

Sacramento Mountains Spectroscopy Workshop

ISIS

Integrated Spectrographic
Innovative Software

Created by
Christian Buil

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- Focus on Lhires III 2400 lines/mm
- C-14, f/11, Focal Length 3556 mm
- Image scale Bin $1 \times 1 = .24$ arcs / pixel
- Local seeing $\sim 1.5 - 2.0$ arcs
- Sampling: $(1.5-2.0)/.24$ arcs/pixel = 6.25-8.33 pixels
- Bin 2×2 : sampling is about 3-4 pixels

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- Atik 460 EX imaging camera
- Atik 414 EX for star field/guiding
- Connect your cameras “backwards” with the Sky X. (Camera is guide camera, Autoguider is you spectra camera – It’s confusing)

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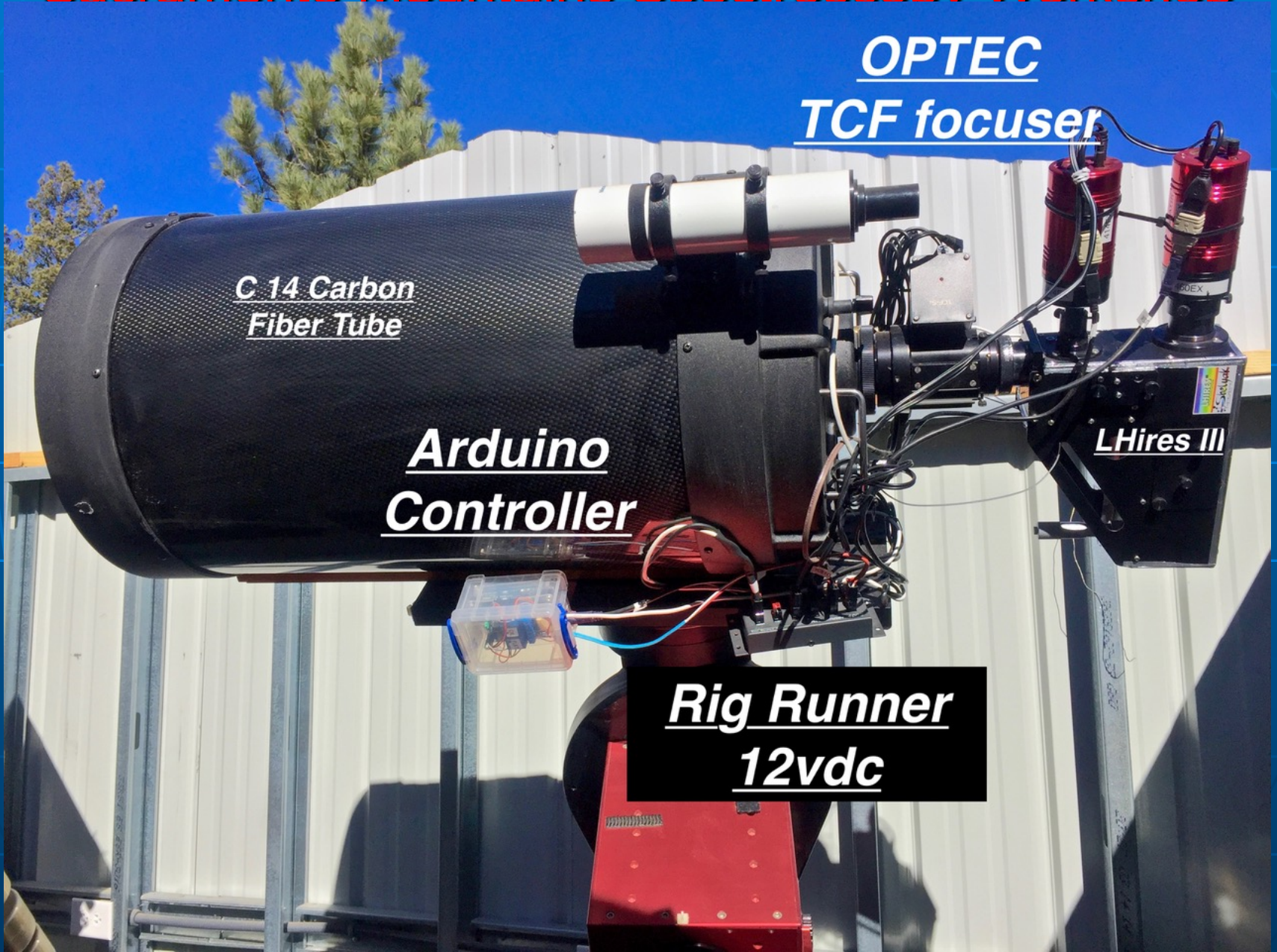
OPTEC
TCF focuser

