

GSAS v3.7 Release Notes

GLAS Team
December 9, 2003

Introduction

GSAS 3.7 contains fixes and minor modifications for L1A, Atmosphere, Waveform, and Elevation processes and products.

For L1A, the following changes were made:

- Added alarm limit checking for GLA03. Improved GLA03 Quality Assurance Product (QAP).
- Fixed duplicate times in GLA04 BST and fixed condition where GLA04 IST and LRS granule end times were 0. Fixed an error in GLA04 IST when the timetag=0. Software now generates QAP04 files.
- Improved GLA01 and GLA02 parameter data base documentation.
- Made laser energy calculations component-sensitive and updated related coefficients.
- Fixed errors and made general improvements in the GLA02 processing code.

For Waveforms, the following changes were made:

- Made laser energy calculations component-sensitive and updated related coefficients.
- Improved GLA05 parameter data base documentation.
- Fixed a problem where some elevations were shown as invalid on GLA05 but valid on elevation products – these invalid elevations will now be valid on GLA05
- Modified weighting of measurements in waveform fitting procedure to use more realistic numbers. This allowed more iterations for irregular returns.
- Fixed option that allows GLA05 to be created with predicted orbits – not used for normal processing, just testing of algorithms by the science team.
- Improved QAP05.
- Fixed transmit pulse major axis – I_tpmajoraxis; now stored in cm so will not overflow 2 byte field – negative numbers in previous releases were caused by this overflow
- Fixed a problem where the max-amp peak had an invalid estimate and was being discarded.

For Elevation processes, the following changes were made:

- Added calculation of the ground track azimuth from footprint locations; d_azimuth.

- Fixed i_sigmaatt (Attitude Quality Indicator)
- Fixed a problem that did not output negative Sun Angles
- Fixed transmit pulse major axis – I_tpmajoraxis; now stored in cm so will not overflow 2 byte field – negative numbers in previous releases were caused by this overflow
- Improved elevation QAP (QAP05,12-15).
- Fixed a problem with isolated and sporadic spikes in the GLA06 azimuth value.

For Atmosphere, the following changes were made:

- The atmosphere calibration file was modified to handle larger values/more precision.
- GLA10 and GLA11 will now have non-0 values.
- Fixed 532 afterpulse correction (SPCM run on after hitting thick clouds)
- 532 calibration constant is being computed from anc36 (prior releases used a default constant)
- Fixed 1064 background correction
- Implemented 532 Channel Afterpulse Correction

Other, more general fixes include:

- Several flag definitions were changed/updated.
- Production documentation was updated/fixed.
- Significant changes were made to the QA and browse products.
- Metadata files were updated to work with ESDT changes.

Product Format/Definition Change Summary

GLA01:

“i_ObScHt” changed product units=millimeters, algorithm units=meters, minimum value= -1.0D9, maximum value= 1.0D9

“i_txwfPk_Flag” changed maximum value=8

“i_instState” changed maximum maximum value=524288

“i_Hoff” changed product units=millimeters, algorithm units=meters, minimum value= -1.0D9, maximum value= 1.0D9

“i_4nsBgMean” changed product units from counts to .01 counts

“i_4nsBgSDEV” changed product units from counts to .01 counts

GLA05

"d_maxTrAmp" changed scale 1.0d-3 to 1.0d-4

"d_maxTrAmp" changed product units millivolts to 0.1 millivolts

"i_gval_rcv" & "i_gval_tx" changed Invalid value NO to i2b
"i_maxRecAmp" changed min value= -300, max value= 30000
"i_maxSmAmp" changed min value= -300, max value= 30000
"i_maxTrAmp" changed min value= -300, max value= 30000
"i_npeaks1" changed min value= 0, max value= 50
"i_tpmajoraxis" changed product units to centimeters
"i_centroidInstr" changed description to "surrounding the maximum amplitude peak"
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)
"i_solnSigmas1" changed description
"i_solnSigmas2" changed description
"i_pcntsat1", "i_pcntsat2" changed To spares

GLA06

"i_maxSmAmp" changed min value= -300, max value= 30000
"i_reflcor_atm" changed min value= 0, max value= 1000000
"i_npeaks1" changed min value= 0, max value= 50
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)

GLA12

"i_maxSmAmp" changed min value= -300, max value= 30000
"i_reflcor_atm" changed min value= 0, max value= 1000000
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)

GLA13

"i_maxSmAmp" changed min value= -300, max value= 30000
"i_reflcor_atm" changed min value= 0, max value= 1000000
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)

