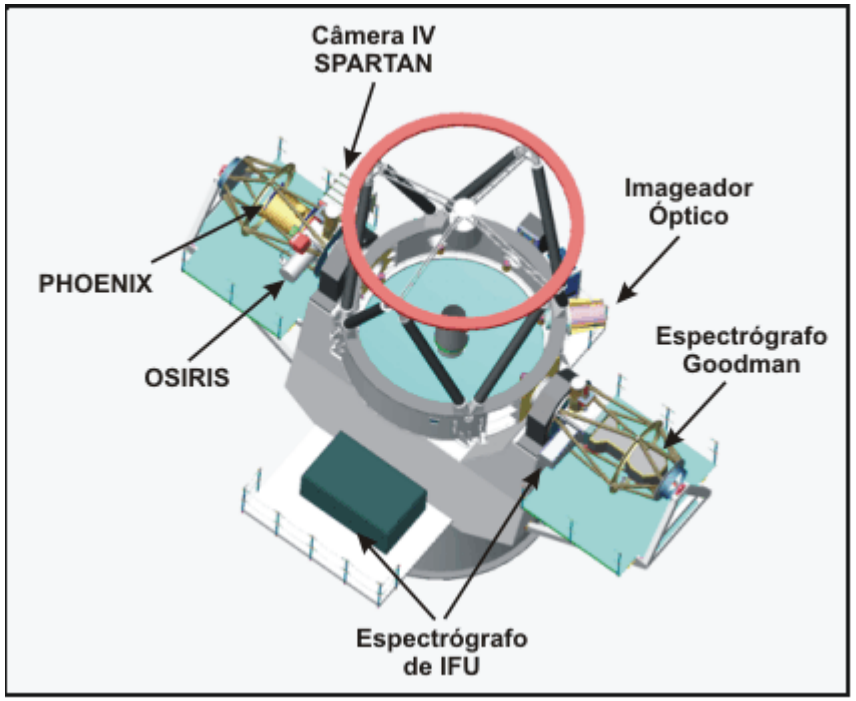
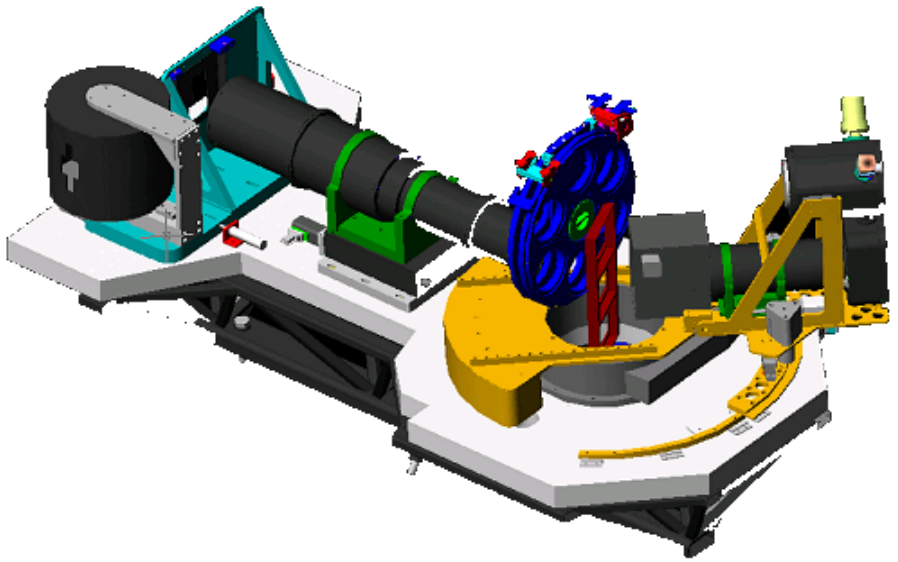
Goodman Spectrograph





Documentation

Goodman HTS Manual

http://www.ctio.noao.edu/soar/content/goodman-hts-manual

Goodman Overview

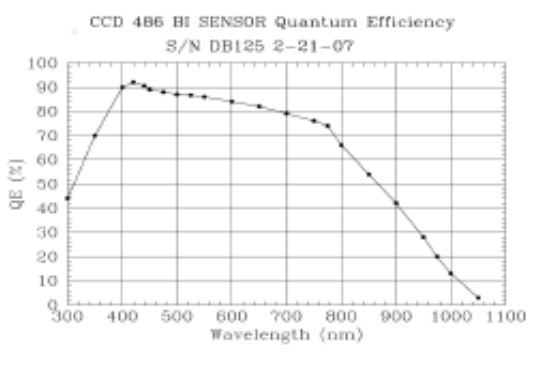
http://www.ctio.noao.edu/soar/content/goodman-spectrograph-overview

Goodman Spectrograph Observer's Cheat Sheet - 1

CCD Characteristics

Read Rate	Analog ATTN	Gain (e-/ADU)	Read Noise (e-)	50% Full Well (ADU)
50 kHz	0	0.25	3.33	279600*
	2	0.47	3.35	148723*
	3	0.91	3.41	76813*
100 kHz	0	0.56	3.69	124821*
	2	1.06	3.72	65943*
	3	2.06	3.99	33932
200 kHz	0	1.4	4.74	49928
	2	2.67	5.12	26179
400 kHz	0	5.67	8.62	12328

* Digital saturation reached before 50% full well



Other Info:
Digital saturation: 65,536 e-
Single Pixel Full Well: 139,800 e-
Linearity: 0-80% Full Well
Dark Current: 0.0003 e-/pixel/sec
Pixel size: 15 microns

Mode	Binning	Serial Origin	Serial Length	Parallel Origin	Parallel Length	Approx. Image Size
Imaging 1x1	1x1	516	3096	500	3096	19 Mb
Imaging 2x2	2x2	516	1548	500	1548	5 Mb
Imaging 3x3	3x3	516	1032	500	1032	2 Mb
Spec 1x1	1x1	0	4142	1100	1896	16 Mb
Spec 2x2	2x2	0	2071	1100	948	4 Mb
Spec 3x3	3x3	0	1381	1100	632	2 Mb
Slit Imaging /alignment	1x2	1250	1200	1100	948	800 Kb

Note: Origins are given in un-binned, absolute pixels, lengths are given in binned pixels

Spectroscopic Info

Grating (lines/mm)	Dispersion (Å/pixel)	Coverage (Å)	Max R @ 550nm (3pix with 0.46" slit)	Blocking Filter
400	1.00	M1: 300-705 M2: 500-905	1850	– GG-455
600	0.65	UV: 301-569 Blue: 350-616 Mid: 435-702 Red: 630-893	2800	-- – GG-385 GG-495
930	0.42	M1: 300-470 M2: 385-555 M3: 470-640 M4: 555-725 M5: 640-810 M6: 725-895	4450	– – GG-385 GG-495 GG-495 OG-570
1200	0.31	M0: 302-436 M1: 350-485 M2: 420-550 M3: 490-615 M4: 555-685 M5: 625-750 M6: 695-815 M7: 765-880	5880	– – – – GG-455 GG-455 GG-495 OG-570
1800	0.19	800	9610	As needed
2100	0.15	630	11930	As needed
2400	0.12	510	14280	As needed

Order sorting filters: GG385, GG455, GG495, OG570, S8612

Imaging Info

Field of View: 7.2' diameter circle
Pixel scale: 0.15"/pixel
Approximate exposure times in imaging mode required to achieve a SNR=100 on a star of V=16 and V=20, for a Moon Phase=7 days, Seeing=1", Airmass=1.2

Available Filters:
- Johnson UBV, Kron-Cousins Rc (round 4" diameter)
- UBVRI (Bessell; 4"x4")
- SDSS ugriz (4"x4")
- Hα (4"x4")
- Other filters per request. Contact the instrument scientist

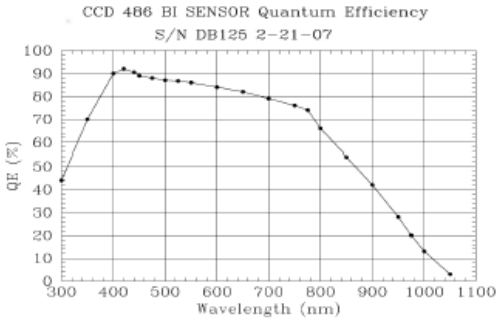
Filter	Exp (s) V=16	Exp (s) V=20
U	7	650
B	1	50
V	1	48
R	0.6	42
I	1.5	110

Goodman Spectrograph

Blue Camera

Read Rate	Analog ATTN	Gain (e-/ADU)	Read Noise (e-)	50% Full Well (ADU)
50 kHz	0	0.25	3.33	279600*
	2	0.47	3.35	148723*
	3	0.91	3.41	76813*
100 kHz	0	0.56	3.69	124821*
	2	1.06	3.72	65943*
	3	2.06	3.99	33932
200 kHz	0	1.4	4.74	49928
	2	2.67	5.12	26179
400 kHz	0	5.67	8.62	12328

* Digital saturation reached before 50% full well



Digital saturation: 65,536 e-
Single Pixel Full Well: 139,800 e-
Linearity: 0-80% Full Well
Dark Current: 0.0003 e-/pixel/sec
Pixel size: 15 microns

Mode	Binning	Serial Origin	Serial Length	Parallel Origin	Parallel Length	Approx. Image Size
Imaging 1x1	1x1	516	3096	500	3096	19 Mb
Imaging 2x2	2x2	516	1548	500	1548	5 Mb
Imaging 3x3	3x3	516	1032	500	1032	2 Mb
Spec 1x1	1x1	0	4142	1100	1896	16 Mb
Spec 2x2	2x2	0	2071	1100	948	4 Mb
Spec 3x3	3x3	0	1381	1100	632	2 Mb
Slit Imaging /align	1x2	1250	1200	1100	948	800 Kb

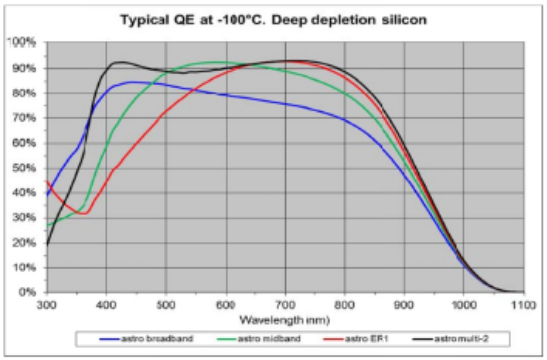
Note: Origins are given in un-binned, absolute pixels, lengths are given in binned pixels

Red Camera

Read Rate	Analog ATTN	Gain (e-/ADU)	Read Noise (e-)	50% Full Well (ADU)
100 kHz	3	1.54	3.45	66,558*
100 kHz	2	3.48	5.88	29,454
344 kHz	3	1.48	3.89	69,257*
344 kHz	0	3.87	7.05	26,486
750 kHz	2	1.47	5.27	69,728*
750 kHz	0	3.77	8.99	27,188

*Digital saturation reached before 50% full well

Full frame readout times		
Readout	ROI	t(s)
750ATTN0	Imaging 1x1	16.2
750ATTN0	Imaging 2x2	6.5
750ATTN0	Spec 1x1	14.0
750ATTN0	Spec 2x2	6.0
344ATTN0	Imaging 1x1	31.5
344ATTN0	Imaging 2x2	10.3
344ATTN0	Spec 1x1	26.0
344ATTN0	Spec 2x2	9.0
100ATTN0	Imaging 1x1	98.0
100ATTN0	Imaging 2x2	26.7
100ATTN0	Spec 1x1	80.5
100ATTN0	Spec 2x2	22.7



* e2v 231-84 deep depletion CCD with multi-2 coating (black line)

Digital saturation: 65,536 e-
Single Pixel Full Well: 205,000 e-
Linearity: 5-80% Full Well
Dark Current: 0.00008 e-/pixel/sec
Pixel size: 15 microns

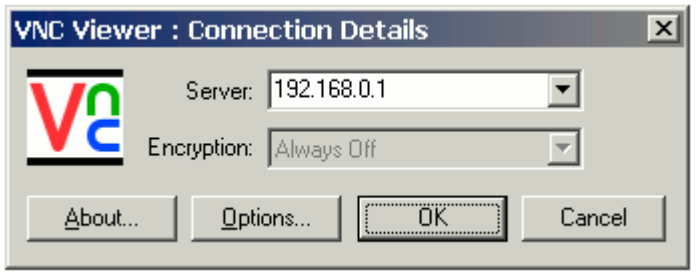
Mode	Binning	Serial Origin	Serial Length	Parallel Origin	Parallel Length	Approx. Image Size
Imaging 1x1	1x1	530	3096	388	3096	19 Mb
Imaging 2x2	2x2	530	1548	388	1548	5 Mb
Imaging 3x3	3x3	530	1032	388	1032	2 Mb
Spec 1x1	1x1	0	1896	980	4142	16 Mb
Spec 2x2	2x2	0	948	980	2071	4 Mb
Spec 3x3	3x3	0	632	980	1381	2 Mb
Slit Imaging/Align*	1x1	1100	1100	1300	1500	3 Mb

Note: Origins given in un-binned, absolute pixels, lengths are given in binned pixels
*Subject to change.

Virtual Network Computing (VNC) enables to remotely control other computers.

For Windows machines, we suggest either the *Real VNC Viewer* or the *Ultra VNC Viewer* client.

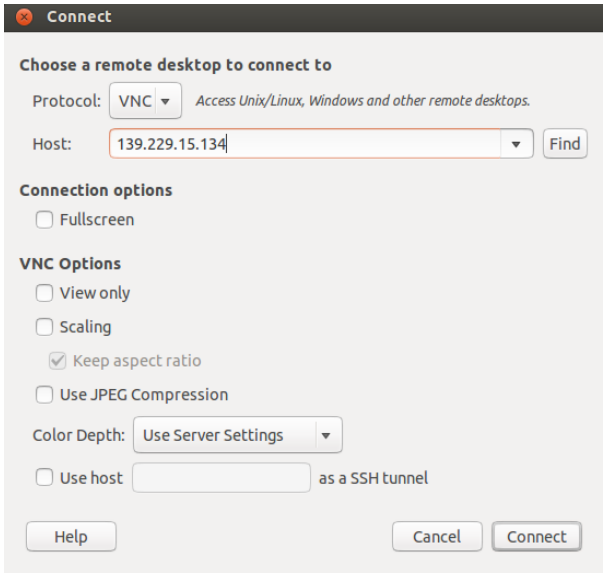
Webpages: www.realvnc.com and http://www.uvnc.com/



For GNU/Linux and Mac OSX machines, we suggest the *Real VNC Viewer* client. The VNC viewers *Remmina, Vinagre*, and *vncviewer* that come installed By default in several Linux distributions also work correctly.

For Mac OSX machines there is also a *Real VNC* client, do not use Chicken VNC.

Vinagre



1) The Goodman data acquistion computer (GUI) is accessed with the command:

Blue Camera:
vncviewer -Shared soaric2.ctio.noao.edu or vncviewer -Shared 139.229.15.132

Red Camera:
vncviewer -Shared soaric6.ctio.noao.edu or vncviewer -Shared 139.229.15.136

2) The Goodman data data analysis computer (IRAF) is accessed with:

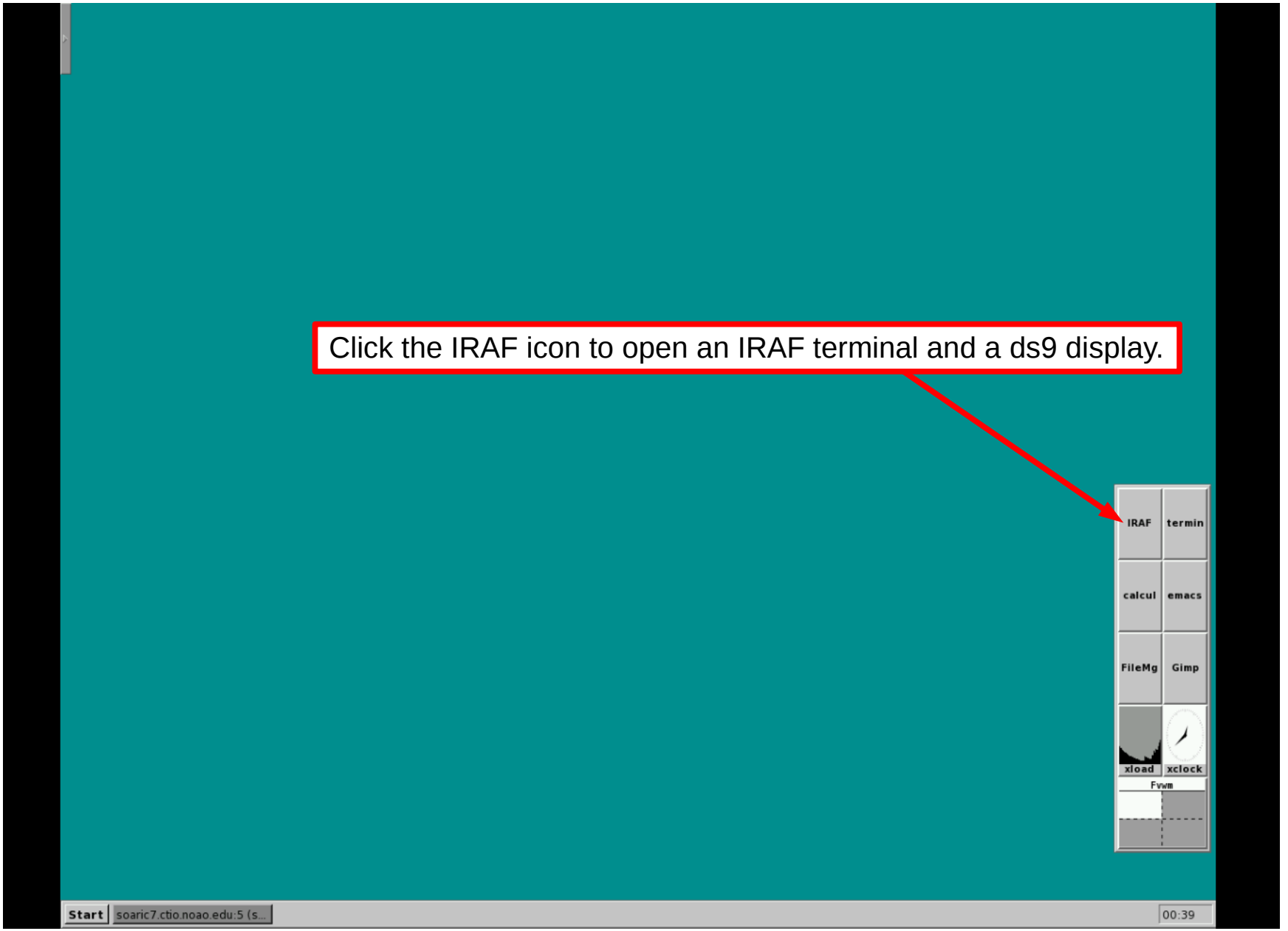
vncviewer -Shared soaric7.ctio.noao.edu:<N>
or
vncviewer -Shared 139.229.15.137:<N>

N is the display number of the respective SOAR partner.

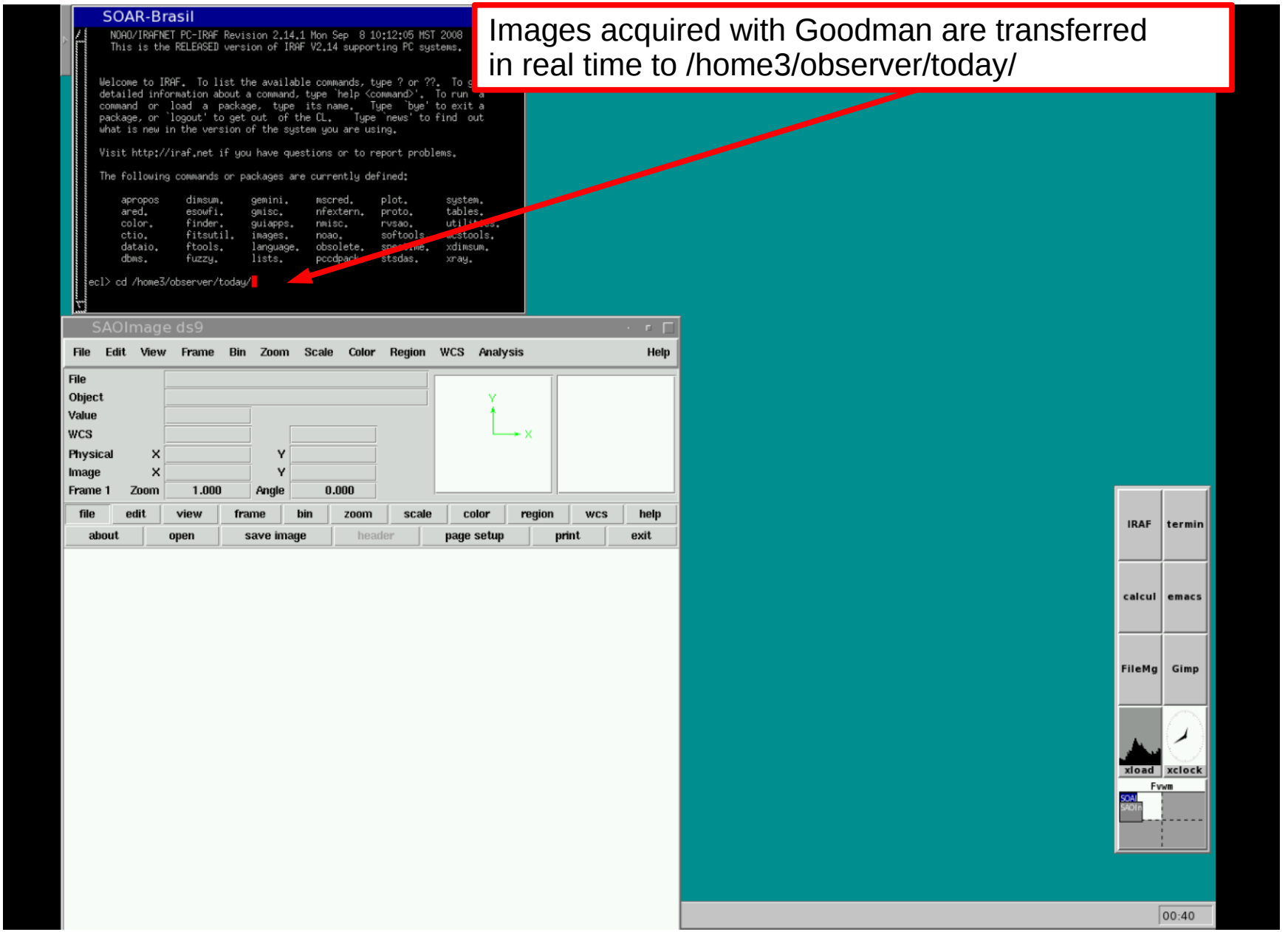
If you have obtained time through NOAO or the Chilean TAC, please contact Cesar Briceño (cbriceno@ctio.noao.edu) or Sean Points (spoints@ctio.noao.edu) to get the password information.

If you have time through the Brazil TAC, contact Bruno Quint (bquint@ctio.noao.edu)

Opening the VNC of SOARIC7

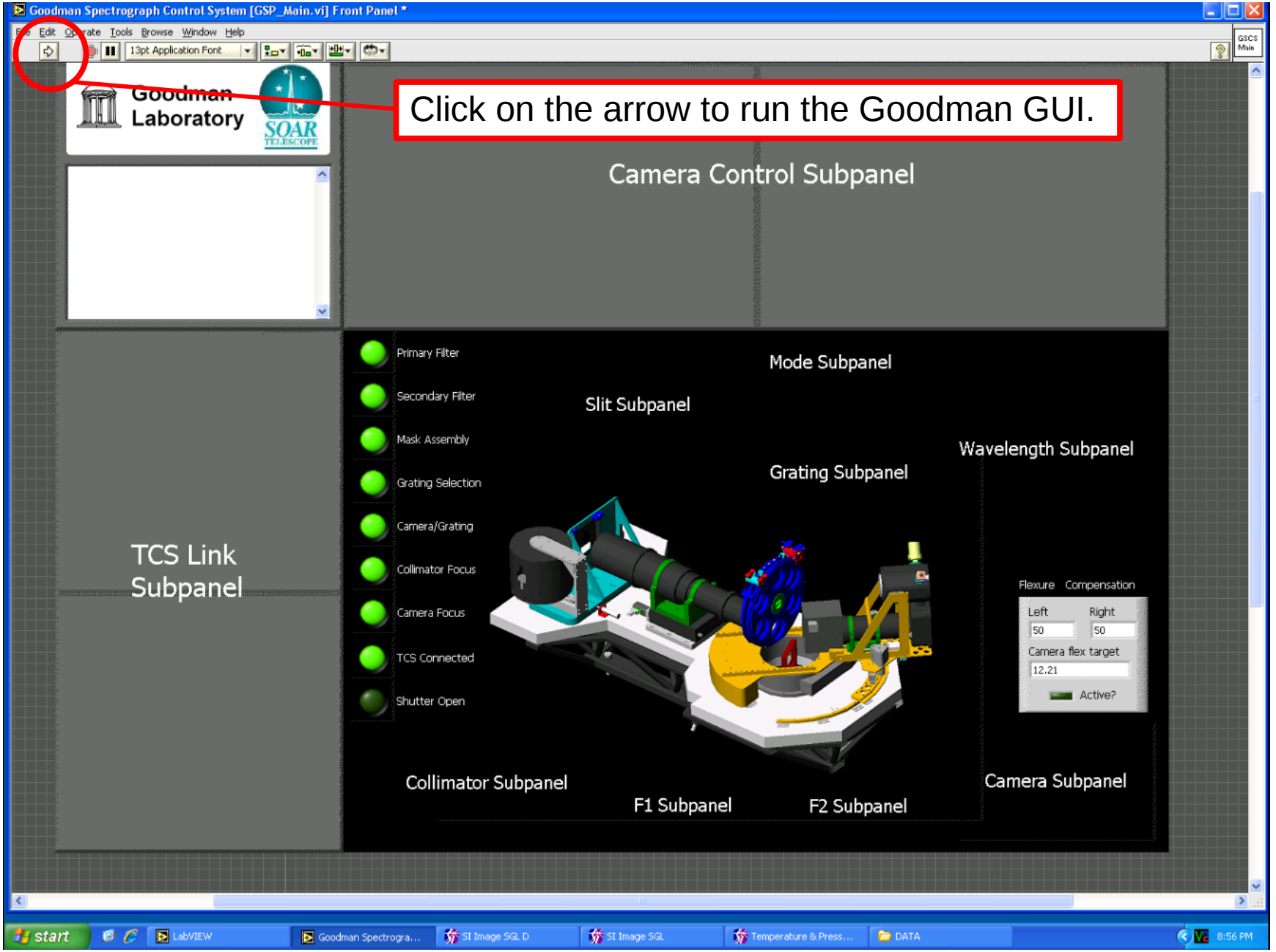


Opening the VNC of SOARIC7

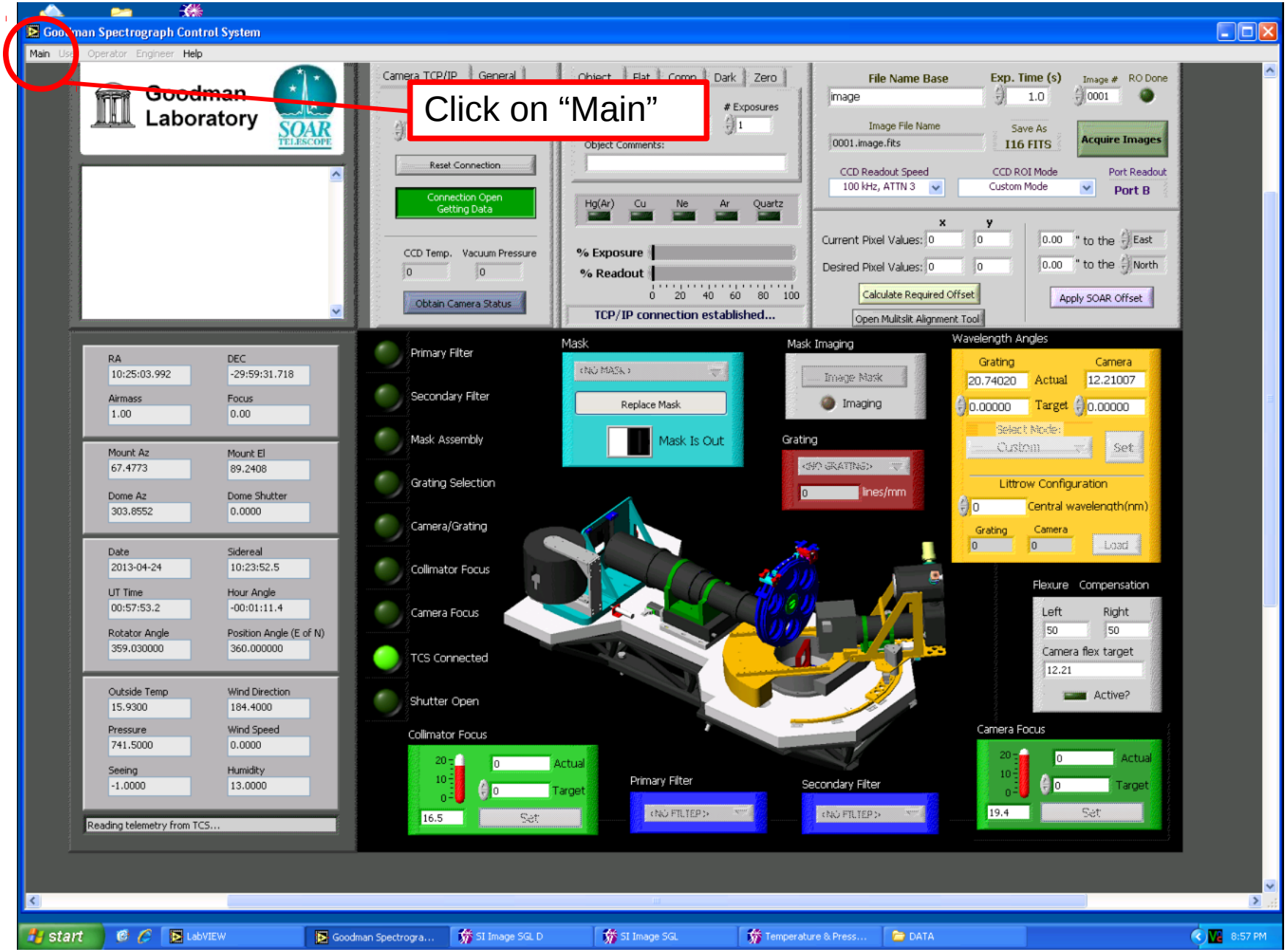



SI Image SGL II_64 - Beta ...
SI Image SGL II_64 - Beta ...
SAOImage DS9
Transfer_T...
DATA - Shortcut
goodman_...
GSCS - Shortcut
GSP_Main - Shortcut
End of night file transfer
Shortcut to the Goodman GUI

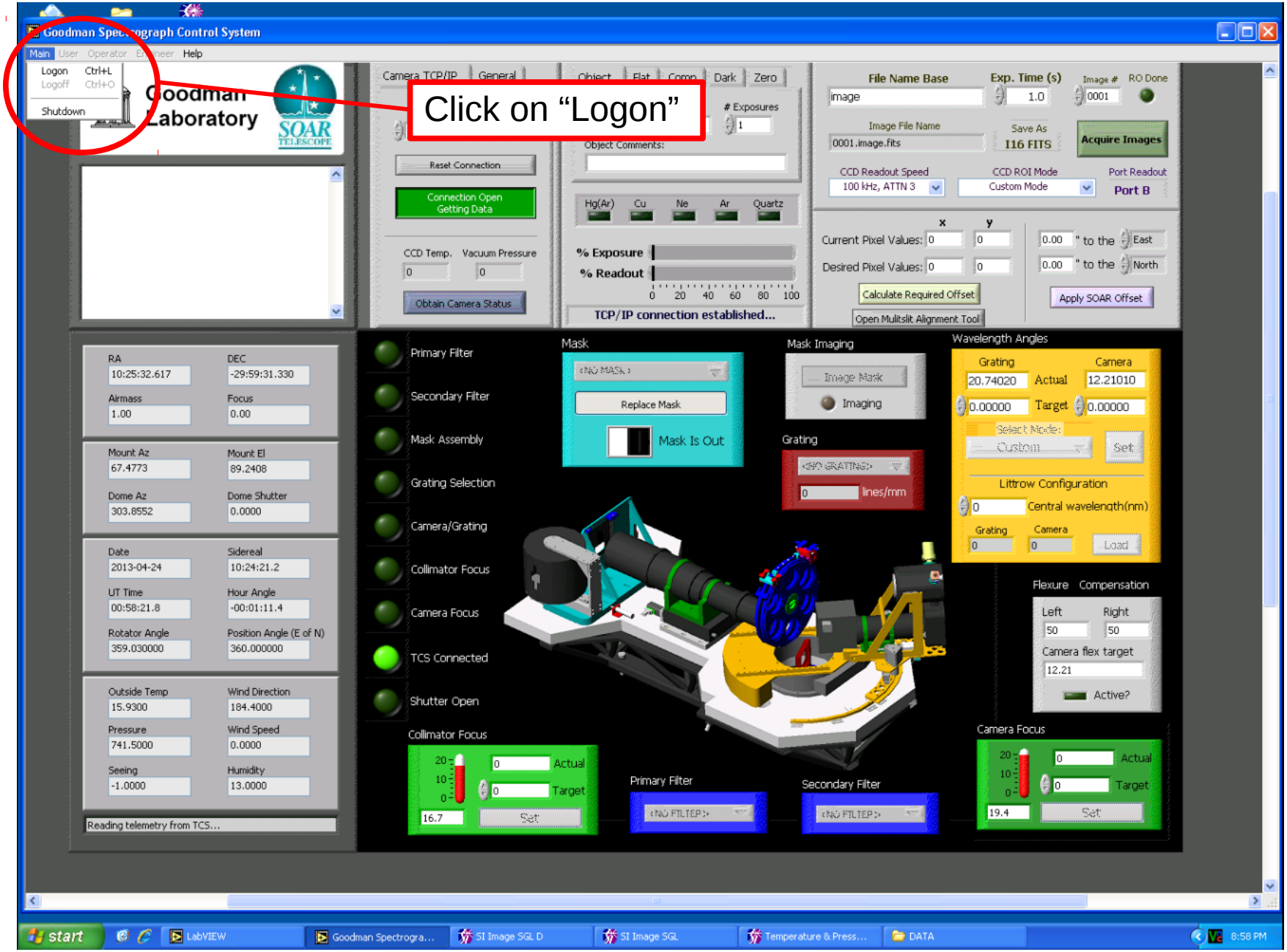
Starting the Goodman GUI



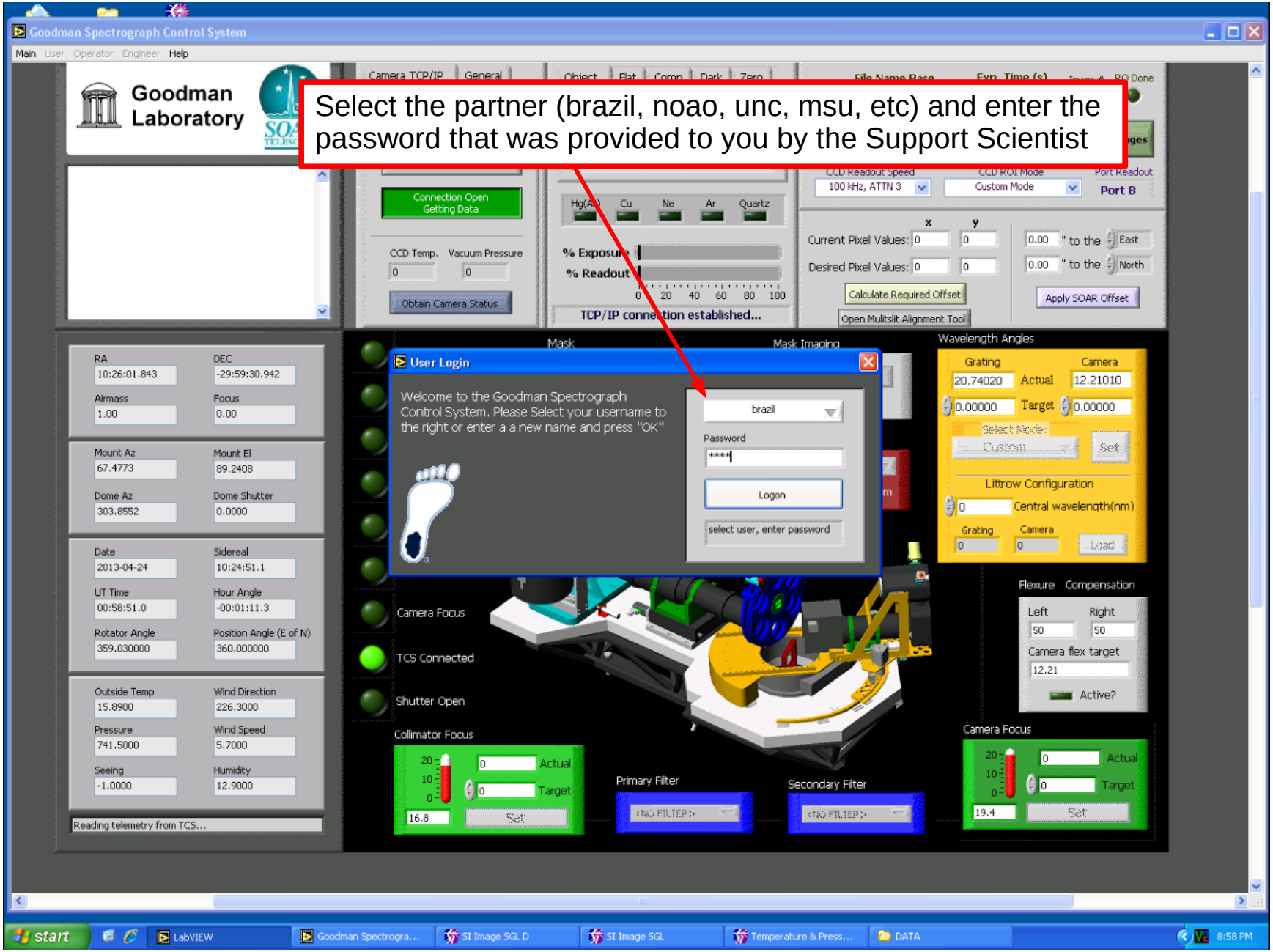
To log in...


