



Processing of observational data with AbAO-T70

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May 30 - June 3, 2022
Observatoire de la côte d'Azur, Nice



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T48cm

Cassegrain telescope has diameter of 480 mm, equivalent focal length of 7715 mm and is equipped with a CCD Apogee Alta KAF-16801E, with U,B,V,R,I filters

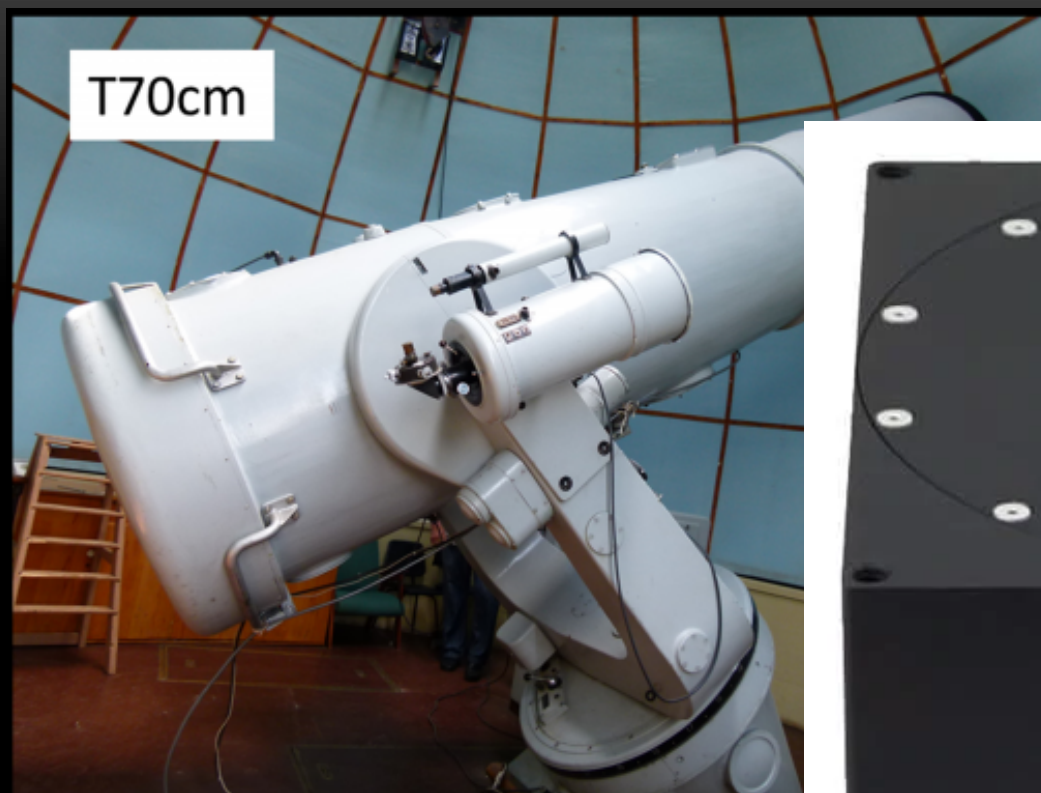




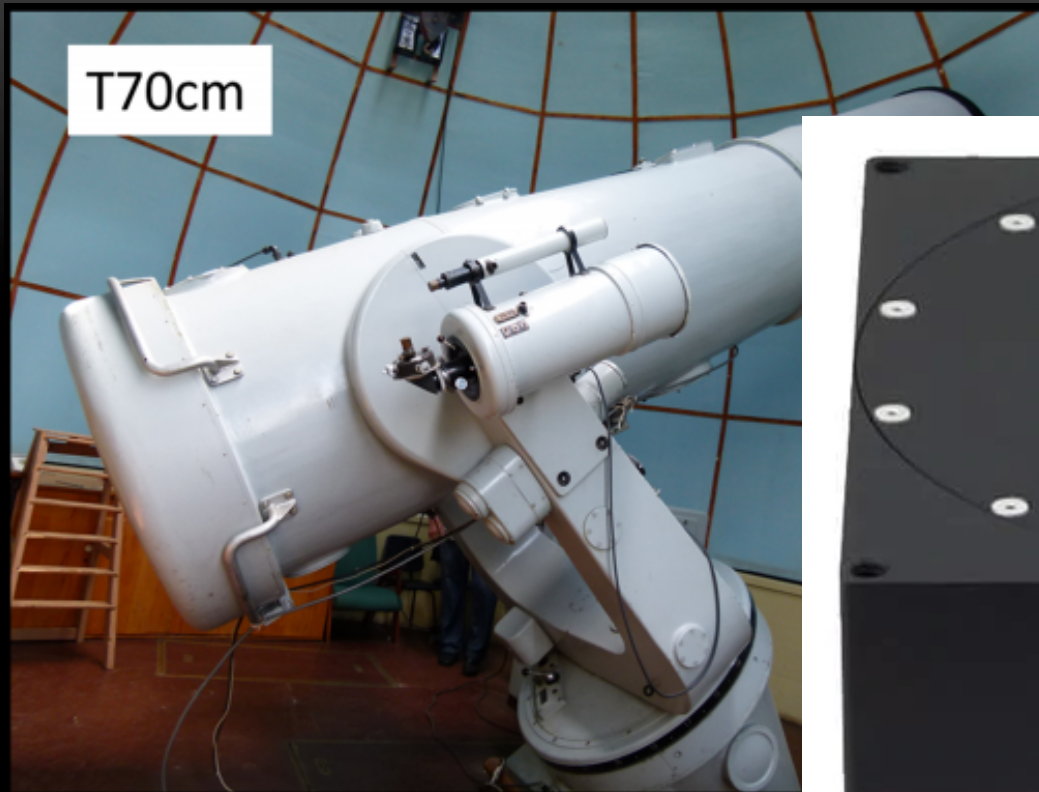
70 cm Meniscus telescope



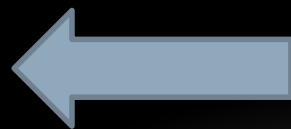
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pl4240-ccd-camera-back-illum-63-5mm-
shutter-gra

