

## ARPEGE MEMORANDUM

**From:** GCO  
**Date:** Aug 19, 2019  
**Subject:** New cycle CY47

A new cycle CY47 has been created. This is a common cycle with ECMWF. The different contributions for this cycle are described in the following pages.

**Contributors:**

ARBOGAST Etienne	arbogaste_CY46T1_hybrid_ctrl_var arbogaste_CY46T1_testoops3d-r1.01
AUGER Ludovic	auger_CY46T1_r1_fullpos auger_CY46T1_r1_grib2
DEGRAUWE Daan	degrauwe_CY46T1_rmi_fix
EL KHATIB Ryad	khatib_CY46T1_r1.02% <i>mrg</i> khatib_CY46T1_r1.03% <i>fix</i> khatib_CY46_t1.08% <i>sp</i>
GCO	gco_CY46T1_r1 gco_CY46T1_r1.02% <i>misc</i> gco_CY46T1_r1.03% <i>misc</i> gco_CY46_t1.08% <i>merge_t1_r1</i>
GUIDARD Vincent	guidardv_CY46T1_interChanCorr
MARGUINAUD Philippe	marguina_CY46T1_acdragsp marguina_CY46T1_ddhsp marguina_CY46T1_ioservsp marguina_CY46T1_sp1
MARSDEN Olivier	gco_CY46T1_r1.02% <i>marsdeno_fixes</i> gco_CY46T1_r1.04% <i>marsdeno_misc</i>
PAYAN Christophe	payan_CY46T1_r1v01_scattupdt
SPANIEL Oldrich	spaniel_CY46T1_r1_v02_alaro_fix
VOITUS Fabrice	voitus_CY46T1_olda_fab_fix voitus_CY46T1_ryad_fix

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## **ARBOGAST Etienne**

### **Doc:**

*Phased CVAR2IN(AD) for IFS/Arpège hybrid control vector components.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs

**Git branch:** arbogaste\_CY46T1\_hybrid\_ctrl\_var

### **Modified:**

arpifs/var cvar2in.F90, cvar2inad.F90

### **Doc:**

*Fix deallocation in aplpar and tovscv\_base\_mod*

*Fix missing initialization in aerosol\_detect\_setup*

*Set default number of snow levels to 1 (YRSURF%YSP\_SG)*

*Fix errgrib parallel reading (SUINFCE)*

*Fix observations locations in the 3D case for OOPS*

*Add NOTVAR use in HOP for OOPS*

*Move observations operator calls under OpenMP in specific routines (for OOPS)*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs, fields\_fp\_mod.F90

**Git branch:** arbogaste\_CY46T1\_testoops3d-r1.01

### **Modified:**

arpifs/module tovscv\_base\_mod.F90

arpifs/obs\_preproc aerosol\_detect\_setup.F90

arpifs/oops allobs\_oper\_mod.F90, fields\_fp\_mod.F90, locations\_mod.F90

arpifs/phys\_dmn aplpar.F90

arpifs/setup sudimf1.F90

arpifs/var suinfce.F90

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**AUGER Ludovic**

**Doc:**

*Fullpos bigfix for surface stress.*

*EXPECTED IMPACT:*

*Fullpos bigfix for surface stress.*

**Projects:** arpifs

**Git branch:** auger\_CY46T1\_r1\_fullpos

**Modified:**

arpifs/fullpos hpos\_cfu.F90

**Doc:**

*Report of grib2 modifications from dble cy43.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** ifsaux

**Git branch:** auger\_CY46T1\_r1\_grib2

**Modified:**

ifsaux/fa facgrm.F90



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## **EL KHATIB Ryad**

### **Doc:**

*merge/fix/cleaning :*

*suetrans0.F90, check\_limits.F90, blend.F90, blendsur.F90, holo.F90, unholo.F90, cprep3.F90, cprep4.F90, fullpos\_oops\_mods.F90, fields\_mod.F90, pos.F90, fpserver.F90, fpchresol.F90, sudimf1.F90, festat.F90, fonctions\_tfl.F90, fonctions\_donnees.F90, inversion\_master.F90, sudil.F90 : merge*

*fields\_io\_mod.F90, ca\_scan2m.F90, surface\_fields\_mix.F90, hpos.F90, su\_surf\_flds.F90 : cleaning*  
*extfpnorm.F90, fpgpnorm.F90 : cleaning (remove test against RMDI not suitable for single precision)*

*sufptr2.F90, sufpggeometry.F90, subfpos.F90, filedate : bugfix*

*mpl\_abort\_mod.F90 : portability fix for non-Intel compilers*

*sufp f.F90, rttov\_scattering\_mod.F90 : support for single precision*

*foomaster : fortran test program to validate constructors and methods against masterodb or ooforecast. foomaster should be bitwise-reproducible with masterodb and ooforecast.*

*Usage : - build executable foomaster like masterodb*

*- export environment variable FOOMASTER\_CONFIGURATION='FORECAST'*

*- to reproduce masterodb export environment variable FOOMASTER\_MODEL\_INIT=0*

*- to reproduce ooforecast export environment variable FOOMASTER\_MODEL\_INIT=1*

*- execute foomaster like masterodb or ooforecast.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** aladin, arpifs, ifsaux, satrad, utilities

**Git branch:** khatib\_CY46T1\_r1.02%*mrg*

### **Added:**

arpifs/programs foomaster.F90

### **Modified:**

aladin/programs blend.F90, blendsur.F90, check\_limits.F90, holo.F90, unholo.F90

aladin/setup suetrans0.F90

arpifs/control ca\_scan2m.F90, cprep3.F90, cprep4.F90

arpifs/dia extfpnorm.F90, fpgpnorm.F90

arpifs/fullpos fpchresol.F90, fpserver.F90, hpos.F90, subfpos.F90, sufpf.F90, sufpggeometry.F90, sufptr2.F90

arpifs/module fields\_mod.F90, fullpos\_oops\_mod.F90, surface\_fields\_mix.F90

arpifs/oops fields\_io\_mod.F90

arpifs/pp\_obs pos.F90

arpifs/setup su\_surf\_flds.F90, suafn2.F90, sudimf1.F90

arpifs/utility	filedate.F90
ifsaux/module	mpl_abort_mod.F90
satrad/module	rttov_scattering_mod.F90
utilities/bcov_lam/programs	festat.F90
utilities/ctpini/module	fonctions_donnees.F90, fonctions_tfl.F90
utilities/ctpini/programs	inversion_master.F90
utilities/rdc/src	sudil.F90

**Doc:**

\* arpifs/phys\_dmn/aplpar.F90, arpifs/phys\_dmn/acmixlentm.F90, arpifs/phys\_dmn/apl\_arome.F90, arpifs/phys\_dmn/ac\_cloud\_model2.F90, ifsaux/fa/faitou.F90 :  
fix uninitialized variable.

\* arpifs/phys\_dmn/vdfhghtnhl.F90, mpa/micro/internals/rain\_ice\_old.F90, ifsaux/module/fa\_mod.F90 :  
bugfix.

\* mpa/turb/internals/compute\_entr\_detr.F90 :  
portability fix.

\* aladin/interpol/elascaw.F90, aladin/coupling/eseimpls.F90, ifsaux/fa/farcis.F90 :  
Fix bounds violations.

\* trans/module/ftinv\_ctl\_mod.F90, ifsaux/grib\_mf/gabyte\_mf.F90 :  
Optimization.

\* arpifs/control/allfpos.F90 :  
Fix for ECMWF usage (allow Ps to be post-processed twice).

\* ifsaux/module/eggpack.F90, aladin/fullpos/suefpg3.F90 :  
Support for single precision.

**EXPECTED IMPACT:**

Numerical impact expected if either vdfhghtnhl.F90 or rain\_ice\_old.F90 are used.