Goodman Spectrograph Control System
Main
Operator
Engineer
Help
Goodman Laboratory
SOAR TELESCOPE
Click on “Main”
Camera TCP/IP
General
Object
Flat
Comp
Dark
Zero
Reset Connection
Connection Open Getting Data
CCD Temp.
Vacuum Pressure
Obtain Camera Status
Exposures
Object Comments:
Hg(Ar)
Cu
Ne
Ar
Quartz
% Exposure
% Readout
TCP/IP connection established...
File Name Base
image
Exp. Time (s)
1.0
Image #
0001
RO Done
Image File Name
0001.image.fits
Save As
I16 FITS
Acquire Images
CCD Readout Speed
100 kHz, ATTN 3
CCD ROI Mode
Custom Mode
Port Readout
Port B
Current Pixel Values:
Desired Pixel Values:
Calculate Required Offset
Open Mulitslit Alignment Tool
Apply SOAR Offset
East
North
RA
10:25:03.992
DEC
-29:59:31.718
Airmass
1.00
Focus
0.00
Mount Az
67.4773
Mount El
89.2408
Dome Az
303.8552
Dome Shutter
0.0000
Date
2013-04-24
Sidereal
10:23:52.5
UT Time
00:57:53.2
Hour Angle
-00:01:11.4
Rotator Angle
359.030000
Position Angle (E of N)
360.000000
Outside Temp
15.9300
Wind Direction
184.4000
Pressure
741.5000
Wind Speed
0.0000
Seeing
-1.0000
Humidity
13.0000
Reading telemetry from TCS...
Primary Filter
Secondary Filter
Mask Assembly
Grating Selection
Camera/Grating
Collimator Focus
Camera Focus
TCS Connected
Shutter Open
Mask
Replace Mask
Mask Is Out
Mask Imaging
Image Mask
Imaging
Grating
lines/mm
Wavelength Angles
Grating
Camera
20.74020
Actual
12.21007
Target
Select Mode:
Custom
Set
Littrow Configuration
Central wavelength(nm)
Load
Flexure Compensation
Left
Right
Camera flex target
12.21
Active?
Collimator Focus
Actual
Target
Set
Primary Filter
Secondary Filter
Camera Focus
start
LabVIEW
Goodman Spectrogra...
SI Image SGL D
SI Image SGL
Temperature & Press...
DATA
8:57 PM

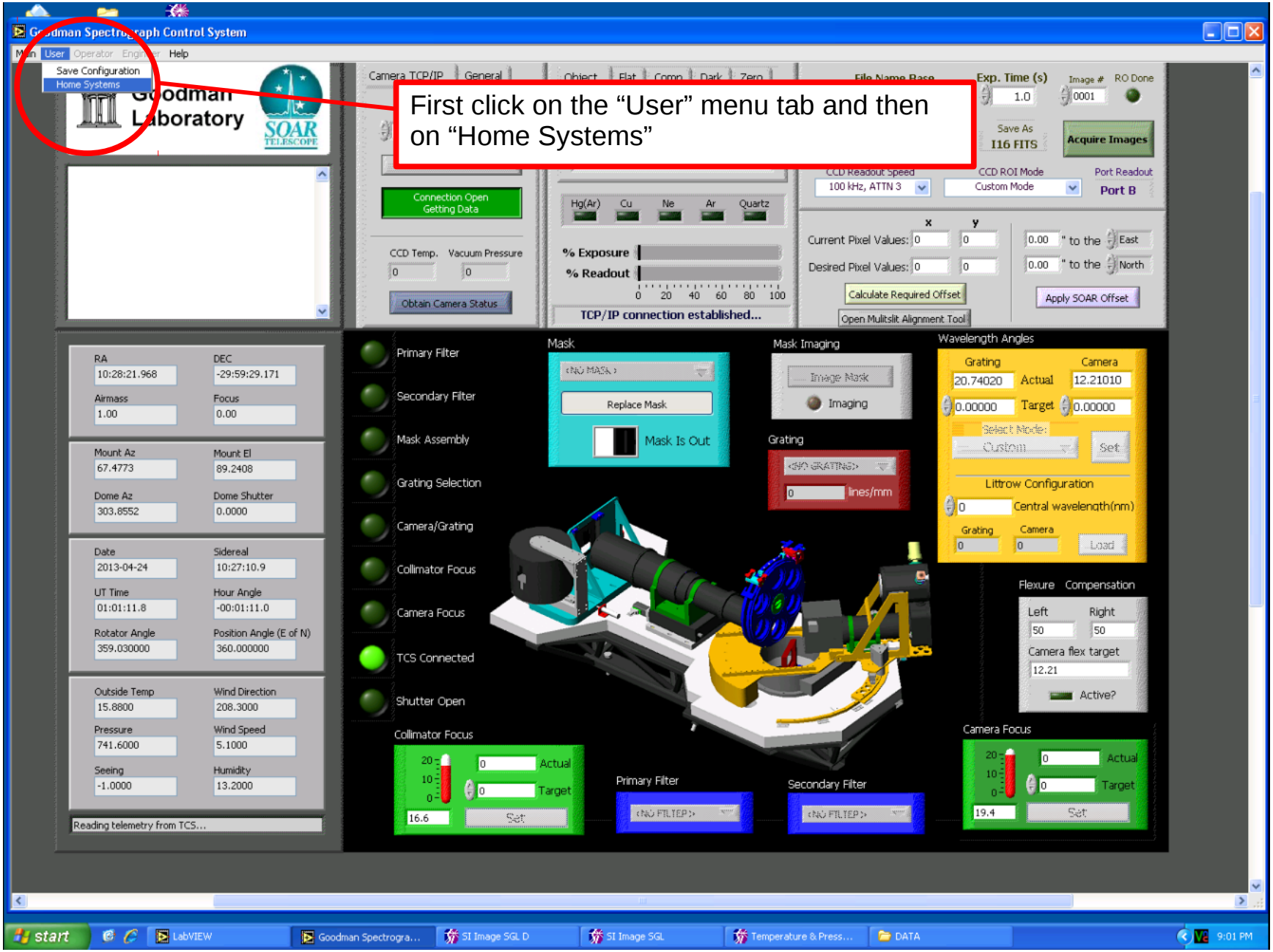
To log in...


Goodman Spectrograph Control System
Main User Operator Engineer Help
Logon Ctrl+L
Logoff Ctrl+O
Shutdown
Goodman Laboratory
SOAR TELESCOPE
Click on “Logon”
Camera TCP/IP General
Object Flat Comp Dark Zero
Exposures
Object Comments:
Reset Connection
Connection Open
Getting Data
Hg(Ar) Cu Ne Ar Quartz
CCD Temp. Vacuum Pressure
% Exposure
% Readout
Obtain Camera Status
TCP/IP connection established...
File Name Base
image
Exp. Time (s)
1.0
Image #
0001
RO Done
Image File Name
0001.image.fits
Save As
I16 FITS
Acquire Images
CCD Readout Speed
100 kHz, ATTN 3
CCD ROI Mode
Custom Mode
Port Readout
Port B
Current Pixel Values:
Desired Pixel Values:
Calculate Required Offset
Apply SOAR Offset
Open Mulitslit Alignment Tool
RA
10:25:32.617
DEC
-29:59:31.330
Airmass
1.00
Focus
0.00
Mount Az
67.4773
Mount El
89.2408
Dome Az
303.8552
Dome Shutter
0.0000
Date
2013-04-24
Sidereal
10:24:21.2
UT Time
00:58:21.8
Hour Angle
-00:01:11.4
Rotator Angle
359.030000
Position Angle (E of N)
360.000000
Outside Temp
15.9300
Wind Direction
184.4000
Pressure
741.5000
Wind Speed
0.0000
Seeing
-1.0000
Humidity
13.0000
Reading telemetry from TCS...
Primary Filter
Secondary Filter
Mask Assembly
Grating Selection
Camera/Grating
Collimator Focus
Camera Focus
TCS Connected
Shutter Open
Mask
Replace Mask
Mask Is Out
Mask Imaging
Image Mask
Imaging
Grating
lines/mm
Wavelength Angles
Grating
Camera
20.74020
Actual
12.21010
Target
Select Mode:
Custom
Set
Littrow Configuration
Central wavelength(nm)
Load
Flexure Compensation
Left
Right
Camera flex target
12.21
Active?
Collimator Focus
Actual
Target
Set
Primary Filter
Secondary Filter
Camera Focus
start
LabVIEW
Goodman Spectrogra...
SI Image SGL D
SI Image SGL
Temperature & Press...
DATA
8:58 PM

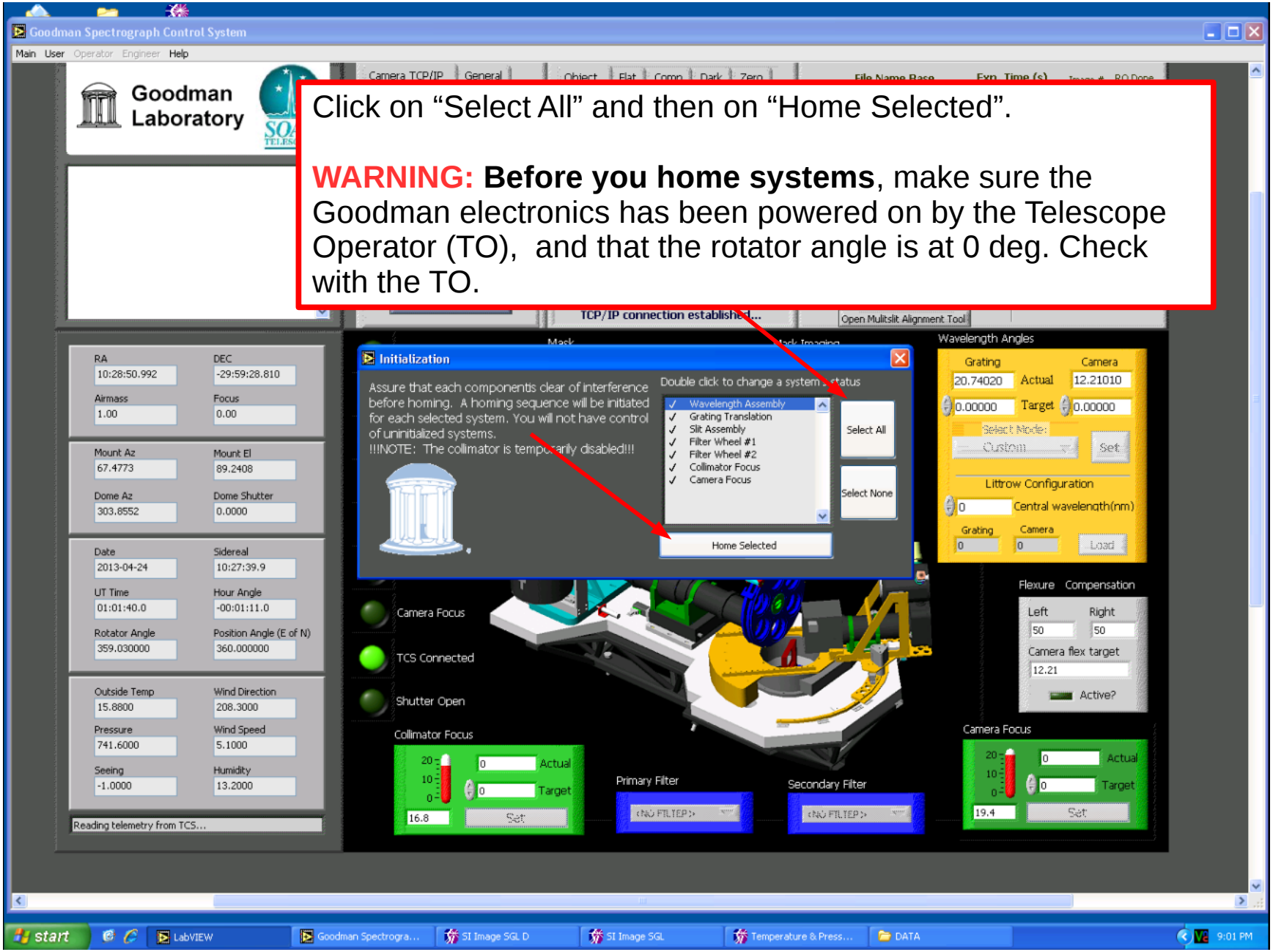
To log in...


Goodman Spectrograph Control System
Main User Operator Engineer Help
Goodman Laboratory
Select the partner (brazil, noao, unc, msu, etc) and enter the password that was provided to you by the Support Scientist
Connection Open
Getting Data
CCD Temp.
Vacuum Pressure
Obtain Camera Status
Hg(Ar) Cu Ne Ar Quartz
% Exposure
% Readout
TCP/IP connection established...
CCD Readout Speed
100 kHz, ATTN 3
CCD ROI Mode
Custom Mode
Port Readout
Port B
Current Pixel Values:
Desired Pixel Values:
Calculate Required Offset
Apply SOAR Offset
Open Mulitslit Alignment Tool
RA
10:26:01.843
DEC
-29:59:30.942
Airmass
1.00
Focus
0.00
Mount Az
67.4773
Mount El
89.2408
Dome Az
303.8552
Dome Shutter
0.0000
Date
2013-04-24
Sidereal
10:24:51.1
UT Time
00:58:51.0
Hour Angle
-00:01:11.3
Rotator Angle
359.030000
Position Angle (E of N)
360.000000
Outside Temp
15.8900
Wind Direction
226.3000
Pressure
741.5000
Wind Speed
5.7000
Seeing
-1.0000
Humidity
12.9000
Reading telemetry from TCS...
Mask
Mask Imaging
User Login
Welcome to the Goodman Spectrograph Control System. Please Select your username to the right or enter a a new name and press "OK"
brazil
Password
Logon
select user, enter password
Wavelength Angles
Grating
Camera
20.74020
Actual
12.21010
Target
Littrow Configuration
Central wavelength(nm)
Load
Flexure Compensation
Left
Right
Camera flex target
Active?
Camera Focus
TCS Connected
Shutter Open
Collimator Focus
Primary Filter
Secondary Filter
start
LabVIEW
Goodman Spectrogra...
SI Image SGL D
SI Image SGL
Temperature & Press...
DATA
8:58 PM

Homing the systems



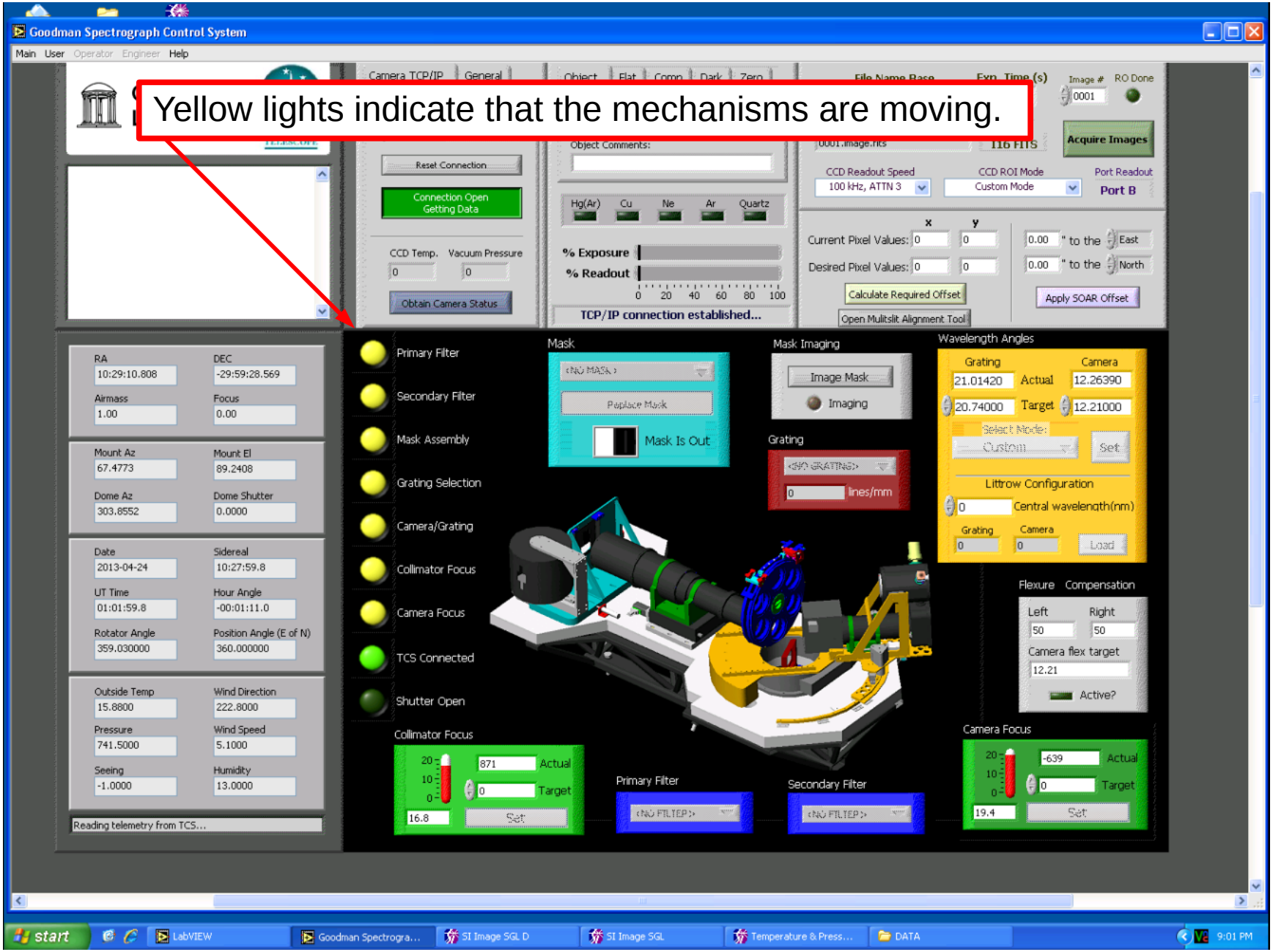
Homing the systems



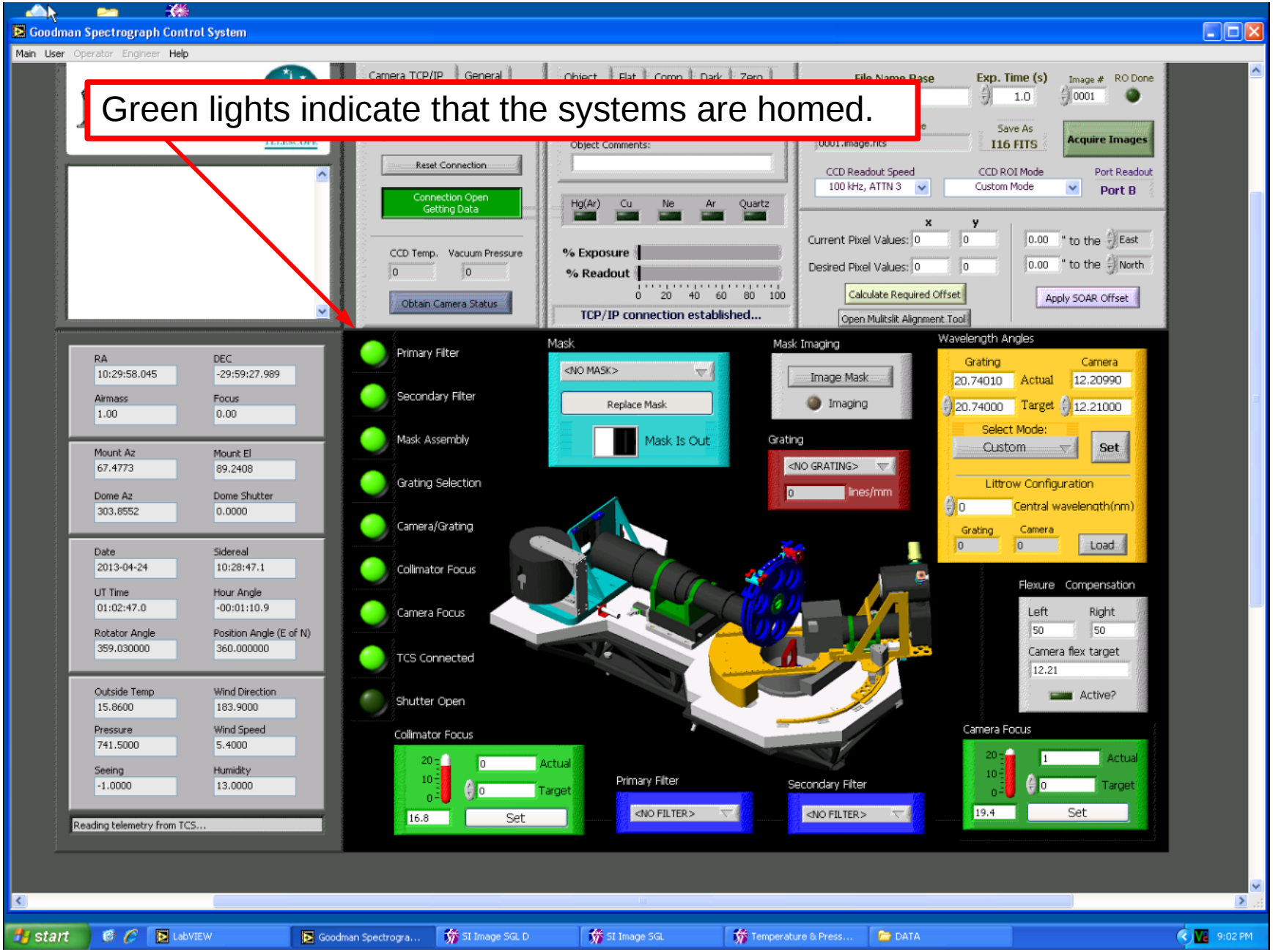
Click on “Select All” and then on “Home Selected”.

WARNING: **Before you home systems**, make sure the Goodman electronics has been powered on by the Telescope Operator (TO), and that the rotator angle is at 0 deg. Check with the TO.