GLA14

"i_maxSmAmp" changed min value= -300, max value= 30000
"i_reflcor_atm" changed min value= 0, max value= 1000000
"i_npeaks1" changed min value= 0, max value= 50
"i_sigmaatt" changed possible values to 0 (good), 50 (warning), and 100 (bad)

GLA15

"i_maxSmAmp" changed min value= -300, max value= 30000

“i_reflcor_atm” changed min value= 0, max value= 1000000

“i_sigmaatt” changed possible values to 0 (good), 50 (warning), and 100 (bad)

The latest product formats/descriptions will be available at
http://glas.wff.nasa.gov/v37_products/.

Known Problems

GLA16 is still not ready for production.

Release Information

The ClearCase label for this release is RELEASE_3.7.

The release date is December 05, 2003.

Version numbers have been updated to “V3.7 November 2003” for the following:

- all libraries
- GLAS_L1A
- GLAS_Alt
- GLAS_Atm
- GLAS_Meta
- anc07_00
- anc07_01
- anc07_02
- anc07_03
- anc07_04
- anc07_05
- anc45_01-15

This should be verified during operation by checking the version information in the appropriate ANC06 files.

SMDS Impact

The distribution tarfile is on glasdev.wff.nasa.gov at the following location:

```
/glasdev1/v3/dist/gsas_v3.7.tar.z.
```

ANC Files

New versions of all the ANC07, ANC45 and ANC46 data files are required.

Compilation

All libraries and binaries should be recompiled using the top-level Makefile.

IMPORTANT: due to internal changes in the makefiles, SDMS MUST use

the command "make runtime" to ensure the software is made without debug flags.

The process for making the libraries and binaries is as follows (**NOTE: SDMS ONLY!!**)

```
cd /install_dir/gsas_v3.7
make runtime
make install
```

Note : developers should not use the above procedure. This procedure is for SDMS only!

Detailed Change Notes

0000334 : d_Azimuth is always invalid

The footprint track azimuth is now computed and included in GLA06 and GLA12 through GLA15. This quantity was not previously computed, with only an R*8 invalid value filled in as a default.

0000338 : GLA02 Release 12 problems found from QA

No action was required.

0000367 : Add alarm limits for use with QAP03

Added limit checking functionality to QAP03. The nominal on orbit yellow limits are checked for each temperature, voltage, and current on the GLA03 product. When a temperature, voltage or current goes above or below the yellow limits, an error code is created, and is shown in the anc06 file for every 500 occurrences. A counter for the "OUT BNDS" with the corresponding variable name is in the QAP03 summary output structure.

0000476 : Completion of testing for sigmaatt data change

The Attitude Quality Indicator, `i_sigmaatt`, has been revised. This parameter appears in GLAS data products 05, 06, and 12-15. Values now available are 0 (good), 50 (warning), and 100 (bad). Previous data products only carried values of 0 (good) and 1 (bad).

0000504 : QAP03 along-track and summary start and end times incorrect

Changes the along track time frame from an incorrect 16 seconds, to the correct time of 3600 seconds so the along track statistics are collected over one hour. A change was made to allow for the along track and summary start and stop times in the QAP file to reflect the actual time of the data, rather than the requested start and stop time from the control file. The GLA03 data is every 16 seconds, and because the start and stop of the data may not reside on a perfect 3600 second boundary there may not always be exactly 3600 seconds in an along track record. There could be up to a 15 second deficit due to the start and stop times of the data. If you have 1.5 hours worth of data, the second along track would also not be a full 3600 seconds, but will measure statistics on the entire 1800 seconds that are available.

0000516 : Coordinate anc08 and anc09 File Opens with Manager Access

Software has been amended to guarantee that orbit and attitude degradations contained within the headers for anc08 and anc09 files is set appropriately for WF, ELEV, and ATM software subsystems. It is also possible to substitute alternate files between WF and ELEV processing and to have the flags be reset rather than just passed up through the GLAS product data chain.

0000531 : Histogram of freeboard for GLA15 computed incorrectly

The computation of the oceans elevation histogram in the QAP file for the GLA15 data product has been corrected. It was previously computed incorrectly using the sea ice values. The parameter being tallied for a histogram is not really freeboard (height of ice above sea level). It is the elevation of the ocean level w.r.t. earth's geoid. The new parameter name is i_HistElevWRTGeoidOC.