C 14 Carbon
Fiber Tube

Arduino
Controller

LHires III

Rig Runner
12vdc



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ISIS Requirements:

1. ISIS likes what it likes for files & file names!
2. If you don't give it what it wants, it will scold you in French! You may not know what it says, but you know you are in trouble or are missing something. You will be speaking French in no time.
3. Once you are setup, use the right names, and fill in the settings, ISIS will be your lifelong productive Friend.

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- All work is done in a single designated file or folder called “Working directory”
- Ex: 2-22-2019 HD_6226_V442_And or
- 20190222_V442_And or
- 20190222V442And
- Many ways to be obsessive
- Put this folder where it is most convenient.
- Ex: c:/ 20190222V442And or
- c:/Libraries/Documents/My Documents

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- How to name: All files must look like this.
- HD_6226-1 ----→If you leave any blank spaces you will have to do 10 pushups in order to proceed. (Those pushups have to be in French).
- Root Name, a connector – (called suffix), and an index (1,2,3,4 not 1,3,4,5 and not 2,3,4,5)

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- This naming system allows ISIS to go into a folder and find all the right stuff, in the right order, that it needs for processing all your data files.
- Most likely, *none* of your files will even look close to this when you acquire your data. With the SkyX you get .00000001.
- You can rename your files by hand or with “Bulk Rename Utility”
- You will use [Replace 3] for most of your name changes.

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Bulk Rename Utility

File Actions Display Options Renaming Options Special Help

Bulk Rename Utility

C:\Users\jldaglen\Desktop\data example

Name	New Name	Size	Modified
cal.00000001.fit	cal-1.fit	2.89 MB	1/28/2019 12:07:54 AM
flat.00000001.fit	flat-1.fit	2.89 MB	1/28/2019 12:09:20 AM
HD_50658.00000001.fit	HD_50658-1.fit	2.89 MB	1/28/2019 12:23:22 AM

Replace (3) R

Match
Replace
 Include Ext.

Name (2) R
Name

Case (4) R
Same
Excep.

Remove (5) R
First n Last n
From to
Chars Words
Crop Before
 Digits High Trim
 D/S Accents Chars
 Sym. Lead Dots Non

Add (7) R
Prefix
Insert
at pos.
Suffix
 Word Space

Auto Date (8) R
Mode
Type
Fmt
Sep. Seg.
Custom
 Cent. Off.

Numbering (10) R
Mode at
Start Incr.
Pad Sep.
Break Folder
Type
Roman Numerals

Move/Copy Parts (6) R

Append Folder Name (9) R
Name Sep. Levels

Extension (11) R

Filters (12) R
Mask Folders Hidden Name Len Min Max
 Files Subfolders Path Len Min Max
 Match Case RegEx
Condition

Copy/Move to Location (13) R
Path
 Copy not Move

Special (14)
 Change File Attributes Status: Not Set
 Change File Timestamps Status: Not Set
 Character Translations Status: Not Set
 Javascript Renaming Status: Not Set

Reset Revert Rename

Bulk Rename Utility is **free for personal, non-commercial, home use**. For use in a commercial environment, a commercial license is required. [More Info](#)

3 Objects (3 Selected)

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ISIS - V5.9.3

1. Image | 2. General | 3. Calibration | 4. Go | 5. Profile | 6. Gnuplot | Masters | Tools | Misc | Instruments | Settings

Spectrograph model

LHIRES III

Working directory

c:\users\jrdaglen\desktop\sig ori e 1-24 to 1-27-2018 fit and ...

Spectral database directory

c:\isis_database_v7-1 ...

GNUPLLOT software directory

c:\gnuplot ...

