

HIRDLS

SW-HIR-2024

HIGH RESOLUTION DYNAMICS LIMB SOUNDER

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Subject/Title: **General Development strategy and notes on running jobs.**

Description/Summary/Contents

Keywords:

Purpose of this Document:

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EOS

General Development Strategy

- 1) Development** – Code changes, incorporate new/modified routines from scientists, update compilers and/or mkl library, update to latest Toolkit. I would try to group all of the non-answer changes into one Build and answer-changing into another.
- 2) Testing** – I would usually just run a simple one orbit test to check my changes quickly.
- 3) Checkin to StarTeam (Buildxxx)**- Check all changes into StarTeam and create a Build label
- 4) Run regression testing** – Run all regression tests and compare against previous release. For GPH changes, I have run just a couple of tests by hand since the scope of GPH is limited to the BOP module. For non-answer changing, the results should compare exactly. Answer changing changes require a more detailed analysis. This can be either comparing a run with a run that the scientist made offline or requesting that the scientist view the results and signoff on the run(s).
- 5) Repeat steps 1-4 until all tests work properly** – There could be several Build labels created before a SIPS delivery is made.
- 6) Create SIPS Delivery label (Vxx.xx.xx)**
- 7) Email SIPS and all HIRDLS users about new release**

RUNNING JOBS

bin/run_build - To run L2 in a testing mode in the SCF, use the bin/run_build command. Its details are documented in bin/run_build.doc. It calls the rl2 script listed below.

bin/rl2 - Jobs run in both the SCF and SIPS environments use the rl2 command to translate information from the USF (user setup file) to the CFG (config) and PCF (process control file used by the Toolkit) and it then runs the L2 processor. The SCF or SIPS user should only need to modify the values in the USF. Developers may need to add additional fields to the USF file to allow new fields to be set in the CFG or PCF. Generic CFG and PCF "mask" files are used by rl2, values are overwritten as specified in the USF and new CFG and PCF files are created for use in the run. A separate USF is used for each of the main L2 steps (CLG, RTP/SIM and BOP). Both CLG and BOP can be run with only one thread. RTP and SIM can be run with multiple threads. Threads are enabled by the script calling separate standalone L2 jobs and then merging the output file(s) together at the end. Neither MPI nor OpenMP are used or required to be on the system.

data/regRuns – "regRuns Buildxxx Buildyyy" - This script submits the suite of regression tests using Buildxxx. If Buildyyy is supplied then the results are automatically compared to this Build. No changes need to be made by hand to any of these scripts except possibly updating to a newer Toolkit.

HIRDLS PROCESSOR SUBDIRECTORIES/MODULES SUMMARY

H2 – Module used by the entire L2 processor. Contains type definitions as well as overloaded general purpose routines and parameters.

H2BOP – “Build Output” – Converts a HIRPROF (HIRDLS profiles on altitude grid) to HIRDLS2ALL (HIRDLS profiles on pressure grid)

H2C – C routine which performs a UNIX system call

H2CLP – “Collocate” – Part of CLG step – Creates time/lat/long collocated climatology and apriori files from gridded input files

H2GMC – “GMAO Collocator” – Part of CLG step – Creates time/lat/long collocated GMAO file from gridded GMAO input data

H2LSP – “Line of Sight” – Called by RTP step – Creates profiles along the line of sight and includes the requested observation profile in the middle. This could be either climatology, model, GMAO or a previously retrieved HIRPROF profile.

H2LWP – “Line of sight weighting” – Part of CLG step – Finds the weighting profiles for each point along the line of sight for every profile in the HIRRAD file. Creates the weighting file (H2LSGW)

H2MET – “Metadata” – HIRDLS files archived at the Goddard DISC require specific metadata to be attached to the files. This module creates that metadata.

H2ROE – science retrieval routine – calls the following modules H2RAL, H2RBA, H2RLD, H2RMA, H2RRC, H2RRN, H2RRT, H2RSS, H2RSU, H2RWF – the specifics of these routines will be described in another document.