**Projects:** aladin, arpifs, ifsaux, mpa, trans

**Git branch:** khatib\_CY46T1\_r1.03%fix

**Modified:**

aladin/coupling	eseimpls.F90
aladin/fullpos	suefpg3.F90
aladin/interpol	elascaw.F90

arpifs/control	allfpos.F90
arpifs/phys_dmn	ac_cloud_model2.F90, acmixlentm.F90, apl_arome.F90, aplpar.F90, vdfhghtnhl.F90
ifsaux/fa	faitou.F90, farcis.F90
ifsaux/grib_mf	gsbyte_mf.F90
ifsaux/module	eggpack.F90, fa_mod.F90
mpa/micro/internals	rain_ice_old.F90
mpa/turb/internals	compute_entr_detr.F90
trans/module	ftinv_ctl_mod.F90

**Doc:**

*Various fixes for simple precision*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs, satrad, surfex

**Git branch:** khatib\_CY46\_t1.08%sp

**Modified:**

arpifs/fullpos	sufpf.F90, sufpushergeo.F90
arpifs/namelist	namfpg.nam.h
satrad/module	rttov_scattering_mod.F90
surfex/SURFEX	mode_gridtype_conf_proj.F90

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## **GCO**

### **Doc:**

*Fix compilation issues, after merge between cycles CY46T1 & CY46R1 .*

*\* aladin/adiab/elarmesad.F90:*

*In fact, fix a compilation issue with "lapineaad.F90" .*

- 1) Remove third argument YDML\_CONF .*
- 2) Add argument YDRIP after YDGEOMETRY .*

*\* arpifs/adiab/gnh\_conv\_nhvar.F90  
arpifs/canari/canari.F90  
arpifs/module/control\_vectors\_base\_mix.F90  
arpifs/module/traj\_main\_mod.F90  
arpifs/module/yomlocs.F90  
arpifs/module/yomvar.F90  
arpifs/obs\_preproc/defrun.F90  
arpifs/oops/ifs\_init.F90  
arpifs/oops/scan2m\_oops.F90  
arpifs/oops/stepo\_oops.F90  
arpifs/op\_obs/obsop\_conv.F90  
arpifs/phys\_dmn/aplpar.F90  
arpifs/setup/su0yoma.F90  
arpifs/setup/sudcmip12\_spec.F90  
arpifs/setup/suslb.F90  
arpifs/var/chavarin.F90  
arpifs/var/chavarinad.F90  
arpifs/var/jbtomodelad.F90  
arpifs/var/suecges.F90:*

*Fix miscellaneous phasing bugs.*

*\* arpifs/chem/acchem.F90:*

*Dirty fix: define and initialize array IELEMBOT(KLON), to be given as last argument in call to ACCH\_CSRV .*

*\* arpifs/control/ca\_scan2m.F90:*

*Dirty fix: add 1 as second index of array SP\_SG (lines 190 & 238).*

*\* arpifs/control/cprep3.F90:*

*Remove some arguments in call to IO\_SERV\_SUIOSCTMPL, to match with the interface of this routine (probably a dirty fix);*

*\* arpifs/control/cprep4.F90:*

*Dirty fixes caused by array shape issues (comment lines).*

*\* arpifs/fullpos/fpchresol.F90:*

*Dirty fix: comment call to PPSURF2D (array shape issue).*

*\* arpifs/fullpos/fpserver.F90:*



Define variable YLEAERATM of type "TEAERATM", and add it as argument in call to SU4FPOS.  
(probably a dirty fix)

\* arpifs/module/surface\_fields\_oper\_traj.F90:

- 1) Fix dimension of array PSP\_SG in its declaration.
- 2) line 97: call to GPOPER\_2 becomes a call to GPOPER\_3.

\* arpifs/control/cprep4.F90  
arpifs/oops/fields\_fp\_mod.F90  
mse/externals/suphmse\_surface.F90:

Use variable JPRD, necessary because of the inclusion of "fcttim.func.h" .

\* arpifs/oops/fields\_io\_mod.F90:

Fix arguments in calls to IO\_SERV\_SUIOSCTMPL & MODEL\_STEP (probably dirty fixes).

\* arpifs/op\_obs/calc\_varqc\_weights.F90:

Declare integer variable IMPLIED\_VARNO, and set it as last argument in call to MAP\_VARNO\_TO\_NVAR.

\* arpifs/op\_obs/departure\_jo.F90:

Add arguments LL\_SCATTBODY & CL\_SCATTBODY\_SQL in call to HOP\_DECIDE\_REQUIRED\_SQLS.

\* arpifs/op\_obs/obsvad.F90:

Comment part 1.1, which (I think...) should be removed soon .

\* arpifs/phys\_dmn/aplpar.F90:

Declare real arrays ZNEEFLX & ZCHEM2AER (initialized to 0.), and add them as arguments in call to CHEM\_MAIN.  
(probably a dirty fix)

\* arpifs/phys\_ec/vdftke.F90:

Declare real arrays ZQICONV/ZQLCONV/ZKQROV/ZKQLROV (initialized to 0.), and add them as arguments in call to ACTKE.  
(probably a dirty fix)

\* arpifs/pp\_obs/pos.F90:

Allocatable 3D array ZGFLT0 has been changed to a 2D pointer, so (ex-)line 907 caused a compilation issue:

```
ZDPHYCTY(JROF,JLEV)=ZGFLT0(JROF,JLEV,YLPPIC%IPHYCTY)
```

To solve this problem, the only way that I found consists in declaring a 3D array ZGFLT0\_3D, initialized as it was in cycle CY46R1:

```
ALLOCATE(ZGFLT0_3D(KPROMA,KFLEVG,IPPGFL))
ZGFLT0_3D(:,:,:) = 0.0_JPRB
DO JVAR=1,IPPGFL
IF (LLIN_GFL(JVAR)) THEN
DO JLEV=1,KFLEVG
DO JROF=KST,KND
ZGFLT0_3D(JROF,JLEV,JVAR)=PGFL(JROF,JLEV,IDIN_GFL(JVAR))
ENDDO
ENDDO
ENDIF
ENDDO
```

...and (ex-) line 907 becomes: ZDPHYCTY(JROF,JLEV)=ZGFLT0\_3D(JROF,JLEV,YLPPIC%IPHYCTY)

(NB: probably a dirty workaround)

\* arpifs/var/cvar2in.F90:

Dirty fix: comment IF blocks concerning LJB\_ACV (remove variable).

\* arpifs/var/cvar2inad.F90:

Dirty fix: comment IF blocks concerning LJB\_ACV (remove variable).

**Projects:** aladin, arpifs, mse

**Git branch:** gco\_CY46T1\_r1

**Modified:**

aladin/adiab	elarmesad.F90
arpifs/adiab	gnh_conv_nhvar.F90
arpifs/canari	canari.F90
arpifs/chem	acchem.F90
arpifs/control	ca_scan2m.F90, cprep3.F90, cprep4.F90
arpifs/fullpos	fpchresol.F90, fpserver.F90
arpifs/module	control_vectors_base_mix.F90, surface_fields_oper_traj.F90, traj_main_mod.F90, yomlocs.F90, yomvar.F90
arpifs/obs_preproc	defrun.F90
arpifs/oops	fields_fp_mod.F90, fields_io_mod.F90, ifs_init.F90, scan2m_oops.F90, stepo_oops.F90
arpifs/op_obs	calc_varqc_weights.F90, departure_jo.F90, hop.F90, obsop_conv.F90, obsvad.F90
arpifs/phys_dmn	aplpar.F90
arpifs/phys_ec	vdftke.F90
arpifs/pp_obs	pos.F90
arpifs/setup	su0yoma.F90, sudcmip12_spec.F90, suslb.F90
arpifs/var	chavarin.F90, chavarinad.F90, cvar2in.F90, cvar2inad.F90, jbtomodelad.F90, suecges.F90
mse/externals	suphmse_surface.F90

**Doc:**

1) Remove useless file "arpifs/chem/acch\_csrsv.F90.orig" .

2) Restore cycle CY46T1 version of "acch\_csrsv.F90" . Previous version of this routine has been restored from version CY46R1, and renamed as "mocage\_csrsv.F90" . It has been necessary to change call to ACCH\_CSRV has been replaced by a call to MOCAGE\_CSRV in "chem\_mocage.F90" .

3) *sufpd.F90*: introduce post-processing domains GLOB01 and EURAT005/EURAT1S20 .

**Projects:** arpifs

**Git branch:** gco\_CY46T1\_r1.02%misc

**Deleted:**

arpifs/chem acch\_csrsv.F90.orig

**Added:**

arpifs/chem mocage\_csrsv.F90

**Modified:**

arpifs/chem acch\_csrsv.F90, acchem.F90, chem\_mocage.F90

arpifs/fullpos sufpd.F90

**Doc:**

1) Fixes from Olivier Marsden:

- clean fix in EC\_MEMINFO (only I/O-processors can call MPI\_BARRIER at this level of CNT0, not model processors);

- a few small fixes for IFS conf (several corrections for screening).

2) Move module "aladin/module/yomenscov.F90" to "arpifs/module" directory (NB: this module is also used in "arpifs").

3) Remove obsolete "lfi" routines.

