MINIMUM                MAXIMUM
        AVE   -.991516468577511E-07 -.888047362928502E-04 0.354011679065703E-04
 GPNORM TKE                   AVERAGE                MINIMUM                MAXIMUM
        AVE   0.693618028867004E-01 0.999999999251600E-06 0.123941717758335E+02
 GPNORM CLOUD_FRACTI          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.427080194342941E-01 0.100000000000000E-11 0.999999999999000E+00
 GPNORM CV_PREC_FLUX          AVERAGE                MINIMUM                MAXIMUM
        AVE   0.103864639312087E-04 0.000000000000000E+00 0.733632169796702E-03
 GPNORM RAD_LIQUID_WATER      AVERAGE                MINIMUM                MAXIMUM
        AVE   0.287235164736362E-05 0.000000000000000E+00 0.446037284341788E-03
 GPNORM RAD_SOLID_WATER       AVERAGE                MINIMUM                MAXIMUM
        AVE   0.863819604707299E-06 0.000000000000000E+00 0.104304309292270E-03
```

Figure 4: Spectral norms comparison for the hydraustatic NH test MNLY between the cy40T1.03 (left) and the cy40OP1.02 (right)

3. Use of DDT debugger:

To explain the non reproducibility of results, more investigation on the 3D model was needed. During this step, I used the DDT debugger which is an efficient tool that enables the check of numerical values of routines variables during the run. I used the DDT tool to compare the cy40t1.v3 to the cy40op1.v2.

a) Installing DDT:

The use of DDT debugging tool required the set of environment variables. A new configuration file named *mpiauto.DDT.conf* should be added in the *.mpiautorc* folder. This file containes the following information:

```
{
 opts =>
   {
    'x11-f-proxy'        => [ '=', ['sassiz@beaufix.meteo.fr'] ],
    'x11-b-proxy'        => [ '=', ['sassiz@beaufixlogin0'] ],
    'debug'              => [ '=', 1 ],
    'x11-display'        => [ '=', 'sassi@lxgmap20.cnrm.meteo.fr:0' ],
    'debugger-path'      => [ '=', '/opt/softs/allinea/tools/3.2.1/bin/ddt' ],
   },
}
```

Moreover, user needs to set the encrypting keys between the local and distant machines. The folder *.ssh* of every machine contains a file named *id_rsa.pub*. This file contains an encrypted key that should be added to the *authorized_keys* file existing in the second machine, and vice versa. The content of the *.ssh* is then as follows:

Table 1: List of setting files for SSH distant display access

In BEAUFIX	In LXGMAP20
– *authorized_keys* – *id_rsa* – *id_rsa_lxgmap20.pub* – *id_rsa.pub* – *known_hosts*	– *authorized_keys* – *id_rsa* – *id_rsa_bfx.pub* – *id_rsa.pub* – *known_hosts*

Finally, user should execute the command "**xhost +**" in order to enable display access from distant machine. (User may need to execute this command every time after reboot)

b) Compiling the code:

In order to use DDT, the code needs to be recompiled using the "*-g*" parameter by setting the compiler option *Ofrt* to 3 in the *ics_** script file of the pack.

After compiling the code, user should run the following DDT patch in the pack directory:

"*~marguina/install/gmkpack/util/gmkpack-make-ddt-session –patch-bin*"

If user notices some non available variables data while running a routine with DDT, this routine should be compiled one more time using the same options and patch mentioned above.

c) Running the code with DDT:

In order to run the code using DDT, some more parameters should be set in the script. The first modification is to update the BULL environment variable as follows:

export MPIAUTOCONFIG=mpiauto.DDT.conf in order of:
export MPIAUTOCONFIG=mpiauto.TIME.conf

In addition, user should define new batch and MPI launch variables according to his run settings. In my case, I used to define these variables as follows:

```
DDT_MPI_LAUNCH="/home/gmap/mrpm/marguina/SAVE/mpiauto.dev/mpiauto"
SWAPP_MPI_DEFAULTS="--wrap  --wrap-stdeo --wrap-stdeo-pack --verbose -np 32 -nnp 2 --"
MPILAUNCH="$DDT_MPI_LAUNCH $SWAPP_MPI_DEFAULTS"
```

The run of the code using the DDT debugger launches a graphical window which displays the code routine, the list of local variables, the variable values, the breaking points and also the dependencies and tree structure of executed routines as described in the following figure:

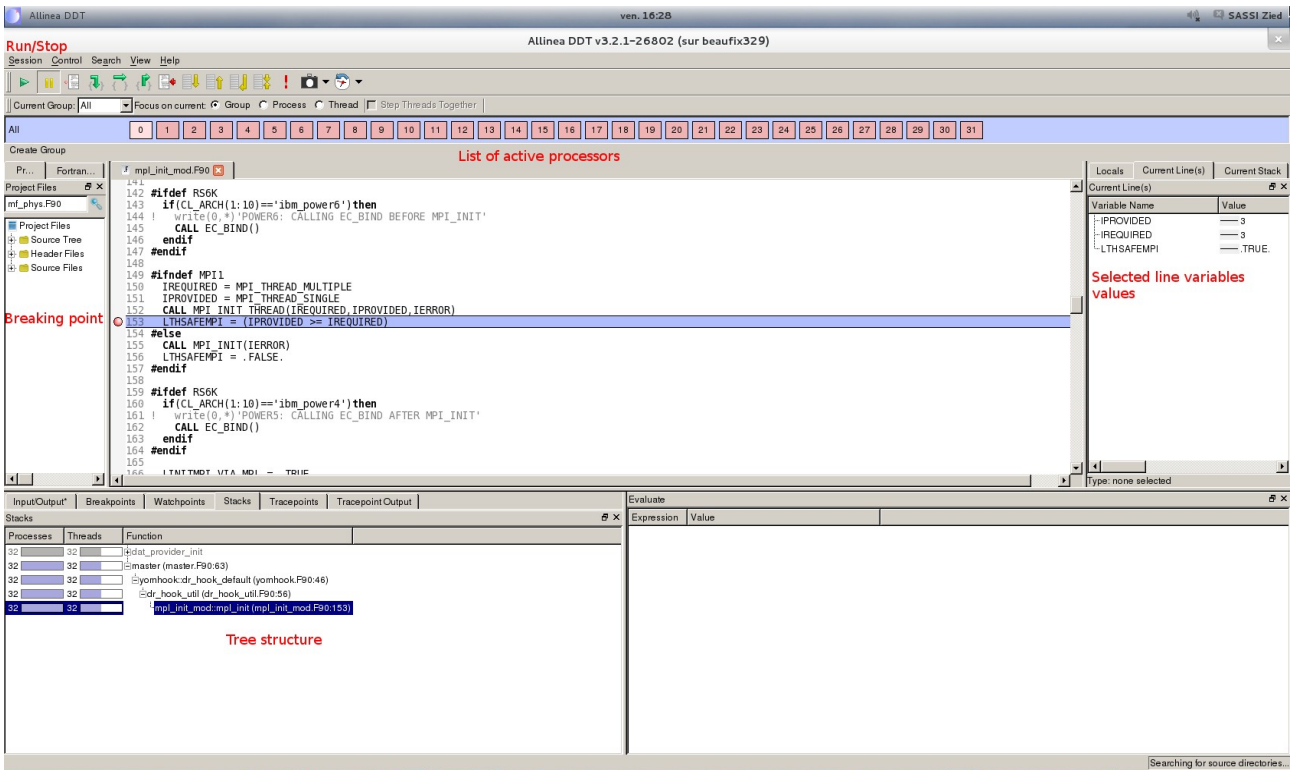


Figure 5: Graphical window of DDT debugger

- CPUTQY.F90 routine:

A numerical impact was detected while considering a new contribution in routine CPUTQY.F90 (Figure 6). This impact was noticed in the ARPEGE hydraustatic run with physics MHLJ while no impact was detected on the ALARO test.