Language

French English

FITS extension

.FIT .FITS

Interpolator type

Bilinear Spline

Addition mode for individual profiles

Standard Weighted

Spectral calibration image

Standard Lateral

Assistant

Check file names consistency

Spectral domain for profile scaling

Lambda 1 : 6616 A Lambda 2 : 6620 A

Observatory

Longitude : -105.531747 deg. Latitude : 32.904248 deg. Altitude : 2202 m
(positive longitude at the east)

Erase automatically intermediate files

Yes No

Display

Rainbow Lambda 1 : 3500 A Lambda 2 : 8500 A

Coef. cosmic rays filter

Value : 15

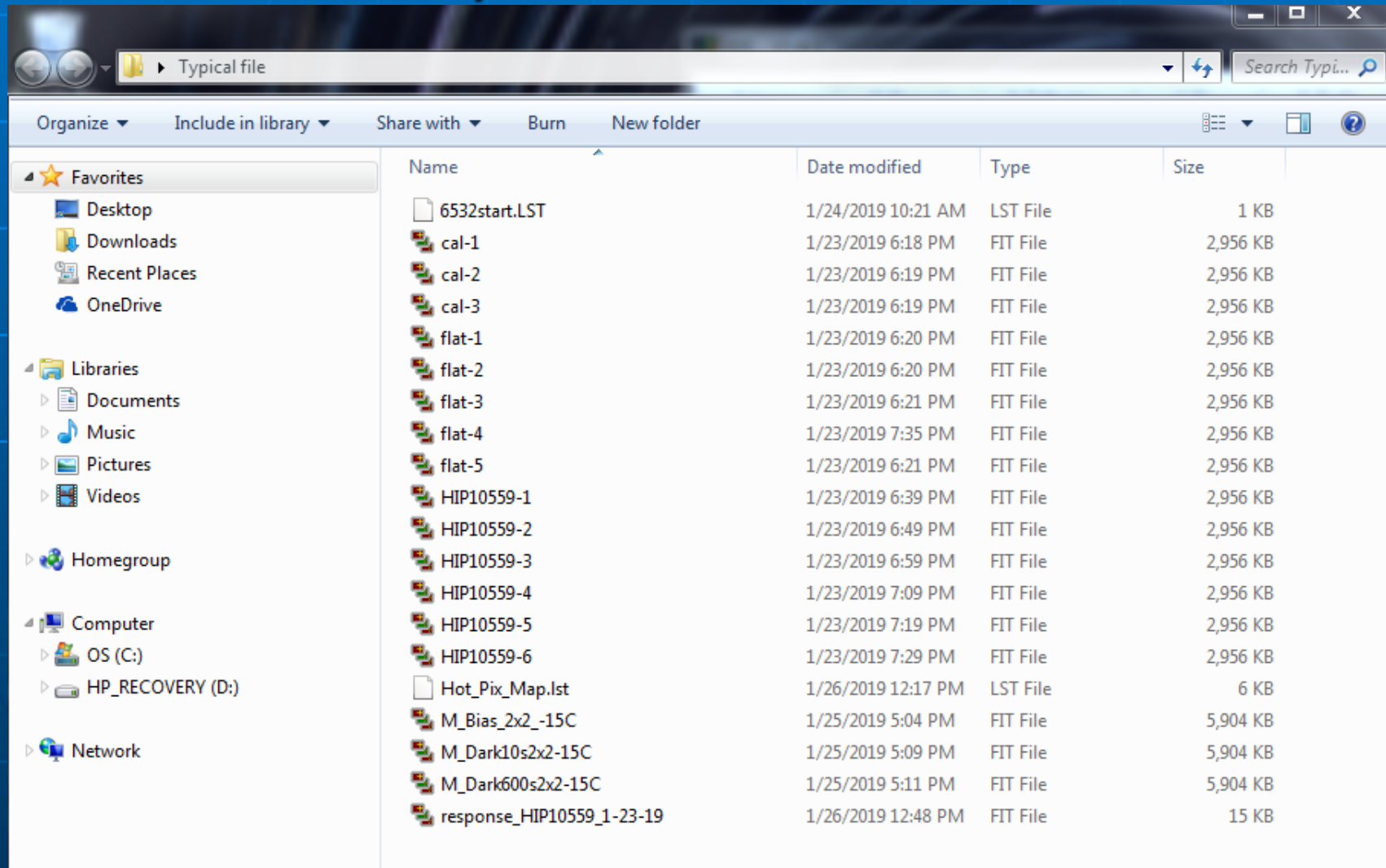
Name of output spectral files

Add your observer name to file name

ISIS Version 5.9.3c (C) 2018 Christian Buil

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- What will my file look like to start?