H2RTP – “Retrieval wrapper” – The module which handles the I/O for the science retrieval routines

MERGE – Standalone routines which run outside of L2. Routines provided to merge HIRPROF and HIRRAD. The HIRRAD merging is used for HIRRDSIM and HIRRDSYN files.

SWATH – “Swath routines” – Routines to handle reading/writing of HDF-EOS5 Swath formatted files. Uses definition files to drive the specific fields which are read/written. Also can be driven by PROFILEIDs.

USF FILES – General info

%XXXX% are strings which are substituted within SIPS. These strings should not be removed.

indicates a comment

Fields which are routinely changed during SCF development are highlighted. Any field may be changed though. Use of the run_build script changes a number of fields which would need to be changed by hand.

Italicized descriptions are comments that are added for this document and do not appear in the USF files

USF FILES – CLG step

TOOLKIT = /usr/local/TOOLKIT5.2.17n	<i>Identifies toolkit (must match the toolkit used in the compilation step as well as the one named in rl2)</i>
RUNCLP = .true.	<i>Runs CLP section</i>
RUNGMC = .true.	<i>Runs GMC section</i>
RUNLWP = .true.	<i>Runs LWP section</i>
RTPRARLoop01 = "	<i>Blank string indicates to not run RTP section</i>
RUNBOP = .false.	<i>Does not run BOP section</i>
RUNTAG = TESTX	<i>Tag identified – substituted with –t flag in run_build, PGE version in SIPS</i>
EXEC = time ./H2Main	<i>execute command</i>
#DEBUGXEXEC = totalview ./H2Main_debug	<i>#DEBUG is removed in run_build if –d is specified</i>
# NUMBER OF PROCESSORS	
NTHREADS = 1	<i>May only run one thread for CLG step</i>
RUNSCRIPT= l2.ksh	<i>Name of run script – don't change</i>
# OUTPUT CAPTURED SCREEN FILE	
SCREENOUT= level2-%FULLJOBID%.out	<i>Name of file where screen output is redirected</i>
# RUN SUPPORT FILES	
HIR2CFG_MASK = %DATA%/HIR2CFG-Mask.txt	<i>Name of mask configuration file</i>
HIR2PCF_MASK = %DATA%/HIR2PCF-Mask.txt	<i>Name of mask PCF file</i>
HIR2CFG = HIR2CFG-%FULLJOBID%.txt	<i>Name of final (substituted) configuration file</i>
HIR2PCF = HIR2PCF-%FULLJOBID%.txt	<i>Name of final (substituted) PCF file</i>
# INPUT FILES	
HIRRAD = /sips/prod/web/nls/HIRRAD/2006/05/18/00/HIRRAD_v05-00-00-c01_2006d138.he5	
# If GEOS72 is true, then GEOS5 must also be true!!!	
GEOS5 = .true.	<i>If true, use GMAO5. If false, use GMAO4</i>
GEOS72 = .true.	<i>If true, use 72 level GMAO. If false, use 36 level GMAO</i>
GEOS72aFILES =	
/sips/prod/web/nls/D5HIRDL4v10/2006/05/18/D5HIRDL4.ops.asm.tavg3d_dyn_v.GEOS510.20060518_0000.V01c1.hdf,/sips/prod/web/nls/D5HIRDL4v10/2006/05/18/D5HIRDL4.ops.asm.tavg3d_dyn_v.GEOS510.20060518_0600.V01c1.hdf,/sips/prod/web/nls/D5HIRDL4v10/2006/05/18/D5HIRDL4.ops.asm.tavg3d_dyn_v.GEOS510.20060518_100.V01c1.hdf,/sips/prod/web/nls/D5HIRDL4v10/2006/05/18/D5HIRDL4.ops.asm.tavg3d_dyn_v.GEOS510.20060518_1800.V01c1.hdf,/sips/prod/web/nls/D5HIRDL4v10/2006/05/19/D5HIRDL4.ops.asm.tavg3d_dyn_v.GEOS510.20060519_0000.V01-c1.hdf	
GEOS72bFILES =	
/sips/prod/web/nls/D5HIRDL6v10/2006/05/18/D5HIRDL6.ops.asm.tavg3d_dyn_v.GEOS510.20060518_0000.V01c01.hdf,/sips/prod/web/nls/D5HIRDL6v10/2006/05/18/D5HIRDL6.ops.asm.tavg3d_dyn_v.GEOS510.20060518_0600.V01c01.hdf,/sips/prod/web/nls/D5HIRDL6v10/2006/05/18/D5HIRDL6.ops.asm.tavg3d_dyn_v.GEOS510.20060518_1200.V01c01.hdf,/sips/prod/web/nls/D5HIRDL6v10/2006/05/18/D5HIRDL6.ops.asm.tavg3d_dyn_v.GEOS510.20060518_1800.V01c01.hdf,/sips/prod/web/nls/D5HIRDL6v10/2006/05/19/D5HIRDL6.ops.asm.tavg3d_dyn_v.GEOS510.20060519_0000.V01-c01.hdf	

