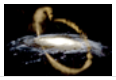

STDRED - Standard Star Photometric pipeline manual

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Basic Explanation

This is the standard star part of the PHOTRED photometric pipeline. STDRED uses images of standard star fields to automatically obtain photometric transformation equations using aperture photometry (with aperture corrections). STDRED requires final, flat, calibrated images to work. STDRED is meant to be run on all of the standard star frames for a whole run at once.

Other useful manuals:
Nidever Mosaic Reduction Cookbook v2 and Standard Star Reduction
Rachael's MOSAIC cookbook
Rachael's ALLFRAME cookbook
The NOAO Deep MOSAIC Reduction Notes
IRAF mscred help notes mscguide (or type "mscguide" at the cl> prompt)
Some more help on IRAF MOSAIC reduction from iraf.net

Installation Instructions

The STDRED software is included in the PHOTRED tar files, so follow the PHOTRED installation instructions in the PHOTRED Manual and STDRED should be ready to go.

Running Instructions

1. Data

Start by putting all the final flat frames in their nights directory. Process them with IRAF's CCDRED, MSCRED or Armin Rest's SuperMacho pipeline to get final flat images.

FIX BAD PIXELS!!!. Make sure to fix any bad pixels or columns in the images because otherwise they might get detected as "sources" and mess up WCS, DAOPHOT, MATCH, and ALLFRAME.

STDRED should be run on all of the standard star frames from a single run. So make a "standards/" or "calib/" directory and put all of the standard star frames in there. STDRED_COPY.PRO will do this for you. Run STDRED_COPY.PRO in the main directory (where your n1, n2, etc. directories are located) and it will copy all of the standard star frames to the "standards" directory. If your nightly directories are not names like n1, n2, then make a list of the directories and give STDRED_COPY the name of the list.

```
IDL>stdred_copy,'@dirlist.lst'
```

By default STDRED_COPY only copies the four Geisler Washington standard star fields (SA98, SA110, SA114, and NGC3680), but a list of **additional** standard star field names can be input. The four Geisler fields are **always** copied.

```
IDL>stdred_copy,'@dirlist.lst','@standards.txt'
```

2. Setup File

STDRED needs a "stdred.setup" file to run. This file specifies a few important parameters. Here's an example of a "stdred.setup" file (a copy is in the "scripts" tar file). The various parameters are described below.

```
##### REQUIRED #####
```

```
scriptsdir  /net/home/dln5q/daophot/
irafdir     /net/home/dln5q/iraf/
telescope   Blanco
instrument  MOSAIC
observatory CTIO
##### OPTIONAL #####
keepmef     0
redo        0
#wcsup      N
#wcsleft    E
#pixscale   0.50
#wcsrefname USNO-B1
#searchdist 60
wcsrmslim   0.5
matchdist   0.8
#ddo51radoffset  1
fiterrlim   0.1
##### STAGES #####
rename
split
wcs
aperphot
daogrow
astrom
matchcat
combinecat
fitdata
```

scriptsdir	The absolute path to the directory that contains the PHOTRED scripts (i.e. daophot.sh, etc.)
irafdir	The absolute path to your IRAF directory (that contains your login.cl file)
telescope	The name of the telescope (e.g. Blanco, Swope)
instrument	The name of the instrument (e.g. MOSAIC)
observatory	(OPTIONAL) The name of the observatory. This is needed if the header does not contain the AIRMASS and it needs to be calculated from the date, ra/dec and observatory location.
keepmef	OPTIONAL. Multi-extension files (MEF) are split by PHOTRED. Do you want PHOTRED to keep the MEF files: YES=1, NO=0 (i.e. erase them).
redo	OPTIONAL. PHOTRED will NOT reprocess files that have already been processed unless "redo" is set. This can also be set as a keyword on the command line (i.e. IDL>stdred,/redo).
wcsup	OPTIONAL. What cardinal direction (i.e. N, S, E or W) is "up" in the image? This is only used for non-standard setups.
wcsleft	OPTIONAL. What cardinal direction (i.e. N, S, E or W) is "left" in the image? This is only used for non-standard setups.
pixscale	The plate scale in arcseconds/pixel. This is ONLY used for non-"standard" imagers (i.e. not MOSAIC, IMACS, LBC or Swope) where the pixel scale cannot be determined from the image headers.
wcsrefname	OPTIONAL. The name of the WCS reference catalog to use. The two options are 'USNO-B1' and '2MASS-PSC'. USNO-B1 is the default. The astrometric accuracy of the 2MASS catalog is better (~0.170 arcsec) than USNO-B1 (~0.270 arcsec), but it does not go as deep (R~18) as USNO-B1 (R~20). So if you have deep images then **definitely** use USNO-B1, but if you have moderately deep images then 2MASS-PSC is probably better (and faster).
searchdist	OPTIONAL. This sets the search distance (in arcmin) for WCS fitting (PHOTRED_WCS). Normally this is not needed. The default is 2*image size > 60 arcmin (i.e. whichever is greater). This is normally sufficient. If the WCS isn't fitting correctly then try setting "searchdist" to a larger value.
wcsrmslim	OPTIONAL. This is the maximum RMS (in arcseconds) allowed for an acceptable WCS fit. The default is 1.0 arcseconds. Normally the RMS values are ~0.2-0.3 arcseconds.
	OPTIONAL. This is the maximum matching distance in