**Projects:** aladin, arpifs, ifsaux

**Git branch:** gco\_CY46T1\_r1.03%misc

**Deleted:**

ifsaux/lfi lficaq.F90, lficax.F90, lfichi.F90, lfidah.F90, lfidst.F90, lfiled.F90

**Renamed:**

aladin/module yomenscov.F90 arpifs/module/yomenscov.F90

**Modified:**

arpifs/control cnt0.F90  
arpifs/io\_serv io\_serv\_grok\_nproc.F90  
arpifs/module traj\_main\_mod.F90, yomlocs.F90  
arpifs/obs\_preproc fgchk.F90  
arpifs/oops ifs\_init.F90  
arpifs/programs master.F90

**Doc:**

*Merge between cycles CY46T1 and CY46R1 .*

**Projects:** aeolus, algor, arpifs, blacklist, ecfttw, ifsaux, ifsobs, obstat, odb, oopsifs, radiation, satrad, scat, surf, surfex, trans

**Git branch:** gco\_CY46\_t1.08%merge\_t1\_r1

**Deleted:**

arpifs/chem bascoe\_wetdep.F90, bascoe\_zenith\_fct.F90  
arpifs/module yo\_aero\_m7.F90, yo\_aero\_trac.F90  
arpifs/obs\_preproc airepbe.F90, dribube.F90, paobbe.F90, pilotbe.F90, ptendcor.F90, synopbe.F90, tempbe.F90  
arpifs/op\_obs hqscatt.F90, qneg.F90, qnegad.F90, qnegtl.F90  
arpifs/phys\_ec aer\_clim.F90, aer\_climg.F90, aer\_climz.F90, aer\_clist.F90, aer\_drydep\_ad.F90, aer\_drydep\_tl.F90, aer\_phy1.F90, aer\_radon.F90, aer\_sdust.F90, aer\_sedim.F90, aer\_tau.F90, aer\_tau2mixr.F90, aer\_unit\_conv.F90, m7.F90, m7\_aero\_prop.F90, m7\_averageproperties.F90, m7\_coaset.F90, m7\_coat.F90, m7\_concoag.F90, m7\_cumnor.F90, m7\_dconc.F90, m7\_delcoa.F90, m7\_dgas.F90, m7\_dnum.F90, m7\_drydep.F90, m7\_emi.F90, m7\_emi\_car.F90, m7\_emi\_dms.F90, m7\_emi\_du.F90, m7\_emi\_so2.F90, m7\_emi\_ss\_lsce.F90, m7\_emi\_ss\_mon.F90, m7\_equil.F90, m7\_equimix.F90, m7\_equiz.F90, m7\_interface.F90, m7\_logtail.F90, m7\_negat.F90, m7\_nuck.F90, m7\_nucl\_ku.F90, m7\_nucl\_ve.F90, m7\_sedimentation.F90, m7\_wetdep.F90, rndecay.F90, su\_aerm7.F90  
arpifs/pp\_obs aerod\_ad.F90, aerod\_op.F90, aerod\_tl.F90, ppch4.F90  
arpifs/setup sucst.F90

arpifs/utility	deallo.F90
arpifs/var	suvar.F90
odb/ddl.CCMA	bator_hdr_7.sql, sat_aeolusl2c.sql
odb/ddl.ECMA	bator_hdr_7.sql, obsort_aeolus_auxmet.sql, obsort_aeolus_hdr.sql, obsort_aeolus_l2c.sql
odb/ddl	bator_hdr_7.sql, obsort_aeolus_auxmet.sql, obsort_aeolus_hdr.sql, obsort_aeolus_l2c.sql
odb/include	timerdefs.func.h
odb/tools	Convert_dbase.F90
oopsifs/src/ifs	ObsBias.cc, ObsBias.h, ObsBiasCovariance.cc, ObsBiasCovariance.h, ObsBiasCtlVec.cc, ObsBiasCtlVec.h, ObsBiasIncrement.cc, ObsBiasIncrement.h
oopsifs/test/testinput	test.xml
satrad/module	rttov_interface_mod.F90
satrad/programs	rttov_scatt_make_coef.F90, rttov_test.F90
satrad/rttov/main	rttov_erfcx.F90, rttov_init_traj_sta.F90, rttov_nullify_prof.F90, rttov_setpredictors_7.F90, rttov_setpredictors_7_ad.F90, rttov_setpredictors_7_k.F90, rttov_setpredictors_7_tl.F90, rttov_setpredictors_8.F90, rttov_setpredictors_8_ad.F90, rttov_setpredictors_8_k.F90, rttov_setpredictors_8_tl.F90
satrad/rttov/mw_scatt	rttov_emis_retrieval.F90
satrad/rttov/mw_scatt_coef	convert_mietable.F90, density_all.F90, gamma_dsd.F90, get_dia.F90, ice_density.F90, liu_dda.F90, liu_density.F90, melting_layer.F90, mg_ellips.F90, mie_coated_sphere.F90, mie_one_temp.F90, mie_one_wc.F90, mie_sphere.F90, mod_gamma_dsd.F90, n0_t.F90, perm_ice.F90, perm_melt.F90, perm_water.F90, permittivity.F90, predict_mom07.F90, predict_psd.F90, predict_psd_F07.F90, scattering.F90, set_spectra.F90, vol_fracs.F90

### Renamed:

algor/external/fourier	fft992.F to algor/external/fourier/fft992.F90
algor/external/linalg	sgtsl.F to algor/external/linalg/sgtsl.F90
algor/external/minim	m1qn3r.F to algor/external/minim/m1qn3r.F90
algor/internal/linalg	hqr2.F to algor/internal/linalg/hqr2.F90, mxva.F to algor/internal/linalg/mxva.F90, sgemmx.F to algor/internal/linalg/sgemmx.F90
algor/internal/minim	ctcab_1dv.F to algor/internal/minim/ctcab_1dv.F90, ctonb_1dv.F to algor/internal/minim/ctonb_1dv.F90, dd.F to algor/internal/minim/dd.F90,

dd\_1dv.F to algor/internal/minim/dd\_1dv.F90, ddr.F to algor/internal/minim/ddr.F90, dds.F to algor/internal/minim/dds.F90, dds\_1dv.F to algor/internal/minim/dds\_1dv.F90, ddsr.F to algor/internal/minim/ddsr.F90, ecube.F to algor/internal/minim/ecube.F90, ecube\_1dv.F to algor/internal/minim/ecube\_1dv.F90, ecuber.F to algor/internal/minim/ecuber.F90, euclid.F to algor/internal/minim/euclid.F90, euclid\_1dv.F to algor/internal/minim/euclid\_1dv.F90, m1qn3ar.F to algor/internal/minim/m1qn3ar.F90, mlis0r.F to algor/internal/minim/mlis0r.F90, mupdts\_1dv.F to algor/internal/minim/mupdts\_1dv.F90, mupdts\_orig.F to algor/internal/minim/mupdts\_orig.F90, mupdtsr.F to algor/internal/minim/mupdtsr.F90, ystbl\_1dv.F to algor/internal/minim/ystbl\_1dv.F90, ystbl\_orig.F to algor/internal/minim/ystbl\_orig.F90, ystblr.F to algor/internal/minim/ystblr.F90

arpifs/module yomacv.F90 to arpifs/module/yomjbhybacv.F90

arpifs/setup setacv.F90 to arpifs/var/setjbhybacv.F90, suacv.F90 to arpifs/var/sujbhybacv.F90, sucom.F90 to arpifs/setup/su\_coup\_com.F90

ifsaux/bufr\_io oldbufr\_close.F to ifsaux/bufr\_io/oldbufr\_close.F90, oldbufr\_open.F to ifsaux/bufr\_io/oldbufr\_open.F90, oldbufr\_read.F to ifsaux/bufr\_io/oldbufr\_read.F90, oldbufr\_rewind.F to ifsaux/bufr\_io/oldbufr\_rewind.F90, oldbufr\_write.F to ifsaux/bufr\_io/oldbufr\_write.F90

ifsaux/cma oldcma\_close.F to ifsaux/cma/oldcma\_close.F90, oldcma\_get\_address.F to ifsaux/cma/oldcma\_get\_address.F90, oldcma\_open.F to ifsaux/cma/oldcma\_open.F90, oldcma\_read.F to ifsaux/cma/oldcma\_read.F90, oldcma\_rewind.F to ifsaux/cma/oldcma\_rewind.F90, oldcma\_set\_address.F to ifsaux/cma/oldcma\_set\_address.F90, oldcma\_write.F to ifsaux/cma/oldcma\_write.F90