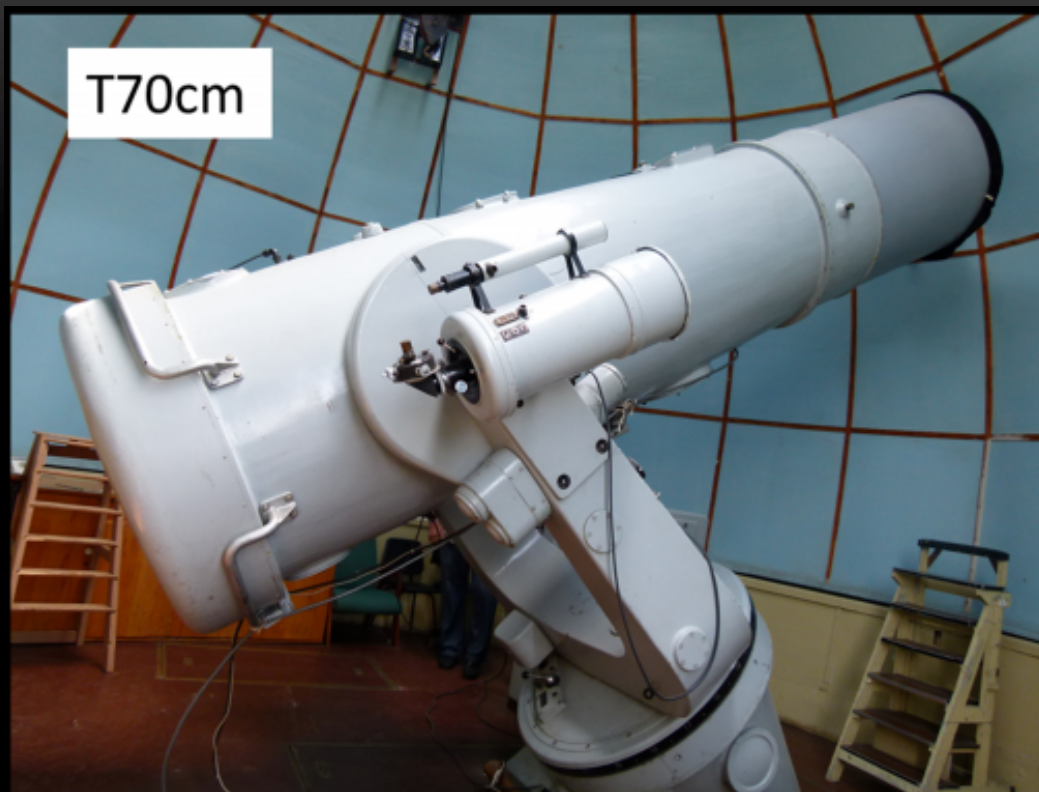


R Filter

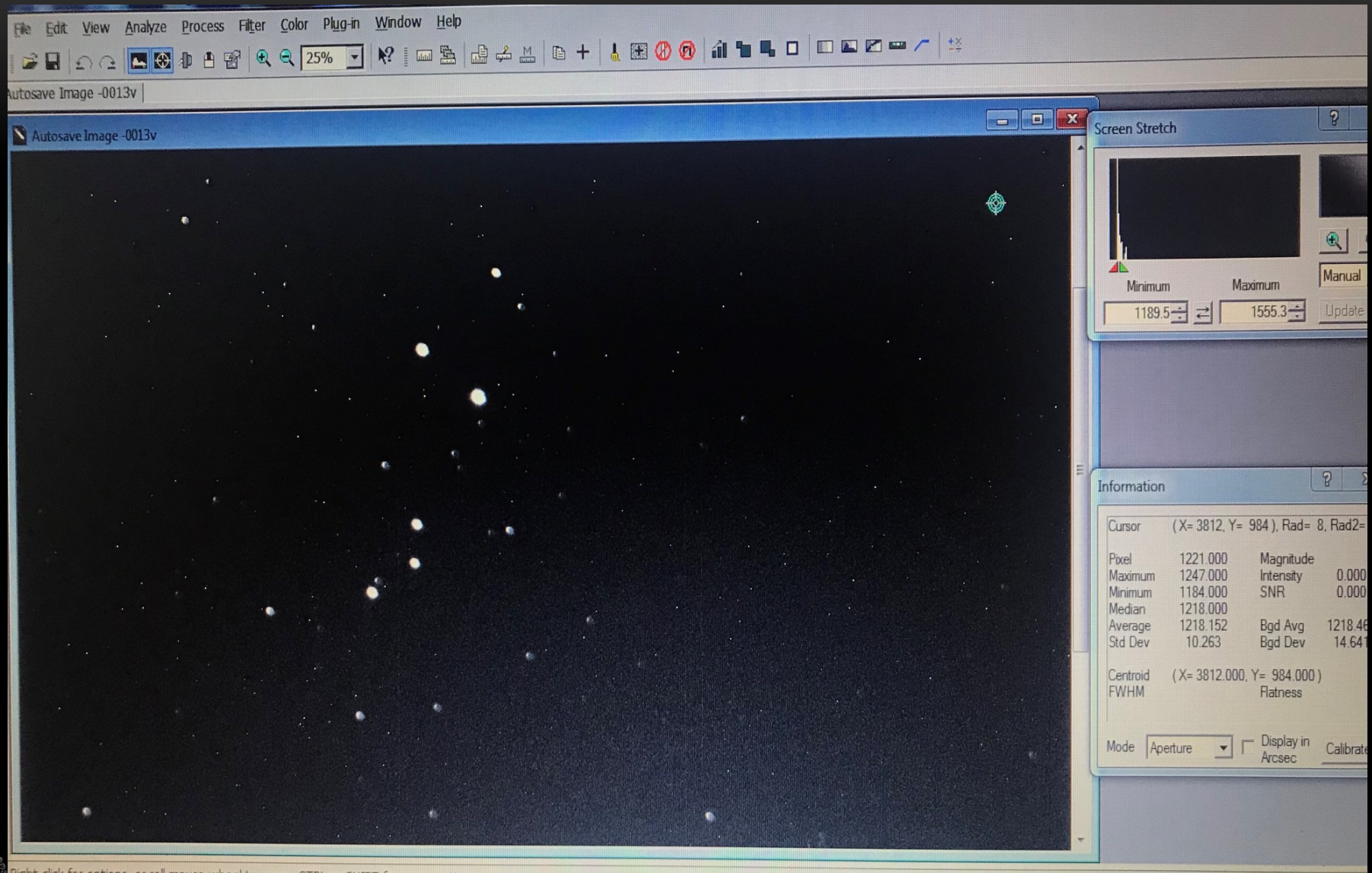


....
B

Abastumani Team



MaxIm DL 5



The screenshot displays the MaxIm DL 5 software interface. The main window shows a dark image of a star field with several bright stars. The interface includes a menu bar (File, Edit, View, Analyze, Process, Filter, Color, Plug-in, Window, Help) and a toolbar with various icons. The title bar of the main window reads "Autosave Image -0013v".

Two panels are visible on the right side:

- Screen Stretch:** This panel shows a histogram of the image data. It includes input fields for "Minimum" (1189.5) and "Maximum" (1555.3), and an "Update" button.
- Information:** This panel displays statistical data for a selected region. The cursor is positioned at (X= 3812, Y= 984) with a radius of 8. The data is as follows:

Property	Value	Property	Value
Pixel	1221.000	Magnitude	
Maximum	1247.000	Intensity	0.000
Minimum	1184.000	SNR	0.000
Median	1218.000		
Average	1218.152	Bgd Avg	1218.46
Std Dev	10.263	Bgd Dev	14.64
Centroid	(X= 3812.000, Y= 984.000)		
FWHM		Flatness	

At the bottom of the Information panel, there is a "Mode" dropdown menu set to "Aperture", a "Display in Arcsec" checkbox, and a "Calibrate" button.



Right-click for options, or roll mouse wheel to zoom. CTRL or SHIFT for more options.

File Edit View Analyze Process Filter Color Plug-in Window Help

GRB_220514 A-021R | GRB_220514 A-022R | GRB_220514 A-023R | GRB_220514 A-024R | GRB_220514 A-025R | GRB_220514 A-026R | GRB_220514 A-027R | GRB_220514 A-028R | GRB_220514 A-020R |

GRB_220514 A-022R

Screen Stretch

Information

Cursor

Pixel	Magnitude
Maximum Intensity	Intensity
Minimum	SNR
Median	Bgd Avg
Average	Bgd Dev
Std Dev	
Centroid	
FWHM	Flatness