HIR2CLIM = DATECHOICE

rl2 script selects correct file based on date in HIRRAD

1993-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2004/HIR2CLIM-BCK-v5.he5

2005-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2005/HIR2CLIM-BCK-v5.he5

2006-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2006/HIR2CLIM-BCK-v5.he5

2007-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2007/HIR2CLIM-BCK-v5.he5

2008-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2008/HIR2CLIM-BCK-v5.he5

ENDCHOICE

HIR2APR = DATECHOICE

rl2 script selects correct file based on date in HIRRAD

1993-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2004/HIR2APR-BCK-v5.he5

2005-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2005/HIR2APR-BCK-v5.he5

2006-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2006/HIR2APR-BCK-v5.he5

2007-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2007/HIR2APR-BCK-v5.he5

2008-01-01 /%host%/cacraig/COMMON/WACCM93/monthlyClimApr/2008/HIR2APR-BCK-v5.he5

ENDCHOICE

INPUT/OUTPUT FILES

HIR2CLCC = HIR2CLCC-%FILE%.he5

output collocated climatology file

HIR2CLCG = HIR2CLCG-%FILE%.he5

output collocated GMAO file

HIR2CLCA = HIR2CLCA-%FILE%.he5

output collocated apriori file

HIR2LSGW = HIR2LSGW-%FILE%.he5

output line of sight weighting file

HIRDLS2D = HIRDLS2D-%FULLJOBID%.txt

output diagnostic file (contains information from the run)

HDF-EOS AND METADATA SUPPORT FILES

HIRRADDEF = %DATA%/HIRRAD_def.txt

definition file for HIRRAD

HIR2CLCCDEF = %DATA%/HIR2CLCC_def.txt

definition file for CLCC file

HIR2CLCGDEF = %DATA%/HIR2CLCG_def.txt

definition file for CLCG file

HIR2CLCADEF = %DATA%/HIR2CLCA_def.txt

definition file for CLCA file

HIR2LSGWDEF = %DATA%/HIR2LSGW_def.txt

definition file for LSGW file

FLAGS

AprErrAdj = .true.

If true, adjusts the apriori errors

GMAOTinAPR = .true.

If true, puts GMAO temperature in apriori file

GMAOO3inAPR = .true.

If true, puts GMAO O3 in apriori file

GMAOH2OinAPR = .false.

If true, puts GMAO H2O in apriori file

SMTHTEMP = .true.

If true, then boxcar smooths GMAO temperature

USF FILES – RTP step

TOOLKIT = /usr/local/TOOLKIT5.2.17n

Identifies toolkit (must match the toolkit used in the compilation step as well as the one named in rl2)

MERGE_HIRRAD_EXE = MERGE_HIRRAD

Name of HIRRAD merge executable

MERGE_HIRPROF_EXE = MERGE_HIRPROF

Name of HIRPROF merge executable

RUNCLP = .false.

