LBT Observing Log: 2025 June 24 UT

Observers: Jenny Power
Partner Observer: Mark Whittle
Telescope Operator: Josh Williams

Plan:

Start with LUCI, switch to SHARK-VIS at 9UT if conditions allow or MODS if not.

Plan:
Telluric: HD101060 (= HIP56736) – works for both 2020ywx and VC1744 (not done)
UVa_Supernova 2020ywx (not done – MOS error on LUCI – lost ~30 mins)

Telluric: HIP 53735 done.
OSU_XMD_SBS1159 (done)
UVa_nirjets (halted due to clouds)
UVa_BCD J1613 (done)
Telluric BD+40 2857 (done)

Near UT 08:00 decide whether to change to SHARK-VIS: program OSU_HIPS_SHARK.

Conditions good for SHARK-VIS.
Handing over to them near UT 9:05
Successful observations of both targets.

For the OSU/UM_XMDs_LUCI program, target priorities across this joint program are, in decreasing order, SBS1159, HS1222, VCC1744 (this is also roughly in order of increasing metallicity: lower metallicity has higher priority).

Summary:

Issues:

MOS error -

Weather:

Overview (times are given in UT):

00:48 UT Error when initializing the LUCI2 translator - precondition violation. Both strain gauses on. Mask 8 (0.25” LS) in FPU with hold, closed, MCR switches on. Zeroing strain gauges. Init success.

Taking some darks. To minimize MOS motions, I’ll just leave the 0.25” longslit in the FPU. With this slit in place, blind filters and lights off is typically sufficient for the darks

Calibrations

UM_XMDs_LUCI Darks

10x[1x5.00s] LIR INT luc1[½].20250624.0001-10
10x[4x15.00s] LIR INT luc1[½].20250624.0011-20
9x[1x600s] MER INT luc1[½].20250624.0021-29 (not enough time for all 10)

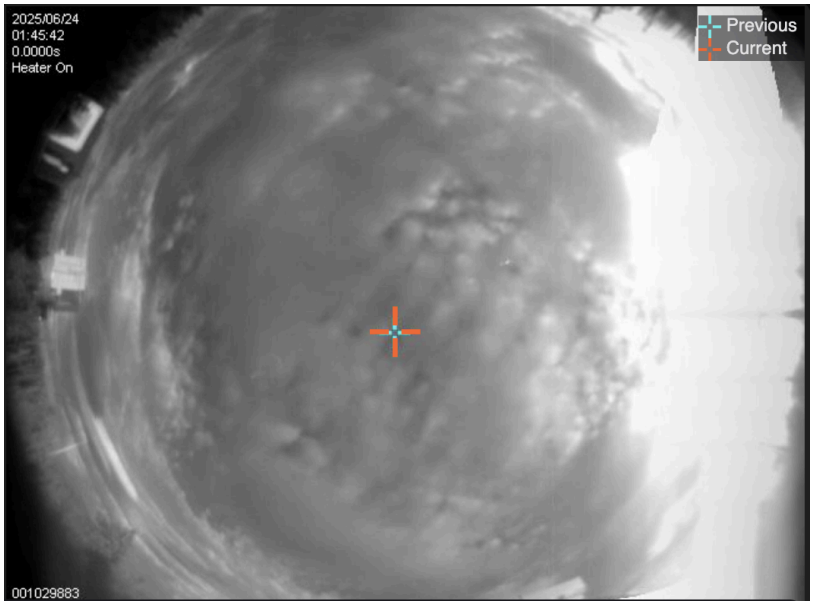
01:15 UT DX WFS powered up and checked out for SHARK VIS. OCAM noisy, cycle of BCU resolved.
Fov and focus set for lmirc_T50

01:25 UT MODS brought up, simSnap run. Taking some biases.
1Kx1Kbiases:
mods[½]{r/b}.20250624.0003-7