Minimum 10434 Maximum 13265 Medium Update >>

GRB_220514 A-022R

View Edit

Calibrate >>

For Help, press F1

3.33 014

```

SIMPLE = T
BITPIX = 16 /8 unsigned int, 16 & 32 int, -32 & -64 real
NAXIS = 2 /number of axes
NAXIS1 = 2048 /fastest changing axis
NAXIS2 = 2048 /next to fastest changing axis
BSCALE = 1.0000000000000000 /physical = BZERO + BSCALE*array_value
BZERO = 32768.000000000000 /physical = BZERO + BSCALE*array_value
DATE-OBS = '2022-05-14T20:06:37' /YYYY-MM-DDThh:mm:ss observation start
EXPTIME = 60.0000000000000000 /Exposure time in seconds
EXPOSURE = 60.0000000000000000 /Exposure time in seconds
SET-TEMP = -15.0000000000000000 /CCD temperature setpoint in C
CCD-TEMP = -15.0000000000000000 /CCD temperature at start of exposure in C
XPISZ = 13.5000000000000000 /Pixel Width in microns (after binning)
YPISZ = 13.5000000000000000 /Pixel Height in microns (after binning)
XBINNING = 1 /Binning factor in width
YBINNING = 1 /Binning factor in height
XORGSUBF = 0 /Subframe X position in binned pixels
YORGSUBF = 0 /Subframe Y position in binned pixels
READOUTM = '500KHz' / Readout mode of image
FILTER = 'R' / Filter used when taking image
IMAGETYP = 'LIGHT' / Type of image
SITELAT = '41 45 15' / Latitude of the imaging location

```



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File Edit View Analyze Process Filter Color Plug-in Window Help

GRB_220514 A-021R | GRB_220514 A-024R | GRB_220514 A-025R | GRB_220514 A-026R | GRB_220514 A-027R | GRB_220514 A-028R | GRB_220514 A-020R

GRB_220514 A-024R

- Calibrate
- Calibrate All
- Set Calibration...
- Calibration Wizard...
- Create Master Frames
- Align...
- Stack...
- Remove Bad Pixels...
- Add Noise...
- Remove Bloom...
- Remove Pedestal
- Resize...
- Double Size
- Half Size
- Make Pixels Square
- Stretch...
- Histogram Specification...
- Curves...
- Levels...
- Threshold...
- Pixel Math...

Screen Stretch

Minimum: 6760.3 Maximum: 10378

Information

Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

FITS Header for GRB_220514 A-024R

```
View | Edit |
SIMPLE = T
BITPIX = 16 / 8 unsigned int, 16 & 32 int, -32 & -64 real
NAXIS = 2 / number of axes
NAXIS1 = 2048 / fastest changing axis
NAXIS2 = 2048 / next to fastest changing axis
BSCALE = 1.0000000000000000 / physical = BZERO + BSCALE*array_value
BZERO = 32768.000000000000 / physical = BZERO + BSCALE*array_value
DATE-OBS = '2022-05-14T20:09:03' / YYYY-MM-DDThh:mm:ss observation start
EXPTIME = 60.0000000000000000 / Exposure time in seconds
EXPOSURE = 60.0000000000000000 / Exposure time in seconds
SET-TEMP = -15.0000000000000000 / CCD temperature setpoint in C
CCD-TEMP = -15.0000000000000000 / CCD temperature at start of exposure in C
XPIXSZ = 13.5000000000000000 / Pixel Width in microns (after binning)
YPIXSZ = 13.5000000000000000 / Pixel Height in microns (after binning)
XBINNING = 1 / Binning factor in width
YBINNING = 1 / Binning factor in height
XORGSUBF = 0 / Subframe X position in binned pixels
YORGSUBF = 0 / Subframe Y position in binned pixels
READOUTM = '500KHz' / Readout mode of image
FILTER = 'R' / Filter used when taking image
IMAGETYP = 'LIGHT' / Type of image
SITELAT = '41 45 15' / Latitude of the imaging location
```

Set up calibration data

3:25 PM



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File Edit View Analyze Process Filter Color Plug-in

GRB_220514 A-021R | GRB_220514 A-022R | GRB_220514 A-023R | GRB_220514 A-024R

GRB_220514 A-024R

Set Calibration

Automatically Generate Groups

Source Folder: C:\Users\Sophia\Desktop\GRANDMA s dakvireba 15.05.2022\All

Auto-Generate (Clear Old) [v] Replace w/ Masters

OK Cancel Advanced

Calibration Groups

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
<input checked="" type="checkbox"/> Dark 1	DARK		60.00s	2048 x 2048	1 x 1	-15.00	12
<input checked="" type="checkbox"/> Flat R1	FLAT	R	20.00s	2048 x 2048	1 x 1	-15.00	6

<AUTO> Add Group Remove Group Clear All Groups

Group Properties

File Name: Dark_60 -001B.fit, Dark_60 -002B.fit, Dark_60 -003B.fit, Dark_60 -004B.fit, Dark_60 -005B.fit, Dark_60 -006B.fit, Dark_60 -007B.fit, Dark_60 -008B.fit, Dark_60 -009B.fit

Show File Names Only Apply Boxcar Filter (one-shot color flats)