matchdist	arcsec for matching stars with the calibrated standard star catalogs. 0.8 is the default.
ddo51radoffset	OPTIONAL. There is a photometric offset in the DDO51 filter that depends on the radial distance from the center of the field. Currently this is only observed in the CTIO+MOSAIC data. Setting this parameter will remove this offset (done in COMBINECAT). If you use this make sure to also use it in PHOTRED.
fiterrlim	OPTIONAL. This sets a magnitude error cut for the observations that are used in STDRED_FITDATA to define the photometry transformation equations. magerrlim=0.1 is probably appropriate.

Then add all the stage names that you want to process from the following list: rename, split, wcs, aperphot, daogrow, astrom, matchcat, combinecat, and fitdata.

3. Transformation Equations Setup

You need to tell STDRED which bands you want transformation equations for and which color to use for each band. This information should be put in the "trans.setup" file. One is located in the "scripts" tar file.

```
M M-T
T M-T
D M-D
```

It's easiest to use the "short" filter names that are in the "filters" file.

4. Standard Star Field List

You need to have catalogs of your standard star fields and put the names of them into the "standards.lst". You can use a local file (in the same directory as your data) or put it in your "scriptsdir" directory. The standard star catalogs must be in your "scriptsdir" directory. The "scripts" tar file contains standard star catalogs for SA98, SA110, SA114 and N3680.

The standards.lst list:

```
SA98.cat
SA110.cat
SA114.cat
N3680.cat
```

This is what one of the standard star catalogs looks like:

SA98.cat

```
ID          T1        T1ERR    T2        T2ERR    M         MERR     D51       D51ERR   C         CERR     RA          DEC
SA98-648    12.6480   0.0058   12.2200   0.0065   13.2520   0.0066   13.2390   0.0099   13.9120   0.0083   103.0153590   -0.3273160
SA98-650    12.2230   0.0039   12.1270   0.0058   12.3400   0.0051   12.3110   0.0064   12.4570   0.0054   103.0188446   -0.3272910
SA98-670    11.2420   0.0025   10.5460   0.0035   12.2920   0.0033   12.3230   0.0058   13.9440   0.0047   103.0479507   -0.3212030
```

The standard star catalogs need to have coordinates, IDs, and the magnitudes (and associated errors) that you want to use. There also needs to be a "header" line that gives a unique name for each column (no spaces in the name). The magnitude/band/filter names need to be in the "filter" file (see below) and the error names need to be the magnitude name plus "ERR".

5. Check "filters" file

STDRED and PHOTRED use short names for filters, and these are stored in the "filters" file. One is provided in the scripts tar file. This is what it looks like:

```
'M Washington c6007'    M
'M'                     M
'I c6028'               T
'T'                     T
'T2'                    T
'DDO 51 c6008'          D
'D51 DDO c6008'         D
'D51 DDO 51 c6008'      D
'D'                     D
'D51'                   D
'DDO51'                 D
'T1'                    T1
'C'                     C
'B Harris c6002'        B
'B-BESSEL'              B
```

```
'B'                     B
'V'                     V
'R-BESSEL'              R
'R'                     R
```

The first column is the text that is found in the FILTER keyword in the FITS header. The second column is the shortname. These can be repeated because different observatories have different names for the same filter. These shortname will be used in the transformation file and the "extinction" file.