0000558 : Lat/lons not changing within 40 Hz for some GLA05

Whenever processing conditions result in an invalid set of lat/lon coordinates because there is no signal, the 1 Hz coordinates are retrieved from GLA01 and propagated into higher level product files. Though understandably less accurate, an approximate coordinate is better than no coordinate. This substitution can happen for an entire record, or for just a portion of the shots within a record, or for several non-connected portions of the shots within a record. Thus the coordinates appear "choppy" and discontinuous; however, this is so only when the signal is not usable. The User's Guide will be amended to show this condition so that it is understood to NOT be an error condition. Also, the NSIDC User's Guide has had the comment added indicating if wfqual indicates no signal then the geolocation is predicted at a 1Hz rate.

0000594 : ElevMgr : Incorrect use of LOGICAL function

This software change causes no known differences in GLA products--it merely averts a potential execution change.

0000596 : Remove array from subroutine A_qa_G8_11

An array size limitation for processing of GLA08 QA data related to PBL (planetary boundary layer) height has been eliminated.

0000656 : No QAP04 from integration branch

GLA04 QAP files are now filled appropriately. Also see CR0000750.

0000686 : Array size error in funpk_AttFlg2

This corrects a potential trouble spot in the software which manipulates the attitude flags; however, it was an error that did not manifest any known data errors in the GLAS products.

0000687 : gla01 units on product and algorithm are both counts, but there is a scale factor other than 1

Prod Units have been changed from 'counts' to '.01 counts' in the variables i_4nsBgMean & i_4nsBgSDEV

0000702 : The Elevation manager will incorrectly calculate the Sun angle if ANC09 is not being used as an input

See Items PR0000829, PR0000816, PR0000706.

0000706 : fake PAD used in calculation of beam coelevation and azimuth in elev mgr

See Items PR0000829, PR0000816, PR0000706.

0000721 : The BST has near duplicate times

Added code (under PR0000750) to throw out data if time2-time1 < .001 seconds.

0000724 : Documentation for GLA05%i_centroidInstr Needs to be Updated

Changed the long description "surrounding the last peak" to read "surrounding the maximum amplitude peak".

0000725 : Spurious records from logic error in ElevMgr

A logic error was resolved in ElevMgr which eliminated the introduction of spurious scattered data records into products GLA12-GLA15.

0000729 : V3.6 Product Database Errors

The following are the changes that were made:

alg var "i_AttFlg" changed i4b(5) to i4b(8) in GLA05,06,07,12-15

changed i4b(4,4) to i4b(8,4) in GLA08-11

alg var "i_podFlg" changed i4b(3) to i4b(6) in GLA01,02,05-07,12-15

changed i4b(3,4) to i4b(6,4) in GLA08-11

alg var "rngCorrFlg" changed i4b(5) to i4b(7) in GLA05,06,12-15

alg var "i_elvFlg" changed i4b(40) to i4b(8,40) in GLA05,06,12-15

alg var "i_RngOffQF" changed i4b(8,40) to i4b(16,40) in GLA06,12-15

alg var "i_SurfRuf_slpQF" changed i4b(2,40) to i4b(7,40) in GLA06,12,14

alg var "i_SiRufQF" changed i4b(2,40) to i4b(7,40) in GLA13

alg var "i_OcRMSqf" changed i4b(2,40) to i4b(7,40) in GLA15

alg var "i_DEMmin" & "i_DEMmax" changed name to "d_DEMmin" & "d_DEMmax" in GLA02

changed i4b to r8b in GLA02

alg var "d_maxTrAmp" changed scale 1.0d-3 to 1.0d-4 in GLA05

changed product units millivolts to 0.1 millivolts in GLA05

prod var "i_gval_rcv" & "i_gval_tx" changed Invalid value NO to i2b in GLA05

0000740 : Laser energy Calibration Coefficients need to be component sensitive

Updated formulae for calculating energy. Some variables used in energy calculation are different depending on which laser, detector and digitizer are being used. The code now checks the instrument state and selects the correct values.

0000750 : The IST "bad" COI algorithm needs change

In the IST data, a bad time computation is occurring which causes x seconds of data to be out-of-order and deleted.

This seems to be a problem which occurs when the IST timetag goes to 0. The code was supposed to delete a whole PRAP record when the timetag=0, but subsequent investigation determined that this was not happening correctly. I put in code which does a better job of deleting the record when timetag=0, and this seems to have fixed the problem.

0000751 : Nose data for the 91 day orbit to ECS

Fortran program has been written that converts the ANC28 data file to same format, but with track numbers all incremented by desired value. Program accepts input & output file names as user-inputs, as well as the track-increment factor.