ifsaux/eclite n\_compat.F to ifsaux/eclite/n\_compat.F90, uv2sd.F to ifsaux/eclite/uv2sd.F90

ifsaux/grib\_mf codega.F to ifsaux/grib\_mf/codega.F90, confi.F to ifsaux/grib\_mf/confi.F90, confp\_mf.F to ifsaux/grib\_mf/confp\_mf.F90, decfp\_mf.F to ifsaux/grib\_mf/decfp\_mf.F90, decoga.F to ifsaux/grib\_mf/decoga.F90, gbyte\_mf.F to ifsaux/grib\_mf/gbyte\_mf.F90, gbytes\_mf.F to ifsaux/grib\_mf/gbytes\_mf.F90, gsbite\_mf.F to ifsaux/grib\_mf/gsbite\_mf.F90, gsbyte\_mf.F to ifsaux/grib\_mf/gsbyte\_mf.F90, mxmn\_mf.F to ifsaux/grib\_mf/mxmn\_mf.F90, offset\_mf.F to ifsaux/grib\_mf/offset\_mf.F90, packgb.F to ifsaux/grib\_mf/packgb.F90, prtbin\_mf.F to ifsaux/grib\_mf/prtbin\_mf.F90, sbyte\_mf.F to ifsaux/grib\_mf/sbyte\_mf.F90, sbytes\_mf.F to ifsaux/grib\_mf/sbytes\_mf.F90, unpagb.F to ifsaux/grib\_mf/unpagb.F90

ifsaux/misc optbadcv.F to ifsaux/misc/optbadcv.F90, optd.F to ifsaux/misc/optd.F90, opteff.F to ifsaux/misc/opteff.F90, opterror.F to ifsaux/misc/opterror.F90, optgee.F to ifsaux/misc/optgee.F90, optmccpa.F to ifsaux/misc/optmccpa.F90, optremez.F to ifsaux/misc/optremez.F90, optwate.F to ifsaux/misc/optwate.F90

ifsaux/utilities sha256\_wrapper.F90 to ifsaux/module/sha256\_wrapper.F90

odb/scripts DUMMY.IOASSIGN to odb/share/odb/DUMMY/DUMMY.IOASSIGN, DUMMY.dd to odb/share/odb/DUMMY/DUMMY.dd, DUMMY.sch to odb/share/odb/DUMMY/DUMMY.sch, an\_depar.cmap to odb/share/odb/an\_depar.cmap, date.cmap to odb/share/odb/date.cmap, dir.cmap to odb/share/odb/dir.cmap, fg\_depar.cmap to odb/share/odb/fg\_depar.cmap, modoro.cmap to odb/share/odb/modoro.cmap, obstype.cmap to odb/share/odb/obstype.cmap, oldwind.cmap to odb/share/odb/oldwind.cmap, press.cmap to odb/share/odb/press.cmap, press\_hpa.cmap to

odb/share/odb/press\_hpa.cmap, procid.cmap to odb/share/odb/procid.cmap, ps.cmap to odb/share/odb/ps.cmap, ps\_hpa.cmap to odb/share/odb/ps\_hpa.cmap, rtablel\_2031 to odb/share/odb/rtablel\_2031, rtablel\_2047 to odb/share/odb/rtablel\_2047, rtablel\_2063 to odb/share/odb/rtablel\_2063, rtablel\_2095 to odb/share/odb/rtablel\_2095, rtablel\_21023 to odb/share/odb/rtablel\_21023, rtablel\_21151 to odb/share/odb/rtablel\_21151, rtablel\_2127 to odb/share/odb/rtablel\_2127, rtablel\_21279 to odb/share/odb/rtablel\_21279, rtablel\_2159 to odb/share/odb/rtablel\_2159, rtablel\_22047 to odb/share/odb/rtablel\_22047, rtablel\_2215 to odb/share/odb/rtablel\_2215, rtablel\_2255 to odb/share/odb/rtablel\_2255, rtablel\_2319 to odb/share/odb/rtablel\_2319, rtablel\_2399 to odb/share/odb/rtablel\_2399, rtablel\_2511 to odb/share/odb/rtablel\_2511, rtablel\_2639 to odb/share/odb/rtablel\_2639, rtablel\_2799 to odb/share/odb/rtablel\_2799, stalt.cmap to odb/share/odb/stalt.cmap, status.cmap to odb/share/odb/status.cmap, t.cmap to odb/share/odb/t.cmap, t2m.cmap to odb/share/odb/t2m.cmap, target.cmap to odb/share/odb/target.cmap, tbr.cmap to odb/share/odb/tbr.cmap, tcelsius.cmap to odb/share/odb/tcelsius.cmap, tfahrenheit.cmap to odb/share/odb/tfahrenheit.cmap, time.cmap to odb/share/odb/time.cmap, tslot.cmap to odb/share/odb/tslot.cmap, wind.cmap to odb/share/odb/wind.cmap

oopsifs/src/ifs

ObsBias.interface.F90 to oopsifs/src/ifs/ObsBiasVARBC.interface.F90, ObsBias2.interface.F90 to oopsifs/src/ifs/ObsBiasTOVSCV.interface.F90, ObsBiasCovariance.interface.F90 to oopsifs/src/ifs/ObsBiasCovarianceVARBC.interface.F90, ObsBiasCovariance2.interface.F90 to oopsifs/src/ifs/ObsBiasCovarianceTOVSCV.interface.F90, ObsBiasCtlVec.interface.F90 to oopsifs/src/ifs/ObsBiasCtlVecVARBC.interface.F90, ObsBiasCtlVec2.interface.F90 to oopsifs/src/ifs/ObsBiasCtlVecTOVSCV.interface.F90, ObsBiasIncrement.interface.F90 to oopsifs/src/ifs/ObsBiasIncrementVARBC.interface.F90, ObsBiasIncrement2.interface.F90 to oopsifs/src/ifs/ObsBiasIncrementTOVSCV.interface.F90, ObsBiasLLists.F90 to oopsifs/src/ifs/ObsBiasLListsVARBC.F90, ObsBiasLLists2.F90 to oopsifs/src/ifs/ObsBiasLListsTOVSCV.F90

satrad/rttov/coef\_io

rttov\_distribute\_coef.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_coef.F90, rttov\_distribute\_coef\_pccomp.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_coef\_pccomp.F90, rttov\_distribute\_coef\_scatt\_ir.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_coef\_scatt\_ir.F90, rttov\_distribute\_coefs.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_coefs.F90, rttov\_distribute\_optpar\_ir.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_optpar\_ir.F90

satrad/rttov/mw\_scatt

rttov\_distribute\_scattcoeffs.F90 to satrad/rttov/coef\_distribute/rttov\_distribute\_scattcoeffs.F90, rttovscatt\_test\_one.F90 to satrad/programs/rttovscatt\_test\_one.F90