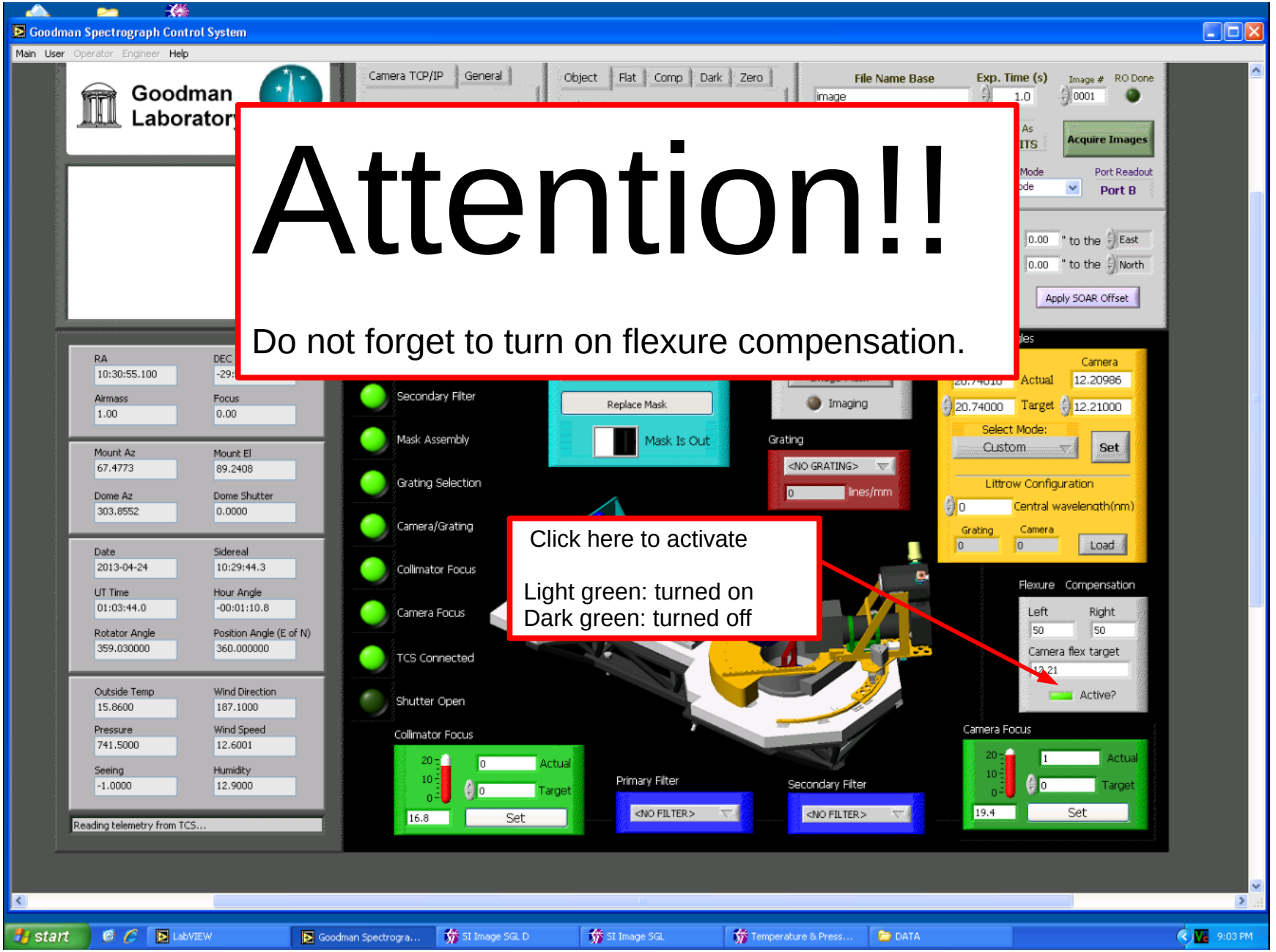
Homing the systems

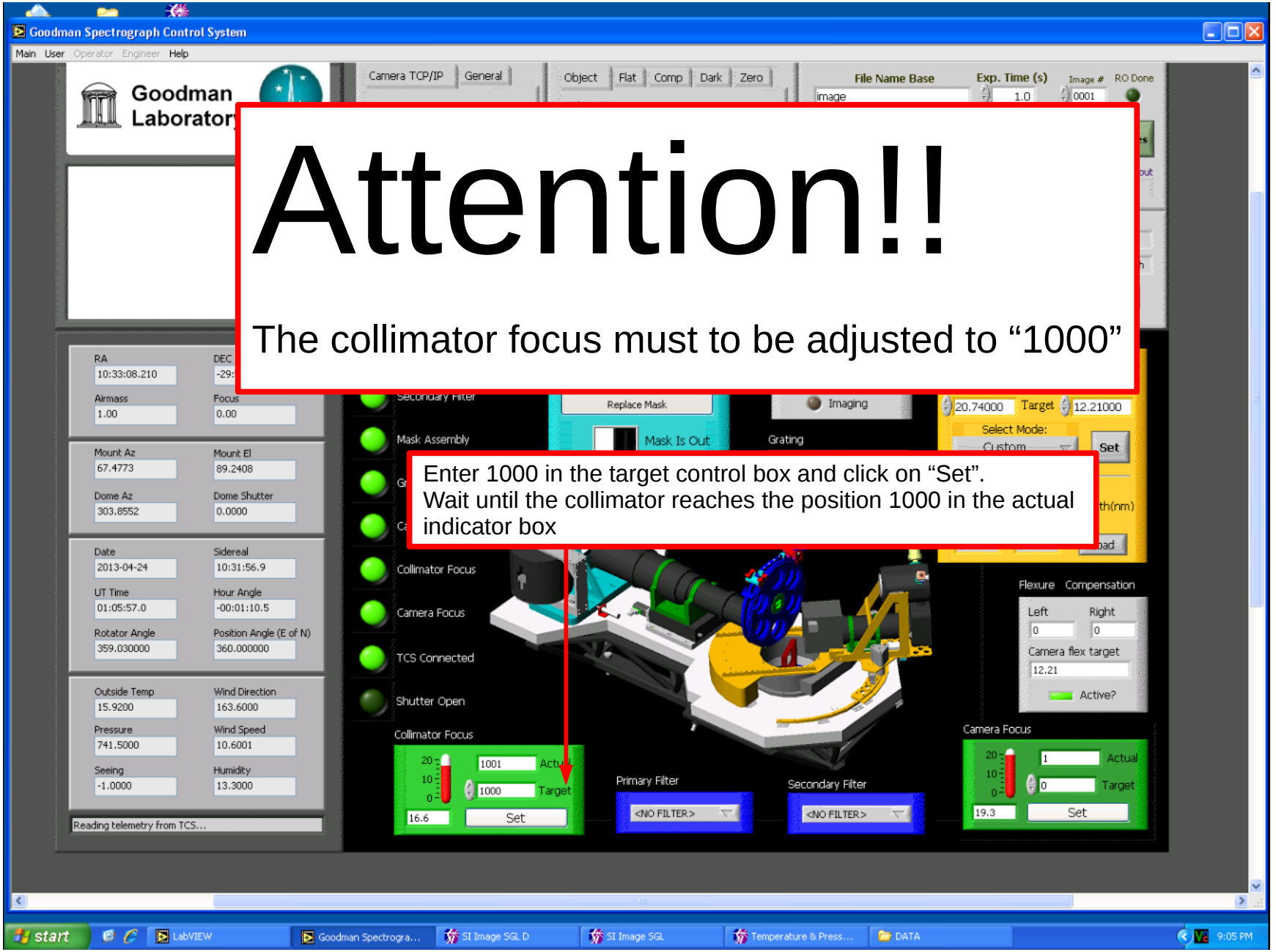


Homing the systems

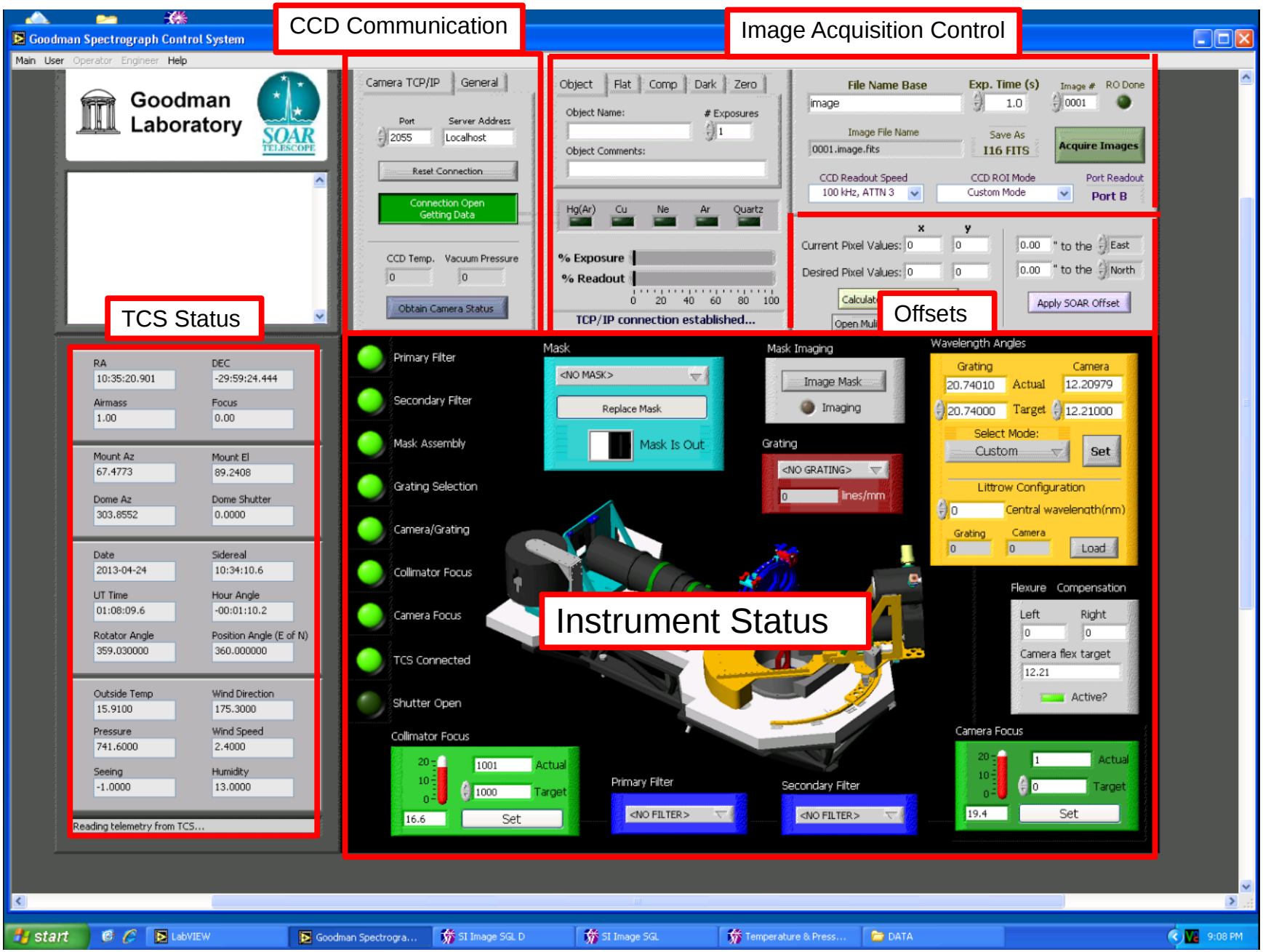


Initial settings

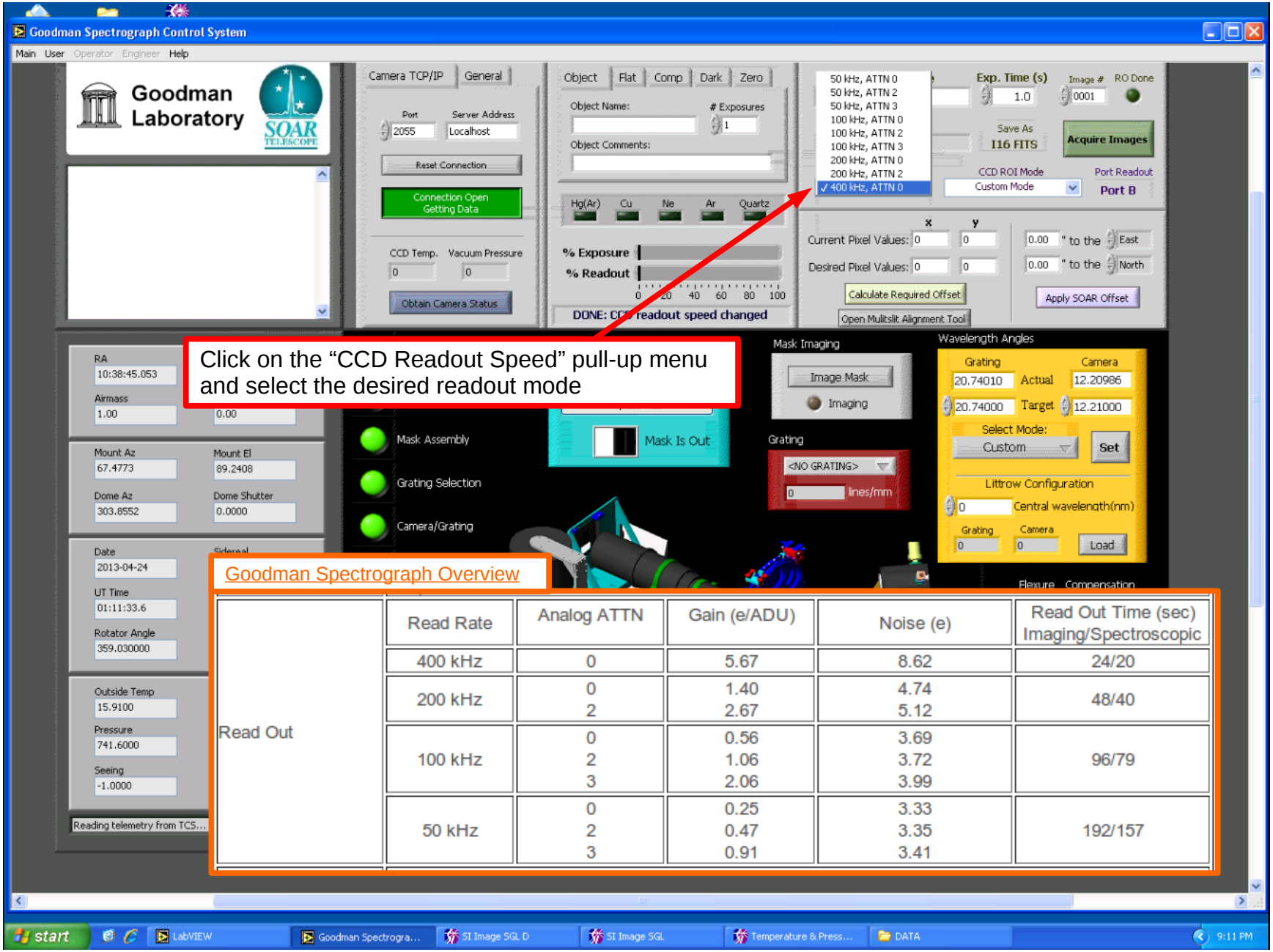



Goodman Spectrograph Control System
Main User Operator Engineer Help
Goodman Laboratory
Camera TCP/IP
General
Object
Flat
Comp
Dark
Zero
File Name Base
image
Exp. Time (s)
1.0
Image #
0001
RO Done
Attention!!
The collimator focus must to be adjusted to “1000”
Enter 1000 in the target control box and click on “Set”.
Wait until the collimator reaches the position 1000 in the actual indicator box
RA
10:33:08.210
Airmass
1.00
Focus
0.00
Mount Az
67.4773
Mount El
89.2408
Dome Az
303.8552
Dome Shutter
0.0000
Date
2013-04-24
Sidereal
10:31:56.9
UT Time
01:05:57.0
Hour Angle
-00:01:10.5
Rotator Angle
359.030000
Position Angle (E of N)
360.000000
Outside Temp
15.9200
Wind Direction
163.6000
Pressure
741.5000
Wind Speed
10.6001
Seeing
-1.0000
Humidity
13.3000
Reading telemetry from TCS...
Replace Mask
Mask Is Out
Imaging
Grating
20.74000
Target
12.21000
Select Mode:
Custom
Set
Mask Assembly
Collimator Focus
Camera Focus
TCS Connected
Shutter Open
Flexure Compensation
Left
Right
Camera flex target
12.21
Active?
Collimator Focus
1001
Actual
1000
Target
16.6
Set
Primary Filter
<NO FILTER>
Secondary Filter
<NO FILTER>
Camera Focus
1
Actual
0
Target
19.3
Set
start
LabVIEW
Goodman Spectrogra...
SI Image SGL D
SI Image SGL
Temperature & Press...
DATA
9:05 PM

GUI Layout

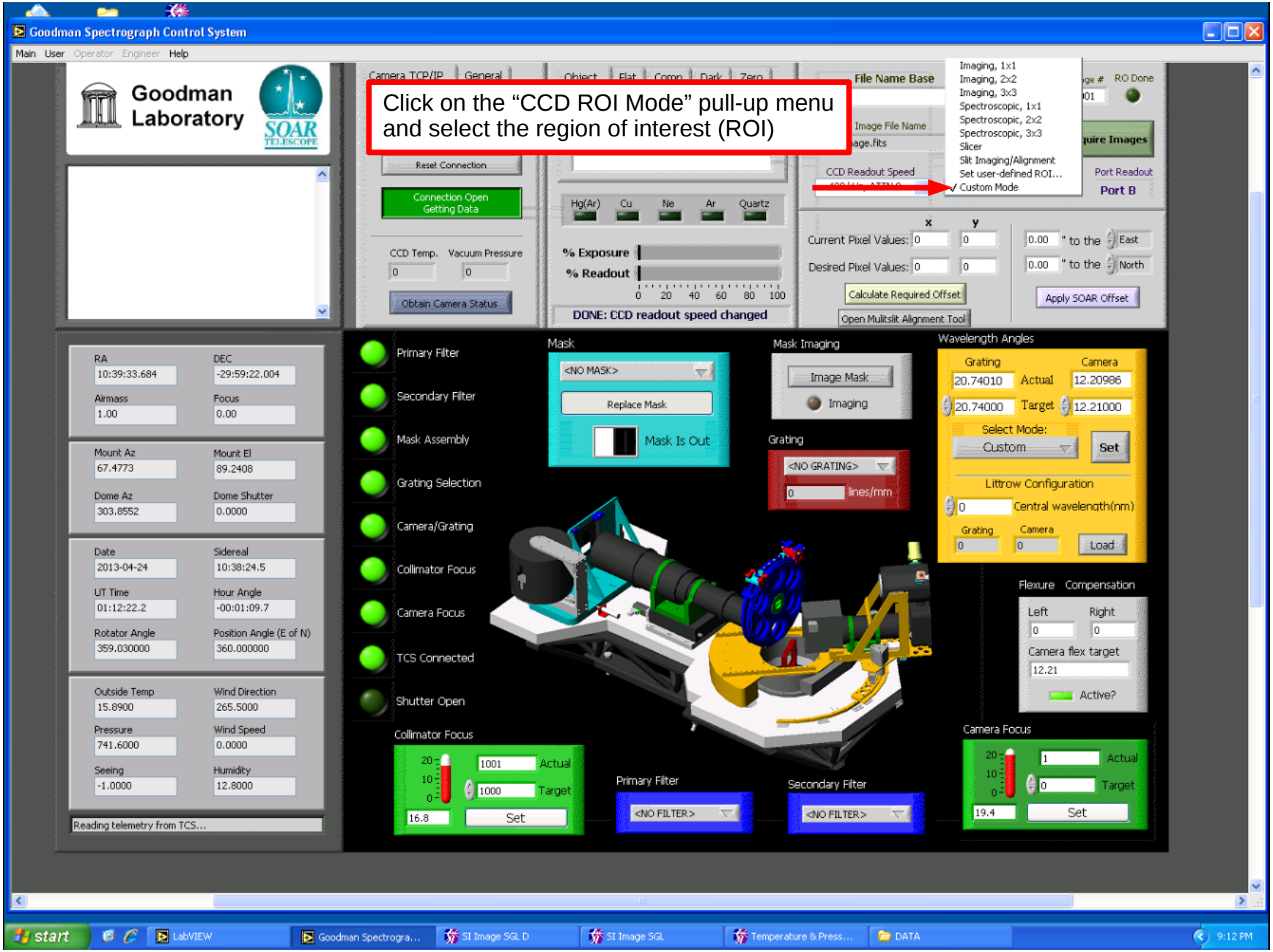

CCD Communication
Image Acquisition Control
TCS Status
Offsets
Instrument Status
Goodman Spectrograph Control System
Goodman Laboratory
Camera TCP/IP
General
Reset Connection
Connection Open
Getting Data
Obtain Camera Status
TCP/IP connection established...
Object
Flat
Comp
Dark
Zero
File Name Base
Exp. Time (s)
Image #
RO Done
Acquire Images
CCD Readout Speed
CCD ROI Mode
Port Readout
Port B
Current Pixel Values:
Desired Pixel Values:
Apply SOAR Offset
Primary Filter
Secondary Filter
Mask Assembly
Grating Selection
Camera/Grating
Collimator Focus
Camera Focus
TCS Connected
Shutter Open
Mask
Replace Mask
Mask Is Out
Mask Imaging
Image Mask
Imaging
Grating
Wavelength Angles
Littrow Configuration
Central wavelength(nm)
Load
Flexure Compensation
Camera flex target
Active?
Collimator Focus
Camera Focus
Primary Filter
Secondary Filter
RA
DEC
Airmass
Focus
Mount Az
Mount El
Dome Az
Dome Shutter
Date
Sidereal
UT Time
Hour Angle
Rotator Angle
Position Angle (E of N)
Outside Temp
Wind Direction
Pressure
Wind Speed
Seeing
Humidity
Reading telemetry from TCS...

Setting the CCD Readout Speed



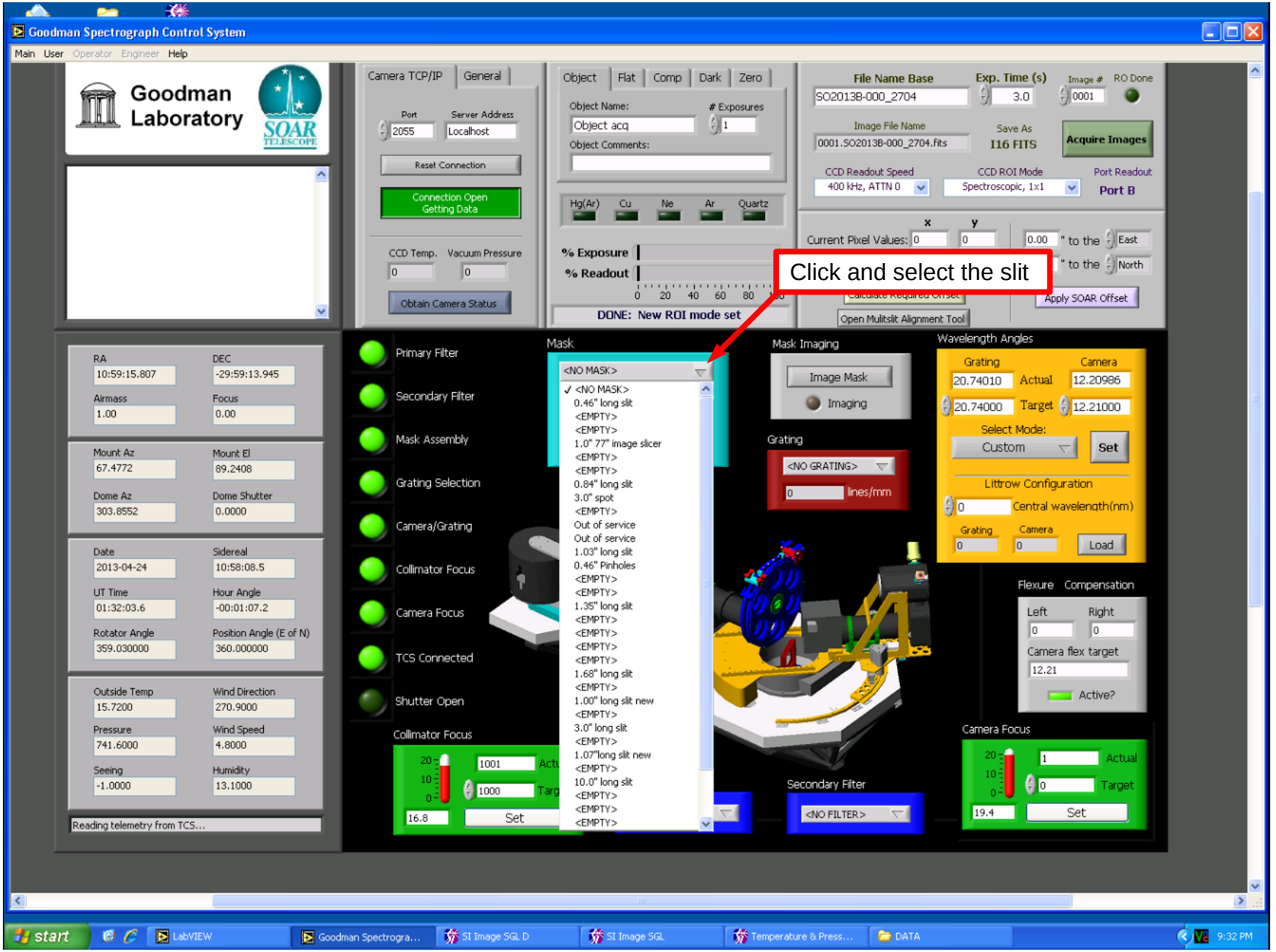
	Read Rate	Analog ATTN	Gain (e/ADU)	Noise (e)	Read Out Time (sec) Imaging/Spectroscopic
Read Out	400 kHz	0	5.67	8.62	24/20
	200 kHz	0 2	1.40 2.67	4.74 5.12	48/40
	100 kHz	0 2 3	0.56 1.06 2.06	3.69 3.72 3.99	96/79
	50 kHz	0 2 3	0.25 0.47 0.91	3.33 3.35 3.41	192/157