0000774 : anc08 and anc09 description changes

Database descriptions for ANC08 and ANC09 were modified.

0000789 : QAPG will not compile with new QAP03 changes

A temporary fix was put in to disable GLA03 calculations. The code now compiles, builds and runs as before except for its treatment of GLA03.

0000791 : GLA04 LRS/IST may report endtime of granule=0 when no alignment occurs at end of processing

com_hdr_update updates the stop time of the granule with the actual granule stop time when the granule is closed. If the data happens not to align when the granule is closed, a time=0 is used instead of the last good time. Code was changed to use the last good time.

0000792 : Correct weighting in least squares fits

Changed weights for fit to depend on an anc07 value. Fixed calculation of standard deviation of fit in LsqFit_mod. Fixed pr872, a typo that caused the number of iterations in the QA to be incorrect.

0000793 : L1A passthru to L1B

Added comments to GLA02 and GLA07 variable descriptions which indicate conditions in which values are not valid.

0000795 : Update QAPCompare for new V&V requirements

QAPCompare was updated to meet newly defined V&V requirements and control changes were made to allow easier use in the SDMS environment.

0000806 : Some elevations invalid on GLA05 are valid on GLA06

A software flaw in W_Assess module has been repaired which caused elevation values in GLA05 to be invalid, where in fact legitimate data exists. This processing deficiency was proven to have affected 7.5% of data records in the sample of data used for problem diagnosis.

0000816 : WFMgr Crashes if no ANC04

See items 0000829, 0000706, 0000702.

0000824 : i_pcmtSat1, i_pcmtSat2 on GLA05 need to be set to spares

On GLA05, i_pcmtSat1 changed to i_spare1.1 and i_pcmtSat2 changed to i_spare1.2. The prod variable type was left as i2b(40) for spares.

0000829 : Default Value For d_OffNadirAngTrop is Incorrect

The default value for d_OffNadirAngTrop in ElevMgr was changed from gd_PI to gd_PI*0.5d0. Also see items 0000816, 0000706, 0000702.

0000838 : Run Atmospheres w/o ANC09 causes CRASH

An potential error was removed that affected the execution of the atmospheres GLAS_Atm code. Whenever it was run without the ANC09 attitudes file the program crashed because it was attempting to search the non-existent data to set flags.

0000842 : Release 12 Waveform-QAPG discrepancy

Changed calculation of along-track average start and end, and the times of first and last shots in average written to the along-track records to agree with the times specified by Mantis 647. NOTE: One change implicit in this mod -- if the frame time (d_UTCTime) is invalid, the data will not be included in the averages.

0000872 : QA For GLA05 Numltns Incorrect

See item 0000792.

0000876 : Integrate SCF reader code into VOB

Stored sample GLAS product reader code created by the SCF into the VOB. The code does not require the large shared libraries used by other GLAS software. Sample code is delivered in src/prod_util/scf_product_readers.

0000877 : QABrowse updates

QABrowse was updated to correct a number of problems and to meet new requirements.

1. QABrowse now returns exit codes as does the other GSAS software.
2. QABrowse now exits gracefully if it is given a file with no data
3. A number of minor problems were corrected and additional desired enhancements and changes were implemented.

0000881 : GLA10, 11 full of zeros

Uncommented the call to A_aer_opt_prop which sets values for GLA10 and GLA11. Products now have values.

0000892 : Tolerance in createGran_util was set too loose for the 91 day reference orbit

Tightened the tolerance when matching the Predicted orbit equator crossings (ascending) with the Reference orbit equator crossings to 0.1 degrees longitude.

0000894 : Investigate NOSE anomalies

Added more error checking to NOSE routines. New sanity checks were limited to lat/lon boundary checks, invalid checks, and count exceeding maximum number of entries checks. Upped the limit of revs/granule to 15 (from 14) and put custom read/conversion routines into GLAS_Meta in order to greatly increase performance.

0000921 : data glitch occurring in track 1099 segment 4

Determined this is caused by bad PAD values.

0000944 : ANC07 energy conversion coef need to be updated

See items 0000740 & 0000951.