3Kx3Kbiases:
mods[½]{r/b}.20250624.0008-12

Dual Imaging Flats
Mods[½]b.20250624.0013-22
mods[½]r.20250624.0013-27

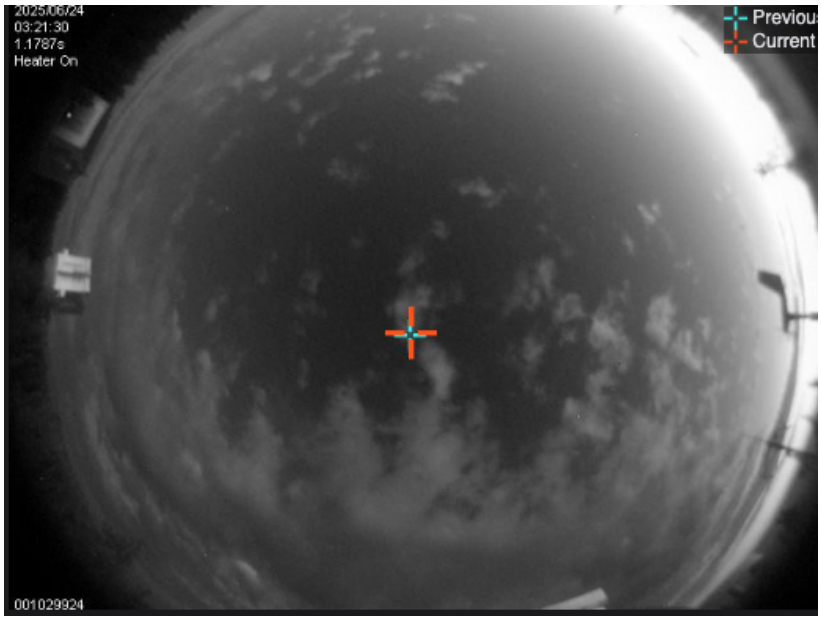
01:49 UT Cloudier than I would have expected given the forecast. Lots of activity in New Mexico and we are seeing the edge of it.



02:34 UT Clouds are pretty ugly. Josh will keep us closed at sunset to monitor these clouds. I will continue to run the LUCI darks for UM_XMDs_LUCI

Weather Loss (sunset-3:38)

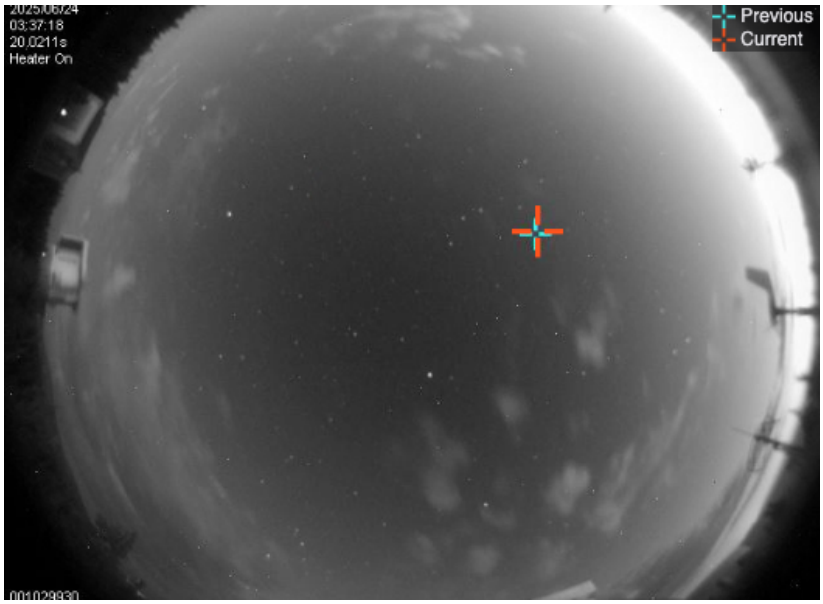
02:37 UT Sunset
02:59 UT Field stop alignments checked. LUCI1 FW2 is currently in K.
03:24 UT Clouds persist, variable. Debating if it's safe to continue



03:27 UT Going for it, observing targets in the North West to avoid the majority of the clouds. Josh is opening shutters now.
03:35 UT 12 degree evening twilight

Pointing and Collimation (3:38-4:48)

03:38 UT Pointing and collimation preset near first target. Clouds are thinning



Seeing 0.9” with collimation preset

OSU XMD LUCI

Telluric HIP 53735 (3:48-4:06)

03:48 UT Sending preset to telluric. Z filter put in for acquisition on FW2 for LUCI1. Switch 10 registering ok. Seeing 0.9-1” on the LUCI wfs.

04:01 UT Starting science with 1”LS zJspec

Telluric for UVa_Supernova (N/A, PI to review setup)

MOS Error (4:06-4:46)

04:06 MOS error moving 0.75” longslit into the FPU. Some questions about the grating setup for this target.

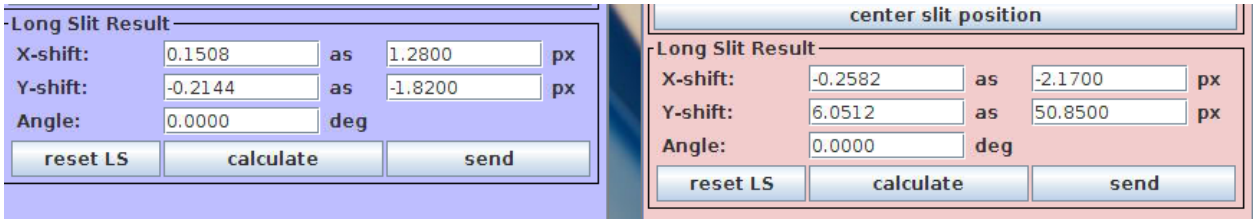
Need to contact PI about their grating/central wavelength/filter selection.