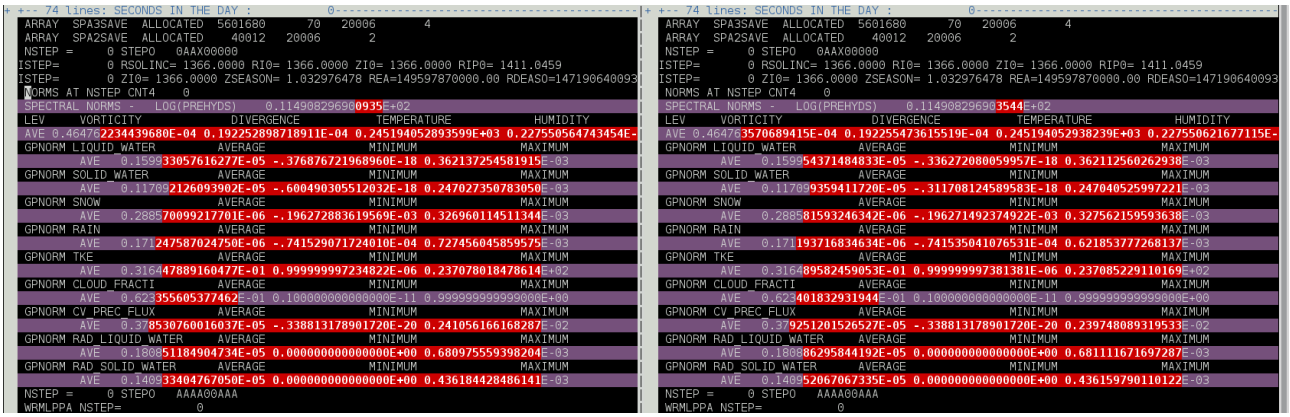


Figure 6: Spectral norms differences between cy40t1.v3 and cy40op1.v2 in ARPEGE run (MHLJ)

The difference in spectral norms has been explained by the different order of calculation of evolution as follows:

In cy40t1.v3:

```
! ZTDCP:
ZTDCP(KST:KPROF,:)=0.
DO JGFL=1,YGFL%NDIM1
  IF (YGFLC(JGFL)%LWATER .AND. YGFLC(JGFL)%LT1) THEN
                                ZTDCP(KST:KPROF,:)=ZTDCP(KST:KPROF,:)+(YGFLC(JGFL)%RCP-
                RCPD)*PTENDGFL(KST:KPROF,:,YGFLC(JGFL)%MP1)
  ENDIF
ENDDO
```

In cy40op1.v2:

```
! ZTDCP:
DO JLEV=1,KFLEV
  DO JROF=KST,KPROF
    ZTDCP(JROF,JLEV)=(RCPV-RCPD)*PTENDGFL(JROF,JLEV,YQ%MP1)
  ENDDO
  IF (LCONDWT) THEN
   DO JROF=KST,KPROF
     ZTDCP(JROF,JLEV) = ZTDCP(JROF,JLEV) &
      & + (RCW - RCPD)* PTENDGFL(JROF,JLEV,YL%MP1) &
      & + (RCS - RCPD)* PTENDGFL(JROF,JLEV,YI%MP1)
   ENDDO
  ENDIF
  IF (LLPREC) THEN
   DO JROF=KST,KPROF
     ZTDCP(JROF,JLEV) = ZTDCP(JROF,JLEV) &
      & + (RCW - RCPD)* PTENDGFL(JROF,JLEV,YR%MP1) &
      & + (RCS - RCPD)* PTENDGFL(JROF,JLEV,YS%MP1)
   ENDDO
  ENDIF
ENDDO
```

After setting LRAYFM to FALSE, I tried to check if there is any initialization difference in the GFL attributes which may explain the different output results. Using DDT, I could verify that all the attributes were corresponding as described in the following table:

Table 2 : Comparison of GFL attributes in routine CPUTQY.F90 between pre_cy40T1 and cy40op1.02 (DDT debugger)

CY40T1		**CY40OP1**	
YGFLC(1)		**YL**	
LWATER	TRUE	LCONDWT	TRUE
LT1	TRUE	LLPREC	TRUE

MP1	1	MP1	1
RCP	4218	RCW	4218
YGFLC(2)		**YI**	
LWATER	TRUE	LCONDWT	TRUE
LT1	TRUE	LLPREC	TRUE
MP1	2	MP1	2
RCP	2106	RCS	2106
YGFLC(3)		**YS**	
LWATER	TRUE	LCONDWT	TRUE
LT1	TRUE	LLPREC	TRUE
MP1	3	MP1	3
RCP	2106	RCS	2106
YGFLC(4)		**YR**	
LWATER	TRUE	LCONDWT	TRUE
LT1	TRUE	LLPREC	TRUE
MP1	4	MP1	4
RCP	4218	RCW	4218
YGFLC(10)		**YQ**	
LWATER	TRUE	LCONDWT	TRUE
LT1	TRUE	LLPREC	TRUE
MP1	10	MP1	10
RCP	1846,0999732335515	RCPV	1846,0999732335515

YGFLC(5), YGFLC(6), YGFLC(7), YGFLC(8), YGFLC(9) could not impact the calculation since the LWATER attribute was set to false.

4. Release of the cy40t1.04 and numerical comparison:

Several contributions were included in the cy40T1.04 such as portability fixes and also a backtrack on the conversion of TKE into enthalpy in routine cputqy.

A full mitraillette run of ARPEGE and ALADIN jobs using the new version binary was achieved. Some jobs are still crashing such as configurations AH8E, AH8T, AC1U, AC5T, AC4T, 8HEX, 8HLX and FPLA. More details about the tested configurations and the encountered errors are presented in appendix.

The next step was to compare the new version cy40T1.04 to the cy40OP1.02 and also to the

cy40T1.03 in order to check the effect of some bug fixes. As an example, the last version contained bug fixes for the NH model with physics, which enabled a numerical reproducibility with the cy40OP1.02 as described in the following figure:

- MNLY; Conf 001NH sl2tl TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;

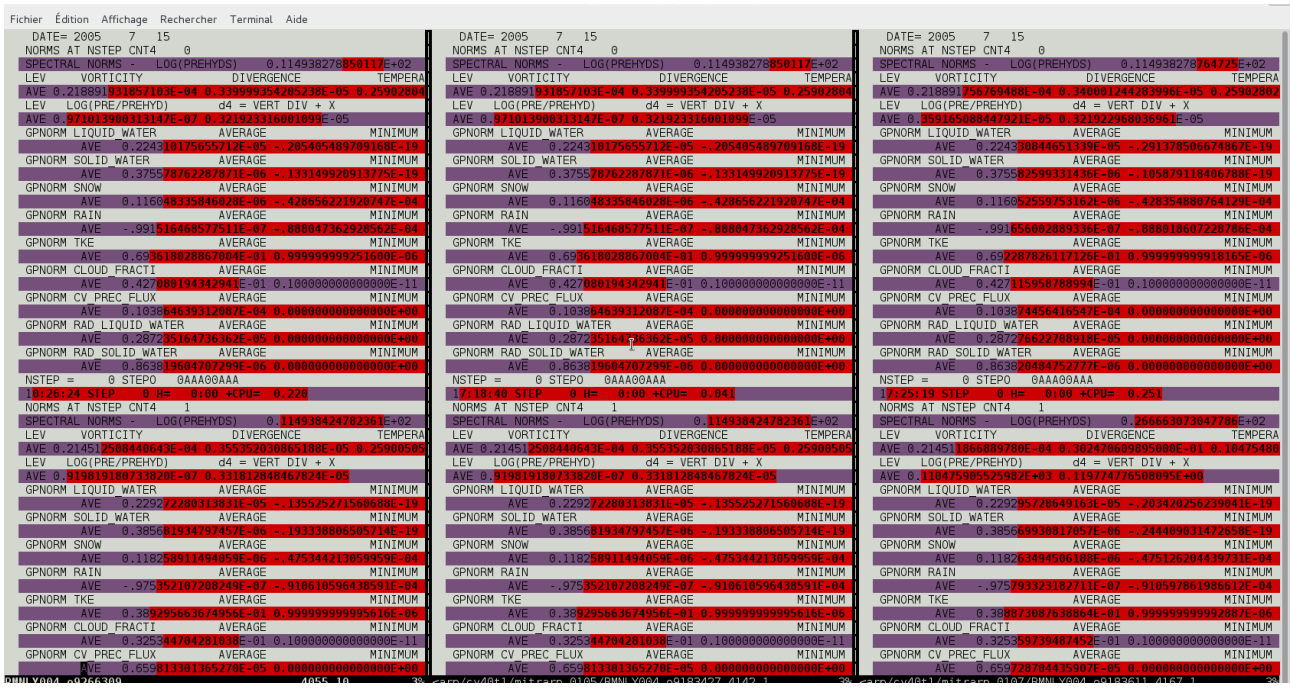


Figure 7: Comparison of the spectral norms for job MNLY between cy40T1.04 (middle), cy40OP1.02 (left) and cy40T1.03 (right)

Further numerical comparisons for ARPEGE and ALADIN mitraillette tests were performed:

- MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA32B1; 16 nd; 12 td;

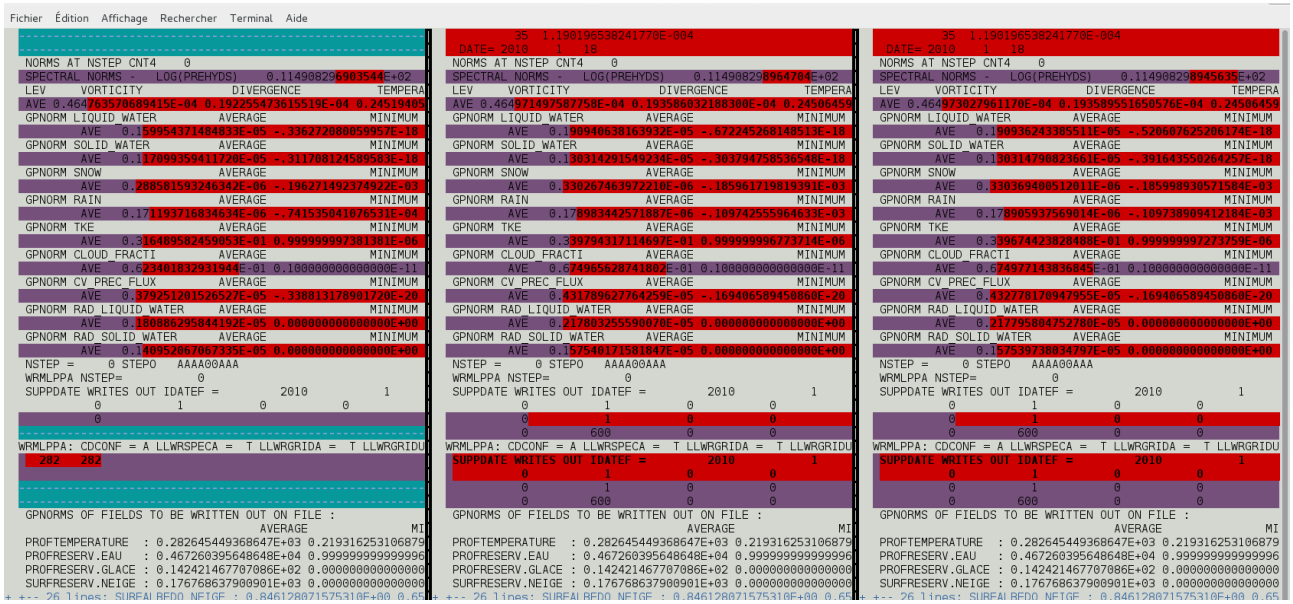


Figure 8: Comparison of the spectral norms for job MHLJ between cy40T1.04 (middle), cy40OP1.02 (left) and cy40T1.03 (right)

- AG1T; Conf 001HYD sl2tl (cf. oper); DFI; dmA32B1; 16 nd; 12 td;

Figure 9: Comparison of the spectral norms for job AG1T between cy40T1.04 (middle), cy40OP1.02 (left) and cy40T1.03 (right)

We can notice according to this figure that the cy40T1.04 is providing closer results to the OP1 run for the ALADIN AG1T job. This was not the case with the ALARO test which reproduced the same results as with the cy40T1.03 as described in the following figure:

- AA1T; Conf 001HYD sl2tl (cf. ALARO); DFI; dmA32B1; 16 nd; 12 td;

Figure 10: Comparison of the spectral norms for job AA1T between cy40T1.04 (middle), cy40OP1.02 (left) and cy40T1.03 (right)

APPENDIX

ALADIN and ARPEGE mitraillette tests with cy40T1.04

A. ALADIN :

I- MULTI :

1- Tested configurations :

000 : AG1T; Conf 001HYD sl2tl (cf. oper); DFI; dmA32B1; 16 nd; 12 td;
001 : AG1T; Conf 001HYD sl2tl (cf. oper); DFI; dmA8B4; 16 nd; 12 td;
002 : AGIT; Conf 001HYD sl2tl (IDFI test); DFI; dmA32B1; 16 nd; 12 td;
003 : AA1T; Conf 001HYD sl2tl (cf. ALARO); DFI; dmA32B1; 16 nd; 12 td;
004 : AA1T; Conf 001HYD sl2tl (cf. ALARO); DFI; dmA8B4; 16 nd; 12 td;
005 : AH1E; Conf 001HYD euler; DFI; Thin-layer; dmA8B1; 2 nd; 6 td;
006 : AH1E; Conf 001HYD euler; DFI; Deep-layer; dmA8B1; 2 nd; 6 td;
007 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; FD; no SLHD; dmA8B1; 2 nd; 6 td;
008 : AH1S; Conf 001HYD sl3tl; DFI; Deep-layer; FD; no SLHD; dmA8B1; 2 nd; 6 td;
009 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
