

AG shutter test

Yuki Moritani (Subaru / Kavli IPMU)


AG shutter operation

- Chi-Hung implemented a function to overwrite the shutter control.
- In November, the function was tested by visually looking the shutter. At that time, behavior looked good. (But I'm not sure the whole combination was tested at that time.)
- In run 14, the function was tested on telescope, but behavior looked unexpected.
 - Shutter control didn't seem to be overwritten some case.
- Using the microphone on PFI, function was tested again.

Test Procedure

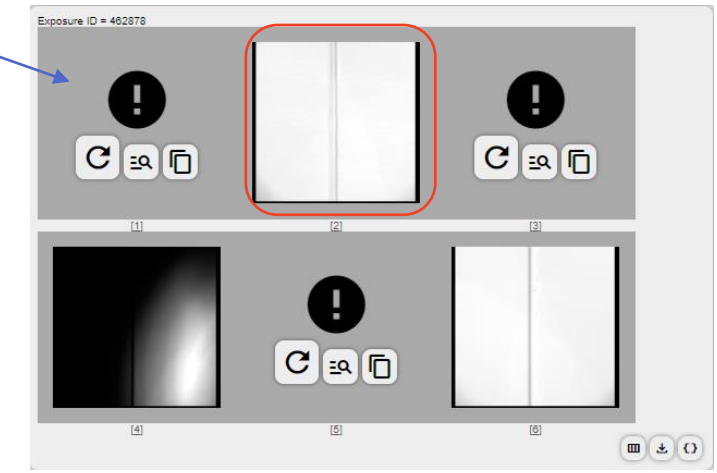
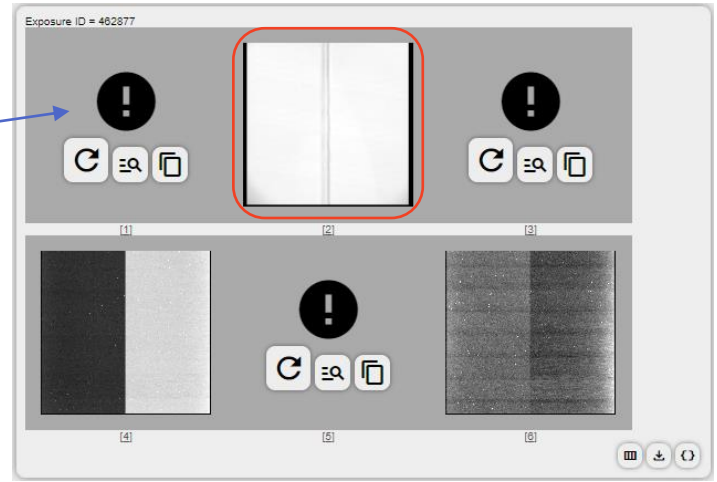
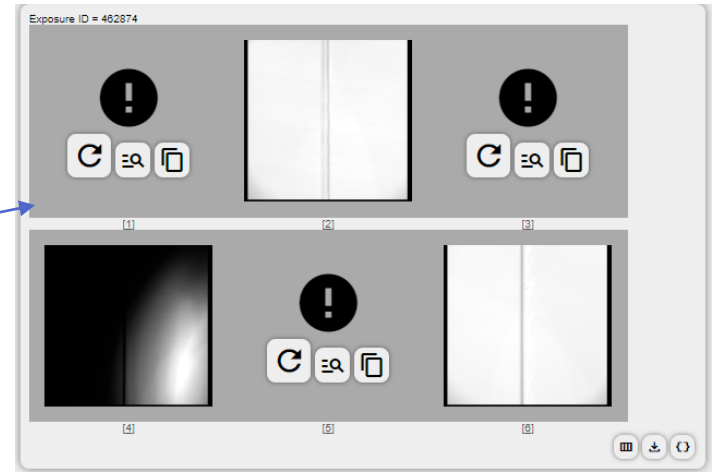
- Shutter operation and exposure (dark/object), recording the sound from microphone attached on PFI.
 - The exact location of the microphone is TBC.
- Test was done on 14 Jan, when the dome room light was on.
 - Without the dome room light, it was too dark for the cameras to get the light.
 - With the dome room light, 0.8-sec exposure counts ~40,000 ADU.
 - Only AG2,4,6 were used because the other three got lost on 8 Jan.
- The cameras were not cooled down. CCD temperature was ~5 degC.
 - Because behavior was unexpected at this temperature, I didn't test them by cooling down.
- Test 1
 - Open and close the shutter of each camera, independently.
- Test 2
 - Open the shutter of one camera, and take exposures
 - The "threadDelay" option was used (2sec) to run the camera one by one.