Do not run CLP step

RUNGMC = .false.

Do not run GMC step

RUNLWP = .false.

Do not run LSGW step

NSTAGES=3

Number of separate RTP stages

RTPRARLoop01 = 'R01'

R01 = use HIR2CTRL01 control file

RTPRARLoop02 = 'R02'

R02 = use HIR2CTRL02 control file – IF ONLY ONE

RETRIEVAL STEP, DELETE THIS LINE

RTPRARLoop03 = 'A01'

A01 = use HIR2RARC01 control file

RUNBOP = .false.

Do not run BOP

RUNTAG = TESTX

Tag identified – substituted with –t flag in run_build, PGE version in SIPS

EXEC = time ./H2Main

execute command

#DEBUGXEXEC = totalview ./H2Main_debug

#DEBUG is removed in run_build if –d is specified

IDENTIFY FILE TO GET THE VERSION/CYCLE/DATE INFO FROM - ONLY USED WITHIN SIPS

WITH FILES WHICH ARE NOT STORED BY SIPS

FULLJOBIDFILE=HIRPROF

NUMBER OF PROCESSORS

NTHREADS = 20

Number of threads for job

RUNSCRIPT= l2.ksh

Name of run script – don't change

OUTPUT CAPTURED SCREEN FILE

SCREENOUT= level2-%FULLJOBID%.out

Name of file where screen output is redirected

RUN SUPPORT FILES

HIR2CFG_MASK = %DATA%/HIR2CFG-Mask.txt

Name of mask configuration file

HIR2PCF_MASK = %DATA%/HIR2PCF-Mask.txt

Name of mask PCF file

HIR2CFG = HIR2CFG-%FULLJOBID%.txt

Name of final (substituted) configuration file

HIR2PCF = HIR2PCF-%FULLJOBID%.txt

Name of final (substituted) PCF file

INPUT FILES

HIRRAD = /sips/prod/web/nls/HIRRAD/2006/05/18/00/HIRRAD_v05-00-00-c01_2006d138.he5

#HIRRAD = /hir1t/cacraig/HIRRAD.5151.2006d138.he5

HIR2CLCC = HIR2CLCC-%FILE%.he5

input collocated climatology file

HIR2CLCG = HIR2CLCG-%FILE%.he5

input collocated GMAO file

HIR2CLCA = HIR2CLCA-%FILE%.he5

input collocated apriori file

HIR2CLCM = /hir1t/cacraig/Build106/SIPS_2006d138/HIR2CLCM-SIPS_b106_2006d138.he5

input collocated model file

HIR2LSGW = HIR2LSGW-%FILE%.he5

input line of sight weighting file

HIR2CTRL01 = %DATA%/HIR2CTRL-RTP-SIPS-FM1.txt

Control file for retrieval step 1

HIR2CTRL02 = %DATA%/HIR2CTRL-RTP-SIPS-FM2.txt

Control file for retrieval step 2

HIR2RARC01 = %DATA%/HIR2CTRL-RTP_RAR.txt

Control file for RAR step 1

HIR2ARSP = /%host%/cacraig/COMMON/HIR2ARSP_c5_na.he5

input aerosol spectrum data (for RAR step)

HIR2TRA = /%host%/cacraig/COMMON/HIR2TRA_c23_na.hdf

input transmittance table

INPUT/OUTPUT FILES

HIRPROF = HIRPROF-%FILE%.he5

output HIRPROF

HIRDLS2 = HIRDLS2-%FILE%.he5

output HIRDLS2 – not created if only RTP step

HIRRETD = HIRRETD-%FULLJOBID%.bin

output retrieval diagnostic file - optional

HIRDLS2D = HIRDLS2D-%FULLJOBID%.txt

output diagnostic file (contains information from the run)

HIRRDSIM = HIRRDSIM-%FILE%.he5

output simulated data (with noise)

HIRRDSYN = HIRRDSYN-%FILE%.he5

output simulated data (no noise)