**Added:**

algor/external/minim	m1qn3.F90.orig
algor/interface	minv.h, minv_8.h
algor/internal/minim	m1qn3a.F90.orig, mli0.F90.orig
arpifs/adiab	call_sl_heap2.F90, larche_incr.F90, larche_incr_ad.F90, larche_incr_tl.F90, larmes_rk.F90, larmes_rk5.F90, larmes_rk_ad.F90, larmes_rk_tl.F90
arpifs/chem	acch_csrv.F90.orig, chem_noyadv.F90, mocage_chem_ini.F90, mocage_elem_racmobus.F90, mocage_equi_racmobus.F90, mocage_hana.F90, mocage_hden.F90, mocage_hete.F90, mocage_hsed.F90, mocage_krat_racmobus.F90, mocage_nebj.F90, mocage_phot.F90, mocage_sola.F90, mocage_soufreaq.F90, tm5_do_ebi_tc02b.F90
arpifs/common	include_abor1_intfb.h
arpifs/control	gp_model_heap2.F90
arpifs/glomap_mode	aer_dust.F90, aer_seasalt.F90, ukca_aero_diag_ifs.F90, ukca_aero_step.F90, ukca_aero_step_ifs.F90, ukca_ageing.F90, ukca_binapara77.F90, ukca_calc_coag_kernel.F90, ukca_calc_drydiam.F90, ukca_calcminmaxgc.F90, ukca_calcminmaxndmdt.F90, ukca_calcnucrate.F90, ukca_check_md_nd.F90, ukca_chem_ifs.F90, ukca_cloudproc.F90, ukca_coag_coff_v.F90, ukca_coagwithnucl.F90, ukca_cond_coff_v.F90, ukca_conden.F90, ukca_dcoff_par_av_k.F90, ukca_ddepaer.F90, ukca_impac_scav.F90, ukca_ingridg.F90, ukca_mode_ems.F90, ukca_mode_ems_ifs.F90, ukca_no3nh4.F90, ukca_offl_ox.F90, ukca_prim_car.F90, ukca_prim_du.F90, ukca_prim_du2.F90, ukca_prim_soa.F90, ukca_prim_ss.F90, ukca_prim_su.F90, ukca_radaer_compute_aod.F90, ukca_radaer_compute_aodlev.F90, ukca_radaer_ifs.F90, ukca_radaer_init.F90, ukca_radaer_lut_in.F90, ukca_radaer_read_luts.F90, ukca_radaer_read_precalc.F90, ukca_radaer_set_thermodynamic.F90, ukca_radaerlev_ifs.F90, ukca_rainout.F90, ukca_remode.F90, ukca_sedim.F90, ukca_sedimnt.F90, ukca_so2so4.F90, ukca_solvecoagnucl_v.F90, ukca_vapour.F90, ukca_vgrav.F90, ukca_vgrav_av_k.F90, ukca_volume_mode.F90, ukca_water_content_v.F90, ukca_wetox.F90
arpifs/interpol	laiddi_rad.F90, laidli_rad.F90, laitri_weno.F90, laitri_weno_ad.F90, laitri_weno_init.F90, laitri_weno_tl.F90, slcomm_obs.F90, slextpol_obs.F90, slextpolad_obs.F90
arpifs/io_serv	io_serv_wv_rec.F90, io_serv_wv_suiosctmpl.F90, io_serv_wv_wgribencode.F90
arpifs/mgrids/advection	mgrids_advection_module.F90, mgrids_advection_submodule.F90, mgrids_mpdata_module.F90, mgrids_sladv_module.F90, plev_hlev_module.F90
arpifs/module	algorithm_state_mod.F90, drydep_par.F90, mocage_chem_module.F90, mocage_tend_racmobus.F90, odb_the_obscure.F90, type_acv.F90, ukca_constants.F90, ukca_mode_setup.F90, ukca_radaer_comptype.F90, ukca_radaer_lut_mod.F90, ukca_radaer_modetype.F90, ukca_radaer_precalc_mod.F90, ukca_radaer_struct_mod.F90, ukca_radaer_tlut_mod.F90, ukca_setup_indices.F90, yoe_phys_mwave.F90, yom_pll_recf.F90, yomjbacv.F90
arpifs/mwave	mwave_assign_emis_amsr2.F90, mwave_assign_emis_gmi.F90
arpifs/namelist	namjbhybacv.nam.h, namsatsim.nam.h, namtraj.nam.h



arpifs/nemo	getnemodiag3d.F90
arpifs/obs_preproc	checkrsdrift.F90, mw_clearsky_screen_wrapper.F90
arpifs/oops	allobs_bias_error_mod.F90, varbc_cov_mod.F90, varbc_increment_mod.F90, varbc_state_mod.F90
arpifs/op_obs	calc_varqc_weights.F90, select_closest_scatt.F90
arpifs/phys_ec	aer_diagglomap.F90, aer_glomapiag_layer.F90, aer_resuspension.F90, aer_so2so4_v2.F90, compo_flux_update.F90, ddr_laminar_res.F90, ddr_surf_res1.F90, ddr_we_season.F90, depvel_wsl.F90, su_aer_climatology3d.F90, surfws_layer.F90, vdfike.F90, wvcouple_init_early.F90, wvcouple_update_grib_handles.F90
arpifs/phys_radi	modify_wv_continuum.F90
arpifs/programs	unbal_eda.F90
arpifs/sekf	sekf_geteda_jacobians.F90
arpifs/setup	set_slhd_sponge.F90, sudcmip16_gu.F90, sudcmip16_spec.F90, sumisc_gu.F90, traj_setup.F90
arpifs/utility	dverint.F90, grib_mean.f90, link.f90, readmask.F90
arpifs/var	jbtoacv.F90, suacv.F90
ifsaux/ddh	comcha.h, comdat.h, comddh.h, ctlarch.F, ctldompf.F, ctldomts.F, ctlzon.F, decops2.F, description_table.dat, getarea.F, getcom1.F, getcom2.F, getdom.F, getrec.F, getreci.F, getzon.F, incdat.F, invjul.F, julday.F, namus.h, offset.F, opone.F, param.h, rearec.F, suarch.F, sucom.F, sucom2.F, swapts.F
ifsaux/fa	ellips64.F90
ifsaux/include	cas.h, ec_rank_reorder.intfb.h
ifsaux/module	parkind_wave.F90
ifsaux/parallel	run_fortran_omp_parallel.F90
ifsaux/programs	ddhrun.F, splits.F
ifsaux/utilities	cxxdemangle.cc, ec_rank_reorder.F90, mpi_version.c, omp_version.c, reserve_hugepages.c, tabort.c
ifsobs/docs	match_dbase.md
ifsobs/src/aux	quicksort_mod.F90
ifsobs/src/misc	match_dbase_mod.F90
ifsobs/src/tools	match_dbase.F90

ifsobs/tests	test_join_views.F90, test_match_dbase.sh, test_quicksort.F90
odb/bufr2odb	b2o_convert_aeolus.F90, b2o_convert_fscat.F90, b2o_crc.c, calc_azim.F90
odb/cmake	odb_target_ignore_missing_symbols.cmake
odb/ddl.CCMA	scat_ambig_select.sql
odb/ddl.ECMA	scat_ambig_select.sql, sufger_aeolus.sql
odb/ddl	scat_ambig_select.sql, sufger_aeolus.sql
odb/interface	calc_azim.h
odb/module	datetimemod_aeol.F90
odb/share	CMakeLists.txt
oopsifs/src/ifs	AllObsBiasCovariance.cc, AllObsBiasCovariance.h, AllObsBiasCovariance.interface.F90, Logbook.interface.F90, LogbookIFS.h, ModelBiasCtlVec.h, ObsBiasCovarianceTOVSCV.cc, ObsBiasCovarianceTOVSCV.h, ObsBiasCovarianceVARBC.cc, ObsBiasCovarianceVARBC.h, ObsBiasCtlVecTOVSCV.cc, ObsBiasCtlVecTOVSCV.h, ObsBiasCtlVecVARBC.cc, ObsBiasCtlVecVARBC.h, ObsBiasIncrementTOVSCV.cc, ObsBiasIncrementTOVSCV.h, ObsBiasIncrementVARBC.cc, ObsBiasIncrementVARBC.h, ObsBiasTOVSCV.cc, ObsBiasTOVSCV.h, ObsBiasVARBC.cc, ObsBiasVARBC.h, PostProcessorIFS.h, instantiateObsAuxFactories.h, instantiateObsOpFactories.h
radiation/module	radiation_ice_optics_baran2016.F90, radiation_ice_optics_baran2017.F90, radiation_ice_optics_yi.F90
satrad/interface	find_lsm.h, get_lsm.h, rttov_dealloc_allcoef.h
satrad/module	mod_screen_1c_buformsg.F90, mod_screen_1c_config.F90, mod_screen_1c_constants.F90, rttov_htfrtc_interface_mod.F90, rttov_lapack_mod.F90, rttov_test_mod.F90
satrad/mwave	mwave_ec_setopt.F90
satrad/pre_screen	find_lsm.F90, get_lsm.F90
satrad/programs	old_screen_1c.F90, rttov_coef_info.F90
satrad/rttov/coef_io	rttov_channel_extract_mfasis.F90, rttov_channel_extract_sublist.F90, rttov_dealloc_coef_htfrtc.F90, rttov_dealloc_coef_mfasis.F90, rttov_nullify_coef_htfrtc.F90, rttov_nullify_coef_mfasis.F90, rttov_read_ascii_mfasis_file.F90, rttov_read_binary_mfasis_file.F90, rttov_read_coefs_htfrtc.F90, rttov_write_ascii_mfasis_file.F90, rttov_write_binary_mfasis_file.F90
satrad/rttov/main	rttov_add_opt_param.F90, rttov_alloc_mfasis_refl.F90, rttov_apply_pc_aer_reg_lims.F90, rttov_apply_pc_aer_reg_lims_ad.F90, rttov_apply_pc_aer_reg_lims_k.F90, rttov_apply_pc_aer_reg_lims_tl.F90, rttov_copy_opt_param.F90, rttov_mfasis.F90, rttov_mfasis_ad.F90,