Setting the CDD Region of Interest

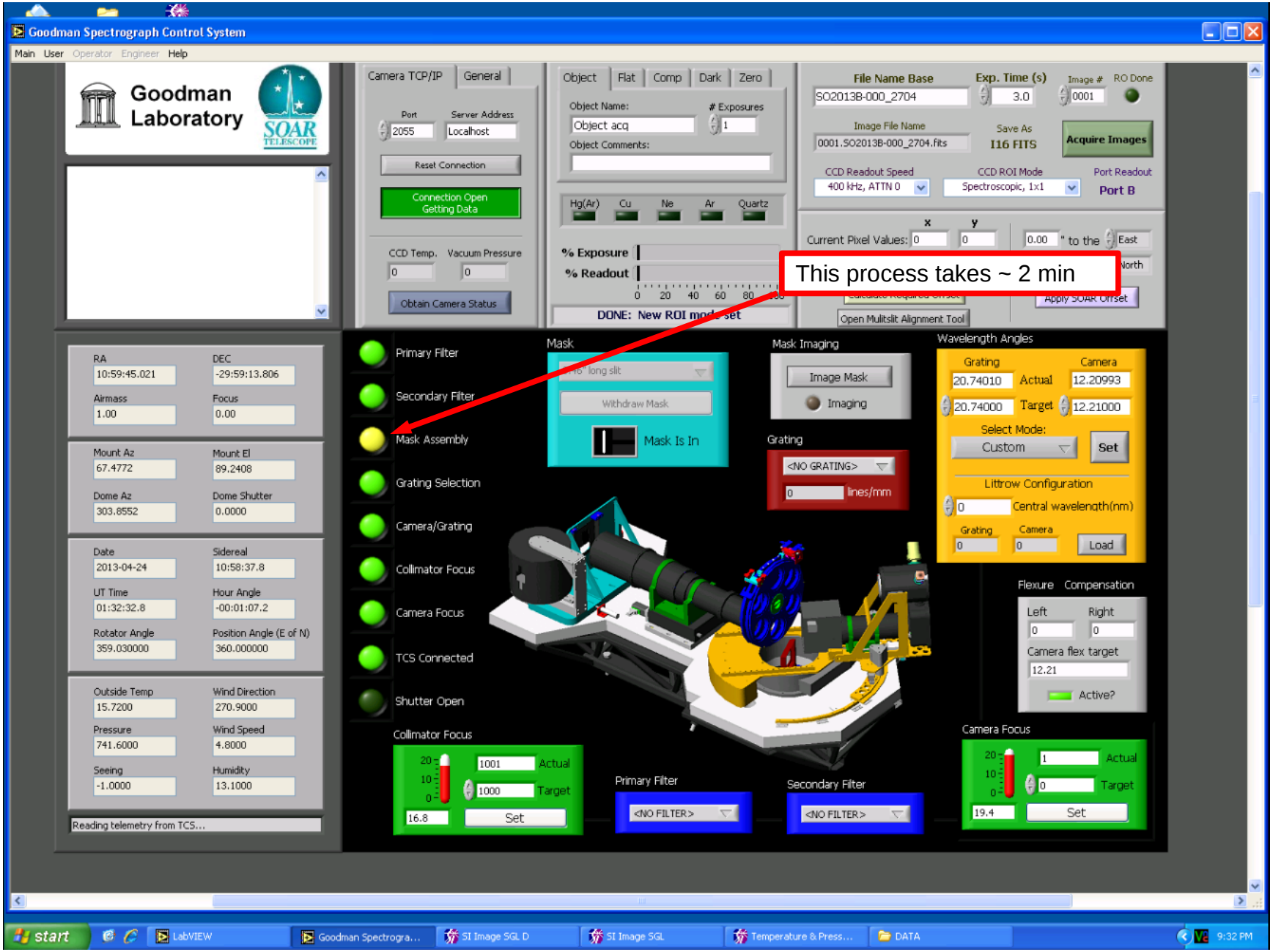


Selecting the image type

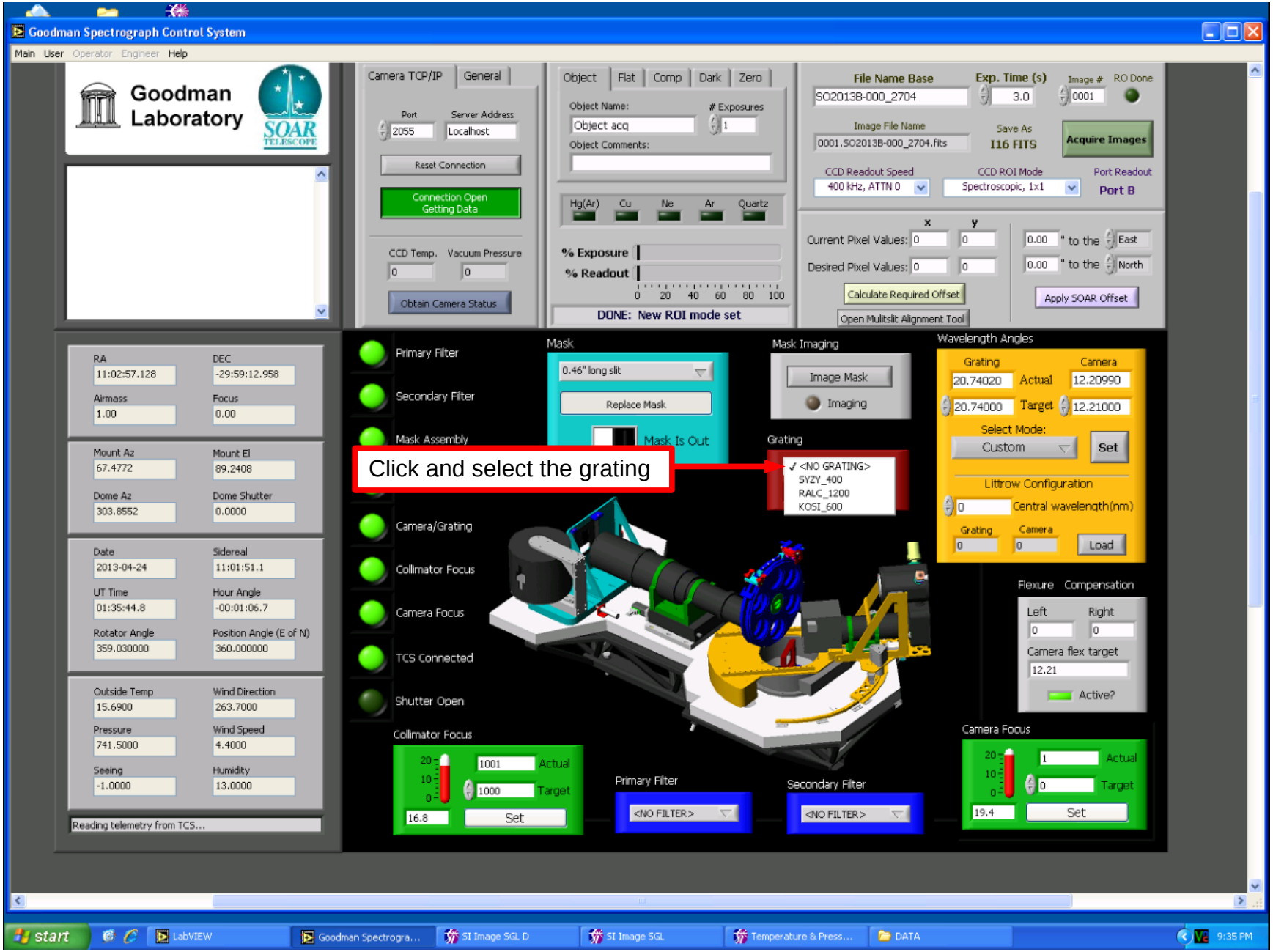
Selecting the slit



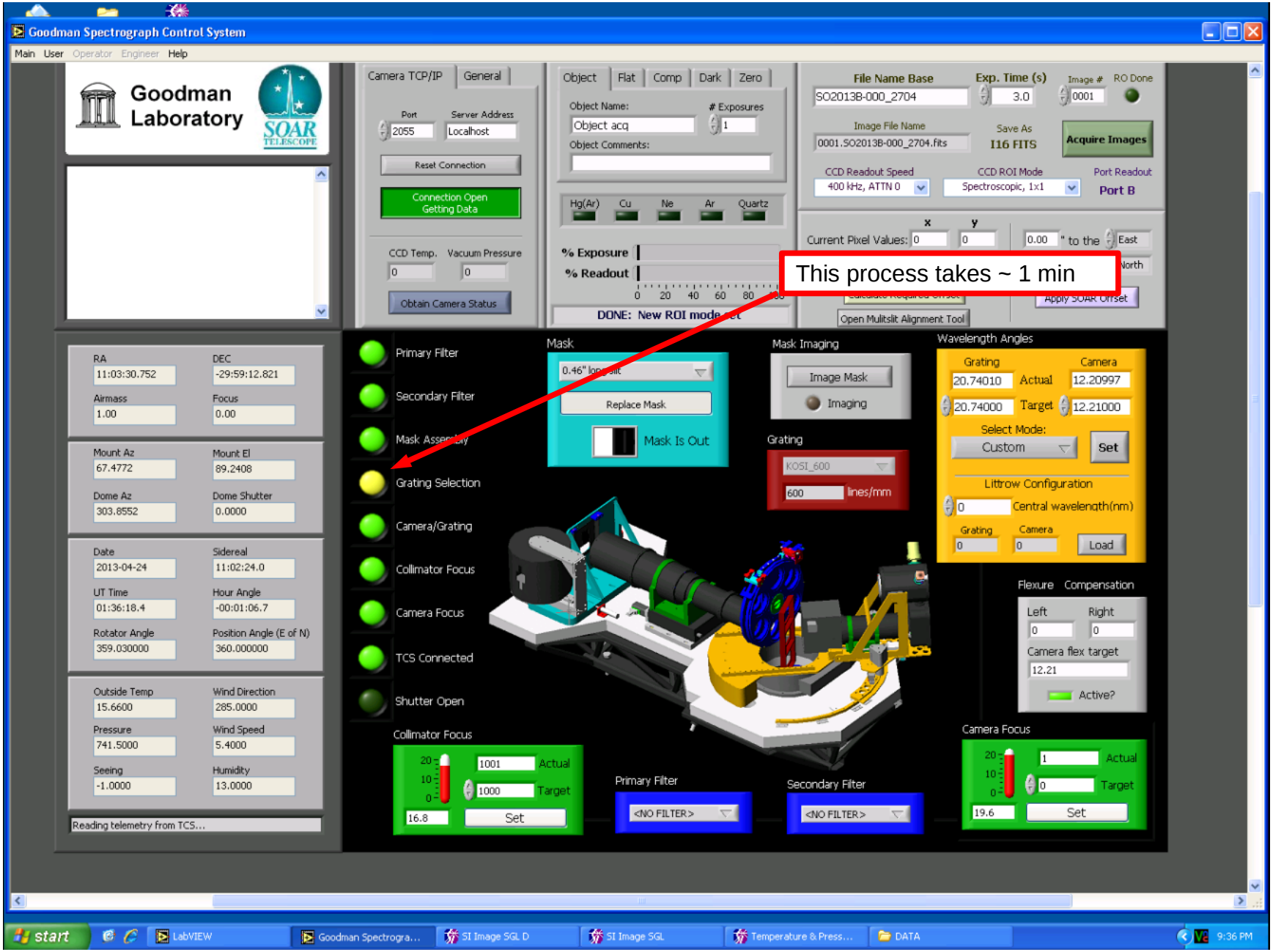
Selecting the slit



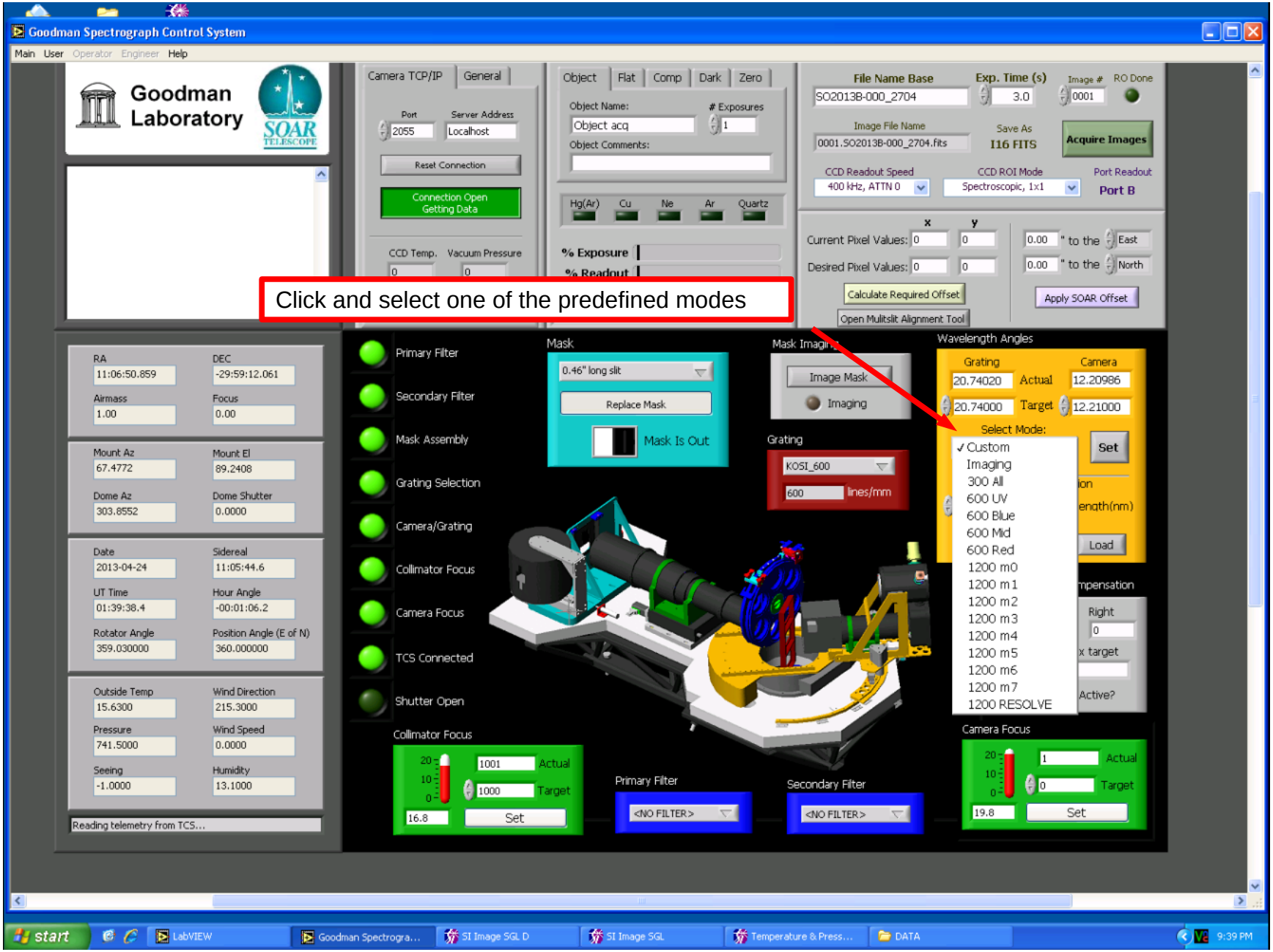
Selecting the grating



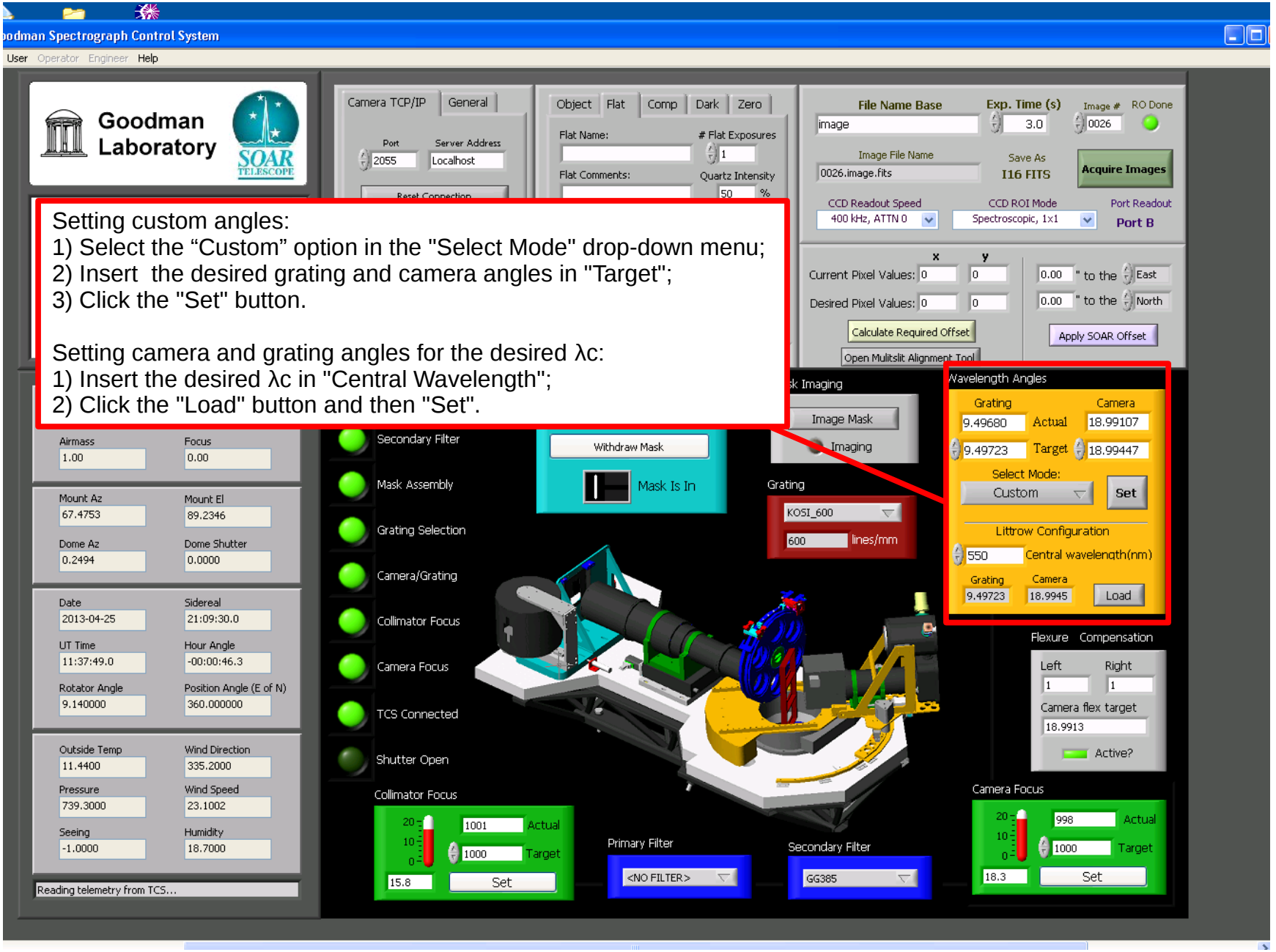
Selecting the grating



Setting the camera and grating angles



Setting the camera and grating angles

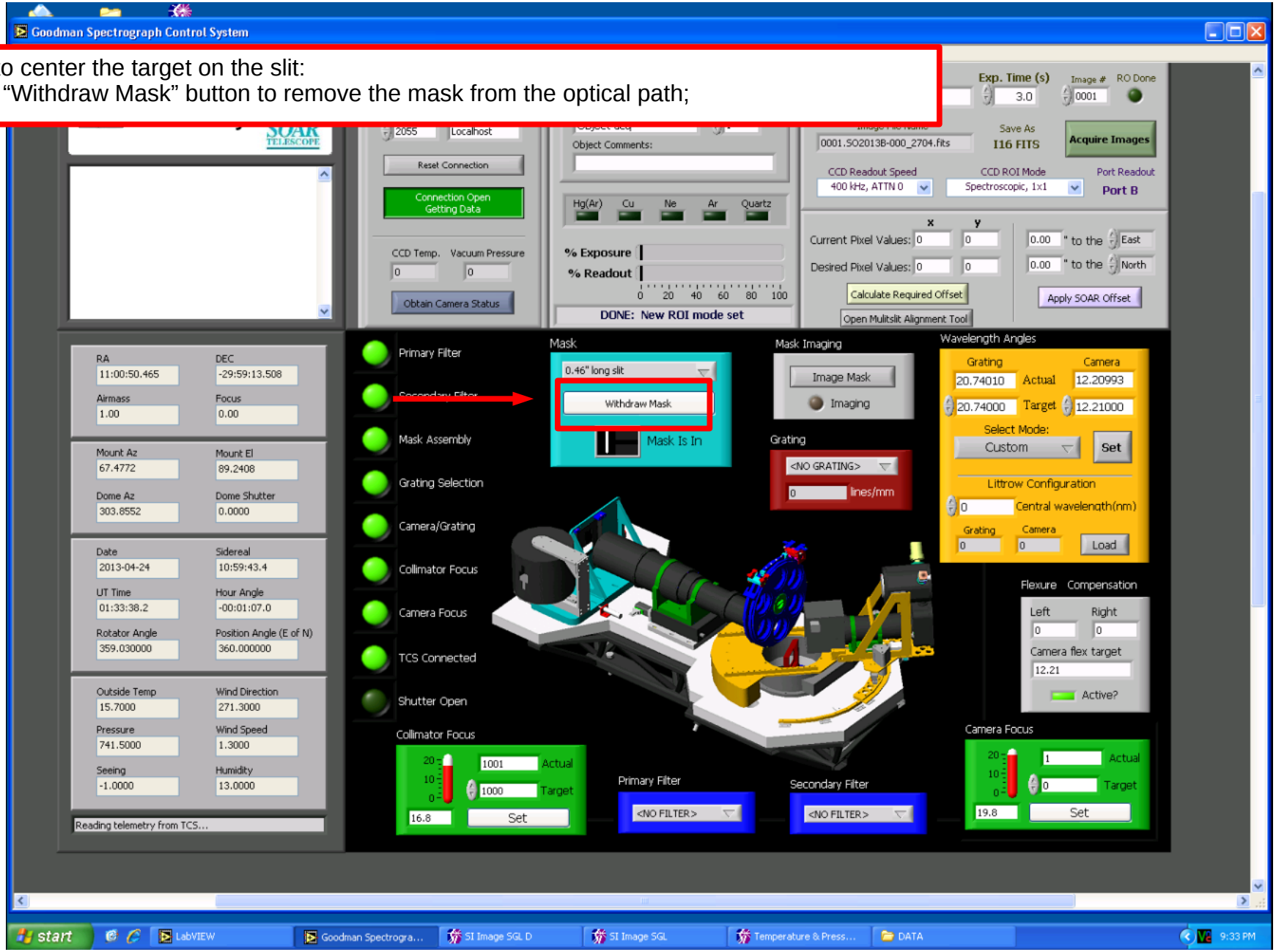


Setting custom angles:
1) Select the “Custom” option in the "Select Mode" drop-down menu;
2) Insert the desired grating and camera angles in "Target";
3) Click the "Set" button.

Setting camera and grating angles for the desired λc:
1) Insert the desired λc in "Central Wavelength";
2) Click the "Load" button and then "Set".

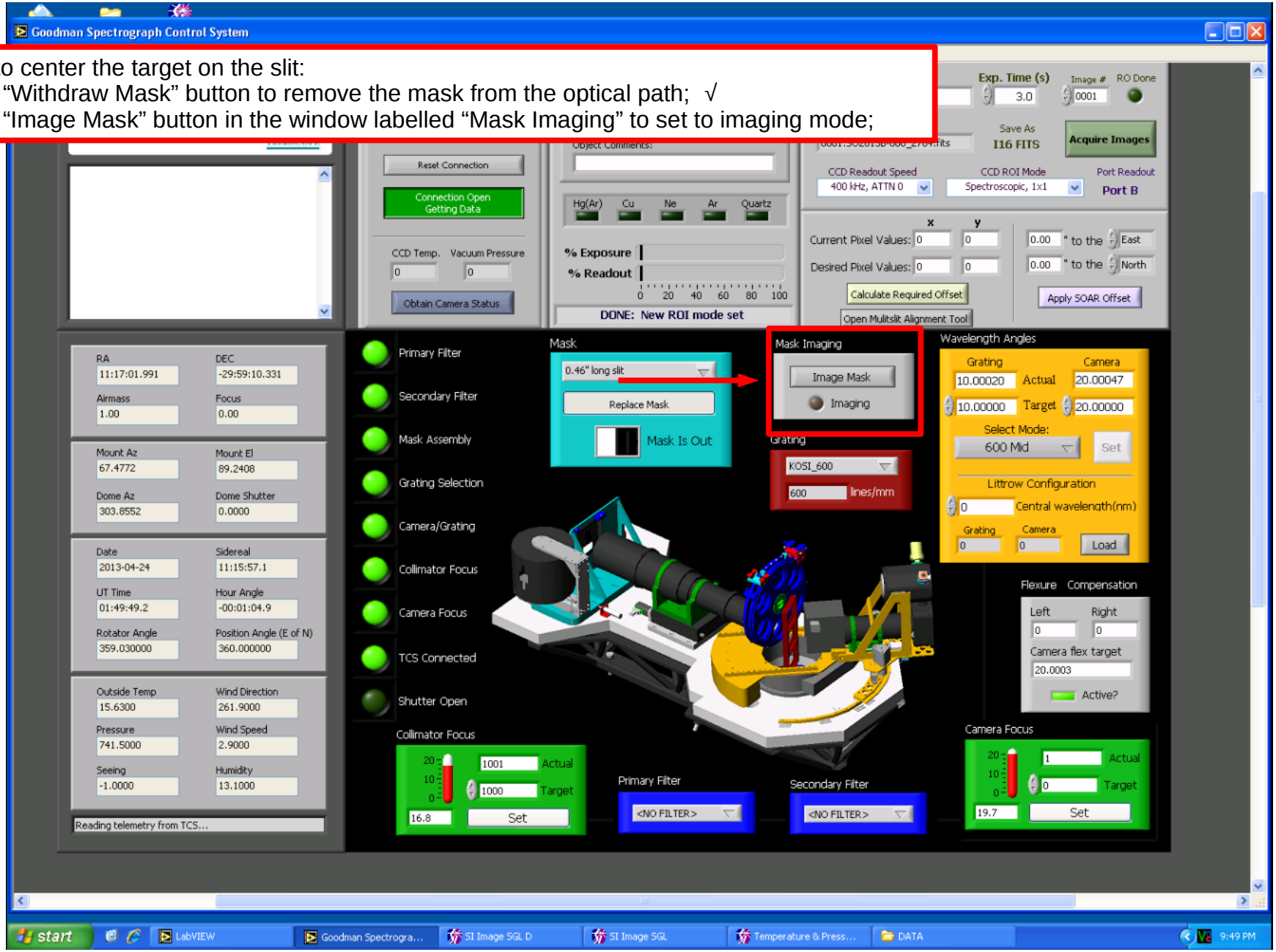
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path;



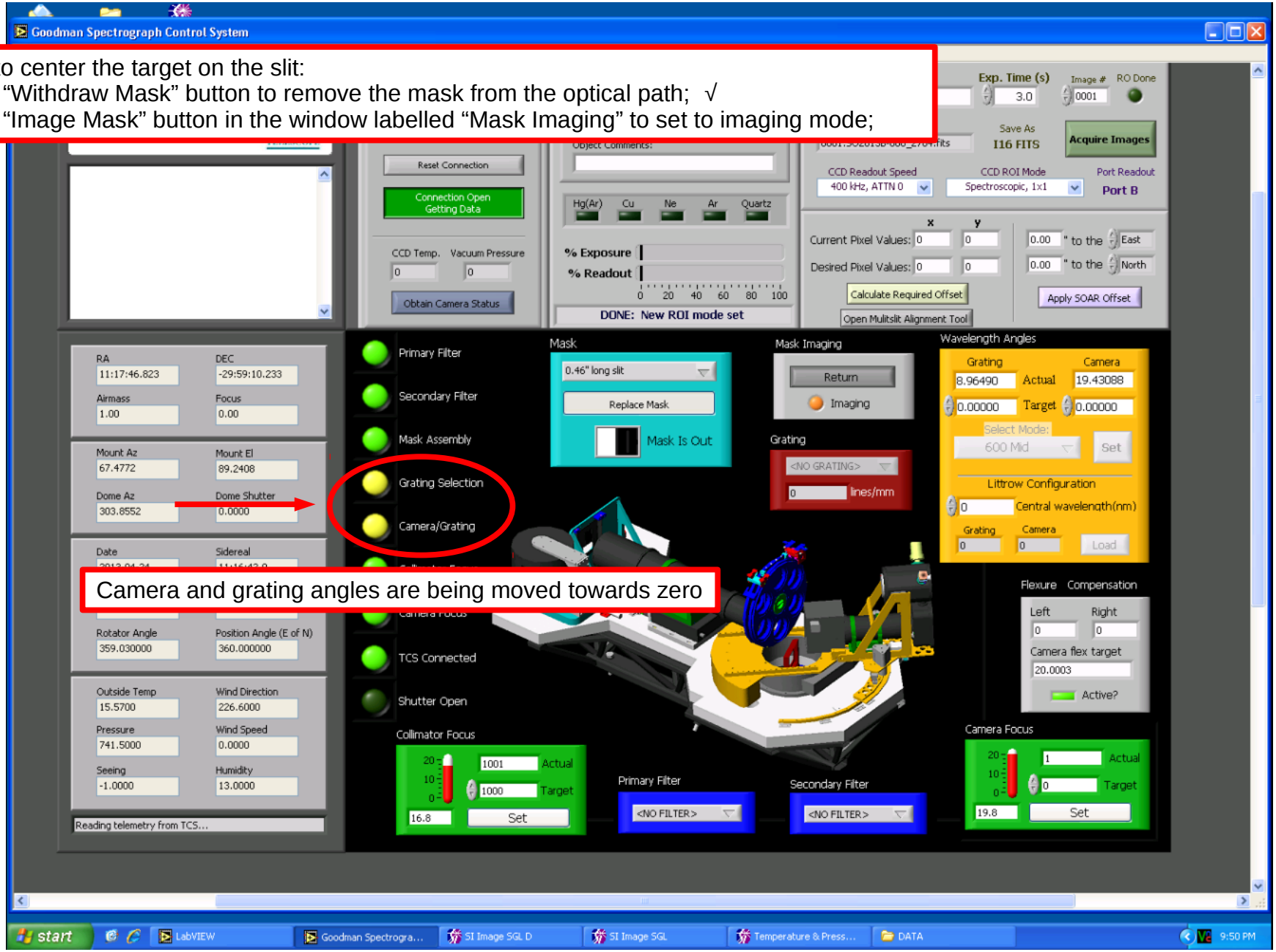
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode;



Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode;

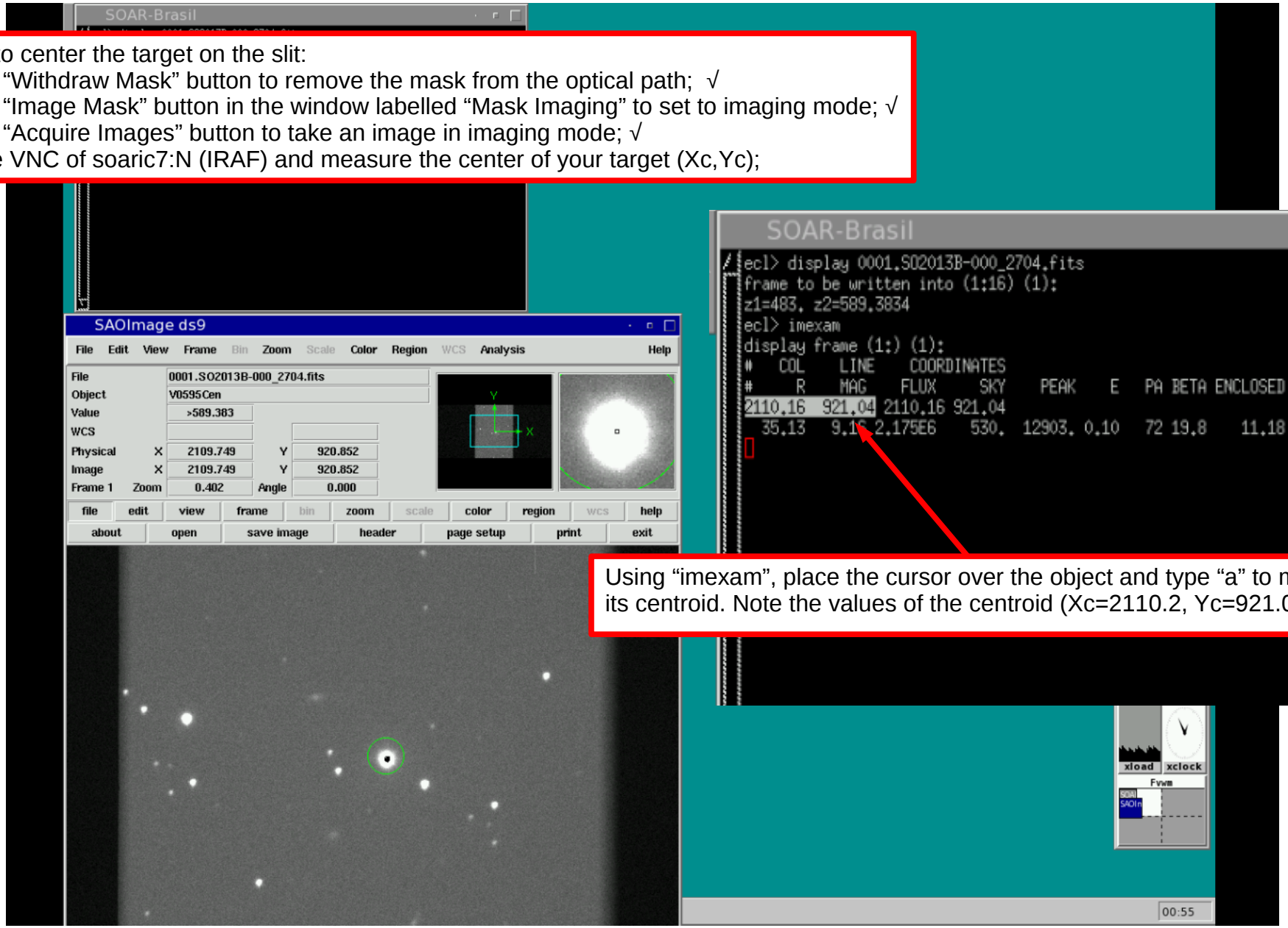


Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode;

Centering the object on the slit

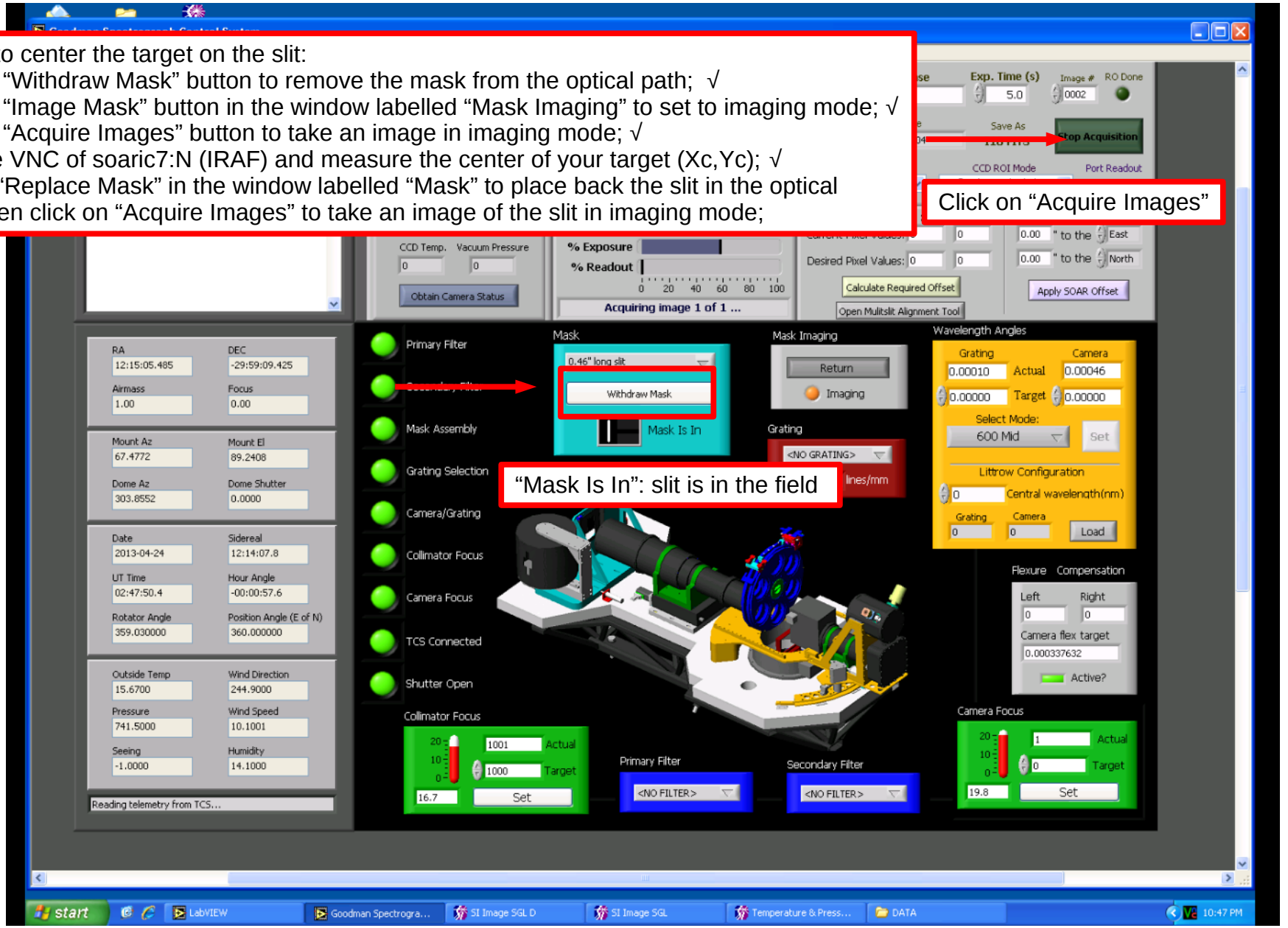
Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc);



Using “imexam”, place the cursor over the object and type “a” to measure its centroid. Note the values of the centroid (Xc=2110.2, Yc=921.0).

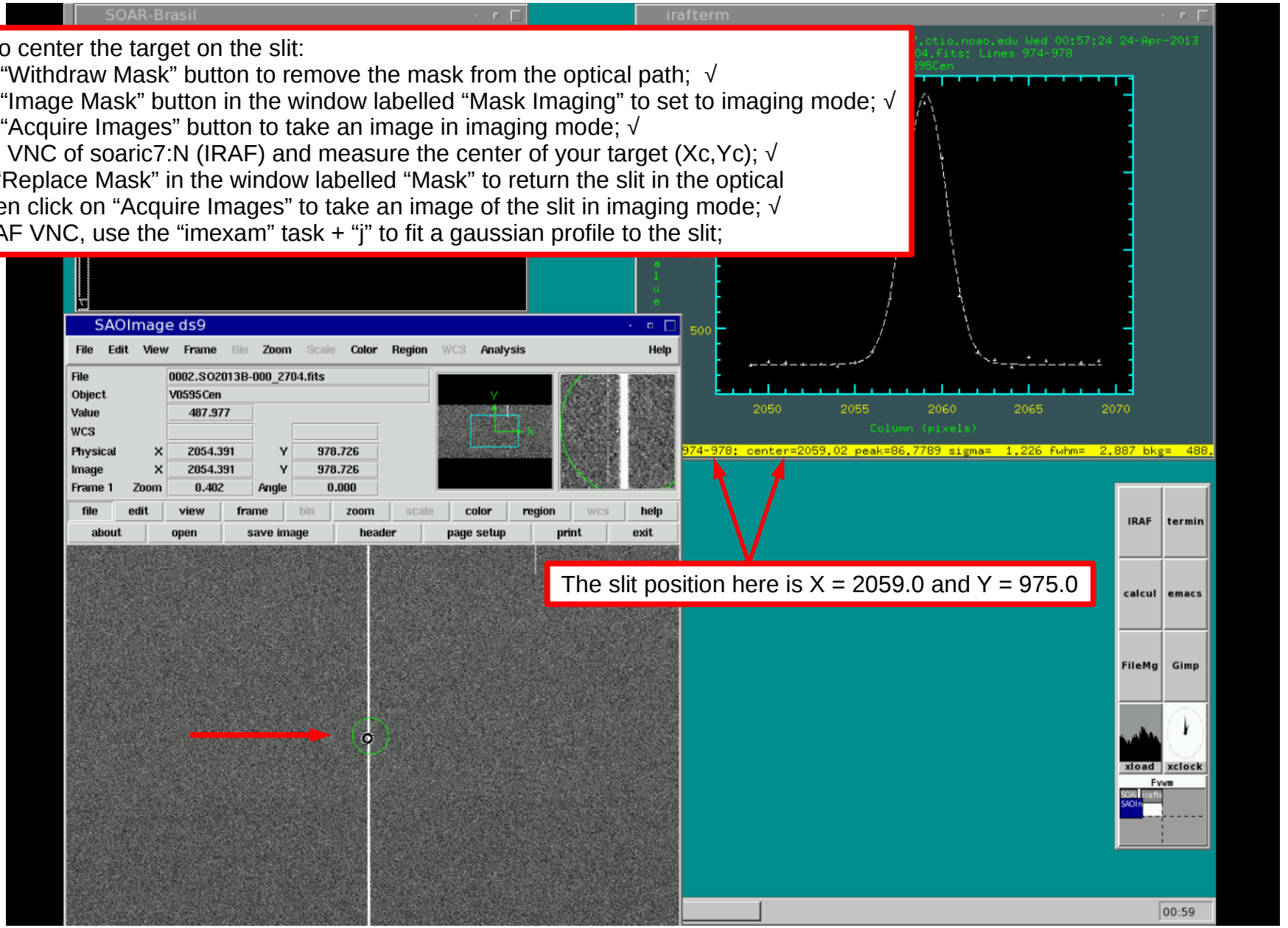
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to place back the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode;



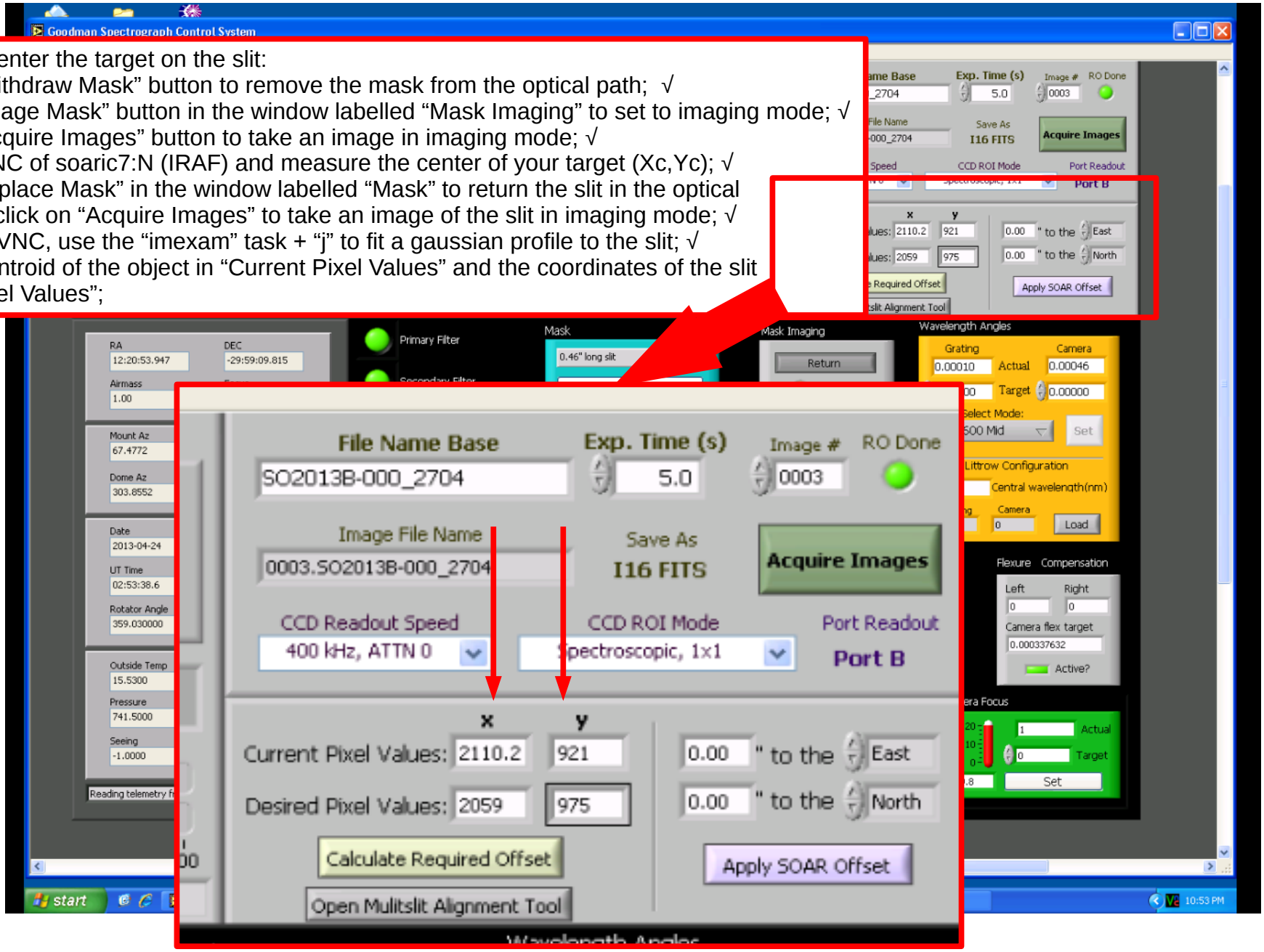
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit;



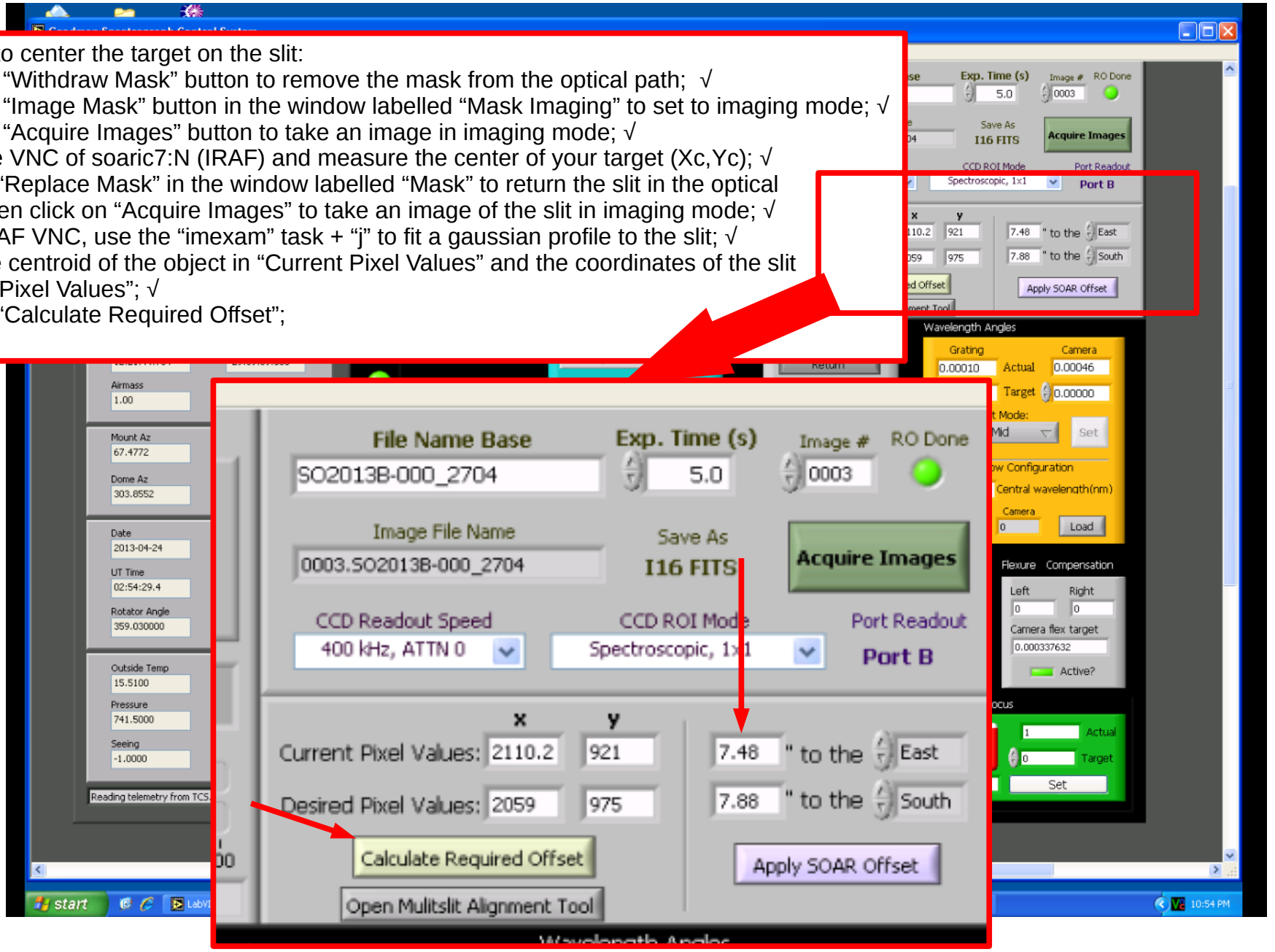
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit; √
7) Enter the centroid of the object in “Current Pixel Values” and the coordinates of the slit in “Desired Pixel Values”;