04:13 UT 18 degree evening twilight

OSU XMD LUCI

SDS 1159+545 (4:46-5:01,5:16-6:20)

04:46 UT Target preset to SDS 1159+545. Seeing 0.8-0.9” on WFS



User error, incorrect filter (5:01-5:16)

05:01 UT Starting science.

Luci1.200250624.0047 incorrect filter in place.

05:16 UT Restarting script with correct filter in place.

luci1.20250624.0048-53
luci2.20250624.0043-49

05:51 UT Seeing has deteriorated to about 1.3”.

UVa_Nirjets

G11 (K partially completed, 6:20-6:44)

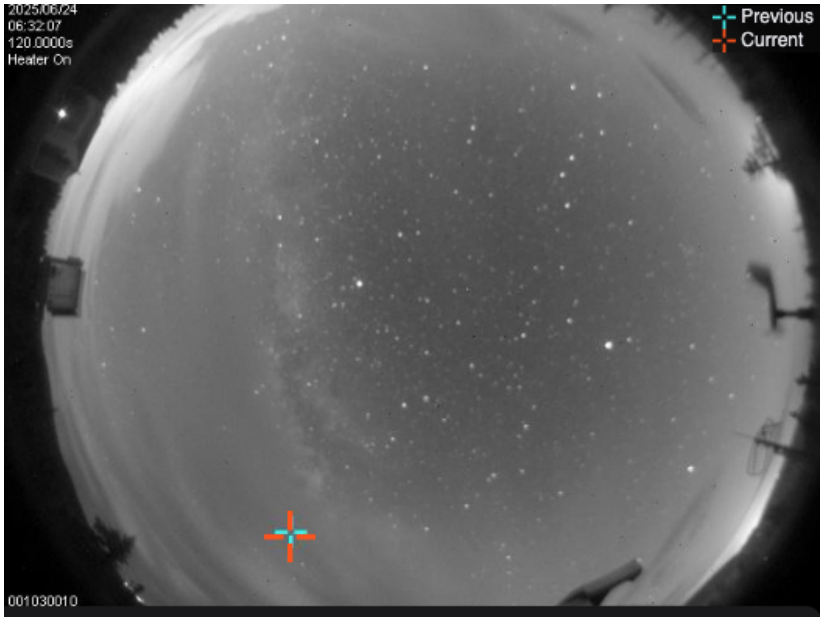
06:20 UT Preset to G011. Filter manually put in place on LUCI1 for the K filter and pauses inserted in advance of all filter changed to ensure we can manually change filters. Switch registered correct position so headers are accurate.

06:25 UT Pointing check needed. Different stars obtained on teh left and right.

06:28 UT Presetting back to target.

06:33 UT Starting to get some cloud cover and seeing some extinction.

06:35 UT Losing guide star. Luci1.20250624.0057 was guiding on noise and looks like it went for a bit of a ride.



Luci2.20250624.0055 is trailed and seeing is up to 2.8”

K-band:
luci1.20250624.0054-60
Luci2.20250624.0050-56

Weather no good downhere. Moving on.

UVa_BCD_LUCI

J1613 (6:40-8:12)

06:44 UTJ1613+3622

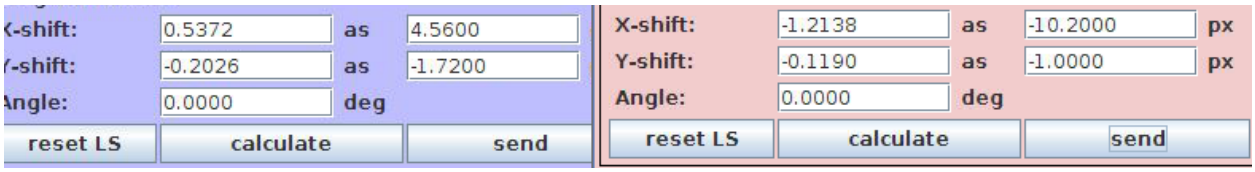
06:46 UT Rotator time to limit warning. Josh is going to unwrap before we align.

06:48 UT Resending preset after unwrap.

06:53 UT Heavy cloud cover. We were losing our guide star. Resent with a slightly brighter guide star.

07:08 UT Target is not easily identifiable in teh exposure time provided. The readme mentioned 192 second acquisition despite the script having only a 60 second acquition. Increased acquisition to 3min

07:11 mask not in turnout for first image. Clouds have largely cleared out. Seeing variable. 1-2” seeing.