010 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; FD; SLHD; dmA8B1; 2 nd; 6 td;
011 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; FD; no SLHD; dmA8B1; 2 nd; 6 td;
012 : AH1T; Conf 001HYD sl2tl; DFI; Deep-layer; FD; no SLHD; dmA8B1; 2 nd; 6 td;
013 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
014 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; FD; SLHD; dmA8B1; 2 nd; 6 td;
015 : AH5E; Conf 501HYD euler; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
016 : AH5E; Conf 501HYD euler; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
017 : AH5T; Conf 501HYD sl2tl; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
018 : AH5T; Conf 501HYD sl2tl; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
019 : AH5T; Conf 501HYD sl2tl; no DFI; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
020 : AH5T; Conf 501HYD sl2tl; no DFI; VFE; no SLHD; dmA4B2; 2 nd; 6 td;
021 : AH4E; Conf 401HYD euler; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
022 : AH4E; Conf 401HYD euler; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
023 : AH4T; Conf 401HYD sl2tl; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
024 : AH4T; Conf 401HYD sl2tl; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
025 : AH4T; Conf 401HYD sl2tl; no DFI; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
026 : AH4T; Conf 401HYD sl2tl; no DFI; VFE; no SLHD; dmA4B2; 2 nd; 6 td;
027 : AH6E; Conf 601HYD euler; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
028 : AH6E; Conf 601HYD euler; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
029 : AH6T; Conf 601HYD sl2tl; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
030 : AH6T; Conf 601HYD sl2tl; no DFI; FD; no SLHD; dmA4B2; 2 nd; 6 td;
031 : AH6T; Conf 601HYD sl2tl; no DFI; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
032 : AH6T; Conf 601HYD sl2tl; no DFI; VFE; no SLHD; dmA4B2; 2 nd; 6 td;
033 : AH8E; Conf 801HYD euler; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
034 : AH8T; Conf 801HYD sl2tl; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;
035 : AH8T; Conf 801HYD sl2tl; no DFI; VFE; no SLHD; dmA8B1; 2 nd; 6 td;
036 : AN1E; Conf 001NH euler; DFI; Thin-layer; FullPCiter; d4; dmA8B1; 2 nd; 6 td;
037 : AN1E; Conf 001NH euler; DFI; Deep-layer; FullPCiter; d4; dmA8B1; 2 nd; 6 td;
038 : AN1S; Conf 001NH sl3tl; DFI; Thin-layer; NoPCiter; d4; dmA8B1; 2 nd; 6 td;
039 : AN1S; Conf 001NH sl3tl; DFI; Thin-layer; NoPCiter; d4; RDbbc; dmA8B1; 2 nd; 6 td;
040 : AN1S; Conf 001NH sl3tl; DFI; Deep-layer; NoPCiter; d4; dmA8B1; 2 nd; 6 td;
041 : AN1S; Conf 001NH sl3tl; DFI; Deep-layer; NoPCiter; d4; RDbbc; dmA8B1; 2 nd; 6 td;
042 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Settls; FD; dmA8B1; 2 nd; 6 td;
043 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; FD; dmA8B1; 2 nd; 6 td;
044 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Settls; FD; dmA8B1; 2 nd; 6 td;
045 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; FD; dmA8B1; 2 nd; 6 td;
046 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; FD; dmA8B1; 2 nd; 6 td;
047 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; CheapPCiter; d4; Nesc; RDbbc; FD; dmA8B1; 2 nd; 6 td;
048 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; FD; ND4SYS=2; dmA8B1; 2 nd; 6 td;
049 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; VFE; dmA8B1; 2 nd; 6 td;
050 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; RDbbc; FD; dmA8B1; 2 nd; 6 td;
051 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; FD; dmA8B1; 2 nd; 6 td;

052 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; CheapPCiter; d4; Nesc; GWadv; FD; dmA8B1; 2 nd; 6 td;
053 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; FD; ND4SYS=2; dmA8B1; 2 nd; 6 td;
054 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; VFE; dmA8B1; 2 nd; 6 td;
055 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; GWadv; FD; dmA8B1; 2 nd; 6 td;
056 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; GWadv; VFE; dmA8B1; 2 nd; 6 td;
057 : AH9E; Conf 001HYD E927-NFPOS2 COU; dmA32B1; 16 nd; 12 td;
058 : AH9E; Conf 001HYD E927-NFPOS2 COU; dmA8B4; 16 nd; 12 td;
059 : AH9E; Conf 001HYD E927 ARU; dmA32B1; 16 nd; 12 td;
060 : AH9E; Conf 001HYD E927 ARU; dmA8B4; 16 nd; 12 td;
061 : AH9E; Conf 001HYD EE927-NFPOS2 NES ARU; dmA32B1; 16 nd; 12 td;
062 : AH9E; Conf 001HYD EE927-NFPOS2 NES ARU; dmA8B4; 16 nd; 12 td;
063 : AH9E; Conf 001HYD EE927-NFPOS2 NES; dmA32B1; 16 nd; 12 td;
064 : AH9E; Conf 001HYD EE927-NFPOS2 NES; dmA8B4; 16 nd; 12 td;
065 : AHFE; Conf 001HYD FPOS MOD; LELAM=T; CFPFMT=MODEL; OFF-LINE; dmA32B1; 16 nd; 12 td;
066 : AHFE; Conf 001HYD FPOS MOD; LELAM=T; CFPFMT=MODEL; OFF-LINE; dmA8B4; 16 nd; 12 td;
067 : AHFE; Conf 001HYD FPOS GRI1; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA32B1; 16 nd; 12 td;
068 : AHFE; Conf 001HYD FPOS GRI1; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA8B4; 16 nd; 12 td;
069 : AHFE; Conf 001HYD FPOS GRI2; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA32B1; 16 nd; 12 td;