0000945 : Errors in GLA01 documentation

Changes were made for the following variables in GLA01_main.

i_ObScHt:

product units=millimeters, algorithm units=meters, minimum value= -1.0D9, maximum value= 1.0D9

i_txwfPk_Flag:

maximum value=8

i_instState:

maximum value=524288

i_Hoff:

product units=millimeters, algorithm units=meters, minimum value= -1.0D9, maximum value= 1.0D9

0000947 : Changes to Product Min & Max In Database

Made the following changes:

i_maxRecAmp; min value= -300, max value= 30000 in GLA05

i_maxSmAmp; min value= -300, max value= 30000 in GLA05,06,12-15

i_maxTrAmp; min value= -300, max value= 30000 in GLA05

i_reflcor_atm; min value= 0, max value= 1000000 in GLA06,12-15

i_npeaks1; min value= 0, max value= 50in GLA05,06,14

0000948 : Negative i_tpmajoraxis in GLA05 & GLA06

An integer overflow problem in the paramter tpmajoraxis in products GLA06, and 12-15 has been corrected. This problem was the result of an inappropriately selected measure of millimeters for product units, and a product-to-algorithm scale conversion factor that consistently produced an overflow. The product unit of measure has been changed to centimeters.

0000949 : Negative d_SolAng

A minor clarification was made to the online product database description for the range of the d_SolAng parameter.

0000961 : Spikes in 1-second footprint azimuth values

Two parameters have been added to the anc07 file for elevations and its access software which allow the computed footprint azimuth to be filtered in two ways. If the number of computations involved in a 1-second interval is less than gi_GT_Azimuth_Num_Vals or if the computed standard deviation within the interval is greater than gd_GT_Azimuth_StDev, then the computed azimuth is set to invalid. Implementation of these filtering parameters involved incorporating the OnePass module for computing averages and standard deviations.

0000951 : Reflectance Is Too Large

See 0000740 & 0000944.

0000985 : Atmosphere constants changes

Changed several constants which should improve the quality of atmosphere processing.

0000994 : GLA02 code error in 1064 channel data usage of background

Corrected a background subtraction problem in the GLA02 code. Not enough background was subtracted off for the 1064 channel. This ultimately created problems in GLA07 for the computation of 1064 attenuated backscatter.

0001024 : 532 Channel Afterpulse Correction

The GLAS 532 nm atmospheric channel has a problem known as 'afterpulsing'. This occurs when a thick cloud or sloping terrain is encountered and the return signal is very large. The strong return causes the 532 detectors to remain stuck on, with a high output count rate, when in fact they should be putting out zero. This problem was corrected.

0001028 : QABrowse should be able to produce HDF file

QABrowse can now generate hdf output. All previous capabilities are still present. The hdf file contains 8-bit raster images.

0001031 : anc07-0005 change ATM constant GI_G_USEDDBG

Changed the selector for how to compute the background for the 532 channel.

0001045 : ANC45/46 Changes for GSAS 3.7

VersionIDs changed in to 13 in ANC45 and ANC46. Requested NSIDC made appropriate changes to the ESDTs.

0001051 : Occasional No Fit (alt) For Good WF

Corrected bug where alternate fits were trying to use the 2nd estimate when the standard deviation of fit wasn't good enough, only it was not being set and was still invalid. That meant that the max-amp peak had an invalid estimate & so was thrown out. Changed code so that the estimate for the max-amp peak is calculated in a similar way for both standard and alternate fits.

0001070 : Change description of GLA05 d_solnSigmas 1 and 2

Description changed for solnSigmas1 & solnSigmas2. Added the following description to both:

In the order of: item1=noise (millivolts), then 6 sets of three parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the parameters for the next-to-last (2nd) peak. ..Items 17-19 are the parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid.

0001093 : Change frequency of errors -40031 and -40032

Changed the frequency of -40031 and -40032 errors reported during atmosphere processing.

Changed Files:

```
./Makefile
./data/anc07_001_01_0000.dat
./data/anc07_001_01_0001.dat
```