	rttov_mfasis_k.F90, rttov_mfasis_tl.F90, rttov_mw_clw_absorption.F90, rttov_mw_clw_absorption_ad.F90, rttov_mw_clw_absorption_k.F90, rttov_mw_clw_absorption_tl.F90, rttov_setpredictors_78.F90, rttov_setpredictors_78_ad.F90, rttov_setpredictors_78_k.F90, rttov_setpredictors_78_tl.F90
satrad/rttov/mw_scatt	rttov_add_scatt_prof.F90, rttov_alloc_emis_ret_terms.F90, rttov_copy_scatt_prof.F90, rttov_scatt_emis_retrieval.F90, rttov_scatt_emis_terms.F90
satrad/rttov/other	rttov_mfasis_lut_info.F90, rttov_print_cld_profile.F90, rttov_print_opts_scatt.F90, rttov_print_radiance_quality.F90
satrad/rttov/parallel	rttov_parallel_scatt.F90, rttov_parallel_scatt_ad.F90, rttov_parallel_scatt_tl.F90
satrad/rttov/test	rttov_make_cld_profile_inc.F90, rttov_make_emisrefl_inc.F90, rttov_make_opt_param_inc.F90, rttov_scale_cld_profile_inc.F90, rttov_scale_opt_param_inc.F90, rttov_taylor_test.F90
scat/module	fscat_buf.F, fscat_flag.F, fscat_wind.F
scat/oretrieve	decode_fscat_flag.F, find_bufindex.F, fscat_read_buf.F, fscat_write_buf.F, fupdate_windstat.F, fwind_biasscorr.F, fwrite_windstat.F, init_fscat_buf.F, rdbuf.F, write_fscat_flag_stat.F
scat/programs	fscat_filter.F
surf/external	surfws.F90
surf/interface	surfws.h
surf/module	surfws_ctl_mod.F90
<b>Modified:</b>	
aeolus/RayleighBrillouinProcessing	tentispectrum.F90
algor/external/linalg	minv.F90, minv_8.F90, minv_caller.F90
algor/module	butterfly_alg_mod.F90, dilatation_mod.F90, interpol_decomp_mod.F90, seefmm_mix.F90
arpifs/adiab	call_sl.F90, call_sl_ad.F90, call_sl_tl.F90, cpedia.F90, cpg.F90, cpg5.F90, cpg_drv.F90, cpg_dyn.F90, cpg_dyn_tl.F90, cpg_gp.F90, cpg_gp_hyd.F90, cpqtuv.F90, fv_gradient.F90, gnh_conv_nhvar.F90, gp_derivatives.F90, gpcty.F90, gpmktend.F90, gpprs0d.F90, gprcp.F90, gpxx.F90, lacdyn.F90, lacdynam.F90, lacynt.F90, laitree_gfl_ad.F90, lapinea.F90, lapinea5.F90, lapineaad.F90, lapineatl.F90, lapineb.F90, larche.F90, larche5.F90, larchead.F90, larchetl.F90, larcin2.F90, larcin2ad.F90, larcin2tl.F90, larcina.F90, larcinaad.F90, larcinatl.F90, larcinb.F90, larcinbad.F90, larcinha.F90, larmes.F90, larmes5.F90, larmesad.F90, larmestl.F90, latte_kappa.F90, latte_kappaad.F90, latte_kappatl.F90, lavabo.F90, lavabotl.F90, lavent.F90, laventad.F90, laventtl.F90, postphy.F90, spcsi.F90, spnh_conv_nhvar.F90, spnhsi.F90
arpifs/c9xx	cseaice.F90, incli10.F90

arpifs/canari	caclsst.F90, cadavr.F90, caeincw.F90, cagade.F90, calico.F90, calina.F90, canami.F90, caohis.F90, caprsurf.F90, carcli.F90, casmswi.F90
arpifs/chem	acch_csrsv.F90, bascoe_chem_ini.F90, bascoe_hetconst.F90, bascoe_kpp_Rates.F90, bascoetm5_chem_ini.F90, bascoetm5_noymass.F90, chem_bascoe.F90, chem_bascoetm5.F90, chem_init.F90, chem_main.F90, chem_massdia.F90, chem_mocage.F90, chem_n2o.F90, chem_scav.F90, chem_tm5.F90, compo_diurnal.F90, tm5_calrates.F90, tm5_chem_ini.F90, tm5_do_ebi.F90, tm5_kpp_Fun.F90, tm5_kpp_Jacobian.F90, tm5_kpp_LinearAlgebra.F90, tm5_kpp_Rates.F90, tm5_kpp_initialize.F90, tm5_kpp_update_cifs_conc.F90, tm5_macc_aerosol.F90, tm5_photo_flux.F90, tm5_photorates_tropo.F90, tm5_rbud.F90, tm5_v0_kpp_update_cifs_conc.F90, tm5_wetchem.F90, tm5_wetchem_point.F90, updcoch.F90
arpifs/climate	cormassdry.F90, updcli.F90, updcli_mse.F90, updclie.F90, updclie_co2.F90, updclie_compo.F90, updclpl.F90, updnemoocan.F90, updnud.F90, updrgas.F90
arpifs/cma2odb	ctxgetdb.F90, ctxinitdb.F90, ctxputdb.F90, getdb.F90, init_odbtools.F90, initmdb.F90, matchupdb.F90, obs_sort_odb.F90, opendb.F90, revmatchupdb.F90, shuffle_odb.F90, update_desc.F90, update_obsdb.F90
arpifs/common	yomdb_defs.h, yomdb_defs_undef.h, yomdb_vars.h
arpifs/control	adjotest.F90, allfpos.F90, cfcens2obs.F90, cgr1.F90, cnt0.F90, cnt1.F90, cnt3.F90, cnt3_glo.F90, cnt3tl.F90, cnt4.F90, cnt4ad.F90, cnt4tl.F90, cprep1.F90, cprep3.F90, csekf2.F90, ctl1.F90, cva1.F90, cva2.F90, forecast_error.F90, gmassdiag.F90, gp_model.F90, gp_model_ad.F90, gp_model_heap.F90, gp_model_tl.F90, iopack.F90, reresf.F90, scan2m.F90, scan2mad.F90, scan2mtl.F90, sim4d.F90, stepo.F90, stepoad.F90, stepotl.F90, tesadj.F90, testlievol.F90
arpifs/dfi	dfi2.F90, reast.F90
arpifs/dia	check_phtrajt.F90, cpcuddh.F90, cphddhe.F90, fpgpnorm.F90, grib_code_message.F90, inifaoutinfo.F90, preset_grib_template.F90, satsim.F90, spnormb.F90, suecfname.F90, sunddh.F90, suppddate.F90, wrmlpp.F90, wrmlppg.F90, wrmlpplg.F90, wrmoderr.F90, wrpgr.F90
arpifs/fp_serv	fp_serv_init_part1.F90, fp_serv_suiosctmpl.F90, fp_serv_sync.F90, suinif_fp.F90
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namdphy.nam.h, namdyn.nam.h, namdyna.nam.h, namdyncore.nam.h,  
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cudtdqntl.F90, cududv.F90, cududv2.F90, cududv2ad.F90, cududv2tl.F90,  
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ifsaux/module	deallocate_if_associated_mod.F90, fdsubs_mod.F90, mpl_abort_mod.F90, mpl_allgather_mod.F90, mpl_arg_mod.F90, mpl_comm_split_mod.F90, mpl_end_mod.F90, mpl_gather_mod.F90, oml_mod.F90, rttov_const.F90, rttov_ec_mod.F90, sdl_mod.F90, sharedmem_mod.F90, yomabrt.F90
ifsaux/parallel	cmpl_binding.F90, coml_binding.F90
ifsaux/support	abor1.F90, cargos.c, dr_hook_util.F90, dr_hook_util_multi.F90, drhook.c, endian.c, env.c, ifssig.c
ifsaux/utilities	ec_meminfo.F90, gentrbk.F90, get_tcmalloc_info.c, getcurheap.c, gethwm.c, linuxtrbk.c
ifsobs	CMakeLists.txt, History.txt, VERSION.cmake, config.sh, README.md, cat_dbase.md, dbase_view_mod.md, generate_docs.sh, CMakeLists.txt, CMakeLists.txt, hdf5_file_mod.F90, ll_mod.F90, netcdf_file_mod.F90, ascii_dbase_mod.F90, dbase_factory_mod.F90, dbase_mod.F90, hdf_dbase_mod.F90, ifsobs_dbase_mod.F90, netcdf_dbase_mod.F90,