070 : AHFE; Conf 001HYD FPOS GRI2; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA8B4; 16 nd; 12 td;
071 : AHFE; Conf 001HYD FPOS LAL; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA32B1; 16 nd; 12 td;
072 : AHFE; Conf 001HYD FPOS LAL; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA8B4; 16 nd; 12 td;
073 : AHFE; Conf 001HYD FPOS LAM1; LELAM=T; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA32B1; 16 nd; 12 td;
074 : AHFE; Conf 001HYD FPOS LAM1; LELAM=T; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA8B4; 16 nd; 12 td;
075 : AHFE; Conf 001HYD FPOS LAM2=E927; LELAM=F; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA8B1; 2 nd; 6 td;
076 : AHFE; Conf 001HYD FPOS LAM2=E927; LELAM=F; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA4B2; 2 nd; 6 td;
077 : AHFE; Conf 001HYD FPOS OPE2; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA32B1; 16 nd; 12 td;
078 : AHFE; Conf 001HYD FPOS OPE2; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA8B4; 16 nd; 12 td;
079 : AHFE; Conf 001HYD FPOS OPEX; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA32B1; 16 nd; 12 td;
080 : AHFE; Conf 001HYD FPOS OPEX; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA8B4; 16 nd; 12 td;
081 : AHFE; Conf 001HYD FPOS INL; LELAM=T; CFPFMT=MODEL; IN-LINE; dmA32B1; 16 nd; 12 td;
082 : AHFE; Conf 001HYD FPOS INL; LELAM=T; CFPFMT=MODEL; IN-LINE; dmA8B4; 16 nd; 12 td;
083 : AC1T; Conf 001HYD sl2tl (rot. Mercator GRANLMRT); DFI; dmA32B1; 16 nd; 12 td;
084 : AC1U; Conf 001NH sl2tl (rot. Mercator GRANLMRT); DFI; dmA32B1; 16 nd; 12 td;
085 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA32B1; 16 nd; 12 td;
086 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA32B1; 16 nd; 12 td;
087 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA32B1; 16 nd; 12 td;
088 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA32B1; 16 nd; 12 td;
089 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; d4; Settls; RDbbc; dmA32B1; 16 nd; 12 td;
090 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; d4; Settls; RDbbc; dmA8B4; 16 nd; 12 td;
091 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; FullPCiter; d4; Nesc; GWadv; dmA32B1; 16 nd; 12 td;
092 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; FullPCiter; d4; Nesc; GWadv; dmA8B4; 16 nd; 12 td;
093 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; CheapPCiter; d4; Nesc; GWadv; dmA32B1; 16 nd; 12 td;
094 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; CheapPCiter; d4; Nesc; GWadv; dmA8B4; 16 nd; 12 td;
095 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; hydrostatic; Settls; dmA32B1; 16 nd; 12 td;
096 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; hydrostatic; Settls; dmA8B4; 16 nd; 12 td;

2- List of errors:

033 : AH8E; Conf 801HYD euler; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;

	forrtl: severe (174): SIGSEGV, segmentation fault occurred			
Image	**PC**	**Routine**	**Line**	**Source**
ALDEXE	**00000000008F5AE8**	**evcost_**	**133**	**evcost.F90**
ALDEXE	**00000000005B6CE8**	**sim4d_**	**398**	**sim4d.F90**
ALDEXE	**00000000007D8782**	**cgr1_**	**145**	**cgr1.F90**
ALDEXE	**0000000000513B59**	**cnt0_**	**201**	**cnt0.F90**
ALDEXE	**00000000005138C7**	**MAIN__**	**76**	**master.F90**
ALDEXE	**00000000005137CC**	**Unknown**	**Unknown**	**Unknown**
libc.so.6	**00002B6F62455CDD**	**Unknown**	**Unknown**	**Unknown**
ALDEXE	**00000000005136C9**	**Unknown**	**Unknown**	**Unknown**

034 : AH8T; Conf 801HYD sl2tl; no DFI; FD; no SLHD; dmA8B1; 2 nd; 6 td;

	forrtl: severe (174): SIGSEGV, segmentation fault occurred			
Image	**PC**	**Routine**	**Line**	**Source**
ALDEXE	**00000000008F5AE8**	**evcost_**	**133**	**evcost.F90**
ALDEXE	**00000000005B6CE8**	**sim4d_**	**398**	**sim4d.F90**
ALDEXE	**00000000007D8782**	**cgr1_**	**145**	**cgr1.F90**
ALDEXE	**0000000000513B59**	**cnt0_**	**201**	**cnt0.F90**
ALDEXE	**00000000005138C7**	**MAIN__**	**76**	**master.F90**
ALDEXE	**00000000005137CC**	**Unknown**	**Unknown**	**Unknown**
libc.so.6	**00002ACBD7CA9CDD**	**Unknown**	**Unknown**	**Unknown**
ALDEXE	**00000000005136C9**	**Unknown**	**Unknown**	**Unknown**

035 : AH8T; Conf 801HYD sl2tl; no DFI; VFE; no SLHD; dmA8B1; 2 nd; 6 td;

	forrtl: severe (174): SIGSEGV, segmentation fault occurred			
Image	**PC**	**Routine**	**Line**	**Source**
ALDEXE	**00000000008F5AE8**	**evcost_**	**133**	**evcost.F90**
ALDEXE	**00000000005B6CE8**	**sim4d_**	**398**	**sim4d.F90**
ALDEXE	**00000000007D8782**	**cgr1_**	**145**	**cgr1.F90**
ALDEXE	**0000000000513B59**	**cnt0_**	**201**	**cnt0.F90**
ALDEXE	**00000000005138C7**	**MAIN__**	**76**	**master.F90**
ALDEXE	**00000000005137CC**	**Unknown**	**Unknown**	**Unknown**
libc.so.6	**00002ABAA0EACCDD**	**Unknown**	**Unknown**	**Unknown**
ALDEXE	**00000000005136C9**	**Unknown**	**Unknown**	**Unknown**

084 : AC1U; Conf 001NH sl2tl (rot. Mercator GRANLMRT); DFI; dmA32B1; 16 nd; 12 td;

```
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!   2  !V WIND TOO STRONG, EXPLOSION!!!