./data/anc07_001_01_0002.dat
./data/anc07_001_01_0004.dat
./data/anc07_001_01_0005.dat
./data/anc45_001_01_0001.dat
./data/anc45_001_01_0002.dat
./data/anc45_001_01_0003.dat
./data/anc45_001_01_0004.dat
./data/anc45_001_01_0005.dat
./data/anc45_001_01_0006.dat
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./data/anc45_001_01_0012.dat
./data/anc45_001_01_0013.dat
./data/anc45_001_01_0014.dat
./data/anc45_001_01_0015.dat
./data/anc46_001_01_0004.dat
./data/anc46_001_01_0008.dat
./data/anc46_001_01_0009.dat
./data/anc46_001_01_0020.dat
./data/anc46_001_01_0022.dat
./data/anc46_001_01_0025.dat
./data/anc46_001_01_0026.dat
./data/anc46_001_01_0033.dat
./data/anc46_001_01_0037.dat
./data/anc46_001_01_0039.dat
./idl/qa_browse/browse
./idl/qa_browse/browse/qab01.pro
./idl/qa_browse/browse/qab01_lowerlevelplots.pro
./idl/qa_browse/browse/qab01_upperlevelplot.pro
./idl/qa_browse/browse/qab02.pro
./idl/qa_browse/browse/qab02_lowerlevelplots.pro
./idl/qa_browse/browse/qab02_upperlevelplot.pro
./idl/qa_browse/browse/qab02_writetabletoplot.pro
./idl/qa_browse/browse/qab03.pro
./idl/qa_browse/browse/qab03_alongtrack.pro
./idl/qa_browse/browse/qab03_summary.pro
./idl/qa_browse/browse/qab04.pro
./idl/qa_browse/browse/qab04_alongtrack.pro
./idl/qa_browse/browse/qab04_atxtickrange.pro
./idl/qa_browse/browse/qab04_barspage1.pro
./idl/qa_browse/browse/qab04_barspage2.pro
./idl/qa_browse/browse/qab04_histograms.pro
./idl/qa_browse/browse/qab04_lpaandlrsimages.pro

.idl/qa_browse/browse/qab04_summary.pro
.idl/qa_browse/browse/qab05.pro
.idl/qa_browse/browse/qab05_gndtrkmaps.pro
.idl/qa_browse/browse/qab05_groundtrackmaps.pro
.idl/qa_browse/browse/qab05_llplotsetup.pro
.idl/qa_browse/browse/qab05_lowerlevelplots.pro
.idl/qa_browse/browse/qab05_multiplot.pro
.idl/qa_browse/browse/qab05_upperlevelplot.pro
.idl/qa_browse/browse/qab05_writetabletoplot.pro
.idl/qa_browse/browse/qab06.pro
.idl/qa_browse/browse/qab06_gndtrkpage.pro
.idl/qa_browse/browse/qab06_lowerlevelplots.pro
.idl/qa_browse/browse/qab06_upperlevelplot.pro
.idl/qa_browse/browse/qab07.pro
.idl/qa_browse/browse/qab08.pro
.idl/qa_browse/browse/qab09.pro
.idl/qa_browse/browse/qab10.pro
.idl/qa_browse/browse/qab11.pro
.idl/qa_browse/browse/qab13and15.pro
.idl/qa_browse/browse/qab13and15_lowerlevelplot.pro
.idl/qa_browse/browse/qab13and15_upperlevelplot.pro
.idl/qa_browse/browse/qab_alongtrackstatplot.pro
.idl/qa_browse/browse/qab_bar__define.pro
.idl/qa_browse/browse/qab_doublebarplot.pro
.idl/qa_browse/browse/qab_noplot.pro
.idl/qa_browse/browse/qab_outputfilename.pro
.idl/qa_browse/browse/qab_plotclose.pro
.idl/qa_browse/browse/qab_plotelevadjustments.pro
.idl/qa_browse/browse/qab_plotelevbars.pro
.idl/qa_browse/browse/qab_plotrangeadjustments.pro
.idl/qa_browse/browse/qab_readcntlfile.pro
.idl/qa_browse/browse/qab_tripleplotpage.pro
.idl/qa_browse/browse/qab_writehdfimage.pro
.idl/qa_browse/browse/qab_writeheadfoottoplot.pro
.idl/qa_browse/browse/qabrowse.pro
.idl/qa_browse/browse/runbrowse
.idl/qa_browse/compare
.idl/qa_browse/compare/qapc_alongtrack.pro
.idl/qa_browse/compare/qapc_inprod_summary_V3.pro
.idl/qa_browse/compare/qapc_metadata.pro
.idl/qa_browse/compare/qapc_product.pro
.idl/qa_browse/compare/qapc_readcntlfile.pro
.idl/qa_browse/compare/qapc_writevectorsumdata.pro
.idl/qa_browse/compare/qapcompare.pro
.idl/qa_browse/compare/runqapc
.idl/qa_browse/compare/sample.txt

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./idl/qa_browse/description-files/qap_description.txt
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./idl/qa_browse/read/qapread.pro
./idl/qa_browse/util
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./idl/qa_browse/util/j2000sectoymdhms.pro
./idl/qa_browse/util/qa_exitcodes.pro
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