Test 1

- Open and close the shutter of each camera, independently. 
 - “ag20240114c_shutterOpenClose_trim.mp3”
 - Shutter was opened and closed twice, in the order of AG2, AG4, and then AG6.
 - Four clicks hear for each camera, although sound from AG4 is weak.
- The shutter open/close commands work.

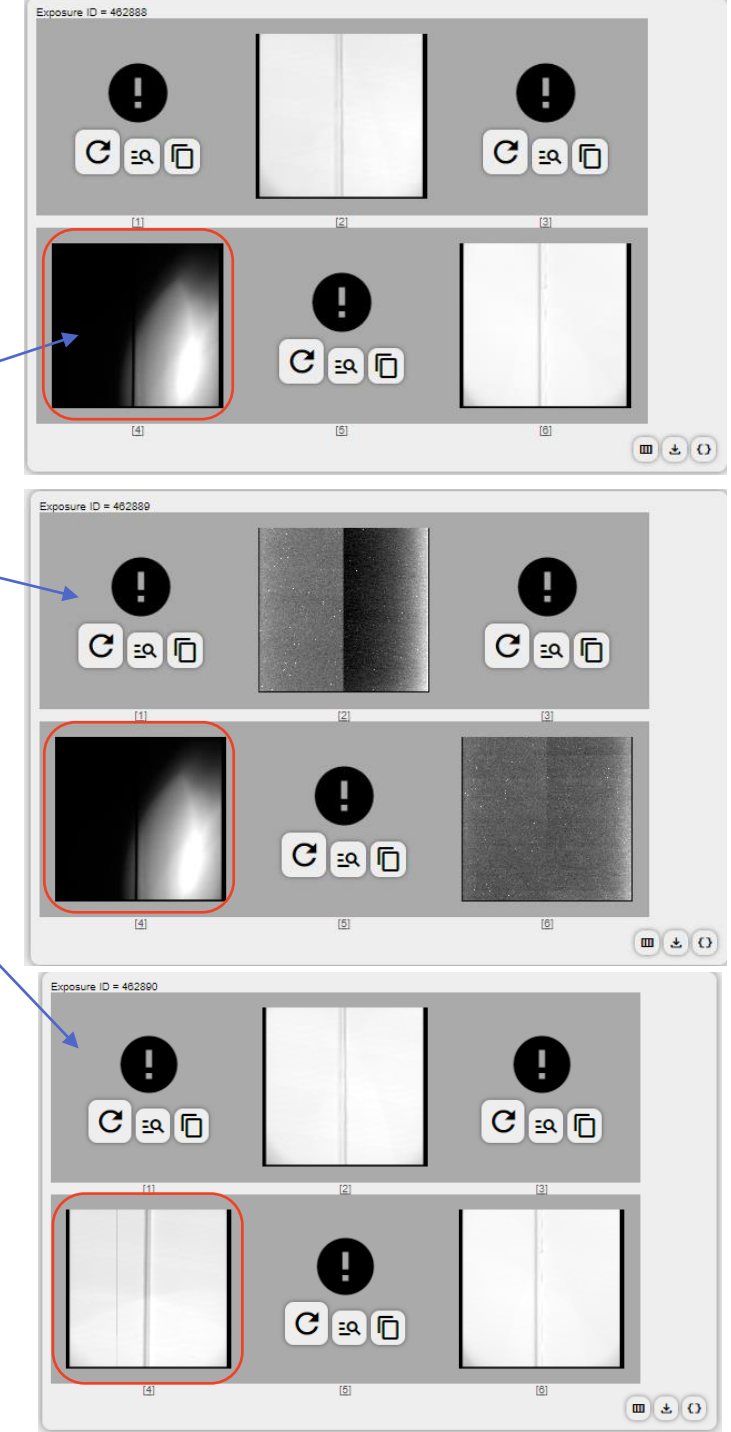
Test 2

- Take object in normal mode
 - “ag20240114a_nomalmode_.mp3”
 - Six clicks.
- The procedure for shutter “open”:
 1. Open AG2 shutter
 2. Take dark (no shutter operation) : AG2 should see the light
 - “ag20240114b_ag2shutterOpen_.mp3”
 - One click.
- Test procedure for shutter “close”:
 1. Close AG4 shutter
 2. Take object (shutter open/close) : AG2 should not see the light
 - “ag20240114b_ag2shutterClose_.mp3”
 - One click at ~2s and six clicks at ~25s
 - AG2 shutter was opened and closed.