Make sure that your filters appears in the list (leading/trailing spaces are not important. If they don't then STDRED will make a new entry in the "filters" file for your filter and make a new shortname. This is **NOT** desirable because the shortname probaby won't match what you have in your transformation file or in the "extinction" file or what PHOTRED will use.

Here's a way to double-check if your filter is in the "filters" file. Copy the "filters" file from your scriptsdir to the directory where your data is. Then run PHOTRED_GETFILTER on one FITS file per filter. Change the shortname to a single capital letter if possible.

```
IDL>print,photred_getfilter('ccd1001.fits')
D
```

PHOTRED_GETFILTER will print out the shortname of the filter. It will tell you if it didn't find the filter in the "filters" file and what new entry it added (you can run it with /noupdate and it won't change the "filters" file). It's preferable to have the most up to date "filters" file in the scriptsdir directory so that it can be used for the next run. STDRED uses the "filters" file in the main directory (where "stdred.setup" and the data are located) if there is one, otherwise it will copy the "filters" file from the scriptsdir directory.

6. Run STDRED_RENAME

Okay, now you're ready to STDRED. STDRED has 9 stages and there is a separate IDL program for each stage (e.g. STDRED_APERPHOT). Each stage can be run on it's own. The STDRED program is actually just a giant wrapper for the 9 stages (and the ones specified in the "stdred.setup" file) run in the correct order. If you ever want to just run ONE stage then it's probably easier to just run that stage at the command line instead of editing the "stdred.setup" file and running stdred. Note that STDRED uses several PHOTRED programs (including the stages PHOTRED_SPLIT.PRO and PHOTRED_WCS.PRO).

It's preferable to run the very first stage, STDRED_RENAME, by itself from the command line and double-check the results. This stage prepends a string to each FITS filename that indicates the filter and night of the frame (i.e. ccd1050.fits -> Dn2-ccd1050.fits). It's **very** important that the files are renamed **properly**. So check closely the text that is output. Any zero/flat/twilight/sky/pointing/focus and test frames are moved to a "calib/" directory.

It's a good idea to run STDRED_RENAME in "testing" mode, so you can see how it will rename files without it actually doing anything. Just type "stdred_rename,/testing". The first thing STDRED_RENAME does is check that all of the FITS header parameters can be found (readnoise, gain, ut-time, filter, exposure time, ra, dec, date, and airmass). If any of these cannot be found then it will spit out errors. Watch for these! Check that the filter and night information for each frame is correct.

If the files were not renamed properly, rename them by hand. Also, update the "logs/RENAME.outlist" file. It might be easiest to delete the "logs/RENAME.outlist" file and remake it by typing "ls -.fits > logs/RENAME.outlist".

7. Run STDRED

Now run STDRED. Start idl, type "stdred" and you're off!!

You can also run STDRED in the background. Make a batch file called "stdred.batch" that has a single line with "stdred" (there is one in the

"scripts" tar file). You can then run this batch file with idlbatch or idlbatchn (a "niced" version). The "idlbatch" programs will run the IDL job in the background and create a log file called "stdred.batch.log". Make sure to put the "idlbatch" programs in your ~/bin/ directory and that ~/bin/ is also in your path (check your .cshrc file). STDRED.PRO automatically creates a "journal" file each time it is run, but it's not as night to look at as the "stdred.batch.log" file that the "idlbatch" programs create.

Double check (in the logfile) that the WCS is being fit correctly. The Total RMS should be around 0.2-0.4 arcsec for USNO-B1 and 0.15-0.25 for 2MASS-PSC. If it's not working properly check that the images have RA/DEC or CRVAL1/CRVAL2 in them and that the pixel scale is correct. If it still isn't working then you can try setting "searchdist" larger (the default is 2*image size > 60 arcmin). You can also set the maximum acceptable RMS with "wcsrmslim" in the "stdred.setup" file.