MPL_ABORT: CALLED FROM PROCESSOR     2 THRD    10
```

```
 MPL_ABORT: THRD        10    !V WIND TOO STRONG, EXPLOSION!!!
 SDL_TRACEBACK: Calling INTEL_TRBK, THRD =          10
Calling traceback from intel_trbk()
Image                    PC                Routine                Line        Source
libintlc.so.5        00002B3A0E120A1E  Unknown                Unknown  Unknown
libintlc.so.5        00002B3A0E11F4B6   Unknown               Unknown  Unknown
libifcoremt.so.5   00002B3A0CA609EE Unknown                Unknown  Unknown
libifcoremt.so.5   00002B3A0C9CF216  Unknown                Unknown  Unknown
ALDEXE               00000000035AB091    intel_trbk_            10          gentrbk.F90
ALDEXE               0000000003537F3E    sdl_mod_mp_sdl_tr    66          sdl_mod.F90
ALDEXE               000000000353B082    mpl_abort_mod_mp_  35
                     mpl_abort_mod.F90
ALDEXE               0000000001221175     abor1_                 31          abor1.F90
ALDEXE               0000000004A9DAB9  elarmes_               304         elarmes.F90
ALDEXE               000000000159A191    lapinea_               254         lapinea.F90
ALDEXE               0000000000EB1D22   call_sl_               296         call_sl.F90
libiomp5.so          00002B3A0DE834F3  Unknown                Unknown Unknown
```

085 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA32B1; 16 nd; 12 td;

```
 ABORT!    1  !V WIND TOO STRONG, EXPLOSION!!!
 ABORT!    1  !U WIND TOO STRONG, EXPLOSION!!!
MPL_ABORT: CALLED FROM PROCESSOR      1 THRD     3
 MPL_ABORT: THRD          3    !V WIND TOO STRONG, EXPLOSION!!!
 SDL_TRACEBACK: Calling INTEL_TRBK, THRD =          3
 ABORT!    1  !V WIND TOO STRONG, EXPLOSION!!!
Calling traceback from intel_trbk()
Image                    PC                Routine                Line        Source
libintlc.so.5        00002B89C540DA1E          Unknown                Unknown   Unknown
libintlc.so.5        00002B89C540C4B6          Unknown                Unknown   Unknown
libifcoremt.so.5   00002B89C3D4D9EE          Unknown                Unknown   Unknown
libifcoremt.so.5   00002B89C3CBC216          Unknown                Unknown   Unknown
ALDEXE               00000000035AB091   intel_trbk_            10          gentrbk.F90
ALDEXE               0000000003537F3E   sdl_mod_mp_sdl_tr    66          sdl_mod.F90
ALDEXE               000000000353B082   mpl_abort_mod_mp_  35
                      mpl_abort_mod.F90
ALDEXE               0000000001221175   abor1_                 31          abor1.F90
ALDEXE               0000000004A9DAB9          elarmes_               304         elarmes.F90
ALDEXE               000000000159A191   lapinea_               254         lapinea.F90
ALDEXE               0000000000EB1D22  call_sl_               296         call_sl.F90
libiomp5.so          00002B89C51704F3  Unknown                Unknown   Unknown
```

086 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD;
dmA32B1; 16 nd; 12 td;

```
 ABORT!    1  !U WIND TOO STRONG, EXPLOSION!!!
MPL_ABORT: CALLED FROM PROCESSOR      1 THRD     3
 MPL_ABORT: THRD          3    !V WIND TOO STRONG, EXPLOSION!!!
 SDL_TRACEBACK: Calling INTEL_TRBK, THRD =          3
Calling traceback from intel_trbk()
Image                    PC                 Routine                  Line        Source
libintlc.so.5        00002B74D0767A1E   Unknown                  Unknown  Unknown
libintlc.so.5        00002B74D07664B6   Unknown                  Unknown  Unknown
libifcoremt.so.5     00002B74CF0A79EE   Unknown                  Unknown  Unknown
libifcoremt.so.5     00002B74CF016216   Unknown                  Unknown  Unknown
ALDEXE               00000000035AB091   intel_trbk_              10       gentrbk.F90
ALDEXE               0000000003537F3E   sdl_mod_mp_sdl_tr        66       sdl_mod.F90
ALDEXE               000000000353B082   mpl_abort_mod_mp_        35
            mpl_abort_mod.F90
ALDEXE               0000000001221175   abor1_                   31       abor1.F90
ALDEXE               0000000004A9DAB9   elarmes_                 304      elarmes.F90
ALDEXE               000000000159A191   lapinea_                 254      lapinea.F90
ALDEXE               0000000000EB1D22   call_sl_                 296      call_sl.F90
libiomp5.so          00002B74D04CA4F3   Unknown                  Unknown  Unknown
```

II- MONO :

1- Tested configurations :

000 : AG1T; Conf 001HYD sl2tl (cf. oper); DFI; dmA1B1; 1 nd; 24 td;
001 : AGIT; Conf 001HYD sl2tl (IDFI test); DFI; dmA1B1; 1 nd; 24 td;
002 : AA1T; Conf 001HYD sl2tl (cf. ALARO); DFI; dmA1B1; 1 nd; 24 td;
003 : AH1E; Conf 001HYD euler; DFI; Thin-layer; dmA1B1; 1 nd; 24 td;
004 : AH1E; Conf 001HYD euler; DFI; Deep-layer; dmA1B1; 1 nd; 24 td;
005 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; FD; no SLHD; dmA1B1; 1 nd; 24 td;
006 : AH1S; Conf 001HYD sl3tl; DFI; Deep-layer; FD; no SLHD; dmA1B1; 1 nd; 24 td;
007 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
008 : AH1S; Conf 001HYD sl3tl; DFI; Thin-layer; FD; SLHD; dmA1B1; 1 nd; 24 td;
009 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; FD; no SLHD; dmA1B1; 1 nd; 24 td;
010 : AH1T; Conf 001HYD sl2tl; DFI; Deep-layer; FD; no SLHD; dmA1B1; 1 nd; 24 td;
011 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
012 : AH1T; Conf 001HYD sl2tl; DFI; Thin-layer; FD; SLHD; dmA1B1; 1 nd; 24 td;
013 : AH5E; Conf 501HYD euler; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
014 : AH5T; Conf 501HYD sl2tl; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
015 : AH5T; Conf 501HYD sl2tl; no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
016 : AH4E; Conf 401HYD euler; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
017 : AH4T; Conf 401HYD sl2tl; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
018 : AH4T; Conf 401HYD sl2tl; no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
019 : AH6E; Conf 601HYD euler; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
020 : AH6T; Conf 601HYD sl2tl; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
021 : AH6T; Conf 601HYD sl2tl; no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