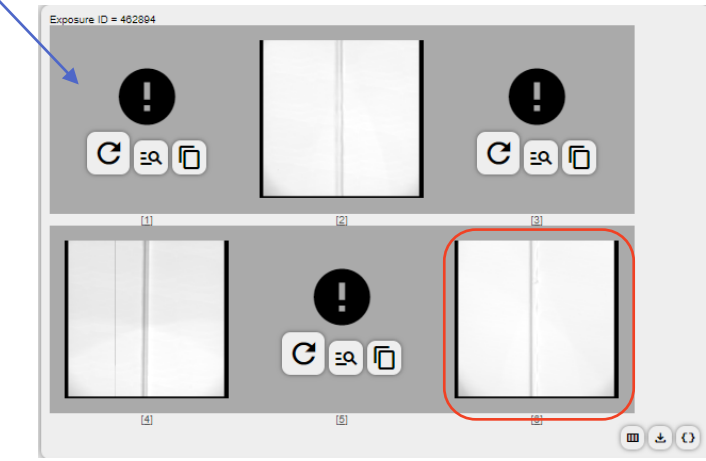
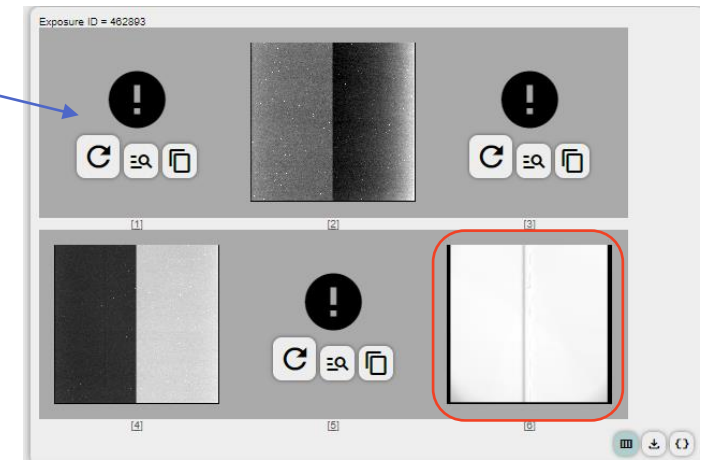
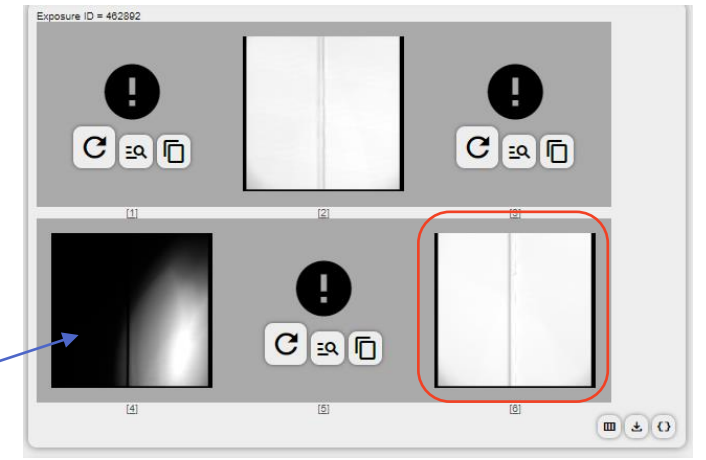
Test 2 (Cont'd)

- The procedure was
 1. Open AG4 shutter ... it didn't open well.
 2. Take dark (no shutter operation) : AG4 should see the light
 3. Take object (shutter open/close)
 4. Dark (no shutter operation) : AG4 should see the light
 5. Close AG4 shutter
 6. Take object (shutter open/close) : AG4 should not see the light
- Even after overwriting the shutter operation to keep "closed", the AG4 shutter was opened.
 - "ag20240114b_ag4shutterOpenClose2_.mp3"
 - One click at ~10s (for step 1.)
 - Four clicks at ~20s (for step 3.)
 - One click at ~30s (for step 5.), then six clicks (for step 6.)