The screenshot shows a Windows File Explorer window with the address bar set to 'Typical file'. The left sidebar shows the 'Favorites' and 'Libraries' sections. The main pane displays a list of files with columns for Name, Date modified, Type, and Size.

Name	Date modified	Type	Size
6532start.LST	1/24/2019 10:21 AM	LST File	1 KB
cal-1	1/23/2019 6:18 PM	FIT File	2,956 KB
cal-2	1/23/2019 6:19 PM	FIT File	2,956 KB
cal-3	1/23/2019 6:19 PM	FIT File	2,956 KB
flat-1	1/23/2019 6:20 PM	FIT File	2,956 KB
flat-2	1/23/2019 6:20 PM	FIT File	2,956 KB
flat-3	1/23/2019 6:21 PM	FIT File	2,956 KB
flat-4	1/23/2019 7:35 PM	FIT File	2,956 KB
flat-5	1/23/2019 6:21 PM	FIT File	2,956 KB
HIP10559-1	1/23/2019 6:39 PM	FIT File	2,956 KB
HIP10559-2	1/23/2019 6:49 PM	FIT File	2,956 KB
HIP10559-3	1/23/2019 6:59 PM	FIT File	2,956 KB
HIP10559-4	1/23/2019 7:09 PM	FIT File	2,956 KB
HIP10559-5	1/23/2019 7:19 PM	FIT File	2,956 KB
HIP10559-6	1/23/2019 7:29 PM	FIT File	2,956 KB
Hot_Pix_Map.lst	1/26/2019 12:17 PM	LST File	6 KB
M_Bias_2x2_-15C	1/25/2019 5:04 PM	FIT File	5,904 KB
M_Dark10s2x2-15C	1/25/2019 5:09 PM	FIT File	5,904 KB
M_Dark600s2x2-15C	1/25/2019 5:11 PM	FIT File	5,904 KB
response_HIP10559_1-23-19	1/26/2019 12:48 PM	FIT File	15 KB

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How to do a NOT Predefined Calibration

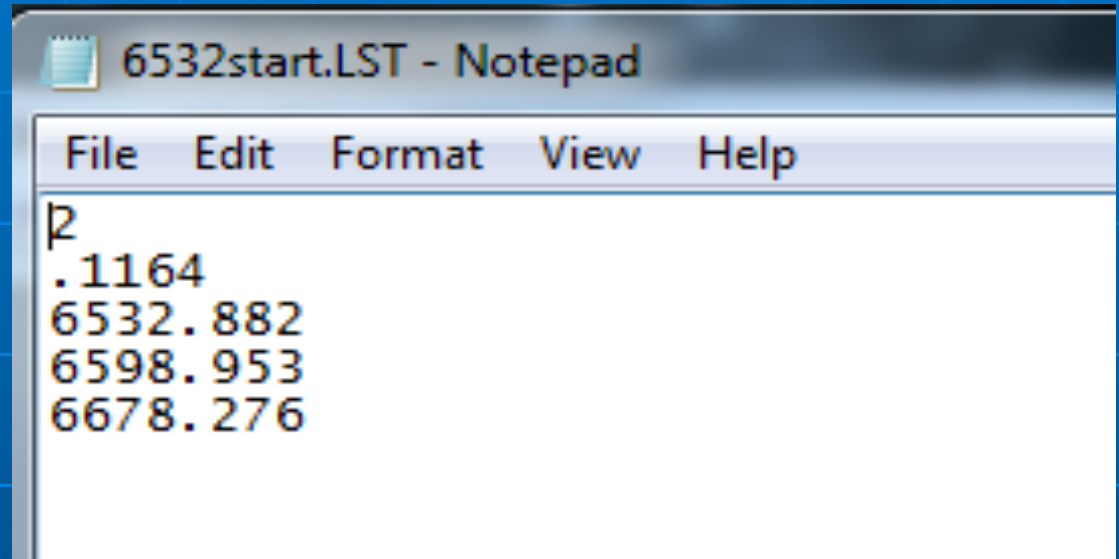
The screenshot shows a software interface for spectroscopy calibration. The '3. Calibration' tab is active. The 'Image to process' is 'HIP10559-1' and the 'Calibration image' is 'cal-1'. The 'Tilt angle' is -0.04 and the 'Slant angle' is -3.06. The 'Vertical coordinate' is 526. The 'X coordinate of line at wavelength' is 6532.882 and 'A' is 20 (pixels). The 'Displayed image' is a spectral image with a white line and horizontal dashed lines. The 'Seuil haut' is 5013 and 'Seuil bas' is 0. The 'Domain' is 32767. The 'Exposure' is 0.1 s.