022 : AH8E; Conf 801HYD euler; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
023 : AH8T; Conf 801HYD sl2tl; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
024 : AH8T; Conf 801HYD sl2tl; no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
025 : AN1E; Conf 001NH euler; DFI; Thin-layer; FullPCiter; d4; dmA1B1; 1 nd; 24 td;
026 : AN1E; Conf 001NH euler; DFI; Deep-layer; FullPCiter; d4; dmA1B1; 1 nd; 24 td;
027 : AN1S; Conf 001NH sl3tl; DFI; Thin-layer; NoPCiter; d4; dmA1B1; 1 nd; 24 td;
028 : AN1S; Conf 001NH sl3tl; DFI; Thin-layer; NoPCiter; d4; RDbbc; dmA1B1; 1 nd; 24 td;
029 : AN1S; Conf 001NH sl3tl; DFI; Deep-layer; NoPCiter; d4; dmA1B1; 1 nd; 24 td;
030 : AN1S; Conf 001NH sl3tl; DFI; Deep-layer; NoPCiter; d4; RDbbc; dmA1B1; 1 nd; 24 td;
031 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Settls; FD; dmA1B1; 1 nd; 24 td;
032 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; FD; dmA1B1; 1 nd; 24 td;
033 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Settls; FD; dmA1B1; 1 nd; 24 td;
034 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; FD; dmA1B1; 1 nd; 24 td;
035 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; FD; dmA1B1; 1 nd; 24 td;
036 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; CheapPCiter; d4; Nesc; RDbbc; FD; dmA1B1; 1 nd; 24 td;
037 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; FD; ND4SYS=2; dmA1B1; 1 nd; 24 td;
038 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; RDbbc; VFE; dmA1B1; 1 nd; 24 td;
039 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; RDbbc; FD; dmA1B1; 1 nd; 24 td;
040 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; FD; dmA1B1; 1 nd; 24 td;
041 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; CheapPCiter; d4; Nesc; GWadv; FD; dmA1B1; 1 nd; 24 td;
042 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; FD; ND4SYS=2; dmA1B1; 1 nd; 24 td;
043 : AN1T; Conf 001NH sl2tl; DFI; Thin-layer; FullPCiter; d4; Nesc; GWadv; VFE; dmA1B1; 1 nd; 24 td;
044 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; GWadv; FD; dmA1B1; 1 nd; 24 td;
045 : AN1T; Conf 001NH sl2tl; DFI; Deep-layer; FullPCiter; d4; Nesc; GWadv; VFE; dmA1B1; 1 nd; 24 td;
046 : AHUT; Conf 001HYD-1D sl2tl with ARPEGE/ALADIN physics; dmA1B1; 1 nd; 24 td;
047 : ARUT; Conf 001HYD-1D sl2tl with AROME physics; dmA1B1; 1 nd; 24 td;
048 : AH2S; Conf 001HYD-2D sl3tl; DFI; dmA1B1; 1 nd; 24 td;
049 : AH2T; Conf 001HYD-2D sl2tl; DFI; dmA1B1; 1 nd; 24 td;
050 : AN2S; Conf 001NH-2D sl3tl; no DFI; NoPCiter; d4; dmA1B1; 1 nd; 24 td;
051 : AN2T; Conf 001NH-2D sl2tl; DFI; FullPCiter; d4; Settls; RDbbc; dmA1B1; 1 nd; 24 td;
052 : AN2T; Conf 001NH-2D sl2tl; DFI; FullPCiter; d4; Nesc; RDbbc; dmA1B1; 1 nd; 24 td;
053 : AN2T; Conf 001NH-2D sl2tl; DFI; FullPCiter; d4; Nesc; GWadv; dmA1B1; 1 nd; 24 td;

054 : AH9E; Conf 001HYD E927-NFPOS2 COU; dmA1B1; 1 nd; 24 td;
055 : AH9E; Conf 001HYD E927 ARU; dmA1B1; 1 nd; 24 td;
056 : AH9E; Conf 001HYD EE927-NFPOS2 NES ARU; dmA1B1; 1 nd; 24 td;
057 : AH9E; Conf 001HYD EE927-NFPOS2 NES; dmA1B1; 1 nd; 24 td;
058 : AHFE; Conf 001HYD FPOS MOD; LELAM=T; CFPFMT=MODEL; OFF-LINE; dmA1B1; 1 nd; 24 td;
059 : AHFE; Conf 001HYD FPOS GRI1; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA1B1; 1 nd; 24 td;
060 : AHFE; Conf 001HYD FPOS GRI2; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA1B1; 1 nd; 24 td;
061 : AHFE; Conf 001HYD FPOS LAL; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA1B1; 1 nd; 24 td;
062 : AHFE; Conf 001HYD FPOS LAM1; LELAM=T; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA1B1; 1 nd; 24 td;
063 : AHFE; Conf 001HYD FPOS LAM2=E927; LELAM=F; CFPFMT=LELAM; C+I+E; OFF-LINE; dmA1B1; 1 nd; 24 td;
064 : AHFE; Conf 001HYD FPOS OPE2; LELAM=T; CFPFMT=LALON; OFF-LINE; dmA1B1; 1 nd; 24 td;
065 : AHFE; Conf 001HYD FPOS OPEX; LELAM=T; CFPFMT=LELAM; C+I; OFF-LINE; dmA1B1; 1 nd; 24 td;
066 : AHFE; Conf 001HYD FPOS INL; LELAM=T; CFPFMT=MODEL; IN-LINE; dmA1B1; 1 nd; 24 td;
067 : AC1T; Conf 001HYD sl2tl (rot. Mercator GRANLMRT); DFI; dmA1B1; 1 nd; 24 td;
068 : AC1U; Conf 001NH sl2tl (rot. Mercator GRANLMRT); DFI; dmA1B1; 1 nd; 24 td;
069 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
070 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
071 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;
072 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;
073 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; d4; Settls; RDbbc; dmA1B1; 1 nd; 24 td;
074 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; FullPCiter; d4; Nesc; GWadv; dmA1B1; 1 nd; 24 td;
075 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; CheapPCiter; d4; Nesc; GWadv; dmA1B1; 1 nd; 24 td;
076 : AR1T; Conf 001NH sl2tl (cf. AROME); no DFI; NoPCiter; hydrostatic; Settls; dmA1B1; 1 nd; 24 td;
077 : AXCX; Conf 923; domain=lelam_lace; dmA1B1; 1 nd; 24 td;
078 : AXCX; Conf 923; domain=lelam_france; dmA1B1; 1 nd; 24 td;
079 : AXCX; Conf 923; domain=lelam_reunion; dmA1B1; 1 nd; 24 td;
080 : AXCX; Conf 923; domain=lalon_franx01; dmA1B1; 1 nd; 24 td;
081 : AXSY; make PGD file for AROME; dmA1B1; 1 nd; 24 td;

2- List of errors:

022 : AH8E; Conf 801HYD euler; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ALDEXE	00000000008F5AE8	evcost_	133	evcost.F90
ALDEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ALDEXE	00000000007D8782	cgr1_	145	cgr1.F90
ALDEXE	0000000000513B59	cnt0_	201	cnt0.F90
ALDEXE	00000000005138C7	MAIN__	76	master.F90
ALDEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002B75724F4CDD	Unknown	Unknown	Unknown
ALDEXE	0000000005136C9	Unknown	Unknown	Unknown

023 : AH8T; Conf 801HYD sl2tl; no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ALDEXE	00000000008F5AE8	evcost_	133	evcost.F90
ALDEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ALDEXE	00000000007D8782	cgr1_	145	cgr1.F90
ALDEXE	0000000000513B59	cnt0_	201	cnt0.F90
ALDEXE	00000000005138C7	MAIN__	76	master.F90
ALDEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002AFB867A4CDD	Unknown	Unknown	Unknown
ALDEXE	00000000005136C9	Unknown	Unknown	Unknown

024 : AH8T; Conf 801HYD sl2tl; no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred				