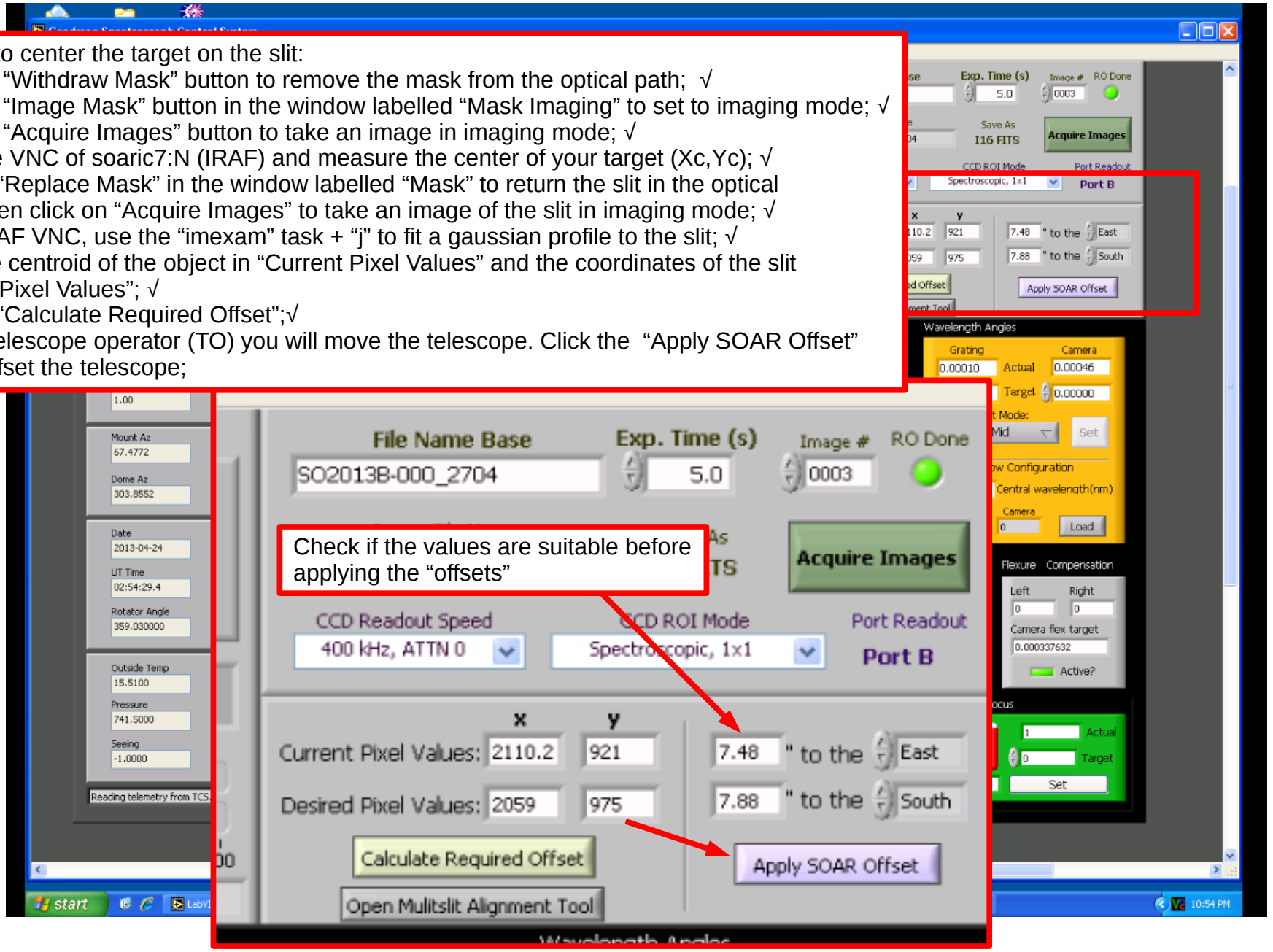
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit; √
7) Enter the centroid of the object in “Current Pixel Values” and the coordinates of the slit in “Desired Pixel Values”; √
8) Click on “Calculate Required Offset”;



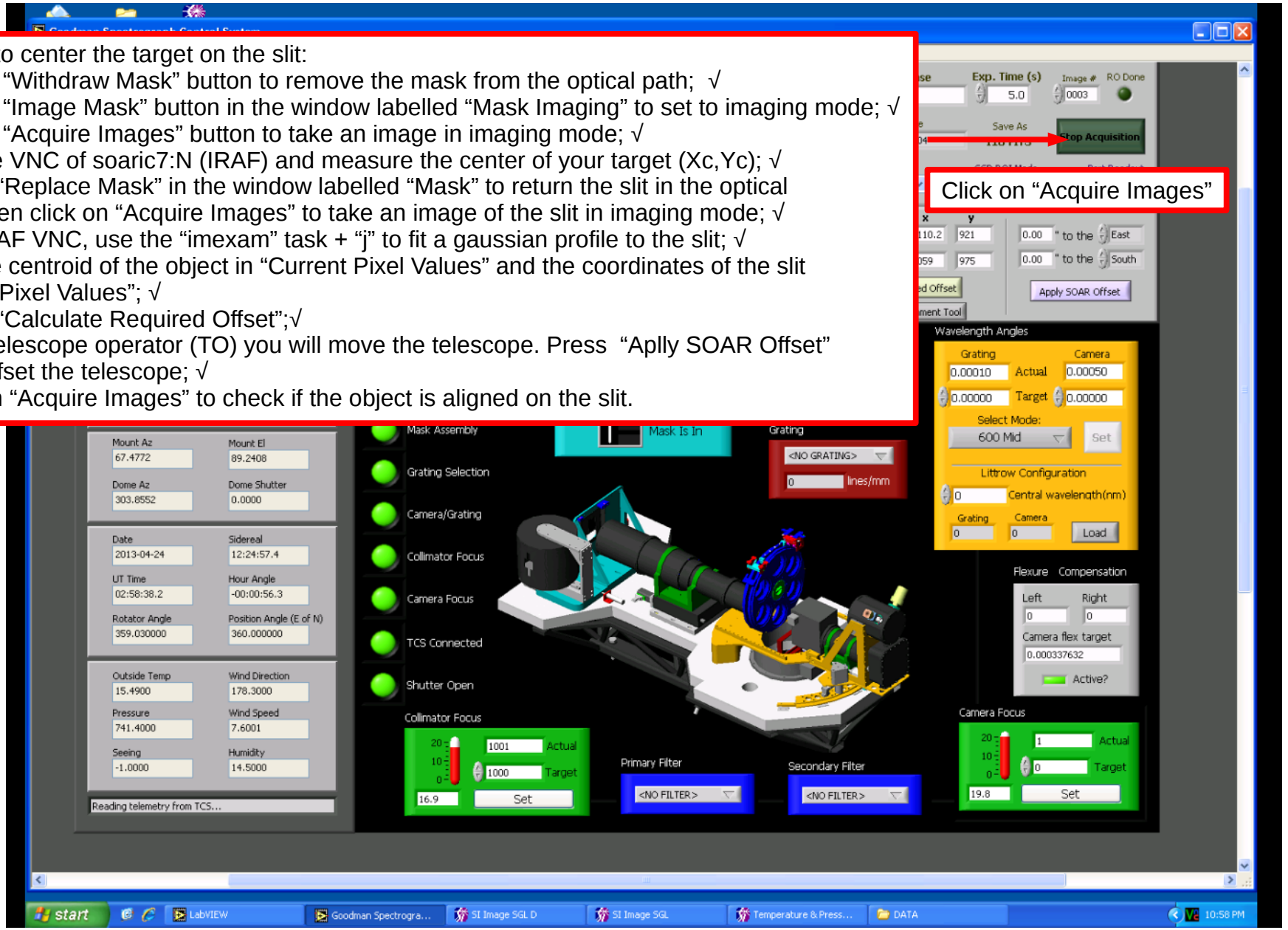
Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit; √
7) Enter the centroid of the object in “Current Pixel Values” and the coordinates of the slit in “Desired Pixel Values”; √
8) Click on “Calculate Required Offset”;√
9) Tell the telescope operator (TO) you will move the telescope. Click the “Apply SOAR Offset” button to offset the telescope;

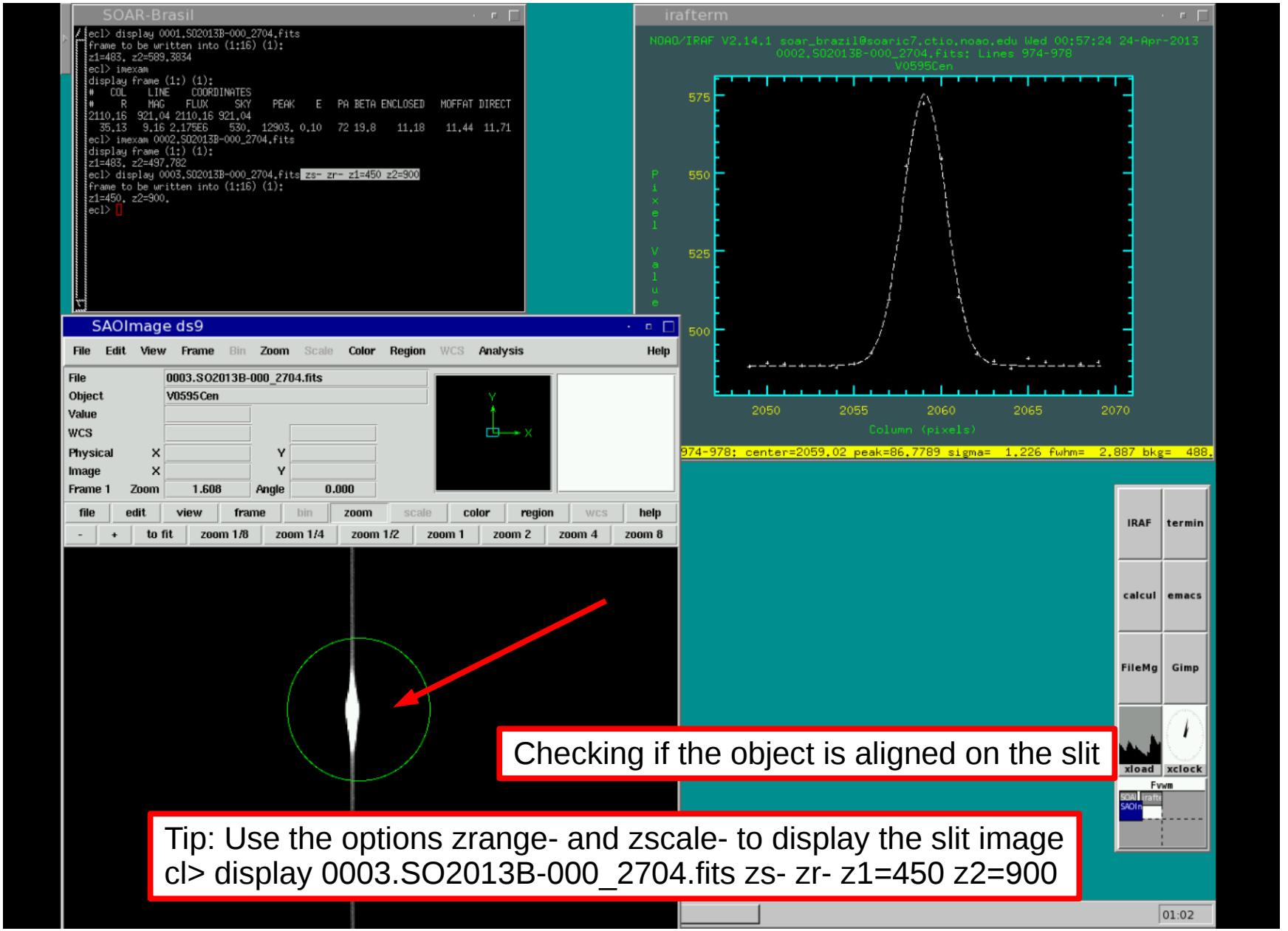


Centering the object on the slit

Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit; √
7) Enter the centroid of the object in “Current Pixel Values” and the coordinates of the slit in “Desired Pixel Values”; √
8) Click on “Calculate Required Offset”;√
9) Tell the telescope operator (TO) you will move the telescope. Press “Aplly SOAR Offset” button to offset the telescope; √
10) Click on “Acquire Images” to check if the object is aligned on the slit.

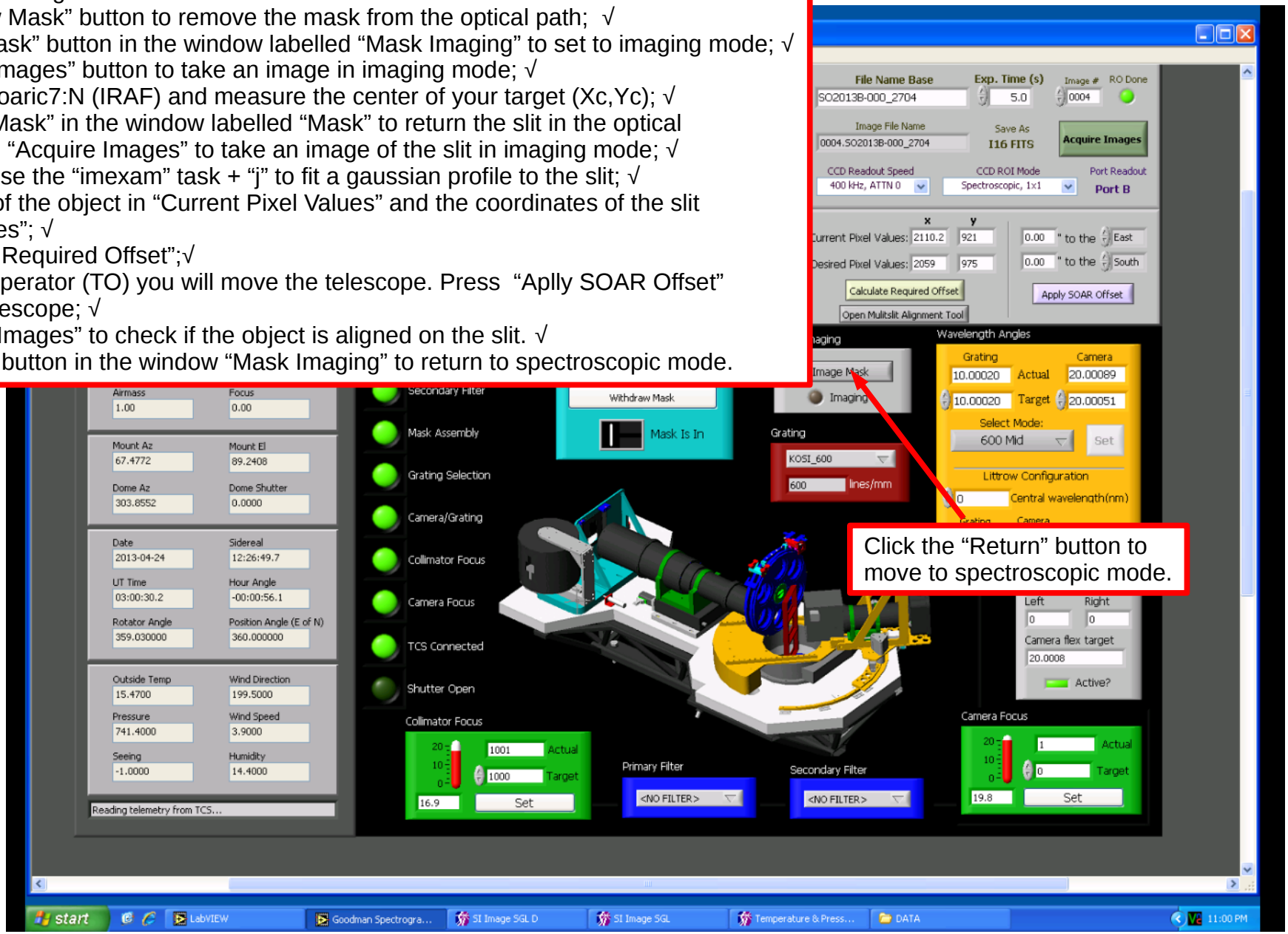


Centering the object on the slit

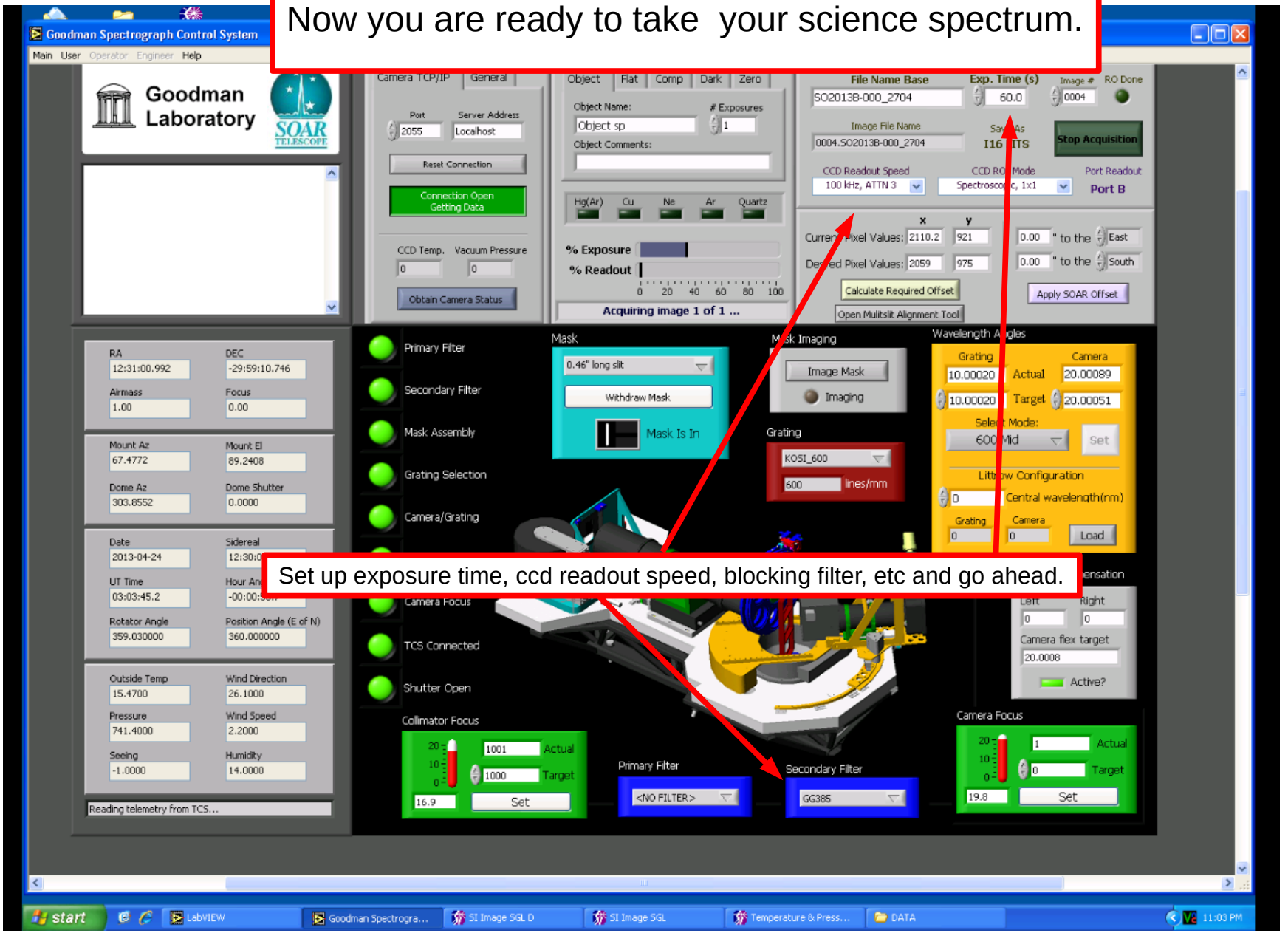


Centering the object on the slit

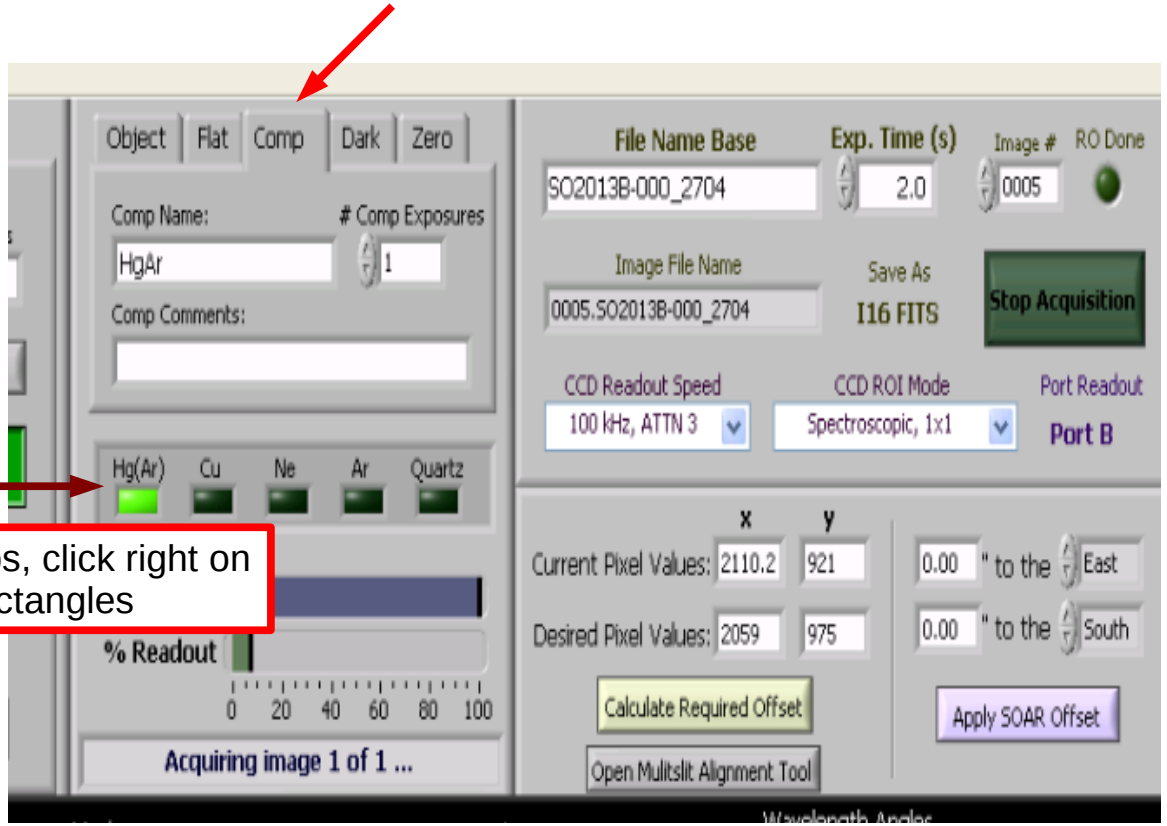
Procedure to center the target on the slit:
1) Click the “Withdraw Mask” button to remove the mask from the optical path; √
2) Click the “Image Mask” button in the window labelled “Mask Imaging” to set to imaging mode; √
3) Click the “Acquire Images” button to take an image in imaging mode; √
4) Go to the VNC of soaric7:N (IRAF) and measure the center of your target (Xc,Yc); √
5) Click on “Replace Mask” in the window labelled “Mask” to return the slit in the optical path and then click on “Acquire Images” to take an image of the slit in imaging mode; √
6) In the IRAF VNC, use the “imexam” task + “j” to fit a gaussian profile to the slit; √
7) Enter the centroid of the object in “Current Pixel Values” and the coordinates of the slit in “Desired Pixel Values”; √
8) Click on “Calculate Required Offset”;√
9) Tell the telescope operator (TO) you will move the telescope. Press “Aplly SOAR Offset” button to offset the telescope; √
10) Click on “Acquire Images” to check if the object is aligned on the slit. √
11) Click the “Return” button in the window “Mask Imaging” to return to spectroscopic mode.



Centering the object on the slit



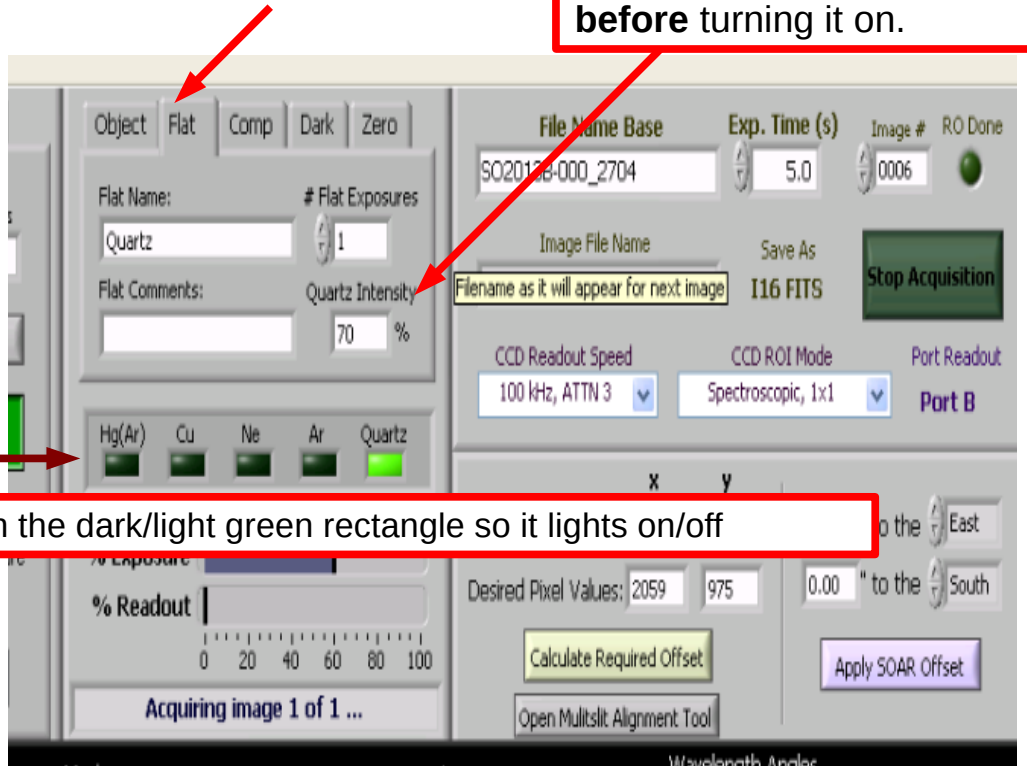
To obtain a comparison lamp spectrum:
1) Ask the TO to stop guiding and to put the comparison mirror in the optical path;
2) Select the tab “Comp”;
3) Turn on the desired lamp (or ask the TO to). Ex.: HgAr. More at Goodman Comparison Lamps
4) Go ahead and click on “Acquire Images”.



To turn on/off the lamps, click right on the dark/light green rectangles

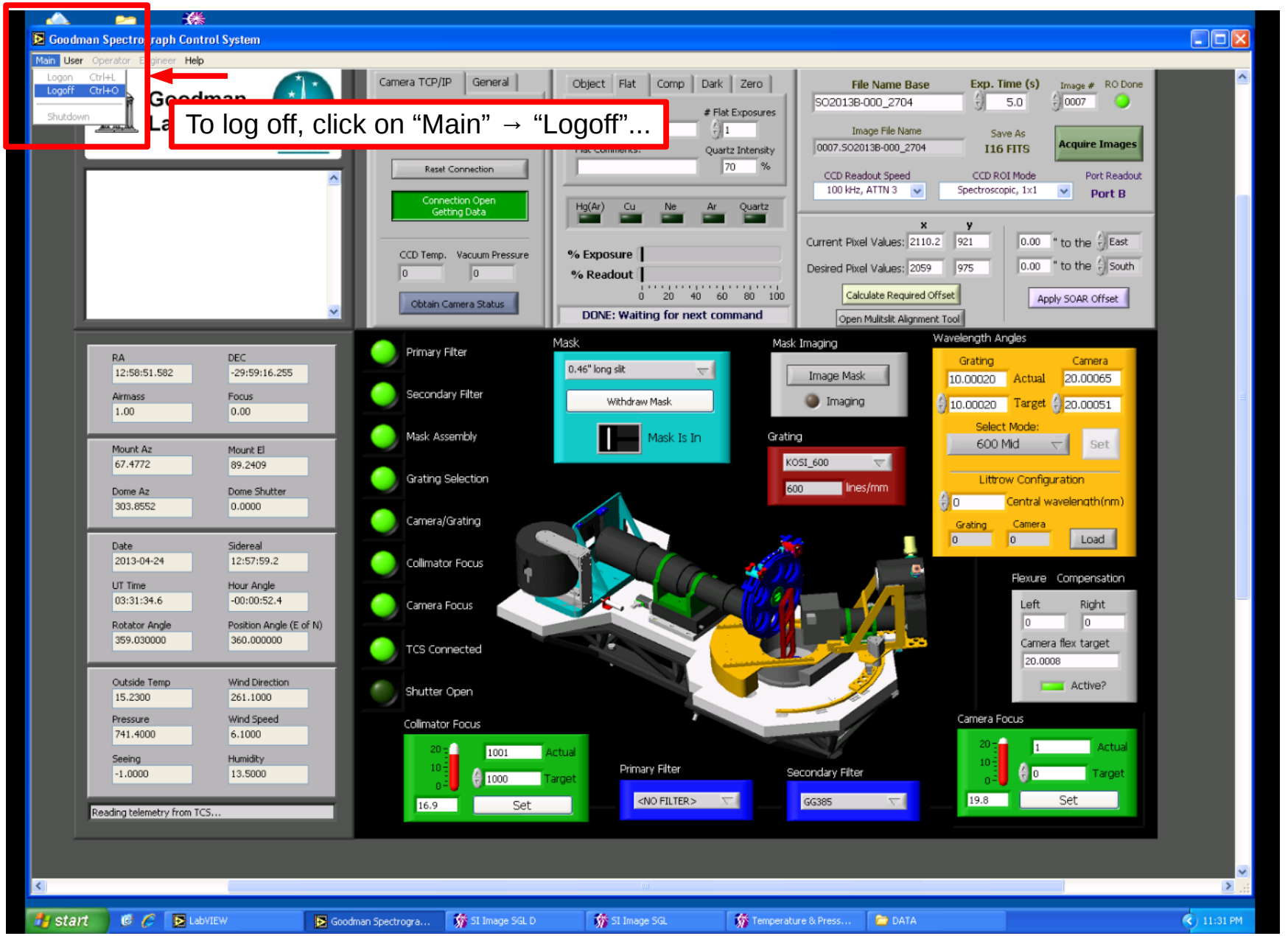
To obtain a flat-field lamp:
1) Ask the TO to stop guiding and to put the comparison mirror in the optical path;
2) Select the tab “Flat”;
3) Adjust the instensity and then turn on the Quartz lamp (or ask the TO to).
4) Go ahead and click on “Acquire Images”.

Adjust the intensity of the quartz lamp **before** turning it on.