Dark Frame Scaling: Auto-Scale

Scale Factor: 1.0000

Combine Type: Average

Add Remove Settings

Apply To All Groups

Information

Cursor

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

Calibrate >>

... 16 & 32 int. -32 & -64 real
...
... bining axis
... test changing axis
... /physical = BZERO + BSCALE*array_value
... /physical = BZERO + BSCALE*array_value
... 09-03' ^YYYY-MM-DDThh:mm:ss observation start
... /Exposure time in seconds
... /Exposure time in seconds
... /CCD temperature setpoint in C
... /CCD temperature at start of exposure in C
... /Pixel Width in microns (after binning)
... /Pixel Height in microns (after binning)
... in width
... in height
... position in binned pixels
... position in binned pixels
... Readout mode of image
...
FILTER = R / Filter used when taking image
IMAGETYP = LIGHT / Type of image
SITELAT = 41 45 15 / Latitude of the imaging location





File Edit View Analyze Process Filter Color Plug-in Window Help

Calibrate

- Calibrate All
- Set Calibration...
- Calibration Wizard...
- Create Master Frames
- Align...
- Stack...
- Remove Bad Pixels...
- Add Noise...
- Remove Bloom...
- Remove Pedestal
- Resize...
- Double Size
- Half Size
- Make Pixels Square
- Stretch...
- Histogram Specification...
- Curves...
- Levels...
- Threshold...
- Pixel Math...

GRB_220514 A-021R GRB_220514 A-022R

GRB_220514 A-024R | GRB_220514 A-025R | GRB_220514 A-026R | GRB_220514 A-027R | GRB_220514 A-028R | GRB_220514 A-020R |

Screen Stretch

Minimum: 10434 Maximum: 13265

Information

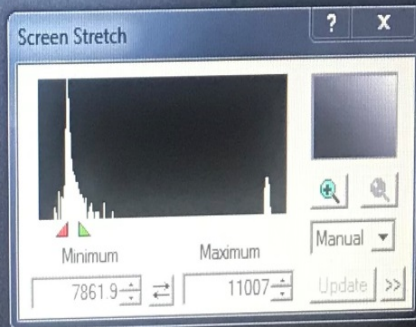
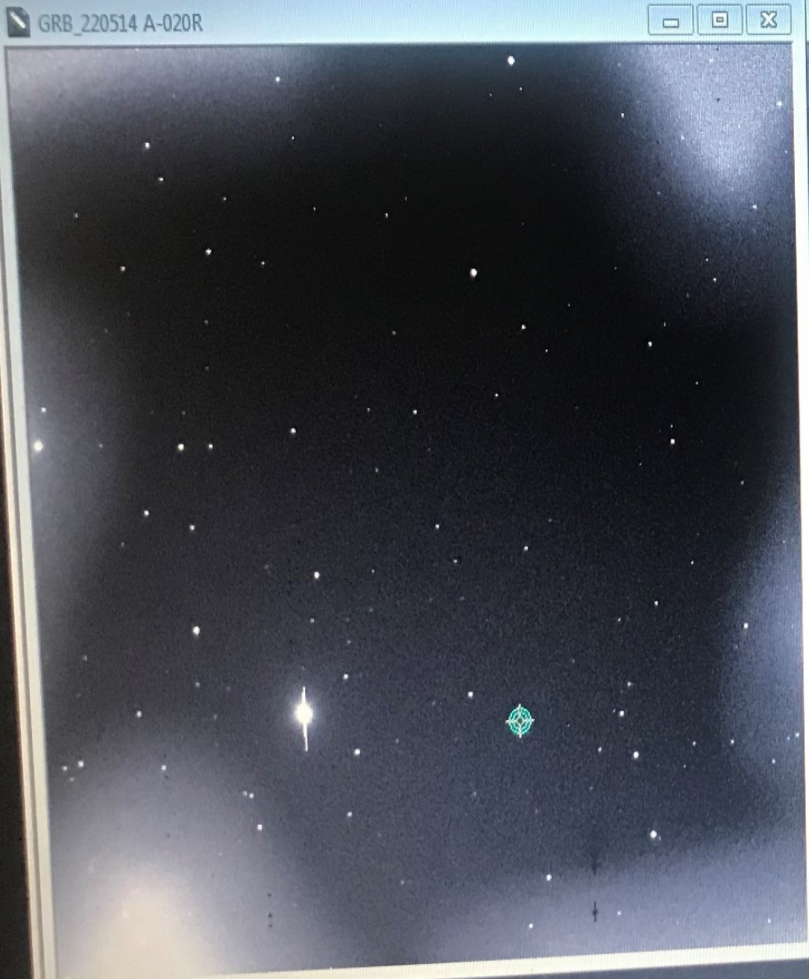
Cursor	Magnitude
Pixel	Intensity
Maximum	SNR
Minimum	Bgd Avg
Median	Bgd Dev
Average	
Std Dev	
Centroid	
FWHM	Flatness