Image	**PC**	**Routine**	**Line**	**Source**
ALDEXE	**00000000008F5AE8**	**evcost_**	**133**	**evcost.F90**
ALDEXE	**00000000005B6CE8**	**sim4d_**	**398**	**sim4d.F90**
ALDEXE	**00000000007D8782**	**cgr1_**	**145**	**cgr1.F90**
ALDEXE	**0000000000513B59**	**cnt0_**	**201**	**cnt0.F90**
ALDEXE	**00000000005138C7**	**MAIN__**	**76**	**master.F90**
ALDEXE	**00000000005137CC**	**Unknown**	**Unknown**	**Unknown**
libc.so.6	**00002B6031D9FCDD**	**Unknown**	**Unknown**	**Unknown**
ALDEXE	**00000000005136C9**	**Unknown**	**Unknown**	**Unknown**

069 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;

APPLICATION TERMINATED WITH THE EXIT STRING: Killed (signal 9)

070 : AC5T; Conf 501HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;

APPLICATION TERMINATED WITH THE EXIT STRING: Killed (signal 9)

071 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; FD; no SLHD; dmA1B1; 1 nd; 24 td;

APPLICATION TERMINATED WITH THE EXIT STRING: Killed (signal 9)

072 : AC4T; Conf 401HYD sl2tl (rot. Mercator GRANLMRT); no DFI; VFE; no SLHD; dmA1B1; 1 nd; 24 td;

APPLICATION TERMINATED WITH THE EXIT STRING: Killed (signal 9)

B. ARPEGE :

I- MULTI :

1- Tested configurations :

000 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA32B1; 16 nd; 12 td;
001 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA8B4; 16 nd; 12 td;
002 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=flt; dmA32B1; 16 nd; 12 td;
003 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=flt; dmA8B4; 16 nd; 12 td;
004 : MNLY; Conf 001NH sl2tl TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
005 : AHLH; Conf 001HYD sl2tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
006 : ANLY; Conf 001NH sl2tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
007 : 4HEX; Conf 401HYD euler TL107L70c1; FD; no DFI; dmA32B1; 16 nd; 12 td;
008 : 4HEX; Conf 401HYD euler TL107L70c1; FD; no DFI; dmA8B4; 16 nd; 12 td;
009 : 4HEY; Conf 401HYD euler adiab TL031L15c1 and TL030L15c2.4; FD; no DFI; dmA8B1; 2 nd; 6 td;
010 : 4HLX; Conf 401HYD sl2tl TL107L70c1; VFE; no DFI; dmA32B1; 16 nd; 12 td;
011 : 4HLX; Conf 401HYD sl2tl TL107L70c1; VFE; no DFI; dmA8B4; 16 nd; 12 td;
012 : 4HLY; Conf 401HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; no DFI; dmA8B1; 2 nd; 6 td;
013 : 4HLZ; Conf 401HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; SLHD; no DFI; dmA8B1; 2 nd; 6 td;
014 : 5HEX; Conf 501HYD euler TL107L70c1; FD; no DFI; dmA32B1; 16 nd; 12 td;
015 : 5HEX; Conf 501HYD euler TL107L70c1; FD; no DFI; dmA8B4; 16 nd; 12 td;
016 : 5HEY; Conf 501HYD euler adiab TL031L15c1 and TL030L15c2.4; FD; no DFI; dmA8B1; 2 nd; 6 td;
017 : 5HLX; Conf 501HYD sl2tl TL107L70c1; VFE; no DFI; dmA32B1; 16 nd; 12 td;
018 : 5HLX; Conf 501HYD sl2tl TL107L70c1; VFE; no DFI; dmA8B4; 16 nd; 12 td;
019 : 5HLY; Conf 501HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; no DFI; dmA8B1; 2 nd; 6 td;
020 : 5HLZ; Conf 501HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; SLHD; no DFI; dmA8B1; 2 nd; 6 td;
021 : 6HEX; Conf 601HYD euler TL031L15c1; FD; no DFI; dmA8B1; 2 nd; 6 td;
022 : 6HEX; Conf 601HYD euler TL031L15c1; FD; no DFI; dmA4B2; 2 nd; 6 td;
023 : 6HLX; Conf 601HYD sl2tl TL031L15c1; VFE; no DFI; dmA8B1; 2 nd; 6 td;
024 : 6HLX; Conf 601HYD sl2tl TL031L15c1; VFE; no DFI; dmA4B2; 2 nd; 6 td;
025 : 8HEX; Conf 801HYD euler TL031L15c1; FD; no DFI; dmA8B1; 2 nd; 6 td;
026 : 8HLX; Conf 801HYD sl2tl TL031L15c1; VFE; no DFI; dmA8B1; 2 nd; 6 td;
027 : AHEA; Conf 001HYD euler adiab TL031L15c1; no DFI; dmA8B1; 2 nd; 6 td;
028 : AHEH; Conf 001HYD euler adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
029 : AHLA; Conf 001HYD sl2tl adiab TL031L15c1; no DFI; dmA8B1; 2 nd; 6 td;
030 : AHLH; Conf 001HYD sl2tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
031 : AHSA; Conf 001HYD sl3tl adiab TL031L15c1; no DFI; dmA8B1; 2 nd; 6 td;
032 : AHSH; Conf 001HYD sl3tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
033 : ANEY; Conf 001NH euler adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
034 : ANSY; Conf 001NH sl3tl adiab TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
035 : FILA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; IN-LINE; dmA32B1; 16 nd; 12 td;
036 : FILA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; IN-LINE; dmA8B4; 16 nd; 12 td;
037 : FILB; Conf 001NH FPOS 5 domains; CFPFMT=LALON; IN-LINE; dmA32B1; 16 nd; 12 td;
038 : FILC; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; LVERCOR=T; IN-LINE; dmA32B1; 16 nd; 12 td;
039 : FILD; Conf 001NH FPOS 5 domains; CFPFMT=LALON; deep-layer; IN-LINE; dmA32B1; 16 nd; 12 td;
040 : FPFA; Conf 001HYD FPOS 927-L2H; CFPFMT=GAUSS; OFF-LINE; dmA32B1; 16 nd; 12 td;
041 : FPFA; Conf 001HYD FPOS 927-L2H; CFPFMT=GAUSS; OFF-LINE; dmA8B4; 16 nd; 12 td;
042 : FPFB; Conf 001HYD FPOS NFPOS2-H2L; CFPFMT=GAUSS; OFF-LINE; dmA32B1; 16 nd; 12 td;
043 : FPFB; Conf 001HYD FPOS NFPOS2-H2L; CFPFMT=GAUSS; OFF-LINE; dmA8B4; 16 nd; 12 td;
044 : FPGA; Conf 001HYD FPOS; CFPFMT=GAUSS; OFF-LINE; dmA32B1; 16 nd; 12 td;
045 : FPGA; Conf 001HYD FPOS; CFPFMT=GAUSS; OFF-LINE; dmA8B4; 16 nd; 12 td;
046 : FPLA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA32B1; 16 nd; 12 td;
047 : FPLA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA8B4; 16 nd; 12 td;
048 : FPLB; Conf 001NH FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA32B1; 16 nd; 12 td;
049 : FPSA; Conf 001HYD FPOS; CFPFMT=MODEL; OFF-LINE; dmA32B1; 16 nd; 12 td;
050 : FPSA; Conf 001HYD FPOS; CFPFMT=MODEL; OFF-LINE; dmA8B4; 16 nd; 12 td;

051 : MHEH; Conf 001HYD euler TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
052 : MHES; Conf 001HYD euler TL030L15c2.4; simpl phys; no DFI; dmA24B1; 1 nd; 1 td;
053 : MHLK; Conf 001HYD sl2tl TL798L70c2.4 with restart; DFI; dmA32B1; 16 nd; 12 td;
054 : MHLK; Conf 001HYD sl2tl TL798L70c2.4 with restart; DFI; dmA8B4; 16 nd; 12 td;
055 : MHLS; Conf 001HYD sl2tl TL030L15c2.4; simpl phys; no DFI; dmA24B1; 1 nd; 1 td;
056 : MHSH; Conf 001HYD sl3tl TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
057 : MNEY; Conf 001NH euler TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;