	odb1_dbase_mod.F90, odb2_dbase_mod.F90, odbserver_dbase_mod.F90, dbase_kinds_mod.F90, dbase_view_mod.F90, dbase_view_tree_mod.F90, CMakeLists.txt, map_dbase_mod.F90, mapping_aux_funcs.F90, mapping_parser_mod.F90, mappings_mod.F90, partition_dbase_mod.F90, CMakeLists.txt, cat_dbase.F90, CMakeLists.txt, nc_sample_map_dbase.cdl, test_map_dbase_bufnr_mapping.dat, test_map_dbase_mapping.dat, test_convert_dbase_odb1.sh, test_cope_repartitioning.F90, test_dbase_view.F90, test_ll.F90
ifsobs/docs	README.md, cat_dbase.md, dbase_view_mod.md, generate_docs.sh
ifsobs/src	CMakeLists.txt, CMakeLists.txt, hdf5_file_mod.F90, ll_mod.F90, netcdf_file_mod.F90, ascii_dbase_mod.F90, dbase_factory_mod.F90, dbase_mod.F90, hdf_dbase_mod.F90, ifsobs_dbase_mod.F90, netcdf_dbase_mod.F90, odb1_dbase_mod.F90, odb2_dbase_mod.F90, odbserver_dbase_mod.F90, dbase_kinds_mod.F90, dbase_view_mod.F90, dbase_view_tree_mod.F90, CMakeLists.txt, map_dbase_mod.F90, mapping_aux_funcs.F90, mapping_parser_mod.F90, mappings_mod.F90, partition_dbase_mod.F90, CMakeLists.txt, cat_dbase.F90
ifsobs/src/aux	CMakeLists.txt, hdf5_file_mod.F90, ll_mod.F90, netcdf_file_mod.F90
ifsobs/src/dbase	ascii_dbase_mod.F90, dbase_factory_mod.F90, dbase_mod.F90, hdf_dbase_mod.F90, ifsobs_dbase_mod.F90, netcdf_dbase_mod.F90, odb1_dbase_mod.F90, odb2_dbase_mod.F90, odbserver_dbase_mod.F90
ifsobs/src/dbase_view	dbase_kinds_mod.F90, dbase_view_mod.F90, dbase_view_tree_mod.F90
ifsobs/src/misc	CMakeLists.txt, map_dbase_mod.F90, mapping_aux_funcs.F90, mapping_parser_mod.F90, mappings_mod.F90, partition_dbase_mod.F90
ifsobs/src/tools	CMakeLists.txt, cat_dbase.F90
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ifsobs/tests/data	nc_sample_map_dbase.cdl, test_map_dbase_bufnr_mapping.dat, test_map_dbase_mapping.dat
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obstat/module	mod_obstat_plot.F90, mod_sat_monitor.F90, obstat_def.F90
obstat/satmon	sat_324_hist_plot.F90
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	b2o_convert_windprofiler.F90, get_varindex.F90, genc.c, aeolus.h, allsky.h, black_robody_4.sql, cma.h, links_aeolus_hdr.sql, pre_thinn_robhdr_2.sql, radiance.h, robhdr.sql, robhdr_rad.sql, sat.h, sat_ssmi.sql, satbody_atovs.sql, scatt.h, setup_tovscv.sql, type_definitions.h, update_hdr_3.sql, b2o_debug.h, cmaio.h, odb_assoc_cols.h, odb_it_members.h, odbcs.h, codb.c, datastream.F90, msgpass_storeobs.F90, twindow.c, b2o_accessor_compressed.F90, b2o_common.F90, b2o_functional.F90, b2o_get.F90, b2o_thinning_heap.F90, b2o_utility.F90, varindex_module.F90, fcqodb_solverif.F90, bator_init_mod.F90, create_ioassign, ecma2ecmascr, Merge_gmi_swaths.F90, Odb2_to_odb1_era.F90
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odb/ddl	aeolus.h, allsky.h, black_robody_4.sql, cma.h, links_aeolus_hdr.sql, pre_thinn_robhdr_2.sql, radiance.h, robhdr.sql, robhdr_rad.sql, sat.h, sat_ssmi.sql, satbody_atovs.sql, scatt.h, setup_tovscv.sql, type_definitions.h, update_hdr_3.sql
odb/include	b2o_debug.h, cmaio.h, odb_assoc_cols.h, odb_it_members.h, odbcs.h
odb/lib	codb.c, datastream.F90, msgpass_storeobs.F90, twindow.c
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oopsifs/mains	CMakeLists.txt, ifs4dvar.cc
oopsifs/src/ifs	AllObs.cc, AllObs.h, AllObs.interface.F90, AllObsCovariance.cc, AllObsCovariance.h, AllObsCovariance.interface.F90, AllObsTLAD.cc, AllObsTLAD.h, AllObsTLAD.interface.F90, CMakeLists.txt, FieldsIFS.cc, FieldsIFS.h, FieldsIFS.interface.F90, GeometryIFS.interface.F90, GomData.h, GomData.interface.F90, GomsIFS.h, IfsFortran.h, IfsTraits.h, IncrModCtlVecIFS.cc, IncrModCtlVecIFS.h, IncrModCtlVecIFS.interface.F90, LinearModelIFS.cc, LinearModelIFS.h, LinearModelIFS.interface.F90, ModelBiasCovariance.h, ModelIFS.cc, ModelIFS.interface.F90, ObsSpaceODB.cc, ObsSpaceODB.h, ObsSpaceODB.interface.F90, ObsVector.cc, ObsVector.interface.F90, StateIFS.cc, StateIFS.h, VariablesIFS.interface.F90, instantiateObsErrorFactory.h, pm_link_mod.F90, pm_linked_list_mod.F90
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satrad/programs	bufr_grid_screen.F90, bufr_screen_amsr2_1d.F90, bufr_screen_cris.F90, bufr_screen_gmi_1d.F90, bufr_screen_nexrad.F90, bufr_screen_reo3_superob.F90, bufr_screen_ssmis_1d.F90, bufr_screen_synop_rain_gauges.F90, create_aer_clim_prof.F90,

example\_aer\_file\_fwd.F90, example\_aer\_param\_fwd.F90,  
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example\_htfrtc\_fwd.F90, example\_k.F90, example\_pc\_fwd.F90,  
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reo3\_prescreen.F90, rttov\_aer\_clim\_prof.F90, rttov\_bpr\_calc.F90,  
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rttov\_read\_ascii\_scldcoef.F90, rttov\_read\_binary\_pccoef.F90,  
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rttov\_calcsurfrefl.F90, rttov\_calcsurfrefl\_ad.F90, rttov\_calcsurfrefl\_k.F90,  
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	rttov_locpat_tl.F90, rttov_mult_profiles_k.F90, rttov_opdep.F90, rttov_opdep_ad.F90, rttov_opdep_k.F90, rttov_opdep_tl.F90, rttov_opdpsscattir.F90, rttov_opdpsscattir_ad.F90, rttov_opdpsscattir_k.F90, rttov_opdpsscattir_tl.F90, rttov_opts_eq.F90, rttov_profaux.F90, rttov_profaux_ad.F90, rttov_profaux_k.F90, rttov_profaux_tl.F90, rttov_refsun.F90, rttov_refsun_ad.F90, rttov_refsun_k.F90, rttov_refsun_tl.F90, rttov_setpredictors_9.F90, rttov_setpredictors_9_ad.F90, rttov_setpredictors_9_k.F90, rttov_setpredictors_9_tl.F90, rttov_tl.F90, rttov_transmit.F90, rttov_transmit_9_solar.F90, rttov_transmit_9_solar_ad.F90, rttov_transmit_9_solar_k.F90, rttov_transmit_9_solar_tl.F90, rttov_transmit_ad.F90, rttov_transmit_k.F90, rttov_transmit_tl.F90, rttov_user_options_checkinput.F90, rttov_user_profile_checkinput.F90
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satrad/rttov/other	rttov_coef_info.F90, rttov_print_opts.F90, rttov_print_profile.F90
satrad/rttov/parallel	rttov_parallel_ad.F90, rttov_parallel_direct.F90, rttov_parallel_k.F90, rttov_parallel_tl.F90
satrad/rttov/test	rttov_k_ad.F90, rttov_k_bf.F90, rttov_k_tl.F90, rttov_make_opt_param.F90, rttov_make_pccomp_inc.F90, rttov_make_profile_inc.F90, rttov_make_radiance_inc.F90, rttov_scale_pccomp_inc.F90, rttov_scale_profile_inc.F90, rttov_scale_radiance_inc.F90
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surf/external	surf_inq.F90, surfexcdriver.F90
surf/function	fcsvdfs.h
surf/interface	surf_inq.h, surfexcdriver.h
surf/make/cfg	cce-optS.cfg, gnu-optS.cfg
surf/make	cce-optS.cfg, gnu-optS.cfg, osm.cfg
surf/module	cotworestress_mod.F90, flake_driver_mod.F90, flakeene_mod.F90, flakerad_mod.F90, sppcfl_mod.F90, sppcflsad_mod.F90, sppcflstl_mod.F90, sppgust_mod.F90, srfsn_driver_mod.F90, srfsn_lwimp_mod.F90, srfsn_regrid_mod.F90, srfsn_rsn_mod.F90, srfsn_vgrid_mod.F90, srfsn_webal_mod.F90, surfexcdriver_ctl_mod.F90, surfseb_ctl_mod.F90, surfsebs_ctl_mod.F90, surfsebsad_ctl_mod.F90, surfsebstl_ctl_mod.F90, surftstp_ctl_mod.F90, suscst_mod.F90, susflake_mod.F90, sussoil_mod.F90, suvexc_mod.F90, suvexc_mod.F90, vexcs_mod.F90, vlamsk_mod.F90,