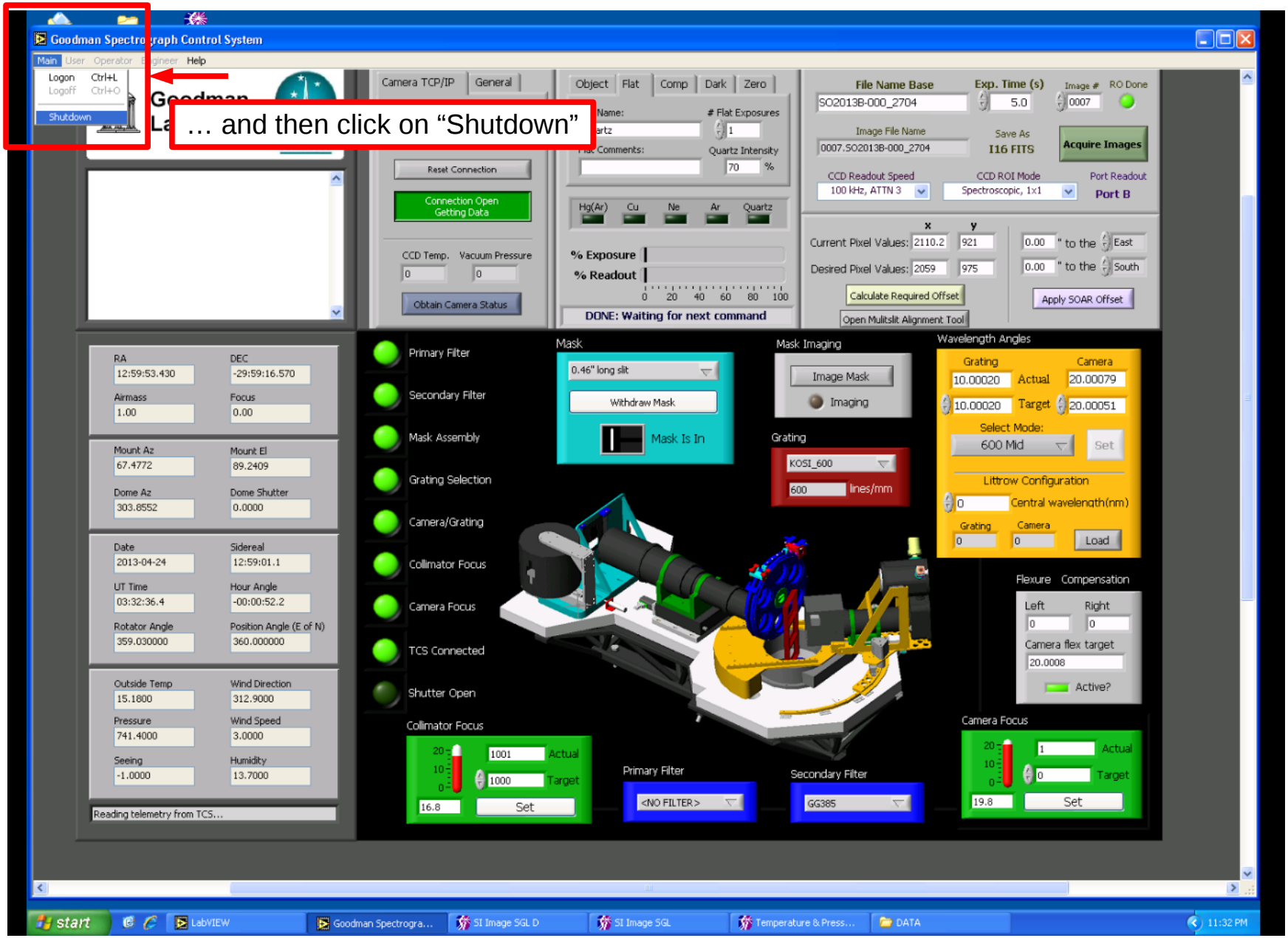


To turn on/off the lamps, click on the dark/light green rectangle so it lights on/off

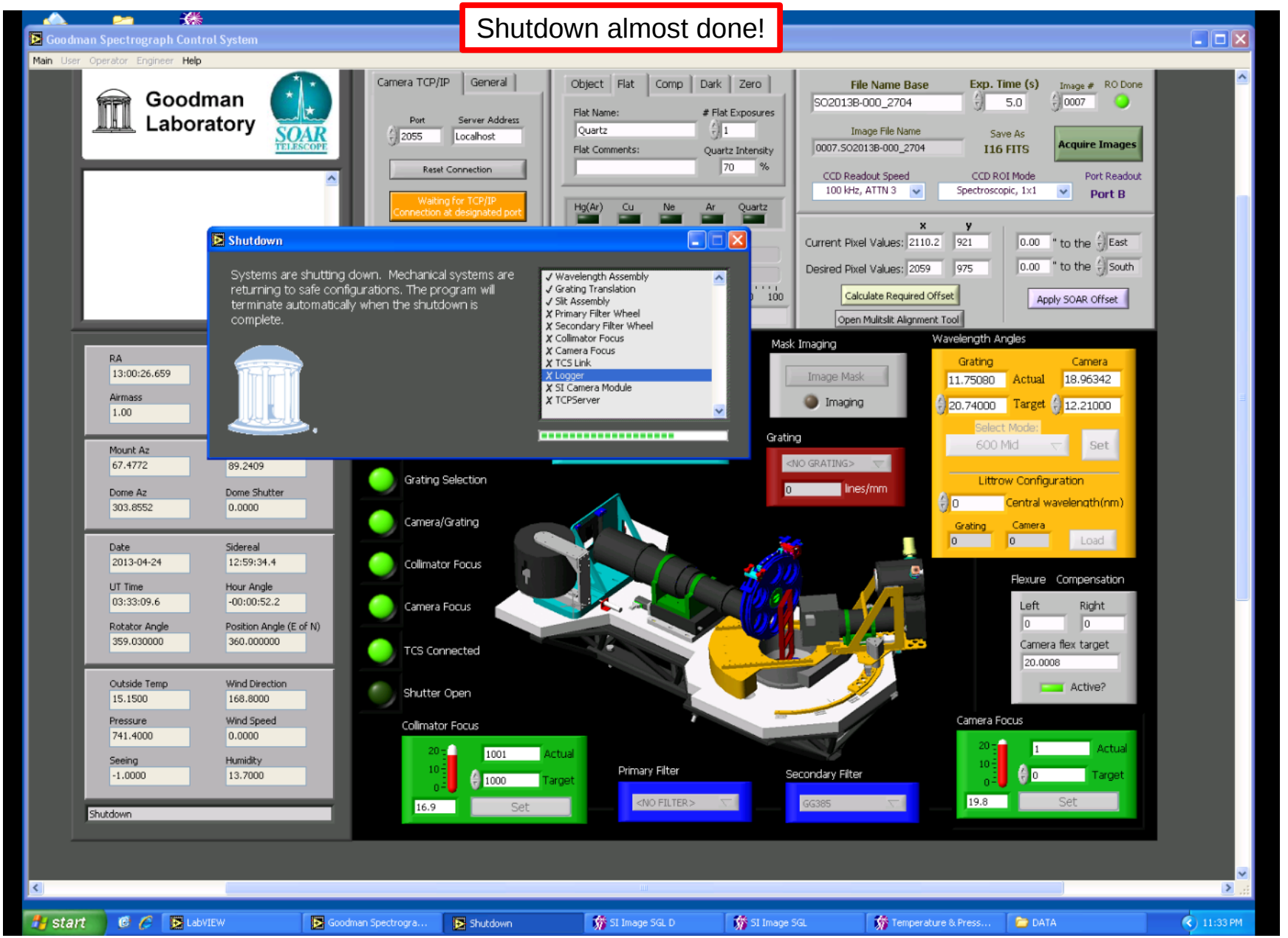
Logoff and Shutdown



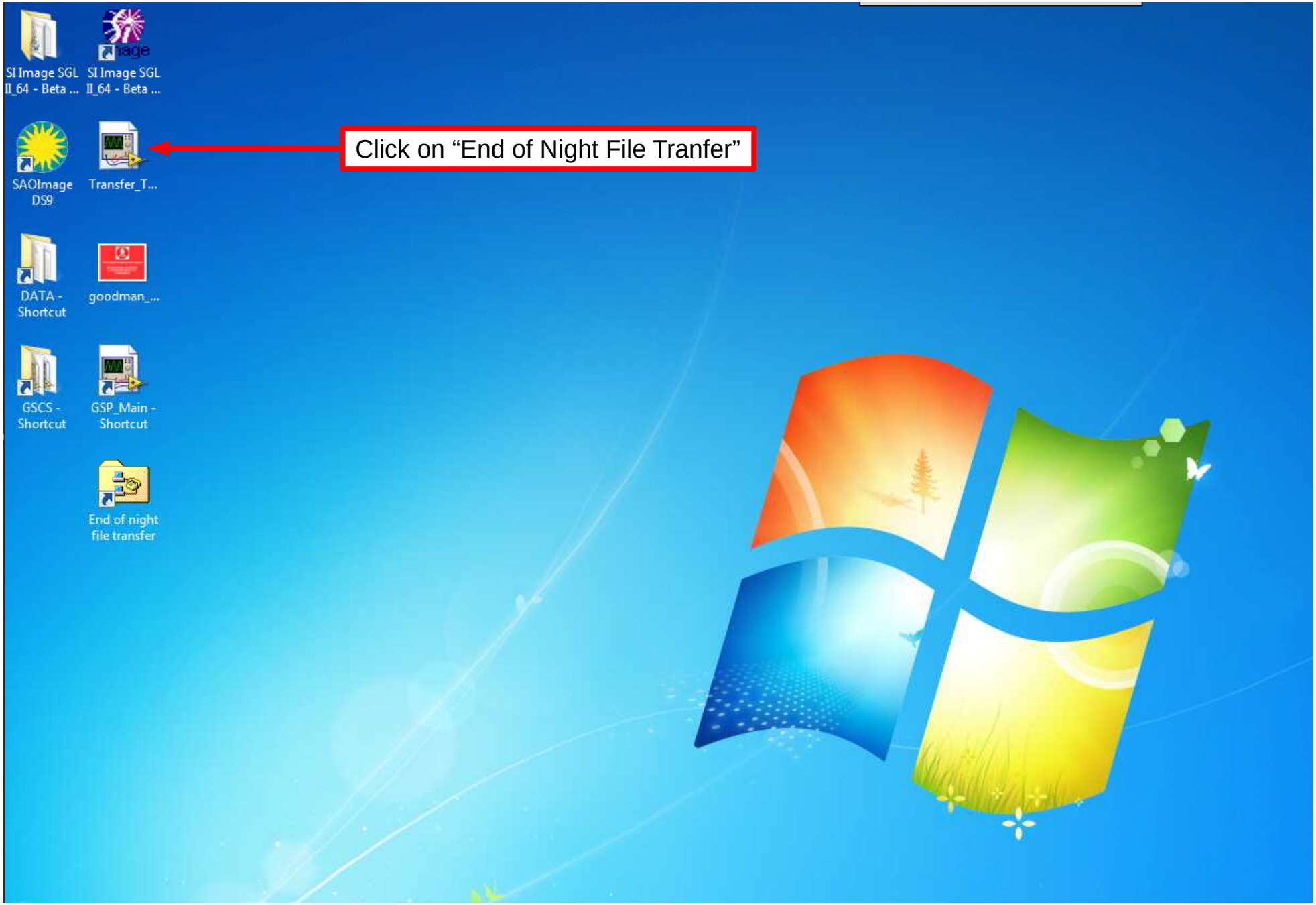
Logoff and Shutdown



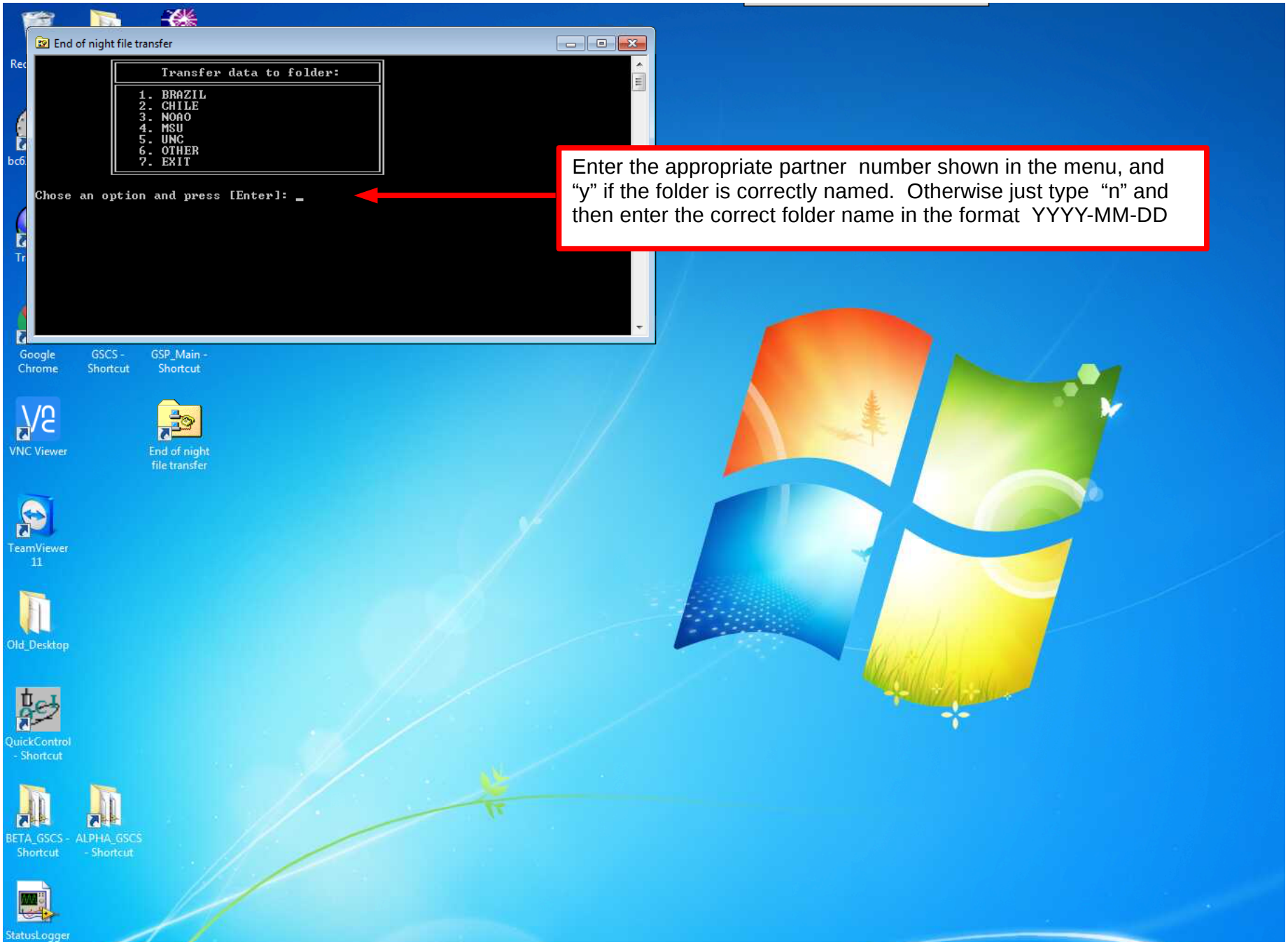
Logoff and Shutdown



Moving data to the backup directory



Moving data to the backup directory

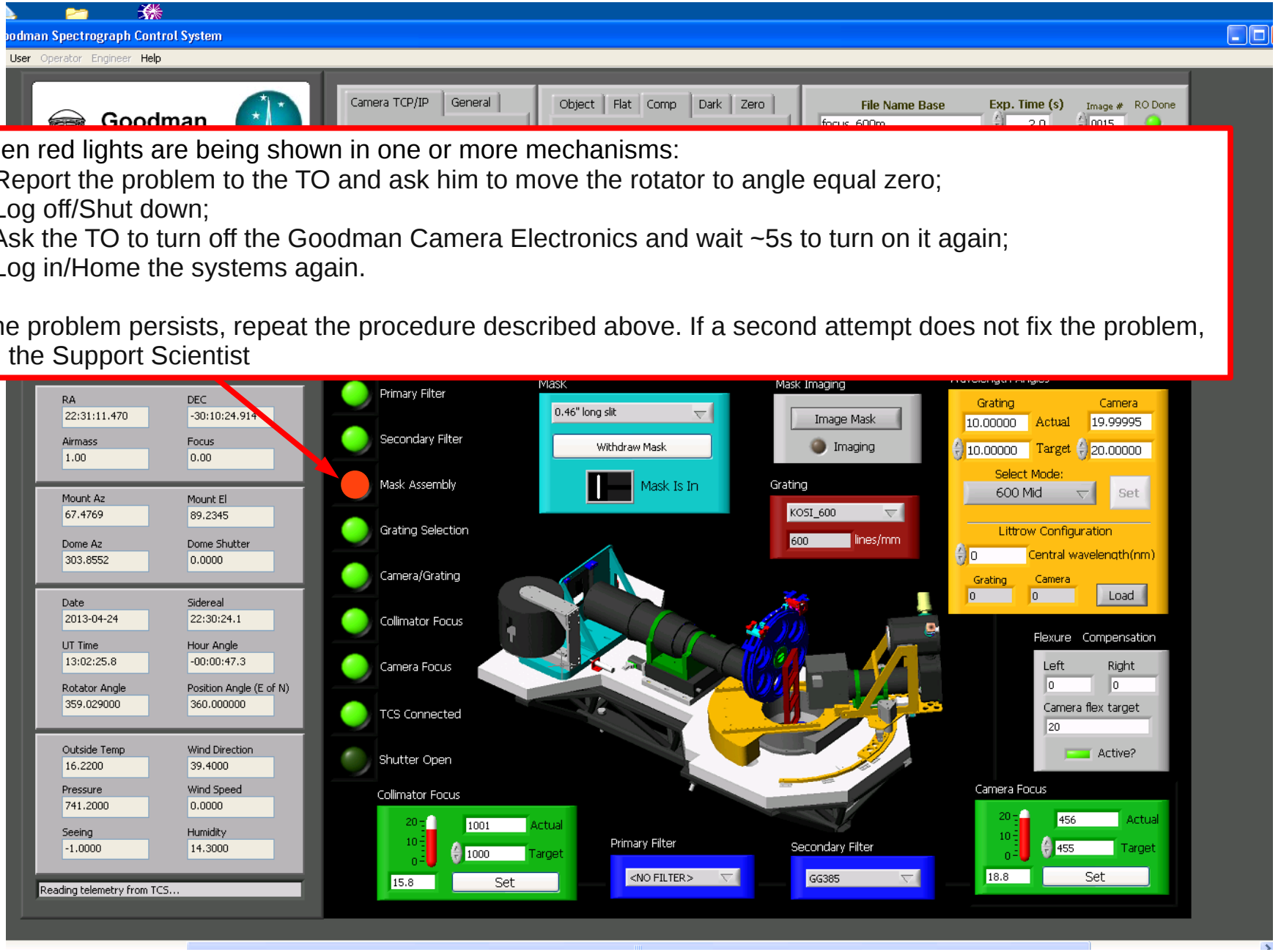


- Red light on the Goodman GUI shown in one or more mechanisms.
- How to abort an acquisition properly.
- The shutter does not close after stopping data acquisition.
- Light trails in bright stars in imaging mode.
- Images are not being transferred to the right folder on soaric7

Red light on the Goodman GUI

When red lights are being shown in one or more mechanisms:
1) Report the problem to the TO and ask him to move the rotator to angle equal zero;
2) Log off/Shut down;
3) Ask the TO to turn off the Goodman Camera Electronics and wait ~5s to turn on it again;
4) Log in/Home the systems again.

If the problem persists, repeat the procedure described above. If a second attempt does not fix the problem, call the Support Scientist



Aborting an image acquisition

To abort an acquisition...

1) Click the “Stop Acquisition” button during an exposure.

Aborting an image acquisition

To abort an acquisition...

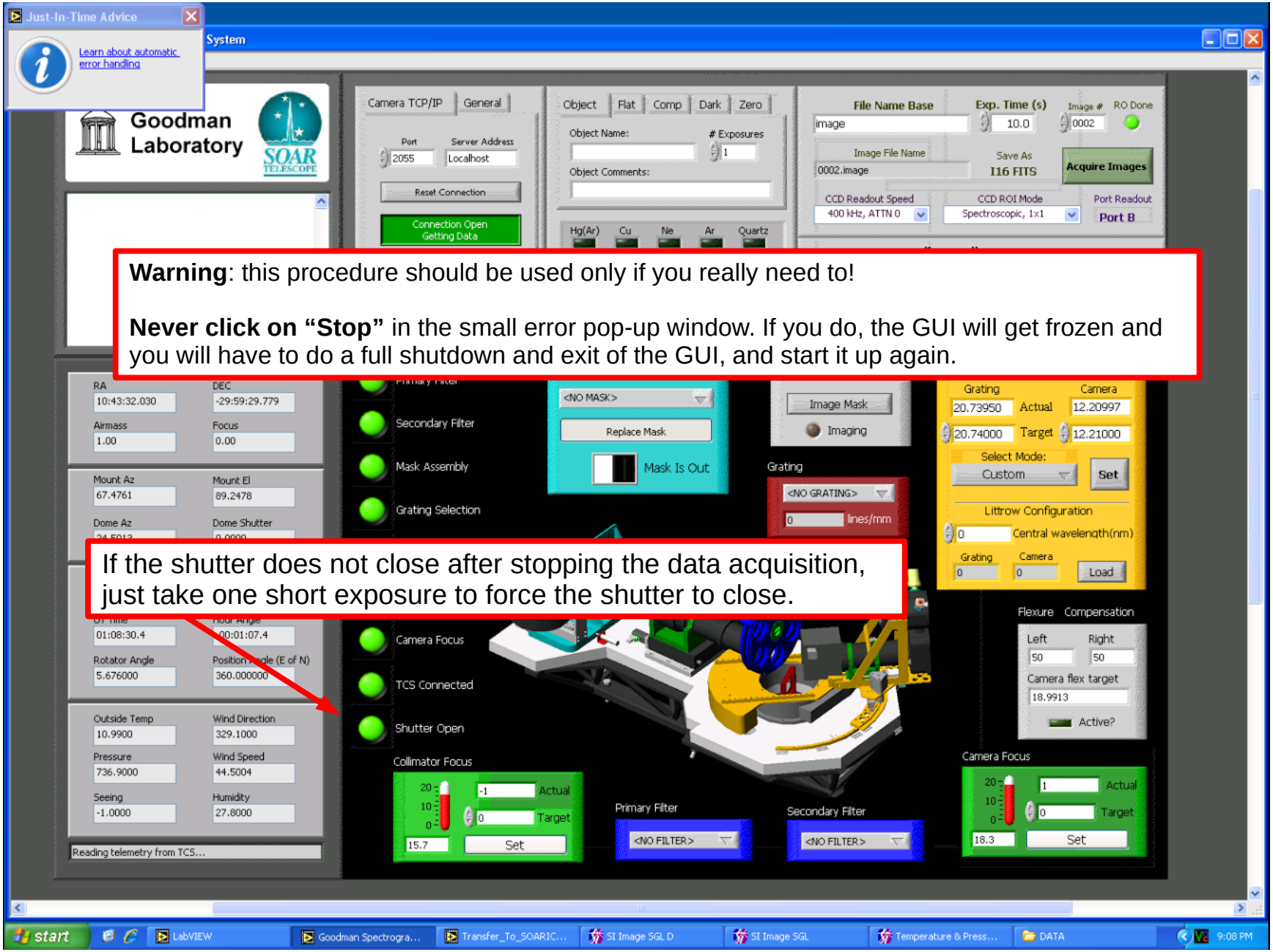
1) Click the “Stop Acquisition” button during an exposure.
2) You will get an error message. Click on **“Continue”**.

Aborting an image acquisition

To abort an acquisition...

1) Click the “Stop Acquisition” button during an exposure.
2) You will get an error message. Click on **“Continue”**.
3) A second error message will appear. Click on **“Continue”** again.

Aborting an image acquisition

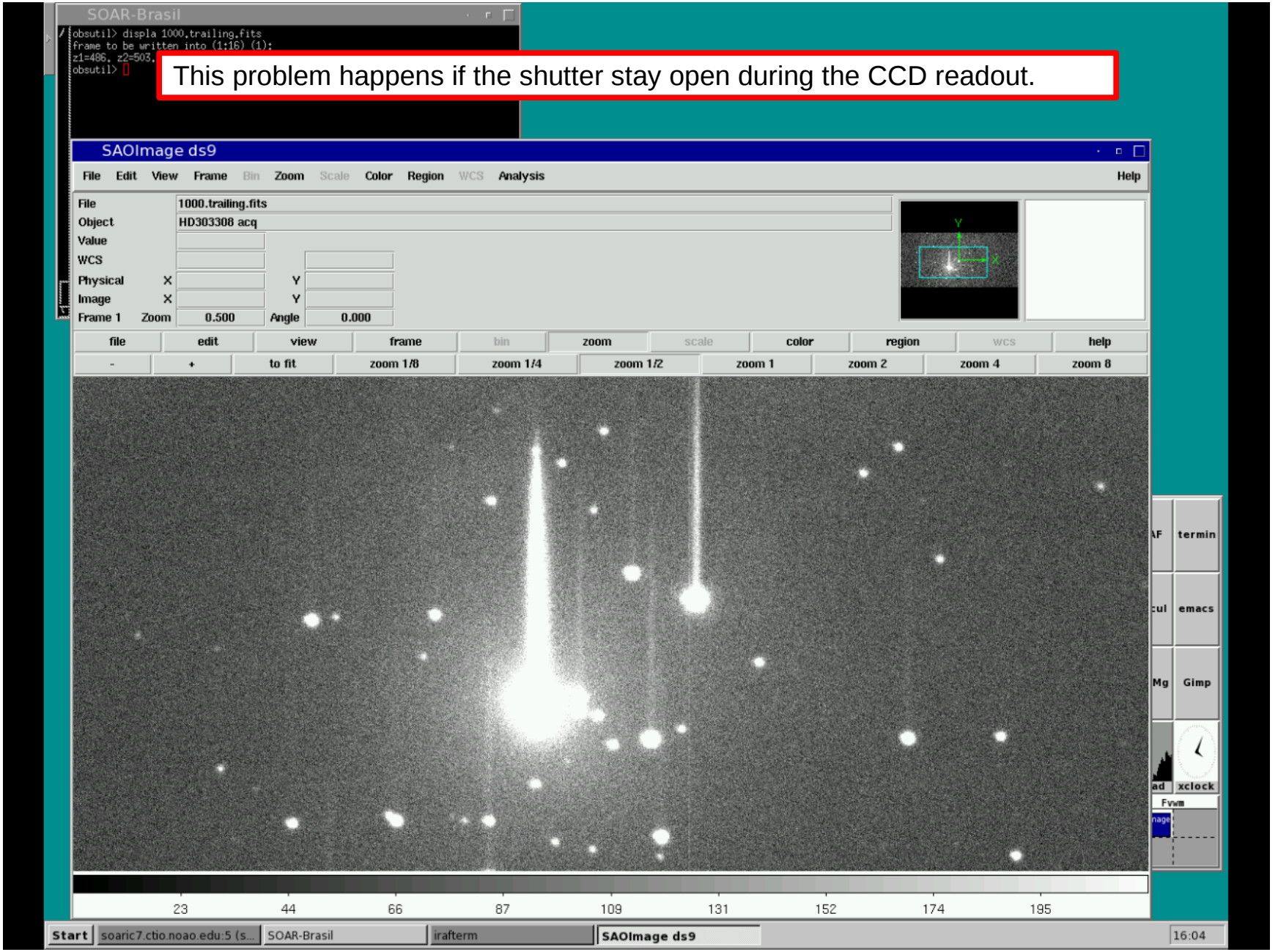


Warning: this procedure should be used only if you really need to!

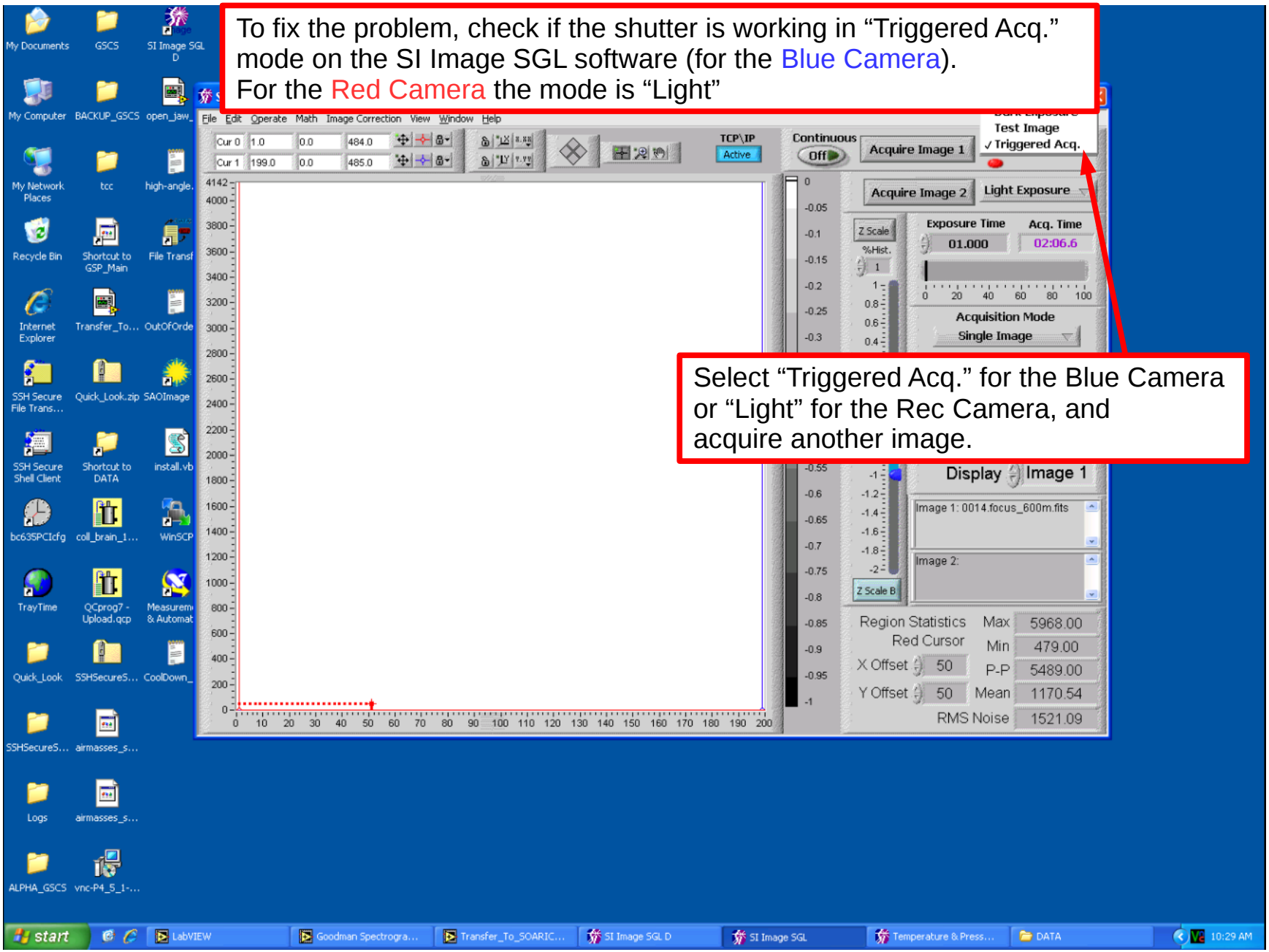
Never click on "Stop" in the small error pop-up window. If you do, the GUI will get frozen and you will have to do a full shutdown and exit of the GUI, and start it up again.

If the shutter does not close after stopping the data acquisition, just take one short exposure to force the shutter to close.