The final stage, STDRED_FITDATA, finds the photometry transformation equations automatically using the FILTER.cat files that STDRED_COMBINECAT creates. However, STDRED_COMBINECAT also creates FILTER.data files that can be used with SKAWDPHOT.PRO (included in the PHOTRED tar file) to interactively get photometric equations. If you decide to use SKAWDPHOT.PRO you can use CONVERT_TRANS.PRO to convert the transformation equations in the SKAWDPHOT output file to the PHOTRED/STDRED format.

```
IDL>convert_trans,'M.data.out','M.skawd.trans','M','M-T'
SKAWDPHOT OUTPUT

Inversion completed successfully
Error of Solution, SIGMA =  5.216E-03
Coefficients and errors:
a( 1) =     2.2993 sigma =  7.817E-03  Night  1 zero point
a( 2) =     2.3077 sigma =  7.764E-03  Night  2 zero point
a( 3) =     2.2799 sigma =  8.740E-03  Night  3 zero point
a( 4) =     0.1344 sigma =  5.702E-03  airmass
a( 5) =    -0.0407 sigma =  1.594E-03  color

Night 1 Transformation Equations
  M  M-T   2.2993    0.1344   -0.0407   0.0000   0.0000
           0.0078    0.0057    0.0016   0.0000   0.0000

Night 2 Transformation Equations
  M  M-T   2.3077    0.1344   -0.0407   0.0000   0.0000
           0.0078    0.0057    0.0016   0.0000   0.0000

Night 3 Transformation Equations
  M  M-T   2.2799    0.1344   -0.0407   0.0000   0.0000
           0.0087    0.0057    0.0016   0.0000   0.0000
Trans equations written to >>M.skawd.trans<<
```

You will still need to make nightly transformation equation files by hand by copying and pasting from the filter transformation files.

You can use STDRED_SUMMARY (run it in the same directory) to get an update on the progress of STDRED.

Basic Explanation

This is the standard star part of the PHOTRED photometric pipeline. STDRED uses images of standard star fields to automatically obtain photometric transformation equations using aperture photometry (with aperture corrections). STDRED requires final, flat, calibrated images to work. STDRED is meant to be run on all of the standard star frames for a whole run at once.

The pipeline is split into stages and the files are "shuttled" from stage to stage via lists of files. Each stage has an INLIST and OUTLIST. The INLIST is the list of files to process, and the OUTLIST is the list of files output. Normally the INLIST of files is moved over from the OUTLIST of the previous stage. The INLIST files that are successfully processed are removed from the INLIST file, and are added to the SUCCESS list. INLIST files that are NOT successfully process are **left** in the INLIST file and are added to the FAILURE list.

Each stage has several log files associated with it:

- **INLIST** The list of files to process. These are normally moved over from the OUTLIST of the previous stage.
- **OUTLIST** The files successfully output from the stage. These might

be in a different format from the INLIST files.
- **SUCCESS** The files in INLIST that were successfully processed
- **FAILURE** The files in INLIST that were NOT successfully processed
- **LOG** A running log of what the stage has done

The main interface and logistical work of STDRED is done in IDL. Most of the heavy processing is done by Peter Stetson's photometric codes DAOPHOT and DAOGROW. Some IRAF tasks, such as MSCCMATCH, are also used.

STAGES

RENAME

Basic Explanation

This program renames object fits files so that it includes their filter and night information. For example, ccd1001.fits gets renamed to Dn2-ccd1001.fits. Any calibration frames (zero, dflat, sflat, etc.) get moved to the "calib/" directory without getting renamed. It also checks that all of the FITS header parameters can be found (readnoise, gain, ut-time, filter, exposure time, ra, dec, date, and airmass). If any of these cannot be found then it will spit out errors.

Lists

It will create the inlist from all fits files in the directory. Outlist will be of all files that aren't zero, dflat, sflat, etc. and were successfully renamed.

INLIST (fits) - Creates it itself from fits files in directory

Single-Chip	Split Multi-chip	Multi-chip (MEF)
zero1001.fits	zero1001_1.fits	zero1001.fits
ccd1012.fits	ccd1012_2.fits	ccd1012.fits
ccd1024.fits	ccd1024c3.fits	ccd1024.fits
ccd1053.fits	ccd1053c5.fits	ccd1053.fits

OUTLIST (fits) - The renamed **object** files

Single-Chip	Split Multi-chip	Multi-chip (MEF)
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits	Dn1-ccd1012.fits
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits	Mn2-ccd1024.fits
Tn3-ccd1053.fits	Tn3-ccd1053c5.fits	Tn3-ccd1053.fits

SPLIT

Basic Explanation

This splits multiple-extension files (MEF) into separate files for each amp/chip. Non-MEF files are not affected.