FITS Header for GRB_220514 A-022R

```
View | Edit |
SIMPLE = T
BITPIX = 16 / 8 unsigned int, 16 & 32 int, -32 & -64 real
NAXIS = 2 / number of axes
NAXIS1 = 2048 / fastest changing axis
NAXIS2 = 2048 / next to fastest changing axis
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BZERO = 32768.0000000000000000 / physical = BZERO + BSCALE*array_value
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EXPTIME = 60.0000000000000000 / Exposure time in seconds
EXPOSURE = 60.0000000000000000 / Exposure time in seconds
SET-TEMP = -15.0000000000000000 / CCD temperature setpoint in C
CCD-TEMP = -15.0000000000000000 / CCD temperature at start of exposure in C
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XBINNING = 1 / Binning factor in width
YBINNING = 1 / Binning factor in height
XORGSUBF = 0 / Subframe X position in binned pixels
YORGSUBF = 0 / Subframe Y position in binned pixels
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FILTER = 'R' / Filter used when taking image
IMAGETYP = 'LIGHT' / Type of image
SITELAT = '41 45 15' / Latitude of the imaging location
```

Calibrate all open images





Information			
Cursor	(X= 1260, Y= 1496), Rad= 8, Rad2= 30		
Pixel	8189.250	Magnitude	
Maximum	8303.303	Intensity	0.000
Minimum	7832.289	SNR	0.000
Median	8096.267		
Average	8092.473	Bgd Avg	8270.229
Std Dev	83.467	Bgd Dev	857.517
Centroid	(X= 1260.000, Y= 1496.000)		
FWHM	Flatness		
Mode	Aperture	<input type="checkbox"/> Display in Arcsec	Calibrate >>



File Edit View Analyze Process Filter Color Plug-in Window Help

35.9%

GRANDMA

Photometry - GRB220514A_Abastumani-T70_2022-05-14T20-04-11_020R.fit

Screen Stretch

Minimum: 7940.3 Maximum: 10996

Information

Cursor	Magnitude
Pixel	Intensity
Maximum	SNR
Minimum	Bgd Avg
Median	Bgd Dev
Average	
Std Dev	
Centroid	Flatness
FWHM	

Mode: Aperture Display in Arcsec Calibrate >>

Photometry

Hours since 2022-05-14 0h UT (JD 2459713.5)

Back << Next Image Load... Print... Settings... Prev Image Save... Close

2048x2048 36% 7:51 PM

Left-click to highlight points; right-click to control exclusions



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File Edit View Analyze Process Filter Color Plug-in Window Help

GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s Photometry - GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s.fit

Photometry - GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s.fit

Screen Statistics

Minimum 65937 Maximum 90879 Medium Update

Information

Cursor	(X= 808, Y= 1300), Rad= 8, Rad2= 30	
Pixel	73206.000	Magnitude 2.950
Maximum	74389.000	Intensity 356868.563
Minimum	67100.000	SNR 90.370
Median	68913.000	
Average	69491.563	Bgd Avg 67680.047
Std Dev	1713.242	Bgd Dev 281.352
Centroid	(X= 807.558, Y= 1298.813)	
FWHM	6.659	Flatness 0.173

Mode Aperture Display in Arcsec Calibrate >>

Photometry

Image list: GRB220514A_Beradze

Tagged objects: Obj1 (600.619), Ref1 (808.1299)

Time/identification field: Date/time from FITS

Mouse click tags as: New Reference Star

Ref Mag: 17.1

Time of Image (Mid-exp.): 2022-05-14 20:09:33.0 JD 2459714.339965

Act on all images, Use star matching, Snap to centroid

View Plot... Close

Obj1

Ref1

2MASS J09505108+1307287 – Star R=17.1





Photometry - GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s.fit

Lim Mag = 18.3

Obj1 (600.619)
Ref1 (808.1299)

Information			
Cursor	(X= 808, Y= 1300), Rad= 8, Rad2= 30		
Pixel	73206.000	Magnitude	2.950
Maximum	74389.000	Intensity	356868.563
Minimum	67100.000	SNR	90.370
Median	68913.000		
Average	69491.563	Bgd Avg	67680.047
Std Dev	1713.242	Bgd Dev	281.352
Centroid	(X= 807.558, Y= 1298.813)		
FWHM	6.659	Flatness	0.173

Mode: Aperture | Display in Arcsec | Calibrate >>

Time/identification field: Date/time from FITS

Mouse click tags as: New Reference Star

Ref Mag: 17.1

Time of Image (Mid-exp.): 2022-05-14 20:09:33.0
JD 2459714.339965

Act on all images | Use star matching | Snap to centroid

View Plot... | Close

Ref1

MASS J09505108+1307287 – Star
R=17.1





GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s Photometry - GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s.fit

Photometry - GRB220514A_Beradze_Abastumani-T70_2022-05-14T20-04-11_R_STACK_9x60s.fit

Screen Stretch

Minimum: 62943 Maximum: 1.0932e+00

Information

Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

Mode: Aperture Display in Arcsec Calibrate >>

Photometry

Image list: GRB220514A_Beradze

Tagged objects: Obj1 (600,619), Ref1 (730,1147)