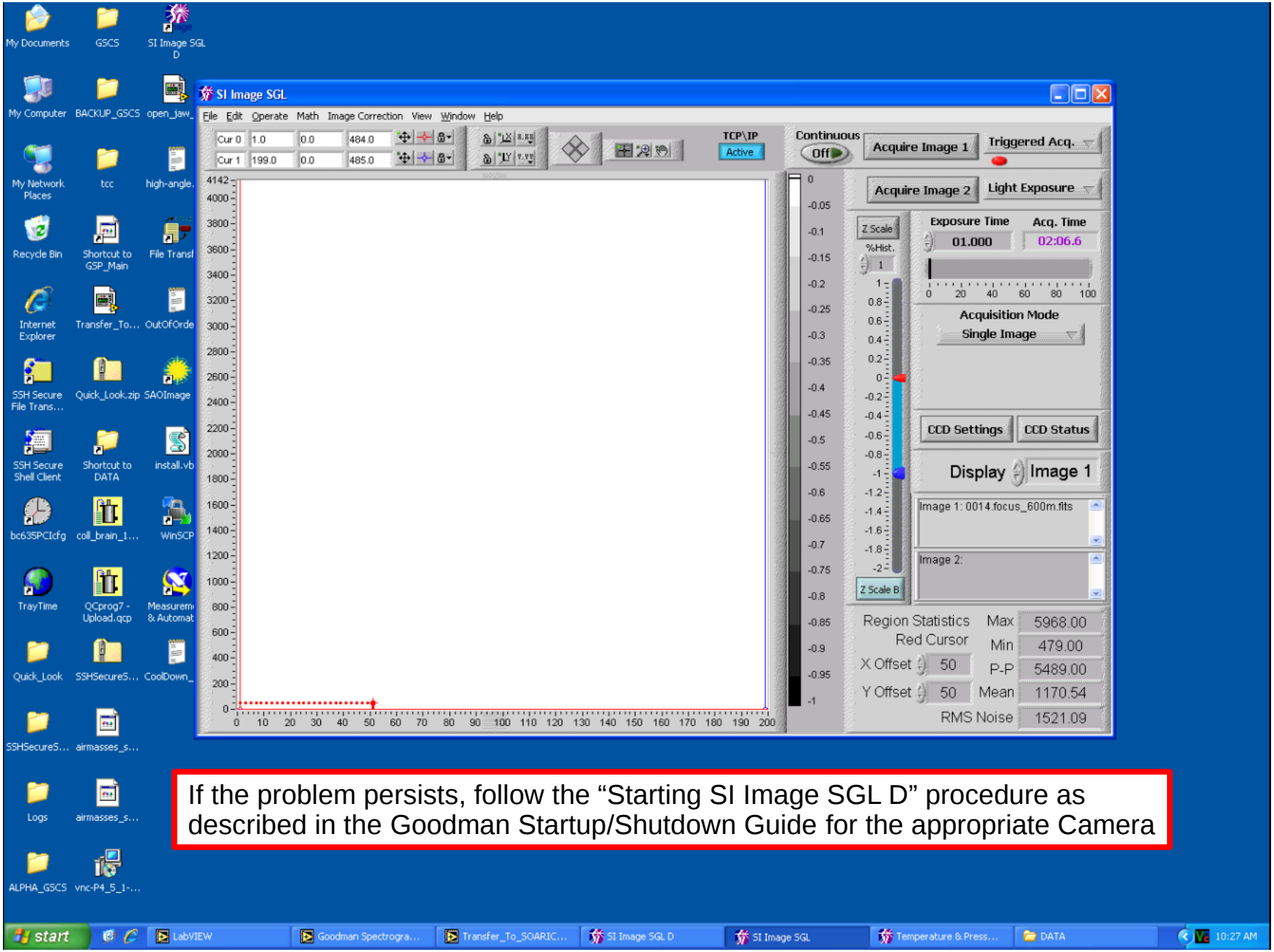
Bright stars with light trails



Bright stars with light trails

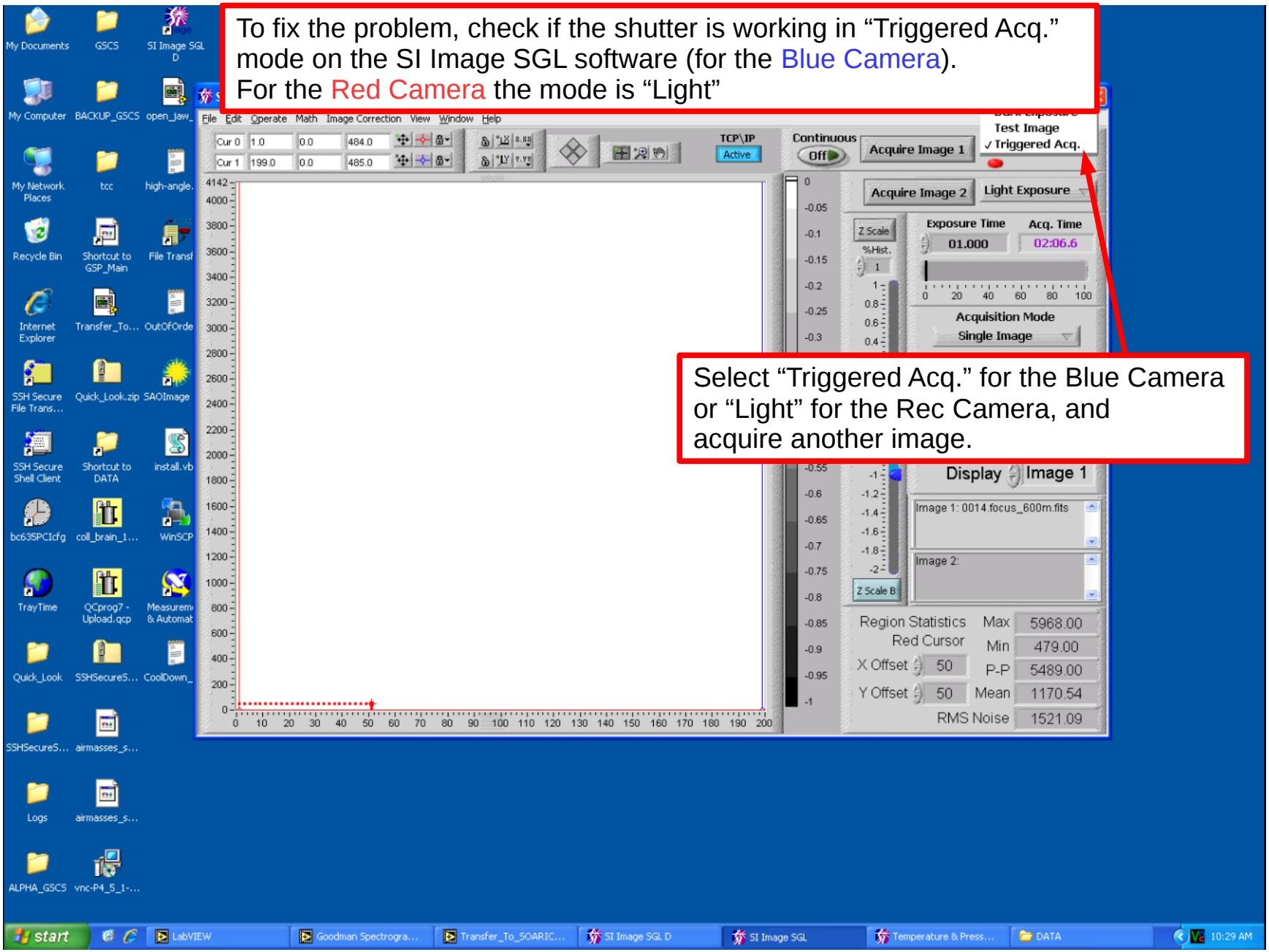


Bright stars with light trails



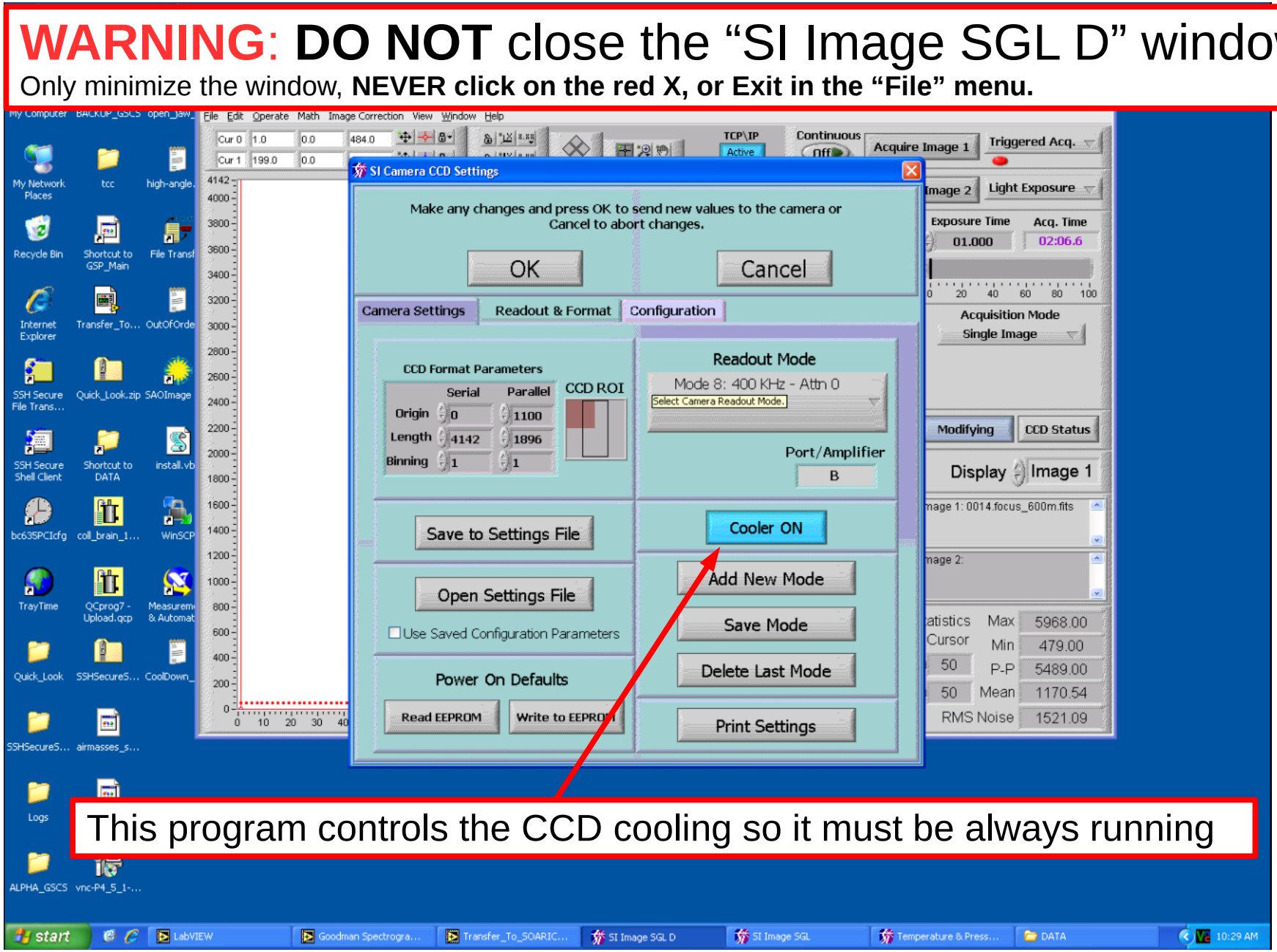
If the problem persists, follow the “Starting SI Image SGL D” procedure as described in the Goodman Startup/Shutdown Guide for the appropriate Camera

Bright stars with light trails

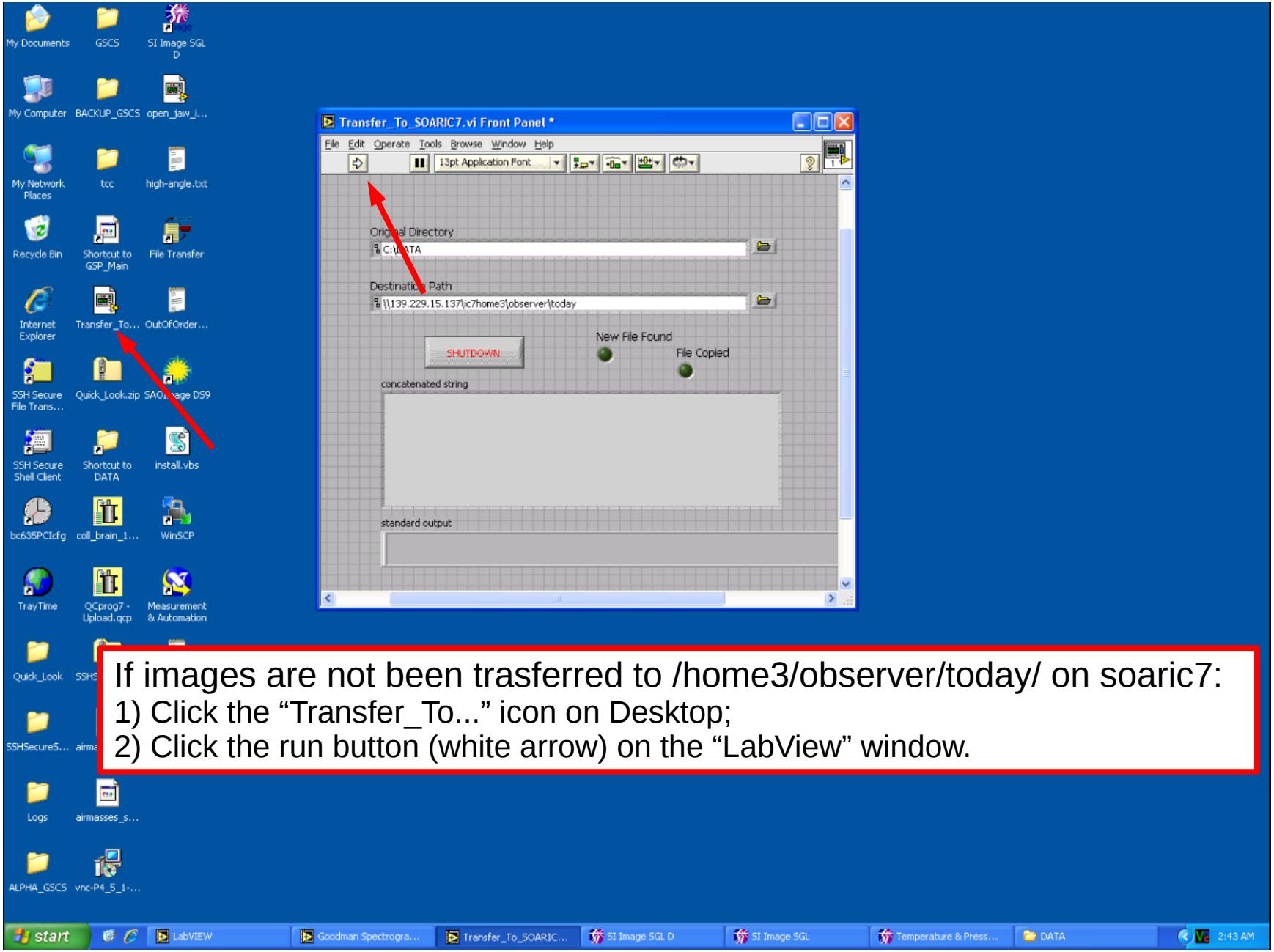


WARNING: DO NOT close the “SI Image SGL D” window.

Only minimize the window, **NEVER click on the red X, or Exit in the “File” menu.**

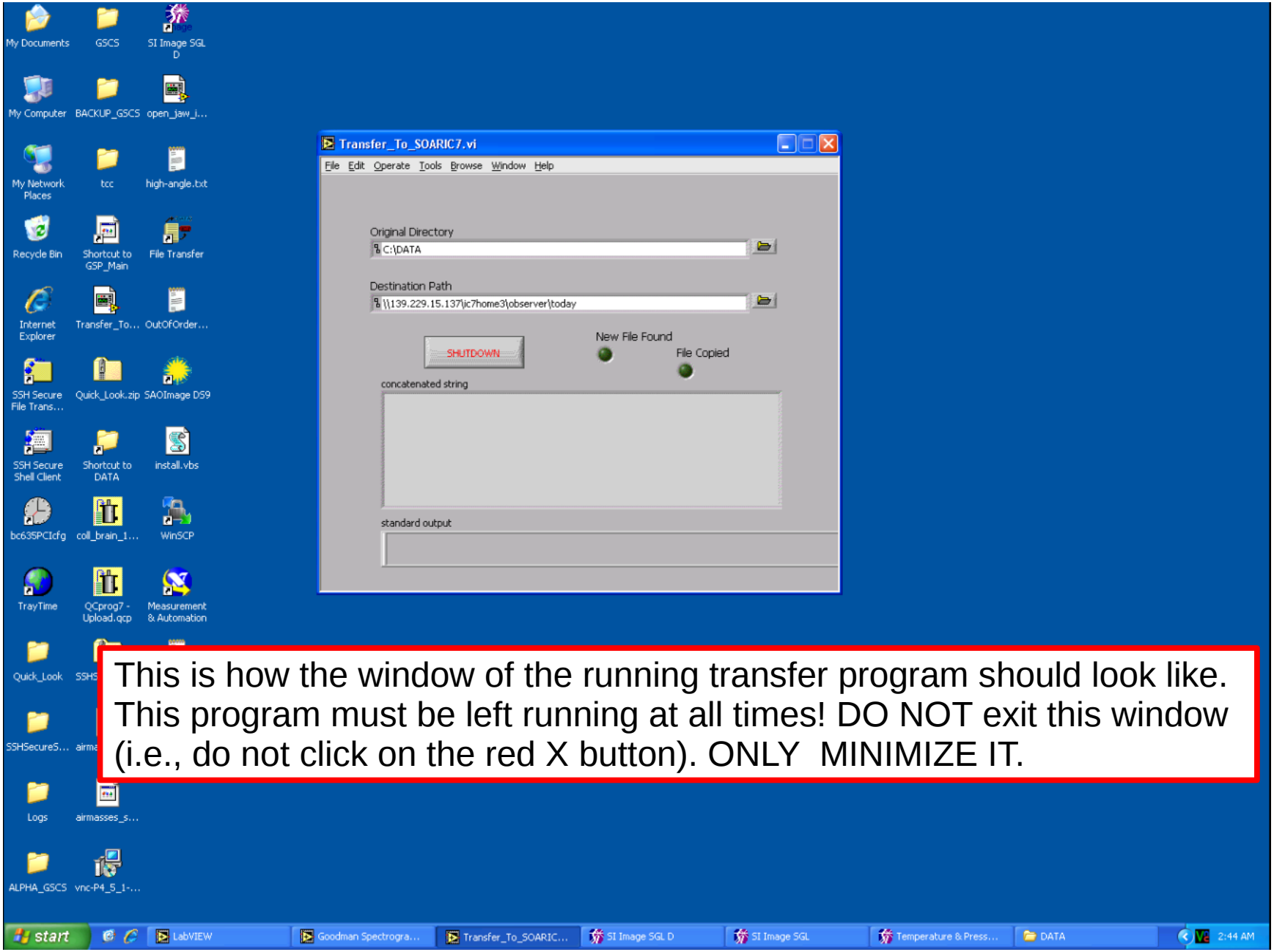


Images are not been transferred to soaric7



If images are not been trasferred to /home3/observer/today/ on soaric7:
1) Click the “Transfer_To...” icon on Desktop;
2) Click the run button (white arrow) on the “LabView” window.

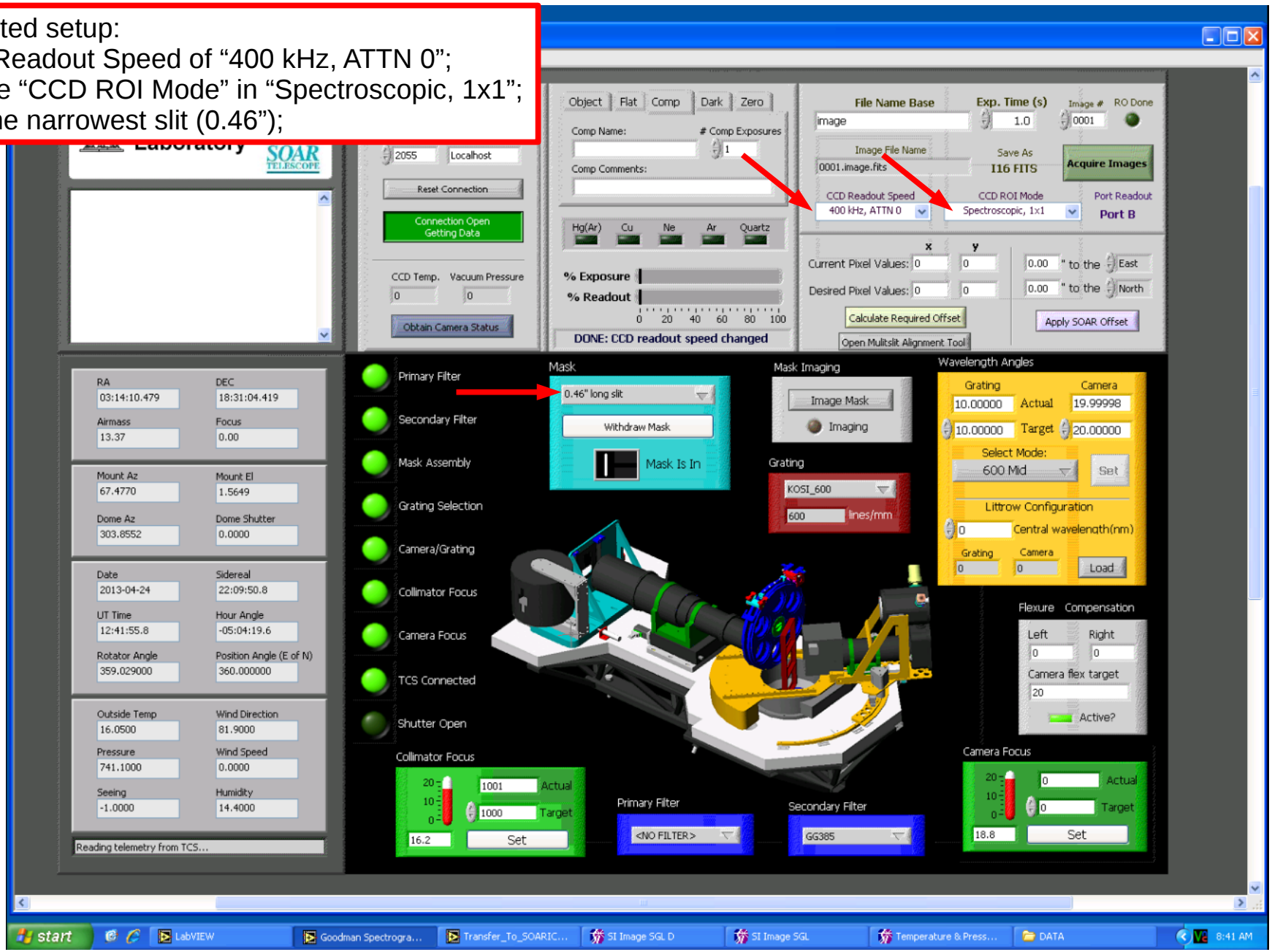
Images are not been transferred to soaric7



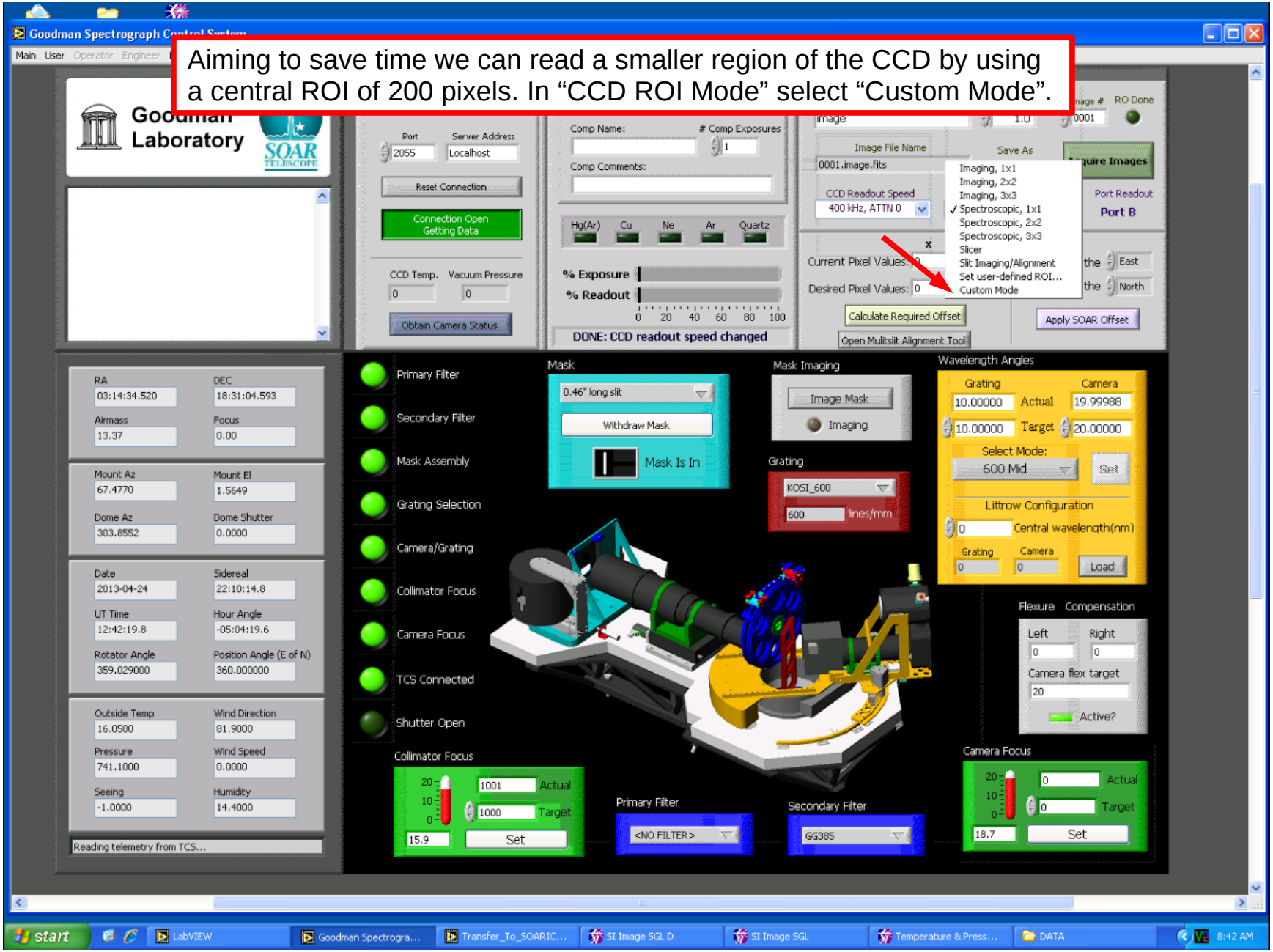
This is how the window of the running transfer program should look like. This program must be left running at all times! DO NOT exit this window (i.e., do not click on the red X button). ONLY MINIMIZE IT.

Focus sequence in spectroscopic mode

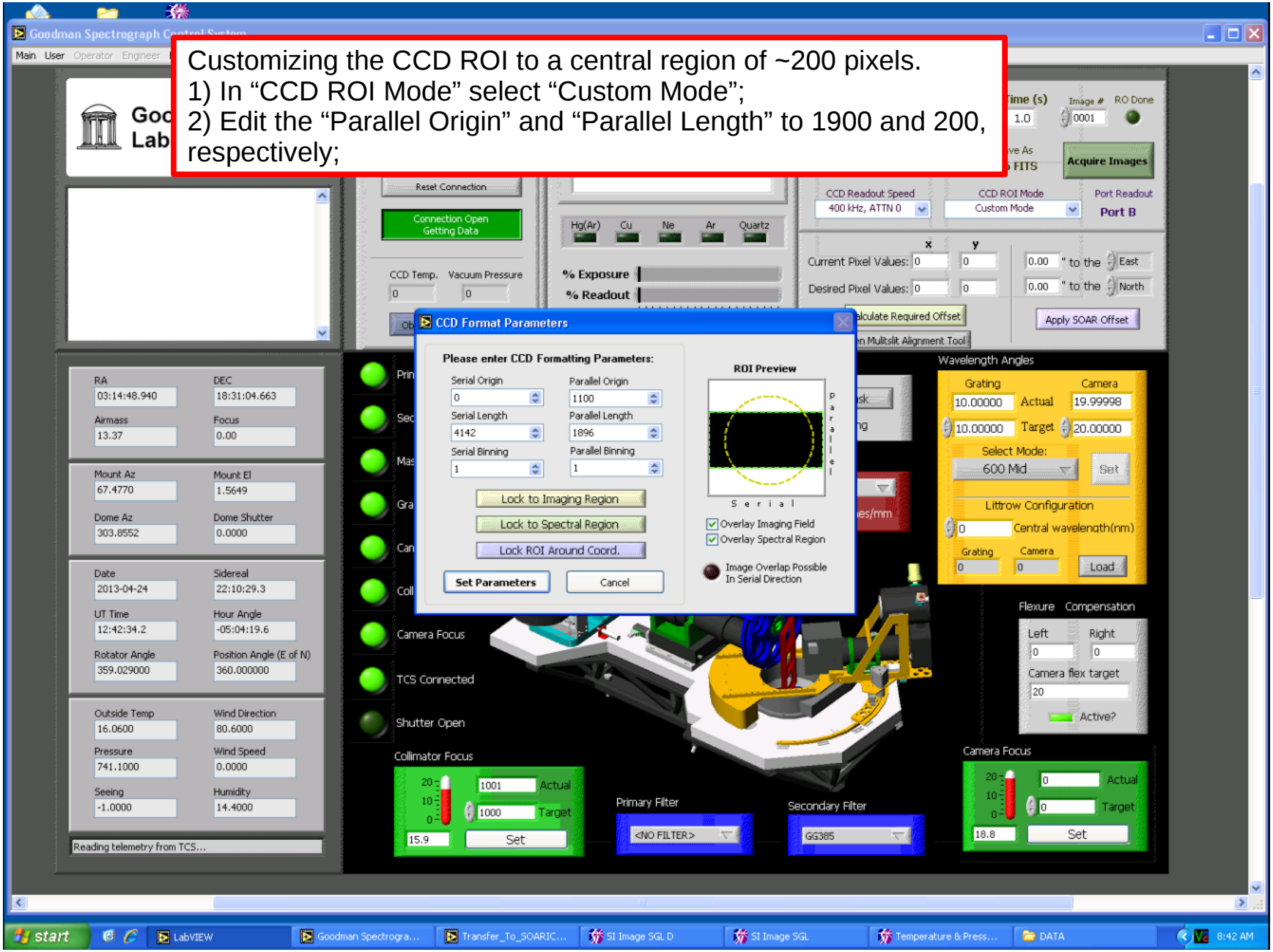
Suggested setup:
- CDD Readout Speed of “400 kHz, ATTN 0”;
- Put the “CCD ROI Mode” in “Spectroscopic, 1x1”;
- Use the narrowest slit (0.46”);



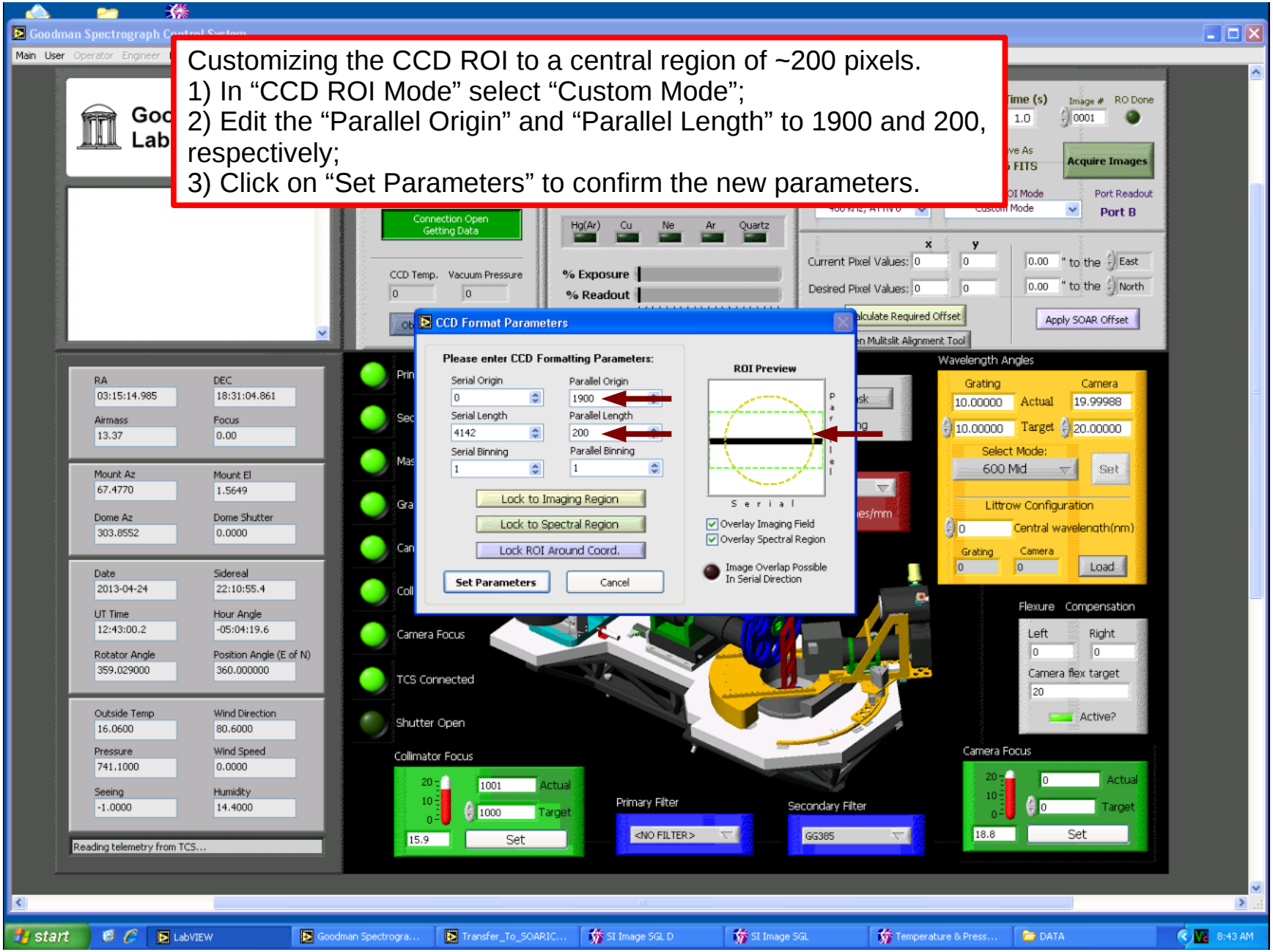
Focus sequence in spectroscopic mode



Focus sequence in spectroscopic mode

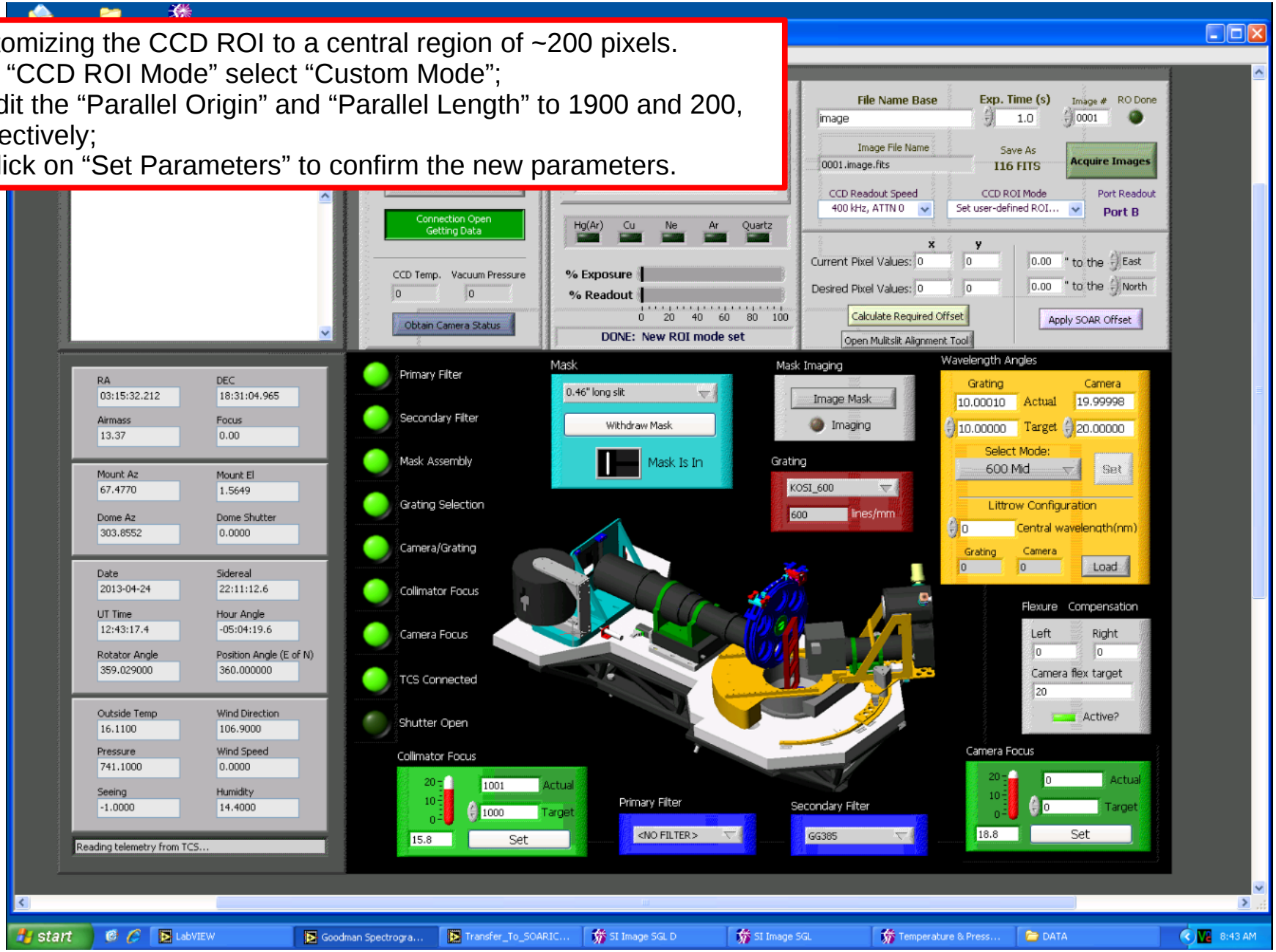


Focus sequence in spectroscopic mode



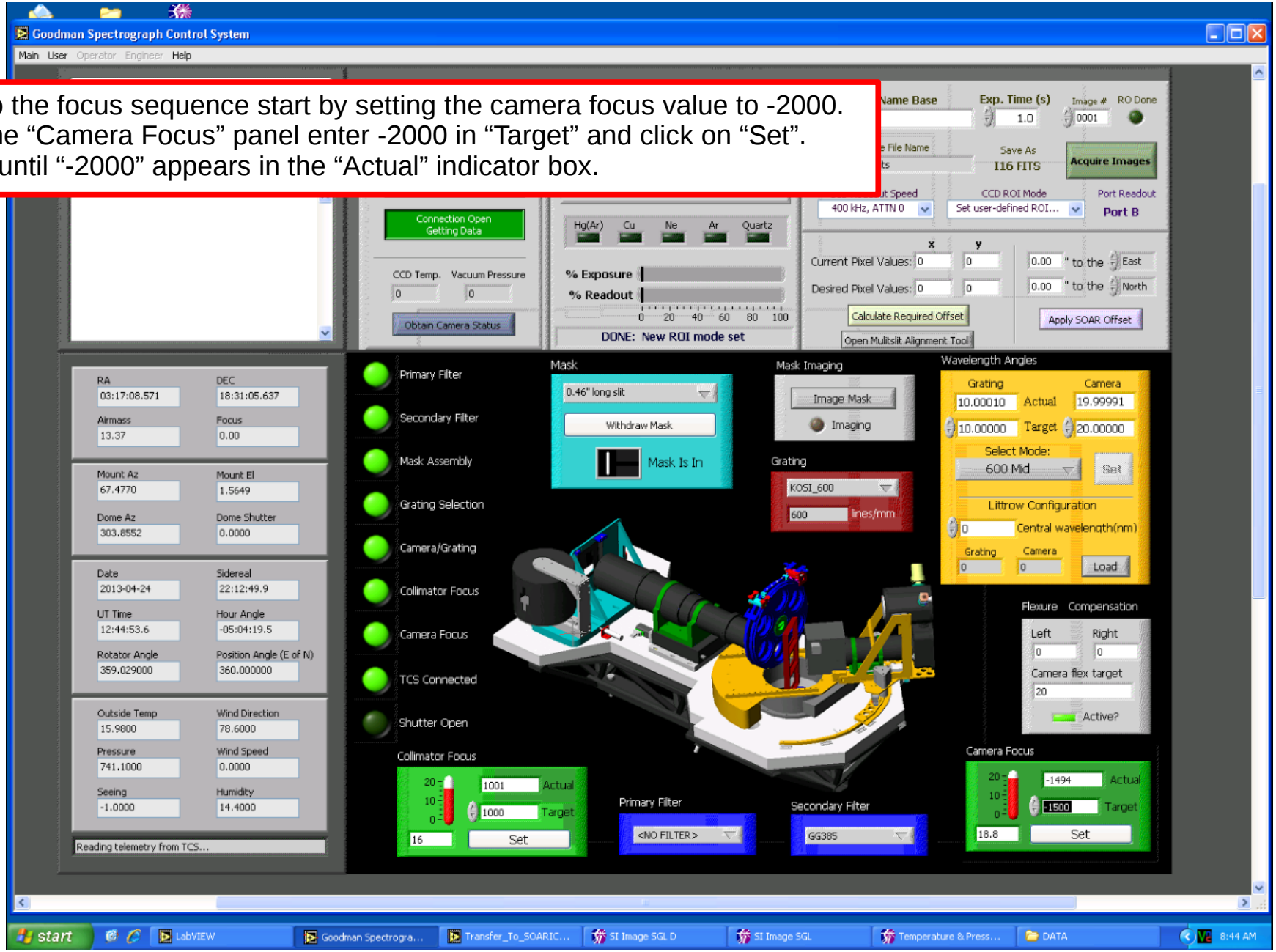
Focus sequence in spectroscopic mode

Customizing the CCD ROI to a central region of ~200 pixels.
1) In “CCD ROI Mode” select “Custom Mode”;
2) Edit the “Parallel Origin” and “Parallel Length” to 1900 and 200, respectively;
3) Click on “Set Parameters” to confirm the new parameters.