058 : MNSY; Conf 001NH sl3tl TL030L15c2.4; DFI; dmA8B1; 2 nd; 6 td;

2- List of errors:

025 : 8HEX; Conf 801HYD euler TL031L15c1; FD; no DFI; dmA8B1; 2 nd; 6 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ARPEXE	00000000008F5AE8	evcost_	133	evcost.F90
ARPEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ARPEXE	00000000007D8782	cgr1_	145	cgr1.F90
ARPEXE	0000000000513B59	cnt0_	201	cnt0.F90
ARPEXE	00000000005138C7	MAIN__	76	master.F90
ARPEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002B1BED4CACDD	Unknown	Unknown	Unknown
ARPEXE	00000000005136C9	Unknown	Unknown	Unknown

026 : 8HLX; Conf 801HYD sl2tl TL031L15c1; VFE; no DFI; dmA8B1; 2 nd; 6 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ARPEXE	00000000008F5AE8	evcost_	133	evcost.F90
ARPEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ARPEXE	00000000007D8782	cgr1_	145	cgr1.F90
ARPEXE	0000000000513B59	cnt0_	201	cnt0.F90
ARPEXE	00000000005138C7	MAIN__	76	master.F90
ARPEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002B064B09FCDD	Unknown	Unknown	Unknown
ARPEXE	00000000005136C9	Unknown	Unknown	Unknown

II- MONO :

1- Tested configurations :

000 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=std; dmA1B1; 1 nd; 24 td;
001 : MHLJ; Conf 001HYD sl2tl TL798L70c2.4; DFI; LegTransf=flt; dmA1B1; 1 nd; 24 td;
002 : MNLY; Conf 001NH sl2tl TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
003 : AHLH; Conf 001HYD sl2tl adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
004 : ANLY; Conf 001NH sl2tl adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
005 : 4HEX; Conf 401HYD euler TL107L70c1; FD; no DFI; dmA1B1; 1 nd; 24 td;
006 : 4HEY; Conf 401HYD euler adiab TL031L15c1 and TL030L15c2.4; FD; no DFI; dmA1B1; 1 nd; 24 td;
007 : 4HLX; Conf 401HYD sl2tl TL107L70c1; VFE; no DFI; dmA1B1; 1 nd; 24 td;
008 : 4HLY; Conf 401HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; no DFI; dmA1B1; 1 nd; 24 td;
009 : 4HLZ; Conf 401HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; SLHD; no DFI; dmA1B1; 1 nd; 24 td;
010 : 5HEX; Conf 501HYD euler TL107L70c1; FD; no DFI; dmA1B1; 1 nd; 24 td;
011 : 5HEY; Conf 501HYD euler adiab TL031L15c1 and TL030L15c2.4; FD; no DFI; dmA1B1; 1 nd; 24 td;
012 : 5HLX; Conf 501HYD sl2tl TL107L70c1; VFE; no DFI; dmA1B1; 1 nd; 24 td;
013 : 5HLY; Conf 501HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; no DFI; dmA1B1; 1 nd; 24 td;
014 : 5HLZ; Conf 501HYD sl2tl adiab TL031L15c1 and TL030L15c2.4; VFE; SLHD; no DFI; dmA1B1; 1 nd; 24 td;
015 : 6HEX; Conf 601HYD euler TL031L15c1; FD; no DFI; dmA1B1; 1 nd; 24 td;
016 : 6HLX; Conf 601HYD sl2tl TL031L15c1; VFE; no DFI; dmA1B1; 1 nd; 24 td;
017 : 8HEX; Conf 801HYD euler TL031L15c1; FD; no DFI; dmA1B1; 1 nd; 24 td;
018 : 8HLX; Conf 801HYD sl2tl TL031L15c1; VFE; no DFI; dmA1B1; 1 nd; 24 td;
019 : AHEA; Conf 001HYD euler adiab TL031L15c1; no DFI; dmA1B1; 1 nd; 24 td;
020 : AHEH; Conf 001HYD euler adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
021 : AHLA; Conf 001HYD sl2tl adiab TL031L15c1; no DFI; dmA1B1; 1 nd; 24 td;
022 : AHLH; Conf 001HYD sl2tl adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
023 : AHSA; Conf 001HYD sl3tl adiab TL031L15c1; no DFI; dmA1B1; 1 nd; 24 td;
024 : AHSH; Conf 001HYD sl3tl adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
025 : ANEY; Conf 001NH euler adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
026 : ANSY; Conf 001NH sl3tl adiab TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
027 : FILA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; IN-LINE; dmA1B1; 1 nd; 24 td;
028 : FILB; Conf 001NH FPOS 5 domains; CFPFMT=LALON; IN-LINE; dmA1B1; 1 nd; 24 td;
029 : FILC; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; LVERCOR=T; IN-LINE; dmA1B1; 1 nd; 24 td;
030 : FILD; Conf 001NH FPOS 5 domains; CFPFMT=LALON; deep-layer; IN-LINE; dmA1B1; 1 nd; 24 td;
031 : FPFA; Conf 001HYD FPOS 927-L2H; CFPFMT=GAUSS; OFF-LINE; dmA1B1; 1 nd; 24 td;
032 : FPFB; Conf 001HYD FPOS NFPOS2-H2L; CFPFMT=GAUSS; OFF-LINE; dmA1B1; 1 nd; 24 td;
033 : FPGA; Conf 001HYD FPOS; CFPFMT=GAUSS; OFF-LINE; dmA1B1; 1 nd; 24 td;
034 : FPLA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA1B1; 1 nd; 24 td;
035 : FPLB; Conf 001NH FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA1B1; 1 nd; 24 td;
036 : FPSA; Conf 001HYD FPOS; CFPFMT=MODEL; OFF-LINE; dmA1B1; 1 nd; 24 td;
037 : MHEH; Conf 001HYD euler TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
038 : MHES; Conf 001HYD euler TL030L15c2.4; simpl phys; no DFI; dmA1B1; 1 nd; 24 td;
039 : MHLK; Conf 001HYD sl2tl TL798L70c2.4 with restart; DFI; dmA1B1; 1 nd; 24 td;
040 : MHLS; Conf 001HYD sl2tl TL030L15c2.4; simpl phys; no DFI; dmA1B1; 1 nd; 24 td;
041 : MHSH; Conf 001HYD sl3tl TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
042 : MNEY; Conf 001NH euler TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;
043 : MNSY; Conf 001NH sl3tl TL030L15c2.4; DFI; dmA1B1; 1 nd; 24 td;

2) List of errors:

017 : 8HEX; Conf 801HYD euler TL031L15c1; FD; no DFI; dmA1B1; 1 nd; 24 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ARPEXE	00000000008F5AE8	evcost_	133	evcost.F90
ARPEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ARPEXE	00000000007D8782	cgr1_	145	cgr1.F90
ARPEXE	0000000000513B59	cnt0_	201	cnt0.F90
ARPEXE	00000000005138C7	MAIN__	76	master.F90
ARPEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002AD71AED5CDD	Unknown	Unknown	Unknown
ARPEXE	00000000005136C9	Unknown	Unknown	Unknown

018 : 8HLX; Conf 801HYD sl2tl TL031L15c1; VFE; no DFI; dmA1B1; 1 nd; 24 td;

forrtl: severe (174): SIGSEGV, segmentation fault occurred

Image	PC	Routine	Line	Source
ARPEXE	00000000008F5AE8	evcost_	133	evcost.F90
ARPEXE	00000000005B6CE8	sim4d_	398	sim4d.F90
ARPEXE	00000000007D8782	cgr1_	145	cgr1.F90
ARPEXE	0000000000513B59	cnt0_	201	cnt0.F90
ARPEXE	00000000005138C7	MAIN__	76	master.F90
ARPEXE	00000000005137CC	Unknown	Unknown	Unknown
libc.so.6	00002B62DA5F0CDD	Unknown	Unknown	Unknown
ARPEXE	00000000005136C9	Unknown	Unknown	Unknown

034 : FPLA; Conf 001HYD FPOS 5 domains; CFPFMT=LALON; OFF-LINE; dmA1B1; 1 nd; 24 td;

APPLICATION TERMINATED WITH THE EXIT STRING: Killed (signal 9)