Lists

All the files in rename.outlist are put in split.inlist. All non-MEF (single chip) files automatically go to split.outlist. All successfully split files (not original MEF files) are put in split.outlist

INLIST (fits) - Copied from rename.outlist

Single-Chip	Split Multi-chip	Multi-chip (MEF)
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits	Dn1-ccd1012.fits
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits	Mn2-ccd1024.fits
Tn3-ccd1053.fits	Tn3-ccd1053c5.fits	Tn3-ccd1053.fits

OUTLIST (fits) - All split files that are split okay, or single-chip files

Single-Chip	Split Multi-chip	Multi-chip (MEF)
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits	Dn1-ccd1012_1.fits, Dn1-ccd1012_2.fits, ...
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits	Mn2-ccd1024_1.fits, Mn2-ccd1024_2.fits, ...
Tn3-	Tn3-	Tn3-ccd1053_1.fits, Tn3-

ccd1053.fits	ccd1053c5.fits	ccd1053_2.fits, ...

From now on the "Split Multi-chip" and "Multi-chip" files will "look" the same, since now the MEF files have been split.

WCS

Basic Explanation

This program gets the correct WCS for images and updates it in the FITS header.

Lists

It takes all files from split.outlist and puts them into wcs.inlist. All files that succeeded get put in wcs.outlist.

INLIST (fits) - Moved from split.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits
Tn3-ccd1053.fits	Tn3-ccd1053c5.fits

OUTLIST (fits) - All object files that are given a proper wcs.

Single-Chip	Split Multi-chip
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits
Tn3-ccd1053.fits	Tn3-ccd1053c5.fits

APERPHOT

Basic Explanation

This program runs DAOPHOT PHOTOMETRY which gets aperture photometry for all the stars in the image.

Lists

It takes all files from wcs.outlist and puts them into aperphot.inlist All fits files that successfully run through DAOPHOT get put into aperphot.outlist

INLIST (fits) - Moved from wcs.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.fits	Dn1-ccd1012_2.fits
Mn2-ccd1024.fits	Mn2-ccd1024c3.fits
Tn3-ccd1053.fits	Tn3-ccd1053c5.fits

OUTLIST (ap) - All files in inlist that are succcessfully processed

Single-Chip	Split Multi-chip
Dn1-ccd1012.ap	Dn1-ccd1012_2.ap
Mn2-ccd1024.ap	Mn2-ccd1024c3.ap
Tn3-ccd1053.ap	Tn3-ccd1053c5.ap

DAOGROW

Basic Explanation

This program corrects the aperture photometry for the aperture correction using DAOGROW. DAOGROW is run on all of the frames for a given night and finds aperture corrections for each separate frame. These are then applied to all of the stars in that frame.

Lists

It takes all files from aperphot.outlist and puts them into daogrow.inlist All ap files that successfully run through DAOGROW get put into daogrow.outlist

INLIST (ap) - Moved from aperphot.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.ap	Dn1-ccd1012_2.ap
Mn2-ccd1024.ap	Mn2-ccd1024c3.ap
Tn3-ccd1053.ap	Tn3-ccd1053c5.ap

OUTLIST (tot) - Every ap files in inlist that is successfully processed and has a tot file.

Single-Chip	Split Multi-chip
Dn1-ccd1012.tot	Dn1-ccd1012_2.tot
Mn2-ccd1024.tot	Mn2-ccd1024c3.tot
Tn3-ccd1053.tot	Tn3-ccd1053c5.tot

ASTROM

Basic Explanation

This program gets coordinates for all stars from the WCS in the image.

Lists

Takes all of the .tot files from daogrow.outlist and puts them into astrom.inlist. All files that are successfully given coordinates are put into the astrom.outlist.

INLIST (tot) - Moved from daogrow.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.tot	Dn1-ccd1012_2.tot
Mn2-ccd1024.tot	Mn2-ccd1024c3.tot
Tn3-ccd1053.tot	Tn3-ccd1053c5.tot

OUTLIST (ast) - All tot files that were successfully process.