HIRLOS2D = HIRLOS2D-%FILE%.he5

output LineOfSight diagnostic information

HDF-EOS AND METADATA SUPPORT FILES

MCFWRITETEMP = MCFWRITE.temp

temporary file for metadata writing

HIRRADDEF = %DATA%/HIRRAD_def.txt

definition file for HIRRAD (HIRRDSIM and HIRRDSYN)

HIRLOS2DDEF = %DATA%/HIRLOS2D_def.txt

definition file for HIR2LOS2D

HIRPROFDEF = %DATA%/HIRPROF_def.txt

definition file for HIRPROF

Flags

HIRPROFNEW = 'Y'

Create a HIRPROF from scratch (if starting a second retrieval step, then this is 'N')

STARTPROF = 0

Start ProfileID

STOPPROF = 0

Stop ProfileID (if both 0,0 then process all of data)

REPROCESSINGPLANNED = 'further update anticipated using enhanced PGE' for metadata

for metadata

REPROCESSINGACTUAL = 'processed once'

for metadata

PGEVERSION = '1.6.0'

If 'YES' produce a HIRRADFIT file

HIRRADFIT = 'YES'

USF FILES – BOP step

Run-time

TOOLKIT = /usr/local/TOOLKIT5.2.17n

RUNCLP = .false.

Do not run CLP step

RUNLWP = .false.

Do not run LWP step

RTPRARLoop01 = "

Do not run RTP/RAR step

RUNBOP = .true.

Run BOP step

RUNTAG = TESTX

Tag identified – substituted with –t flag in run_build, PGE version in SIPS

EXEC = time ./H2Main

execute command

#DEBUGXEXEC = totalview ./H2Main_debug

#DEBUG is removed in run_build if –d is specified

IDENTIFY FILE TO GET THE VERSION/CYCLE/DATE INFO FROM - ONLY USED WITHIN SIPS

WITH FILES WHICH ARE NOT STORED BY SIPS

FULLJOBIDFILE=HIRDLS2

NUMBER OF PROCESSORS

NTHREADS = 1

May only run one thread for CLG step

RUNSCRIPT= l2.ksh

Name of run script – don't change

OUTPUT CAPTURED SCREEN FILE

SCREENOUT= level2-%FULLJOBID%.out

Name of file where screen output is redirected

RUN SUPPORT FILES

HIR2CFG_MASK = %DATA%/HIR2CFG-Mask.txt

Name of mask configuration file

HIR2PCF_MASK = %DATA%/HIR2PCF-Mask.txt

Name of mask PCF file

HIR2CFG = HIR2CFG-%FULLJOBID%.txt

Name of final (substituted) configuration file

HIR2PCF = HIR2PCF-%FULLJOBID%.txt

Name of final (substituted) PCF file

INPUT FILES

HIRPROF = HIRPROF-%FILE%.he5

Input HIRPROF

EGM96 = %DATA%/EGM96-1.txt

Input file for GPH calculation

CORRCOE = %DATA%/CORRCOE.txt

Input file for GPH calculation

OUTPUT FILES

HIRDLS2ALL = HIRDLS2ALL-%FILE%.he5

Output HIRDLS2ALL file

HIRDLS2D = HIRDLS2D-%FULLJOBID%.txt

output diagnostic file (contains information from the run)

HDF-EOS AND METADATA SUPPORT FILES

MCFWRITETEMP = MCFWRITE.temp

temporary file for metadata writing

HIRDLS2ALLDEF = %DATA%/HIRDLS2ALL_def.txt

definition file for HIRDLS2ALL file

HIRDLS2MCF = %DATA%/HIRDLS2.mcf

metadata control file for HIRDLS2ALL file

FLAGS

REPROCESSINGPLANNED = 'further update anticipated using enhanced PGE' *for metadata*

REPROCESSINGACTUAL = 'processed once' *for metadata*

PGEVERSION = 'TestBuild' *for metadata*

BUILDNUMBER = '%pgeversion%' *for metadata (SIPS replaces this with their PGE name)*