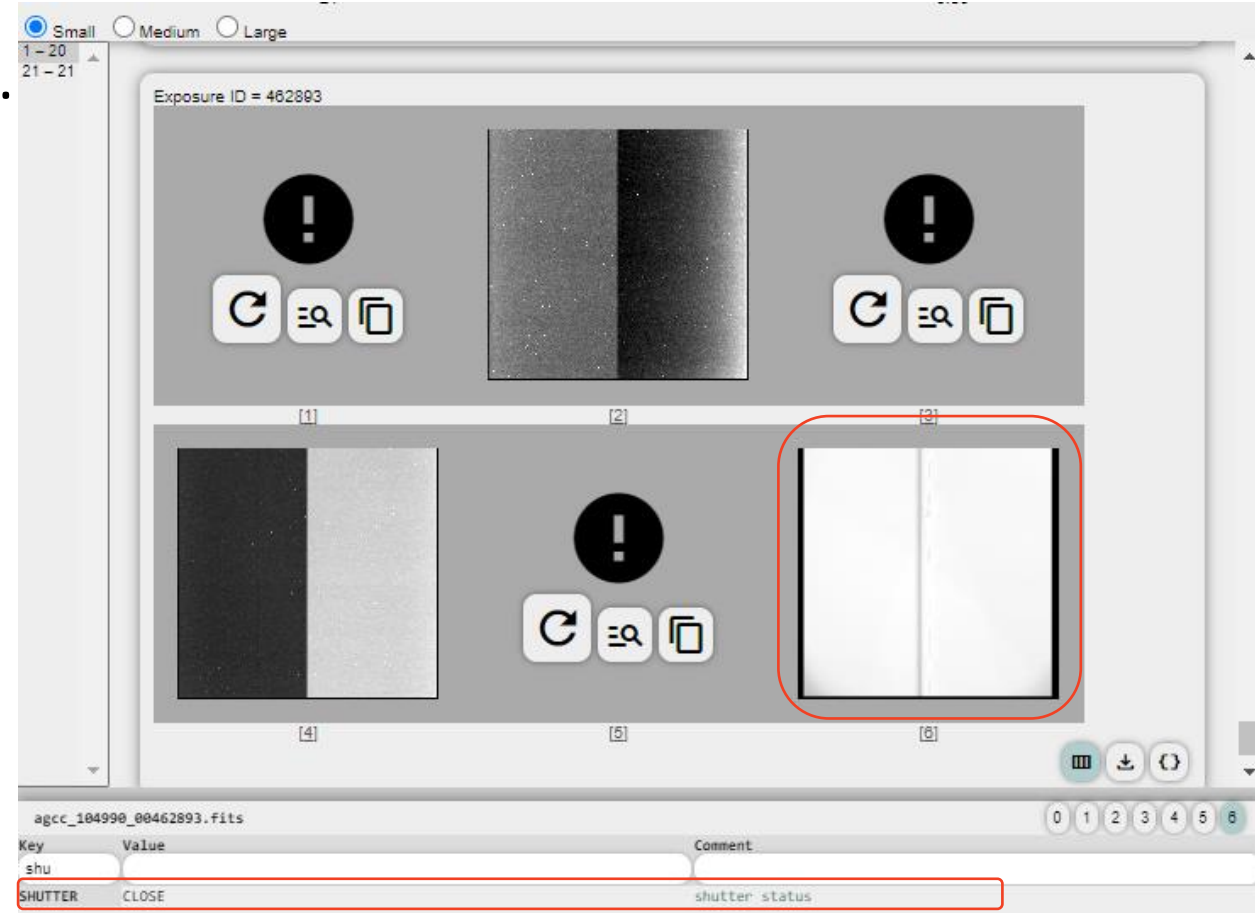
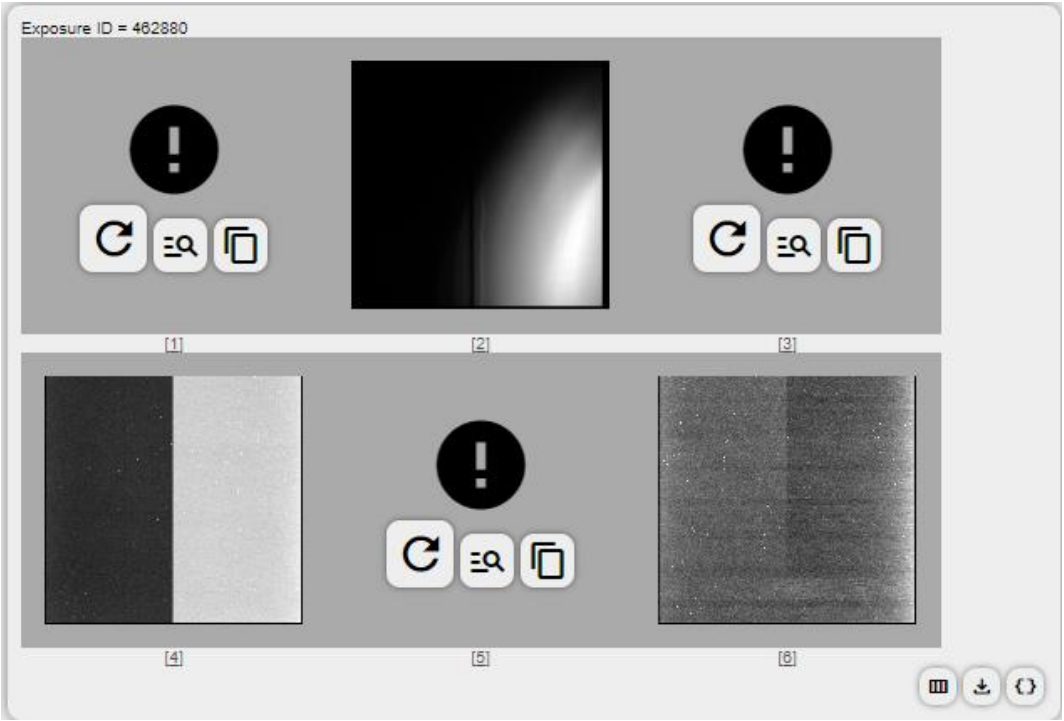
Test 2 (Cont'd)