Single-Chip	Split Multi-chip
Dn1-ccd1012.ast	Dn1-ccd1012_2.ast
Mn2-ccd1024.ast	Mn2-ccd1024c3.ast
Tn3-ccd1053.ast	Tn3-ccd1053c5.ast

MATCHCAT

Basic Explanation

This takes all of the .ast files and matches the stars to the standard stars in the standard star catalogs. It uses the coordinates to figure out which field it is (i.e. SA98, SA110, etc.), and uses the coordinates to match the individual stars. The instrumental photometry and the calibrated photometry are combined in the .cat output file.

Lists

Takes all of the .tot files from astrom.outlist and puts them into matchcat.inlist. All files that have successful matches are put into matchcat.outlist.

INLIST (ast) - Moved from astrom.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.ast	Dn1-ccd1012_2.ast
Mn2-ccd1024.ast	Mn2-ccd1024c3.ast
Tn3-ccd1053.ast	Tn3-ccd1053c5.ast

OUTLIST (cat) - All ast files that have some standard star matches.

Single-Chip	Split Multi-chip
Dn1-ccd1012.cat	Dn1-ccd1012_2.cat
Mn2-ccd1024.cat	Mn2-ccd1024c3.cat
Tn3-ccd1053.cat	Tn3-ccd1053c5.cat

COMBINECAT

Basic Explanation

All of the .cat files for a given filter are combined and put in a format that is usable by STDRED_FITDATA.PRO to find transformation equations. The output filenames are called FILTER.cat. FILTER.data files are also created that can be used by SKAWDPHOT.PRO (included in the photred tar file) to fit transformation equations interactively.

Lists

Takes all of the .cat files from matchcat.outlist and puts them into combinecat.inlist. A combined .cat file is created for each filter that has at least one observation. These are put into the combinecat.outlist.

INLIST (cat) - Moved from matchcat.outlist

Single-Chip	Split Multi-chip
Dn1-ccd1012.cat	Dn1-ccd1012_2.cat
Mn2-ccd1024.cat	Mn2-ccd1024c3.cat
Tn3-ccd1053.cat	Tn3-ccd1053c5.cat

OUTLIST (cat) - A cat file for each filter that has data. A .data file is also created that can be used with SKAWDPHOT.PRO.

Single-Chip	Split Multi-chip
D.cat	D.cat
M.cat	M.cat
T.cat	T.cat
D.data	D.data
M.data	M.data
T.data	T.data

FITDATA

Basic Explanation

This takes the matched standard star catalogs for each filter and fits the photometric transformation equations automatically. A transformation equation file is created for each filter and for each night (and for each filter/night pair).

Lists

This takes all the files in combinecat.outlist and puts them into fitdata.inlist.

INLIST (cat) - Moved from combinecat.outlist

D.cat
M.cat
T.cat

OUTLIST (trans) - A trans file for each filter and each night.

D.trans
M.trans
T.trans
n1.trans
n2.trans
n3.trans

Adding new imagers

STDRED/PHOTRED is currently set up to run on data from KPNO+MOSAIC, CTIO+MOSAIC (Blanco), Swope CCD, and LBT Camera (LBC). New imagers can be added, but there are a couple of things that need to be double-checked:

- Make sure that PHOTRED_GETUTTIME.PRO, PHOTRED_GETFILTER, PHOTRED_GETEXPTIME.PRO, PHOTRED_GETGAIN.PRO, PHOTRED_GETRDNOISE.PRO, PHOTRED_GETDATE.PRO and

PHOTRED_GETAIRMASS.PRO return the proper values. PHOTRED_RENAME.PRO checks that all of the appropriate keywords are in the FITS headers. Run PHOTRED_RENAME in /testing mode and see if you get any errors. If there are errors then the above programs might need to be modified to deal with the new data type.

- Add the necessary filters to the "filters" file
- Make sure that PHOTRED_WCS.PRO can properly process the images. PIXSCALE might need to be specified in the "photred.setup" file.
- If the data is multi-chip then certain programs (such as PHOTRED_SPLIT.PRO, PHOTRED_MATCH.PRO and PHOTRED_COMBINE.PRO) might need to be modified.

-- DavidNidever - 19 May 2008

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