

## **RETROCAM Lensed Quasar Observing Procedure**

1. Using a web browser, log on to:

<http://www.astronomy.ohio-state.edu/~ckochanek/>

2. Click on the “--Delays” link in the lower left hand corner of the page. A page entitled “Lens Monitoring Project Target Identification” will come up.

3. Under “Observatory”, select Kitt Peak. Verify that the current date is shown and select the seeing that you are encountering tonight. If unknown, select 1.0 arcsec.

4. Click the “Submit Request” button. Scroll down to reveal a table of possible targets in order of priority.

5. Select your target from the table in the website. (Be sure to click the “Done” button when you have finished observing a particular target).

6. Referring to the information given in the table below, slew the telescope to the target using the **xtcs** control:

<b>Target</b>	<b>RA (J2000)</b>	<b>Dec. (J2000)</b>
FBQ 0951	09 51 22.6	+26 35 14
H 1413	14 15 46.4	+11 29 41
HE 0435	04 38 14.0	-12 17 14
HE 1104	11 06 33.5	-18 21 24
HE 2149	21 52 07.4	-27 31 01
HS 2209	22 11 30.3	+19 29 12
PG 1115	11 18 17.0	+07 45 58
PSS 2322	23 22 07.2	+19 44 23
Q 0142	01 45 16.5	-09 45 17
Q 0957	10 01 20.8	+55 53 49
Q 1355	13 55 43.4	-22 57 23
Q 2237	22 40 30.3	+03 21 29
RXJ 1131	11 31 51.6	-12 31 57
SBS 0909	09 13 01.1	+52 59 29
SBS 1520	15 21 44.8	+52 54 49
SDSS 0246	02 46 34.1	-08 25 36
SDSS 0924	09 24 55.9	+02 19 25
SDSS 1004	10 04 34.2	+41 12 44
SDSS 1138	11 38 03.7	+03 14 58
SDSS 1226	12 26 08.1	-00 06 02
SDSS 1335	13 35 34.8	+01 18 06
SDSS 1650	16 50 43.4	+42 51 45

7. Move **RETROCAM** to the “In” position using the **xmis** control

8. Select the focus offset appropriate for the primary instrument in use:

Instrument	Telescope Focus Offset (Secondary Mirror Encoder Units)
CCDS	0
TIFKAM	+50
MODSPEC	+128
Mark III	+171
Direct Imagers (Templeton, Echelle)	-15

\*This value was measured using the RETROCAM ‘r’ filter and the Johnson-Cousins ‘R’ filter with Echelle. Focus offsets with other filters have not yet been measured and are likely to be different.

Set the telescope focus to the RETROCAM position using the **xtcs** control.

*Example: If Mark III is in use and the current focus is 3174:*

$$3174+171=3345$$

*=>Set telescope focus to 3345 using the xtcs control.*

9. In a **chichon:visitor%** xterm:

- Enter the following command: **retrocam\_gs**
- Follow the program’s instructions to obtain a recommended (x,y) position for the guide probe.
- Move the guide probe to the recommended (x,y) position using the **xmis** control.

11. Verify that a guide star is visible in the guider TV screen. Focus the guider using the guide probe focus hand paddle, if necessary. If no guide stars are visible, try the following troubleshooting steps:

- Increase the guider gain – the gain may be set too low.
- Under the ‘Preset’ menu in the **xmis** control window, select ‘Origin’. Re-execute the guide probe (x,y) movement command from step 6.
- Attempt to refocus the guide probe. (Severely out-of-focus stars won’t be visible.)
- Verify that the instrument rotator encoder is set properly. The ‘retrocam\_gs’ program will produce erroneous results if an incorrect instrument rotator angle is entered. (The 2.4m rotator angle encoder is known to drift by up to 5°.)

11. If you are using the ‘Seitzer Guider’ (also known as ‘TVGUIDER’) or the ‘DTI Guider’ (also known as ‘PCGUIDER’) in the direct mode, select the guide star and commence guiding.

12. If you are using the ‘DTI Guider’ (‘PCGUIDER’) in the downward-looking mode, such as during use with the MODSPEC or Mark III spectrographs:

- On the **Guider PC**, press the ‘p’ key to enter the parameter settings
- Set the ‘Flip E/W’ parameter to ‘0’.

- c) Set the 'Guider Angle' parameter to (90 + TCS Rotator Angle)
- d) Exit parameter settings, select the guide star and commence guiding.

13. In the **RETROCAM Control Panel**:

- a) Enter the **Object Name**, **RA** and **Dec**. Enter your name in the **Observer** field. Enter the current instrument rotator angle in the **Rotator PA** field.
- b) Set **ExpTime** to 180sec
- c) Set **#Images** to '3' and select 'Object' under **Image Type**.
- d) Set the **Filename** to *ryymmdd.%4.4d*  
Note: The SeqNo will automatically reset to '1' if the Filename is changed. Be sure that you don't inadvertently overwrite data!
- e) Verify that the **Data Directory** is set properly
- f) Select the '**r**' filter.
- g) Click the '**GO**' button. The exposure sequence will take approximately 9 minutes and 30 seconds.

13. When the exposure sequence is complete:

- a) Using **xmis**, move **RETROCAM** to the '**Out**' position
- b) Restore the telescope focus to its original setting using **xtcs**
- c) If applicable, restore the guide probe to the '**Slit**' position using **xmis**.
- d) If using the downward-looking mode with the DTI guider, restore the '**Flip E/W**' parameter to '1', and the '**Guider Angle**' parameter to (270 - **TCS Rotator Angle**) (slit guiding)
- c) Refocus the guider

14. When you are finished with all lensed quasar observations for the night, please send the data to my incoming ftp directory. The ftp procedure is summarized below:

- a) cd to the directory in which you have saved RETROCAM data
- b) Enter the following command: **ftp -i ftp.astronomy.ohio-state.edu**
- e) When prompted, enter the following:
  - Name: **anonymous**
  - Password: *your email address*
- g) Enter: **cd incoming/morgan/**
- h) Enter: **binary**
- h) Enter: **mput ryymmdd.\*.fits**
- i) When transfer is complete, type: **quit**
- j) Please send a quick summary email to:  
[morgan@astronomy.ohio-state.edu](mailto:morgan@astronomy.ohio-state.edu)