Time/identification field: Date/time from FITS

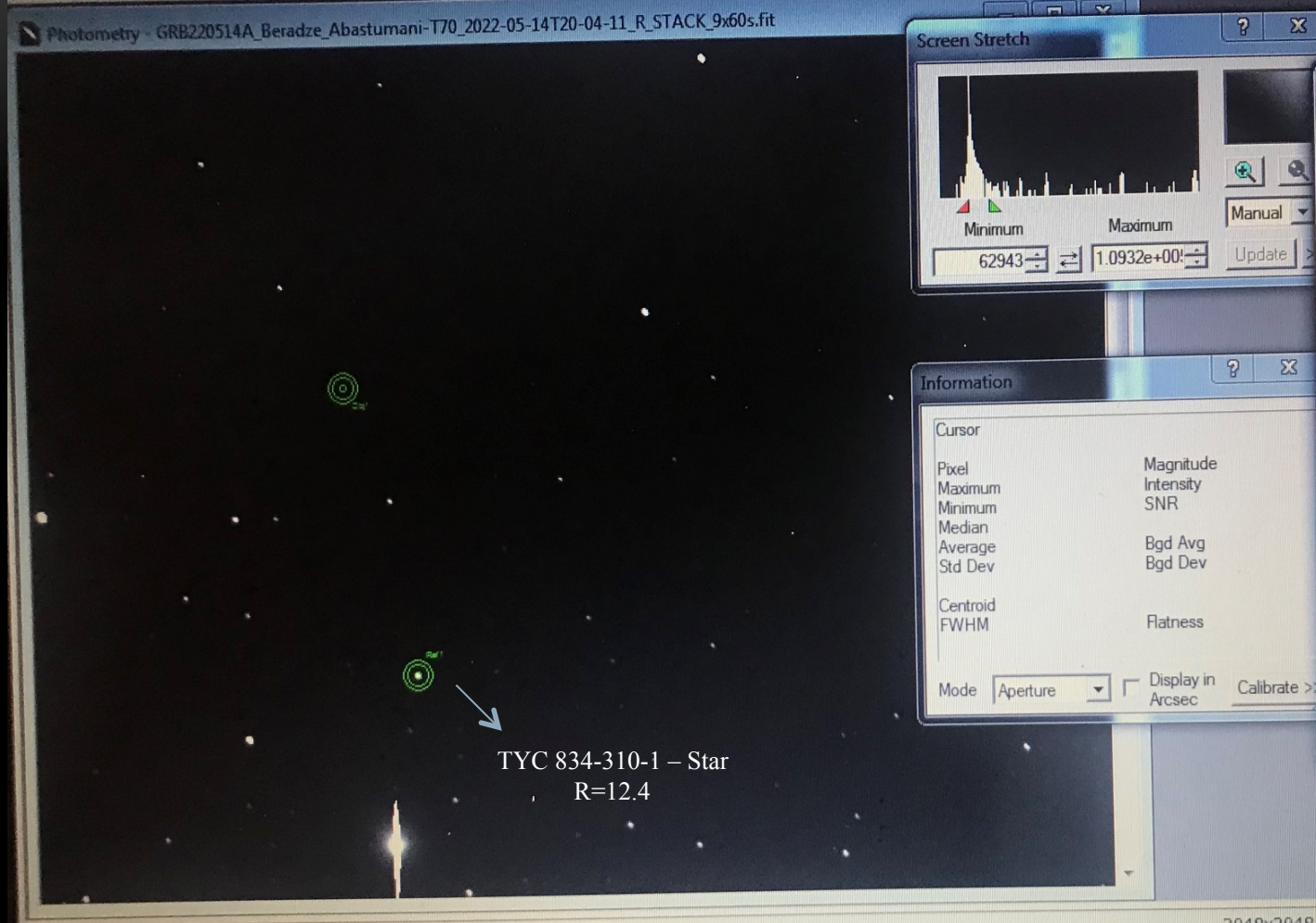
Ref Mag: 12.4

Time of Image (Mid-exp.): 2022-05-14 20:09:33.0, JD 2459714.339965

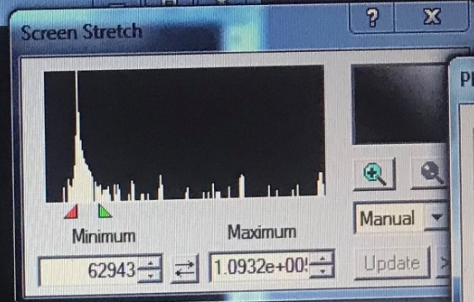
Act on all images Use star matching Snap to centroid



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TYC 834-310-1 - Star
R=12.4



Photometry

Image list	Tagged objects
GRB220514A_Beradze	Obj1 (600.619)
	Ref1 (730.1147)