6678.28 A	1294 pix
6532.88 A	19 pix
145.4 A	1275 pix

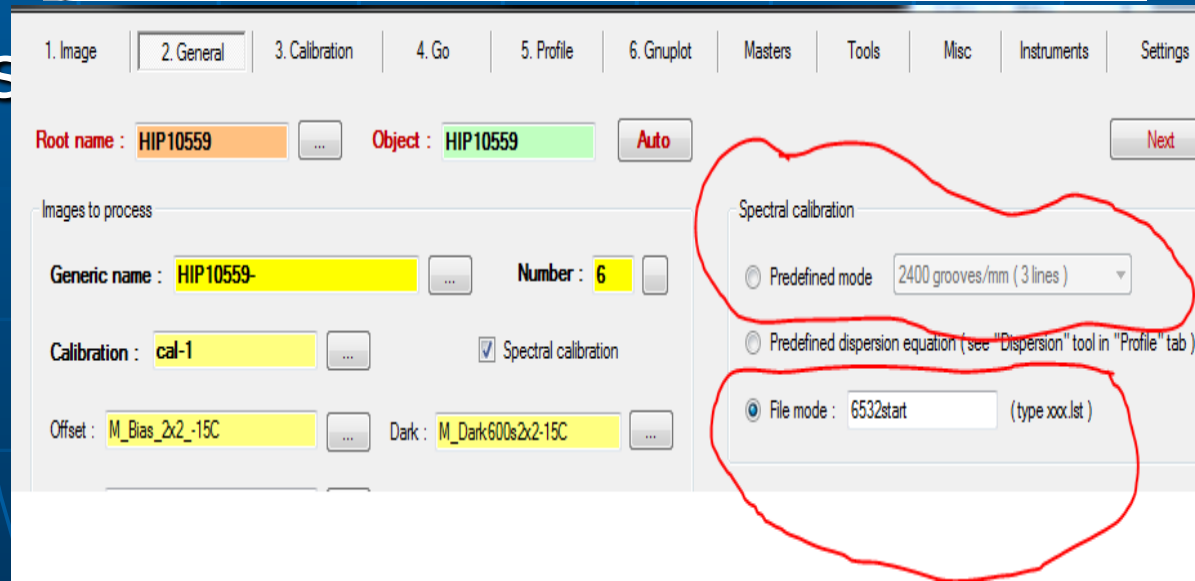
$$145.4/1275 = .114 \text{ A/pix}$$

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- Make a simple .lst (list) file in Notepad and put it in your working file. Save as → “a name that makes sense”.lst (not as .txt which is the default)



```
6532start.LST - Notepad
File Edit Format View Help
p
.1164
6532.882
6598.953
6678.276
```



1. Image | 2. General | 3. Calibration | 4. Go | 5. Profile | 6. Grunplot | Masters | Tools | Misc | Instruments | Settings

Root name : HIP10559 | Object : HIP10559 | Auto | Next

Images to process

Generic name : HIP10559- | Number : 6

Calibration : cal-1 | Spectral calibration

Offset : M_Bias_2x2_-15C | Dark : M_Dark600s2x2-15C

Spectral calibration

- Predefined mode 2400 grooves/mm (3 lines)
- Predefined dispersion equation (see "Dispersion" tool in "Profile" tab)
- File mode : 6532start (type xxx.lst)