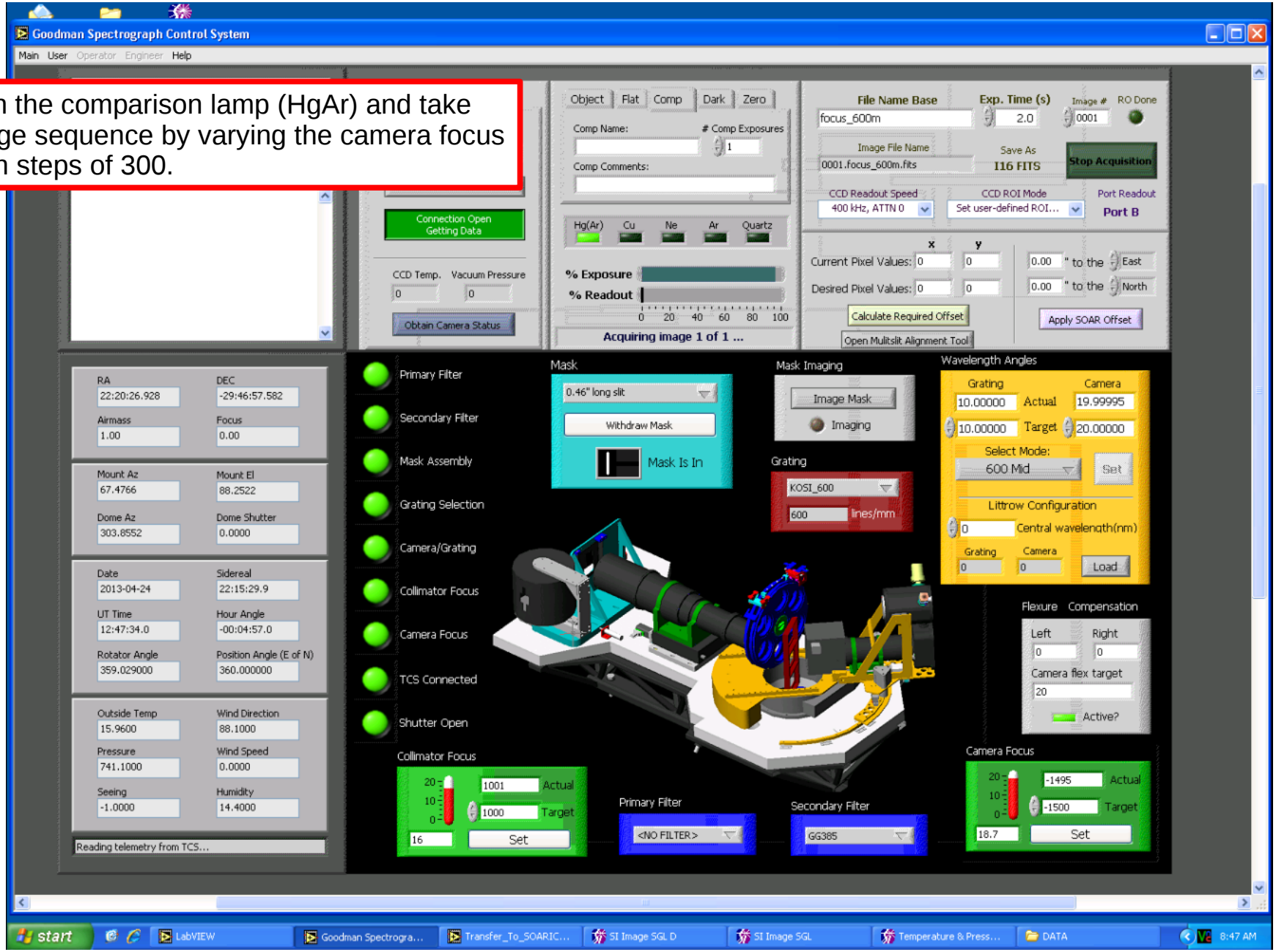
Focus sequence in spectroscopic mode

To do the focus sequence start by setting the camera focus value to -2000.
On the “Camera Focus” panel enter -2000 in “Target” and click on “Set”.
Wait until “-2000” appears in the “Actual” indicator box.

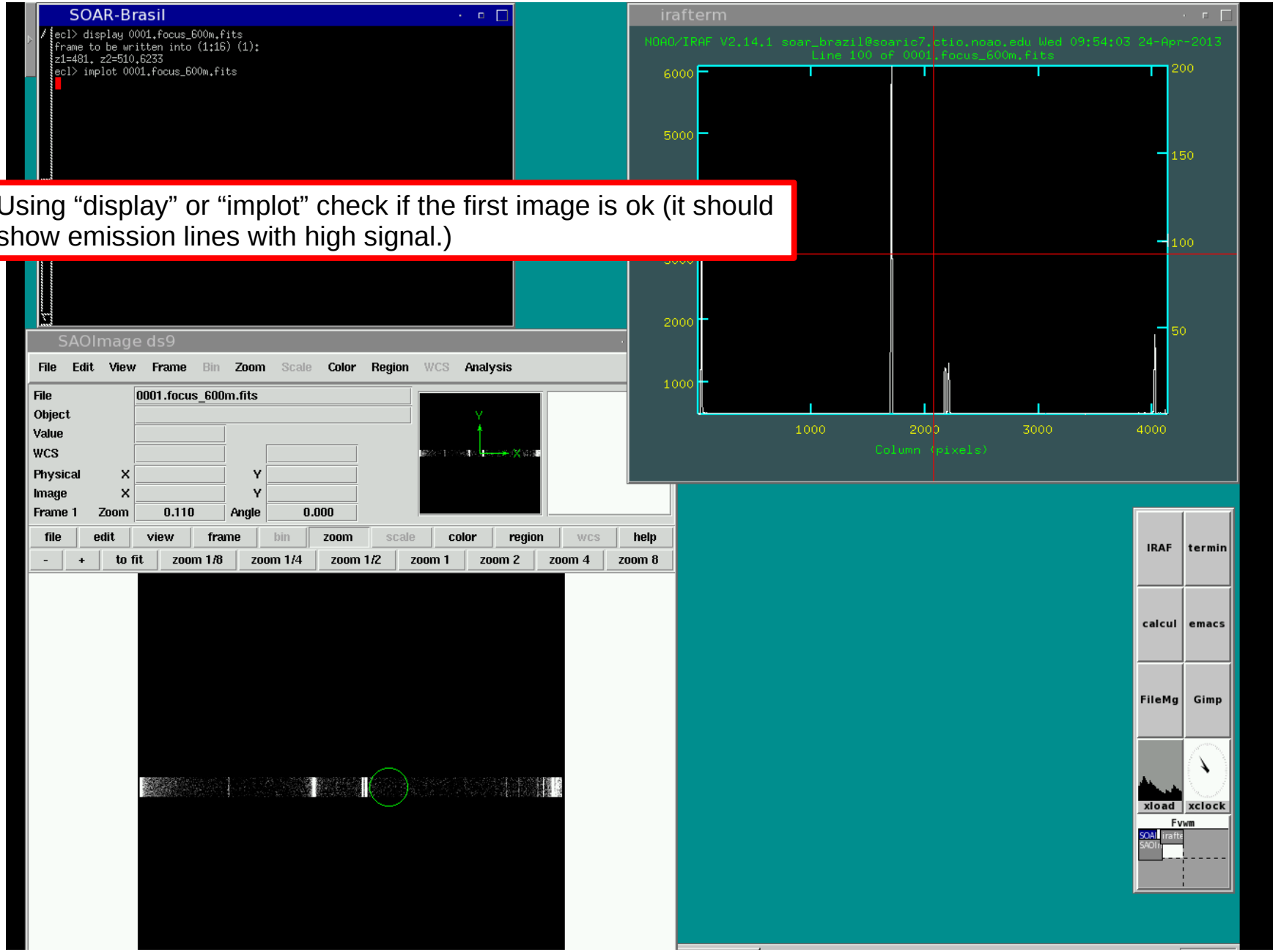


Focus sequence in spectroscopic mode

Turn on the comparison lamp (HgAr) and take an image sequence by varying the camera focus value in steps of 300.

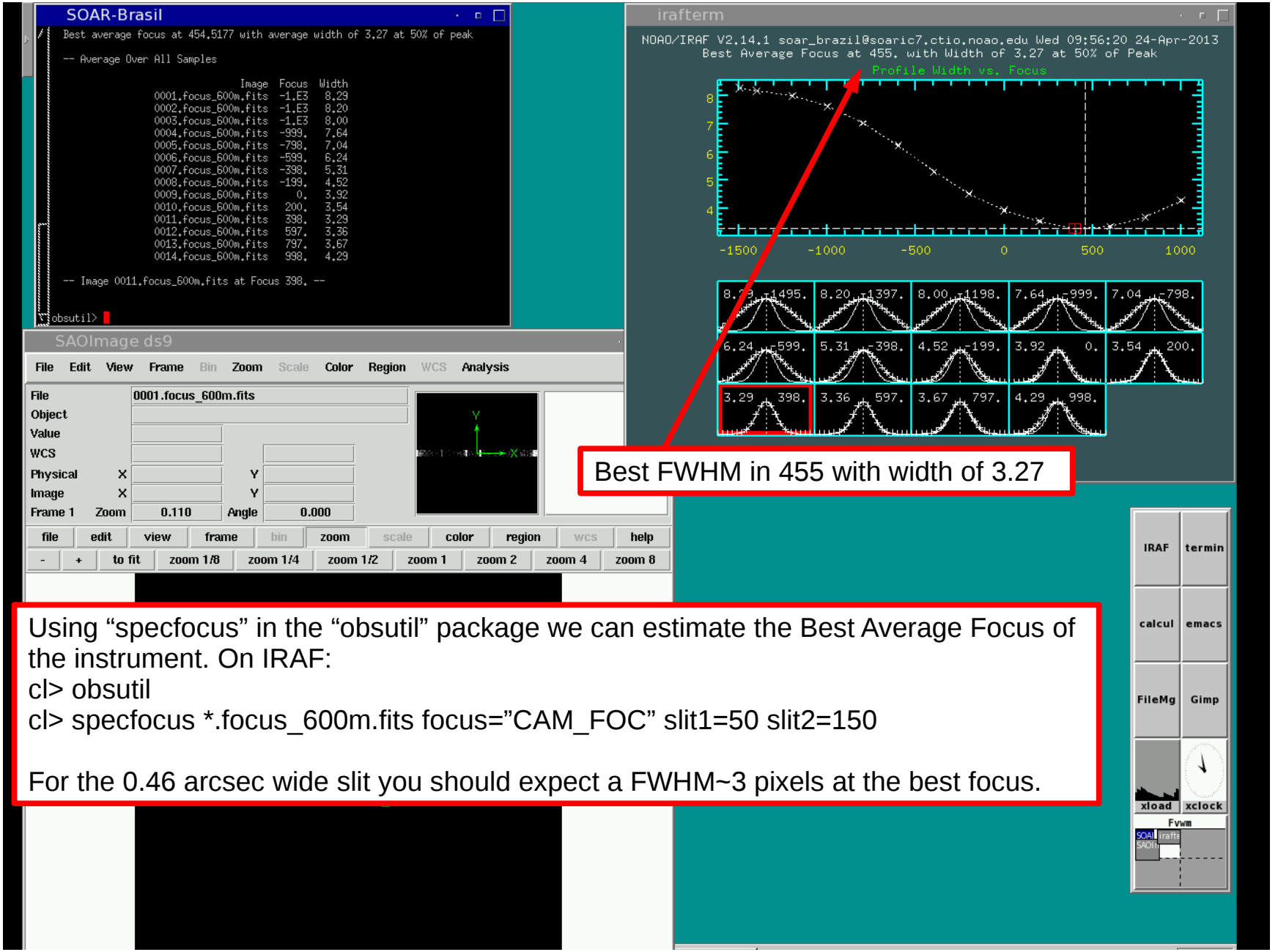


Focus sequence in spectroscopic mode

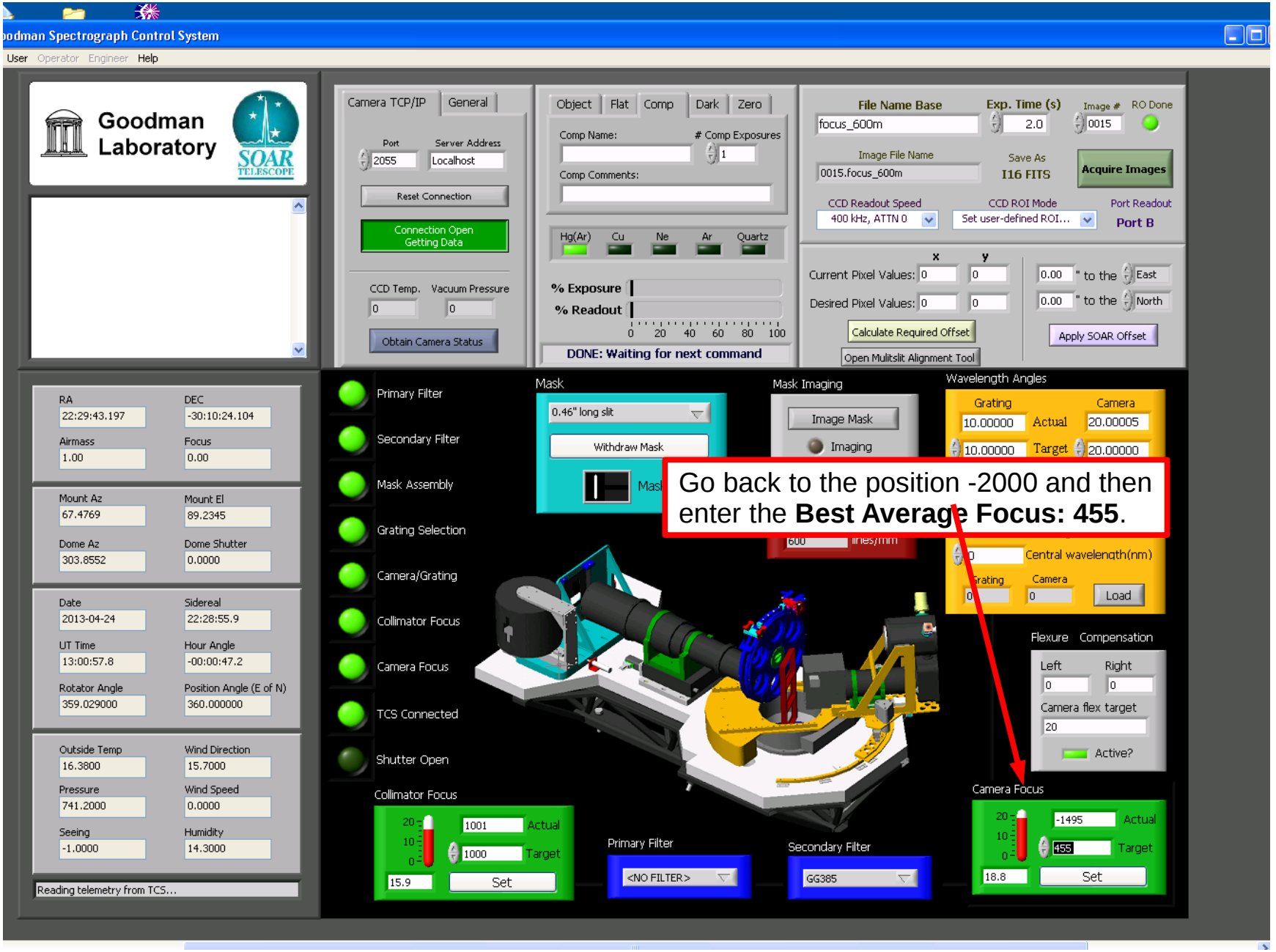


Using “display” or “implot” check if the first image is ok (it should show emission lines with high signal.)

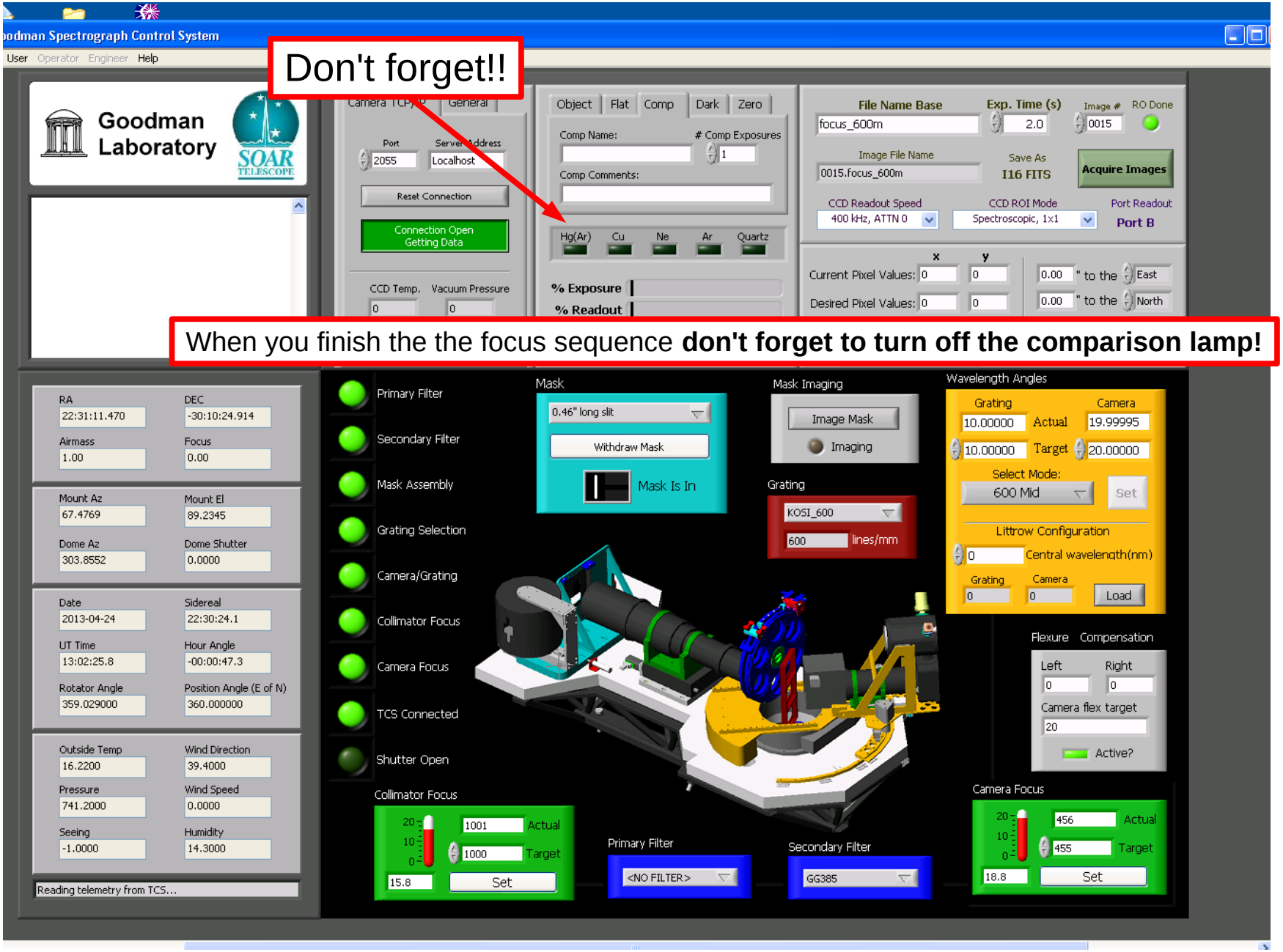
Focus sequence in spectroscopic mode



Focus sequence in spectroscopic mode

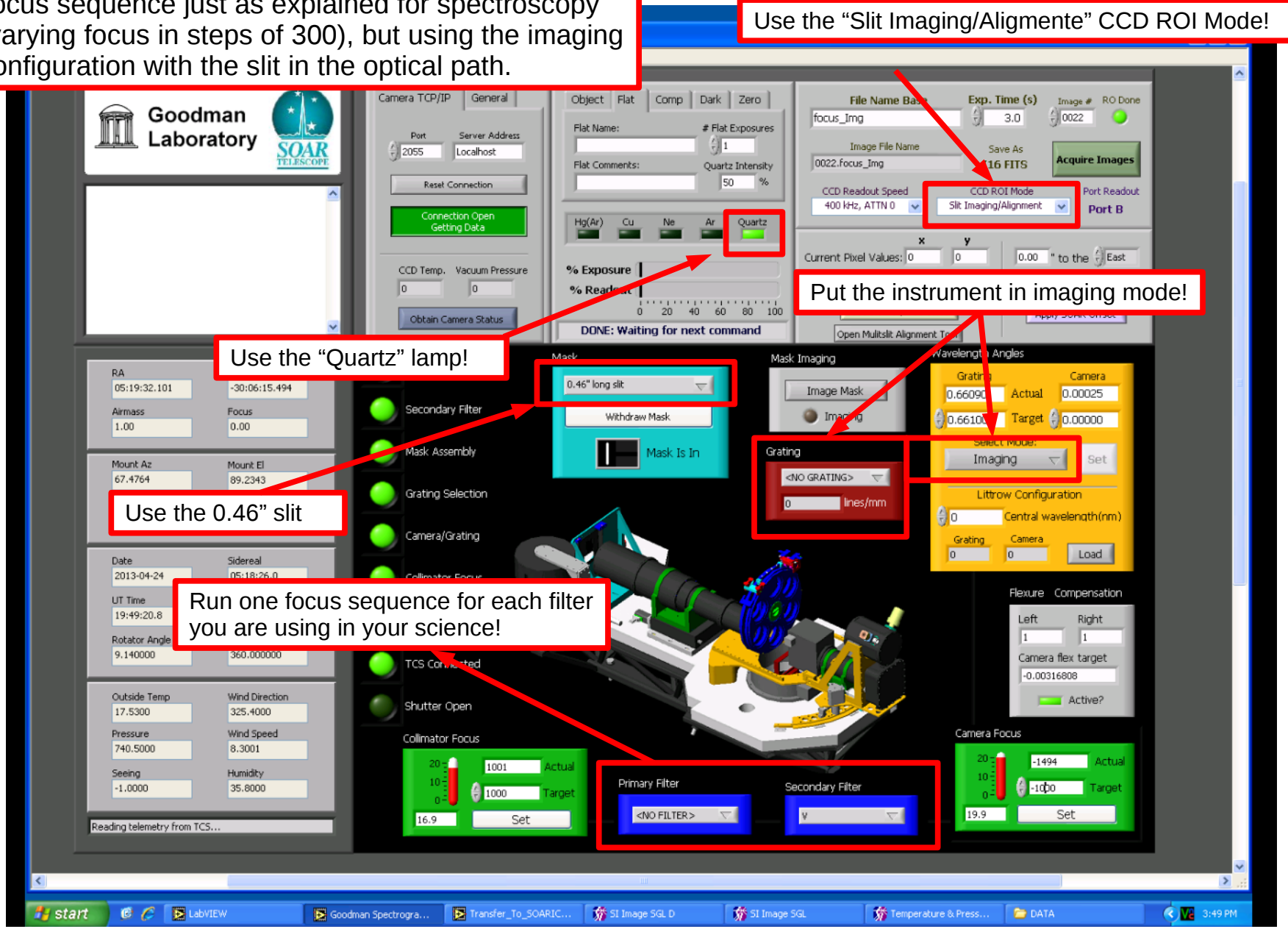


Focus sequence in spectroscopic mode



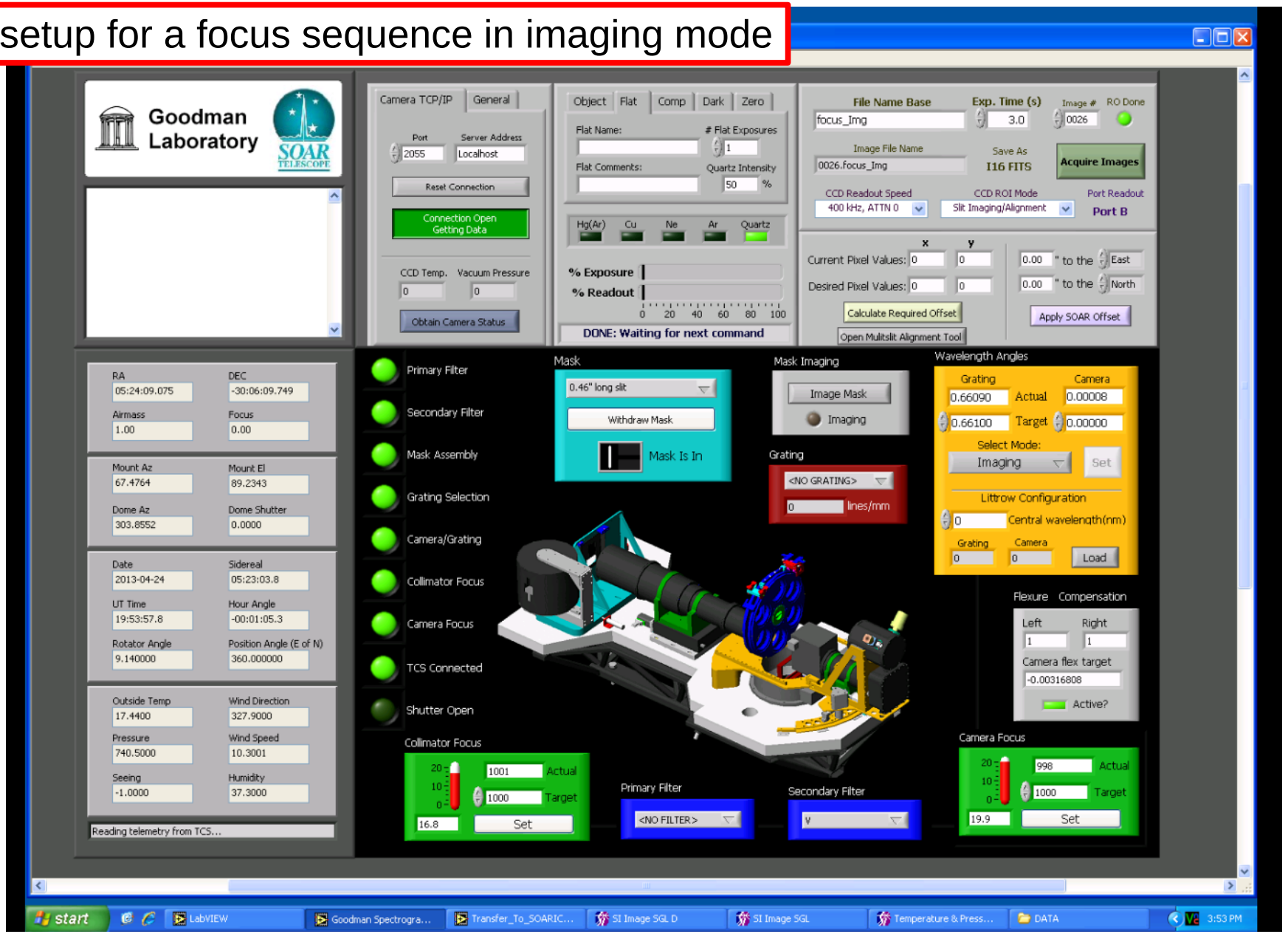
Focus sequence in imaging mode

Run a focus sequence just as explained for spectroscopy mode (varying focus in steps of 300), but using the imaging mode configuration with the slit in the optical path.

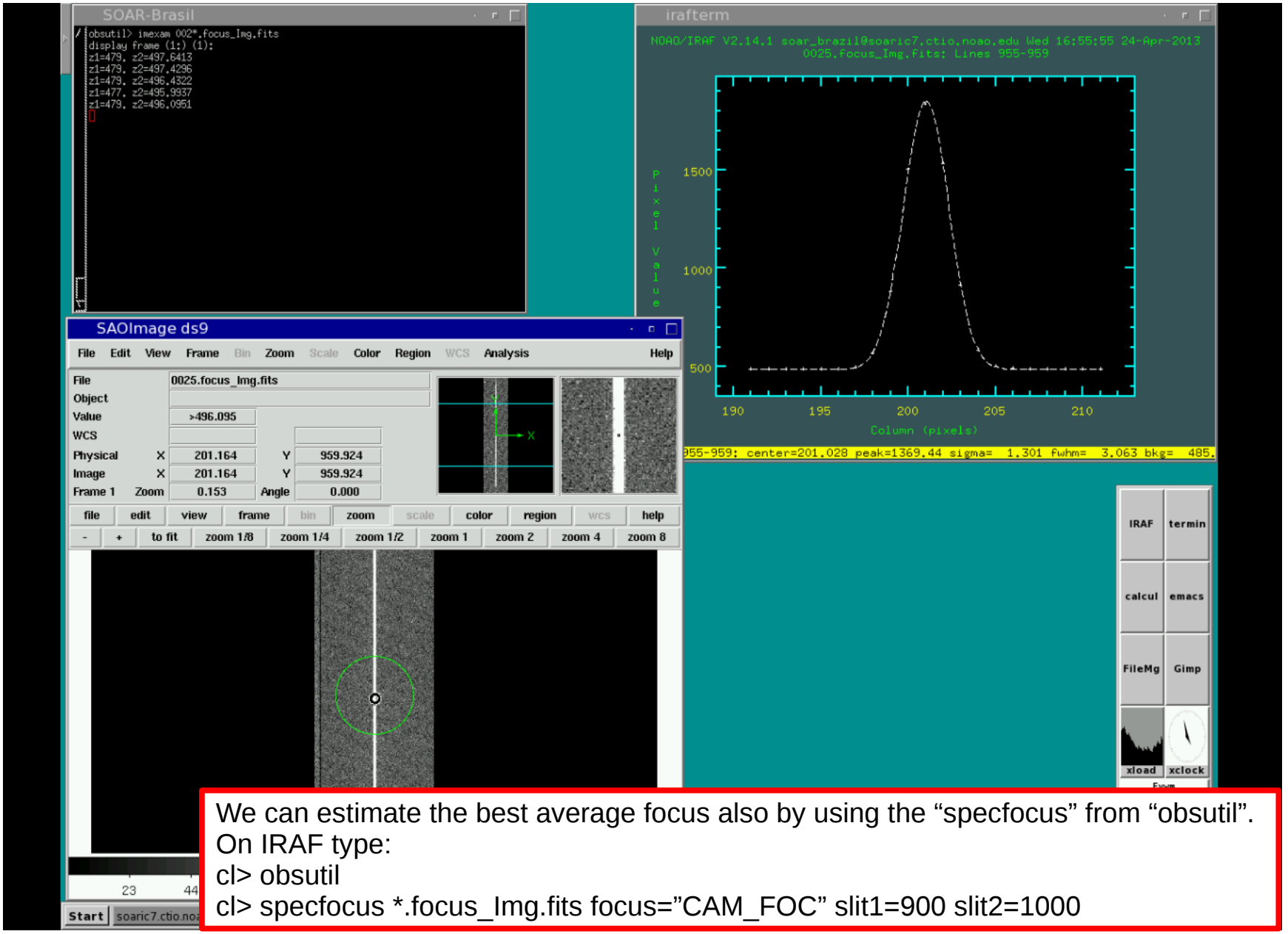


Focus sequence in imaging mode

GUI setup for a focus sequence in imaging mode



Focus sequence in imaging mode



We can estimate the best average focus also by using the “specfocus” from “obsutil”.
On IRAF type:
cl> obsutil
cl> specfocus *.focus_Img.fits focus=”CAM_FOC” slit1=900 slit2=1000