Time/identification field: Date/time from FITS

Mouse click tags as: New Reference Si

Ref Mag: 12.4

Exclude Untag

Time of Image (Mid-exp.): 2022-05-14 20:09:33.0
JD 2459714.339965

Act on all images Use star matching Snap to centroid

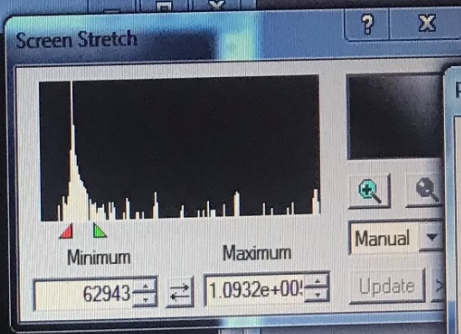
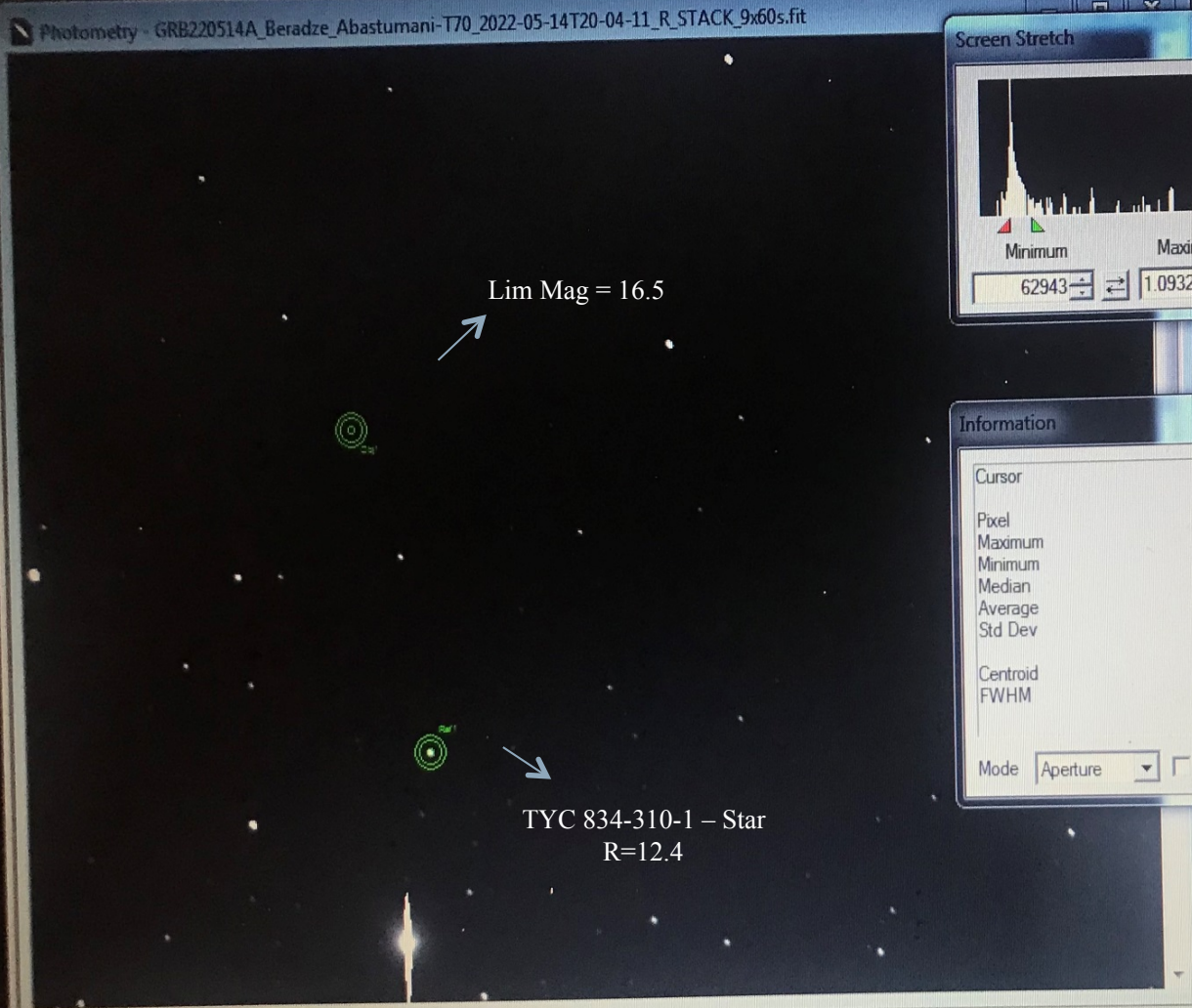
View Plot... Close

Information

Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

Mode: Aperture Display in Arcsec Calibrate >>





Information

Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Bgd Avg
Average	Bgd Dev
Std Dev	
Centroid	Flatness
FWHM	

Mode: Aperture Display in Arcsec Calibrate >>

Photometry

Image list: GRB220514A_Beradze

Tagged objects: Obj1 (600,619), Ref1 (730,1147)

Time/identification field: Date/time from FITS

Mouse click tags as: New Reference Si

Ref Mag: 12.4

Time of Image (Mid-exp.): 2022-05-14 20:09:33.0, JD 2459714.339965

Act on all images Use star matching Snap to centroid

View Plot... Close





Thank you for your attention !!!



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