- The procedure was
 1. Open AG6 shutter
 2. Take dark (no shutter operation) : AG6 should see the light
 3. Take object (shutter open/close)
 4. Dark (no shutter operation) : AG6 should see the light
 5. Close AG6 shutter
 6. Take object (shutter open/close) : AG6 should not see the light
- Even after overwriting the shutter operation to keep “closed”, the AG6 shutter was opened.
 - “ag20240114b_ag6shutterOpenClose_.mp3”
 - One click at ~10s (for step 1.)
 - Four clicks at ~20s (for step 3.)
 - One click at ~30s (for step 5.), then six clicks (for step 6.)



Other finding

- FITS Header “SHUTTER” card looks confusing.
 - Value seems determined by exposure mode, not shutter status itself.
- AG2 shutter didn't open fully once when “shutter open” command was used.



agcc image	command	note (audio file)
agcc_104990_00462874.fits	oneCmd.py agcc expose object exptime=0.8 threadDelay=2000	only 246, normal mode ag20240114a_nomalmode_.mp3
agcc_104990_00462875.fits	oneCmd.py agcc expose dark visit=104990 exptime=0.0	
agcc_104990_00462876.fits	oneCmd.py agcc expose dark visit=104990 exptime=0.8	
agcc_104990_00462877.fits	oneCmd.py agcc shutter open cameras=2 oneCmd.py agcc expose dark visit=104990 exptime=0.8	ag20240114b_ag2shutterOpen_.mp3
agcc_104990_00462878.fits	oneCmd.py agcc shutter close cameras=2 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000	ag20240114b_ag2shutterClose_.mp3
agcc_104990_00462879.fits	oneCmd.py agcc expose dark visit=104990 exptime=0.8	
agcc_104990_00462880.fits agcc_104990_00462881.fits agcc_104990_00462882.fits	oneCmd.py agcc shutter open cameras=2 oneCmd.py agcc expose dark visit=104990 exptime=0.8 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000 oneCmd.py agcc expose dark visit=104990 exptime=0.8	after it close the AG2 shutter
agcc_104990_00462883.fits agcc_104990_00462884.fits agcc_104990_00462885.fits agcc_104990_00462886.fits	oneCmd.py agcc shutter open cameras=4 oneCmd.py agcc expose dark visit=104990 exptime=0.8 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000 oneCmd.py agcc expose dark visit=104990 exptime=0.8 oneCmd.py agcc shutter close cameras=4 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000	
agcc_104990_00462887.fits agcc_104990_00462888.fits agcc_104990_00462889.fits agcc_104990_00462890.fits	(same as above)	ag20240114b_ag4shutterOpenClose2_.mp3
agcc_104990_00462891.fits agcc_104990_00462892.fits agcc_104990_00462893.fits agcc_104990_00462894.fits	oneCmd.py agcc shutter open cameras=6 oneCmd.py agcc expose dark visit=104990 exptime=0.8 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000 oneCmd.py agcc expose dark visit=104990 exptime=0.8 oneCmd.py agcc shutter close cameras=6 oneCmd.py agcc expose object visit=104990 exptime=0.8 threadDelay=2000	ag20240114c_shutterOpenClose_trim.mp3