	vsurf_mod.F90, vupdz0_mod.F90, yos_exc.F90, yos_flake.F90
surf/offline/driver	callpar1s.F90, cpg1s.F90, dtforc.F90, incdat.F90, netcdf_utils.F90, parkind1.F90, rdfvar.F90, rdsupr.F90, sucst.F90, sudcdf.F90, sufcdf.F90, sugdi1s.F90, sugp1s.F90, suinif1s.F90, sulun1s.F90, suphec.F90, suvdfs.F90, upddiag.F90, vdfdifh1s.F90, vdfmain1s.F90, wrtdcdf.F90, yoephy.F90, yomgdi1s.F90, yomgf1s.F90
surf/offline/function	fcttim.h, fcvdfs.h
surf/offline/namelist	namct01s.h
surf/offline/util	mpl_mod_ctl.F90
surfex/SURFEX	mode_gridtype_conf_proj.F90
trans/external	setup_trans.F90, trans_inq.F90
trans/interface	setup_trans.h, trans_inq.h
trans/module	dealloc_resol_mod.F90, dist_grid_ctl_mod.F90, ftinv_ctl_mod.F90, ledir_mod.F90, leinv_mod.F90, ltinv_ctl_mod.F90, setup_geom_mod.F90, suleg_mod.F90, supolf_mod.F90, tpm_fields.F90, tpm_geometry.F90
trans/programs	rgrid.F90

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**GUIDARD Vincent**

**Doc:**

*Fix for inter-channel obs error correlation in MF case.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs

**Git branch:** guidardv\_CY46T1\_interChanCorr

**Modified:**

arpifs/var

surad.F90





arpifs/io\_serv

io\_serv\_suiosctmpl.F90

**Doc:**

*Fix bug in grid-point norm calculations (non reproducible in single prec.), refactor verint.F90 in order to be able to use plain matrix multiply.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs, trans

**Git branch:** marguina\_CY46T1\_sp1

**Modified:**

arpifs/utility verint.F90

trans/external gpnorm\_trans.F90

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**MARSDEN Olivier**

**Doc:**

*Fix minor bugs.*

**Projects:** arpifs, ifsaux

**Git branch:** gco\_CY46T1\_r1.02%marsdeno\_fixes

**Modified:**

arpifs/canari	caapar.F90
arpifs/module	yomgrib.F90
arpifs/namelist	namgrib.nam.h
ifsaux/fa	facgrm.F90
ifsaux/module	mpl_abort_mod.F90

**Doc:**

*Last fixes from ECMWF upon CY46T1\_r1.04 .*

*\* io\_serv\_suiosctmpl.F90: fix a Cray compiler issue (line 354).  
\* hop.F90: fix test on NSATEM (add .OR. LECMWF - line 507).*

**Projects:** arpifs

**Git branch:** gco\_CY46T1\_r1.04%marsdeno\_misc

**Modified:**

arpifs/io_serv	io_serv_suiosctmpl.F90
arpifs/op_obs	hop.F90

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**PAYAN Christophe**

**Doc:**

*Scatt update: HY-2A reinserted properly.*

**Projects:** arpifs

**Git branch:** payan\_CY46T1\_r1v01\_scattupdt

**Modified:**

arpifs/module parersca.F90

arpifs/obs\_preproc defrun.F90, fgwnd.F90, kscatin.F90, scaqc.F90, sufglim.F90

arpifs/op\_obs obsop\_conv.F90

arpifs/var suscat.F90

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## **SPANIEL Oldrich**

### **Doc:**

*arpifs/setup/sugfl3.F90: fix - at line 560 missing argument LDADV=YUOM\_NL%LADV in CALL SET\_GFL\_ATTR for ALARO physics.*

*aladin/setup/suetrans0.F90: modification according to global code at line 99  
LALLOPERM=(NOPT\_MEMORY>=1)*

**Projects:**        aladin, arpifs

**Git branch:**    spaniel\_CY46T1\_r1\_v02\_alaro\_fix

### **Modified:**

aladin/setup                                suetrans0.F90

arpifs/setup                                sugfl3.F90

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## **VOITUS Fabrice**

### **Doc:**

*Main fixes for module/Setup of LAM configuratons, and SL trajectory research + TL/AD and SLHD option.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** aladin, arpifs, biper, etrans, ifsaux, satrad, utilities

**Git branch:** voitus\_CY46T1\_olda\_fab\_fix

### **Modified:**

aladin/adiab	elarmes.F90, elarmes5.F90, elarmesad.F90, elarmestl.F90, especrt.F90
aladin/c9xx	eincli10.F90
aladin/interpol	elascaw.F90, elascawad.F90, elascawtl.F90
aladin/sinvect	ewrtsv.F90
aladin/var	ecosjr.F90, ewreini.F90, suecvtest.F90, suejbtest.F90, suescal.F90
arpifs/adiab	gnh_conv_nhvar.F90, lapinea5.F90, lapineaad.F90, spnh_conv_nhvar.F90
arpifs/control	cnt4.F90, cprep3.F90, reresf.F90, reresf_part2.F90
arpifs/fullpos	hpos.F90, subfpos.F90, sufpc.F90, sufpggeometry.F90
arpifs/io_serv	io_serv_suiosctmpl.F90, io_serv_write_ec.F90
arpifs/phys_dmn	aplpar.F90
arpifs/setup	print_gfp.F90, su0yoma.F90, suafn.F90, suafn1.F90, suafn2.F90, suafn3.F90, sudimf1.F90, sudyn.F90, sudyna.F90
arpifs/transform	transinv_nhconv.F90
arpifs/utility	opdis.F90
biper/programs	test_Ezones.F90, test_TwoTrunc.F90
etrans/external	esetup_trans.F90, etrans_inq.F90
etrans/interface	esetup_trans.h
ifsaux/module	mpl_abort_mod.F90, parkind_wave.F90, sdl_mod.F90
ifsaux/support	timef.F

satrad/module	gaussgrid.F90
satrad/rttov/mw_scatt	rttov_boundaryconditions.F90, rttov_boundaryconditions_ad.F90, rttov_boundaryconditions_tl.F90
utilities/rdc/src	sudil.F90

**Doc:**

*Main fixes (introduced by Ryad El Khatib) for fullpos-setup, and i/o-server.*

*NO NUMERICAL IMPACT IS EXPECTED.*

**Projects:** arpifs, ifsaux, satrad

**Git branch:** voitux\_CY46T1\_ryad\_fix

**Modified:**

arpifs/control	cnt4.F90, cprep3.F90, reresf.F90, reresf_part2.F90
arpifs/fullpos	hpos.F90, subfpos.F90, sufpc.F90, sufpggeometry.F90
arpifs/io_serv	io_serv_suiosctmpl.F90, io_serv_write_ec.F90
arpifs/phys_dmn	aplpar.F90
arpifs/setup	print_gfp.F90, su0yoma.F90, suafn2.F90, suafn3.F90, sudimf1.F90
arpifs/utility	opdis.F90
ifsaux/module	parkind_wave.F90
ifsaux/support	timef.F
satrad/module	gaussgrid.F90
satrad/rttov/mw_scatt	rttov_boundaryconditions.F90, rttov_boundaryconditions_ad.F90, rttov_boundaryconditions_tl.F90