Even in 3min the source is barely visible.

Clouds seem to be clearing out as seen on the satellite. Seeing just improved to 0.9” and stabilized

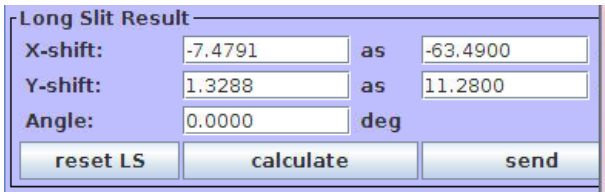
07:33 UT FW2 on LUCI1 moved to zJspec. Starting science. Seeing is 0.8”
luci1.20250624.0070-77
Luci2.20250624.0066-73

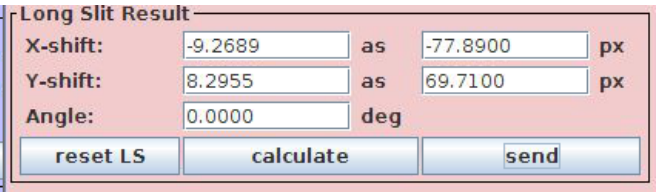
08:00 UT Seeing just jumped up to 1.8” and come clouds coming in from the west.

08:10 UT Seeing is back down to 0.8”

Telluric BD+40 (8:12-8:25)

08:12 UT Preset to BD+40





luci1.20250624.0081-82
Luci2.20250624.0077-78

UVa_Nirjets

G11 Continued - K continued & BrG/H2 (8:25-9:04)

08:25 UT Sending preset back to G11. Seeing has improved and clouds have largely moved out. Putting in K filter in FW2. No issues with switch 10. Headers will report filters properly.

08:29 UT Skipping to the 7th obs item to start script from where we left off with the next dither dither (15.85”,8.32”). Seeing averaging 1.1” on the guiders at an airmass of 1.7

LUCI2 fieldstop looks misaligned. This was well aligned at the start of the night.

luci1.20250624.0083-87
Luci2.20250624.0079-83

08:37 UT Starting BrG and H2. Seeing 1-1.2” on guider. Mostly clear with some cloud to teh west.
luci1.20250624.0088-
Luci2.20250624.0084-

Completed K and BrG/H2, Pending J & P-beta/FeII

09:04 Safing LUCI and handing over for SHARK.

SHARK BHBin

Reconfig & Pointing (9:04-9:18)

09:05 UT Reconfig SHARK VIS

09:09 UT Preset to Alpha Cyg for pointing and collimation.

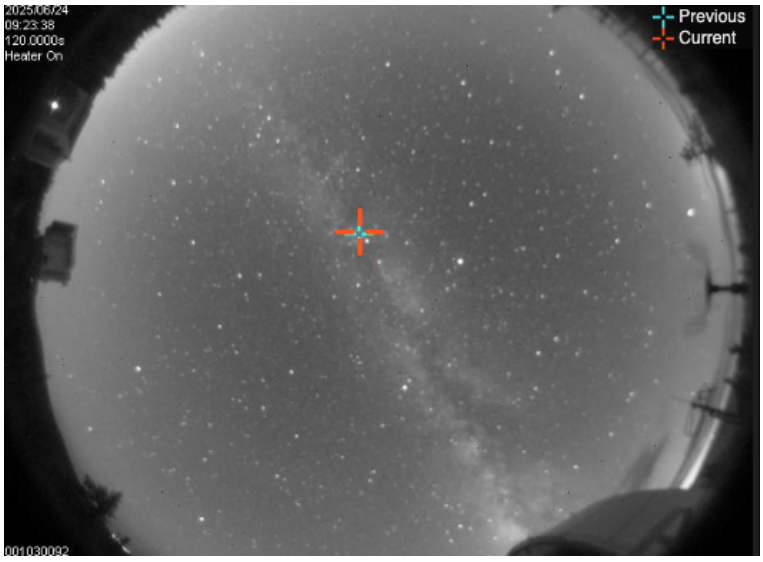
- IE/CA 33/96.5
- Z7-1500
- Z8 3500

HIP103360 (9:18-10:18)

09:18 UT Sending preset to HIP 103360, catalog magnitude 5.91

- OCAM magnitude 7.91 but the window had moved in when checking.
- Seeing 1.03” line of sight
- Applied SV_Lmirc NCPA
- Baysides moved to center target: -40.8, -49.0, -43.3
- GOpt 0.43
- TNs 20250624_093118, 093137, 093150
- Tt jitter around 6mas
-

09:29 UT SV team notes variable transparency

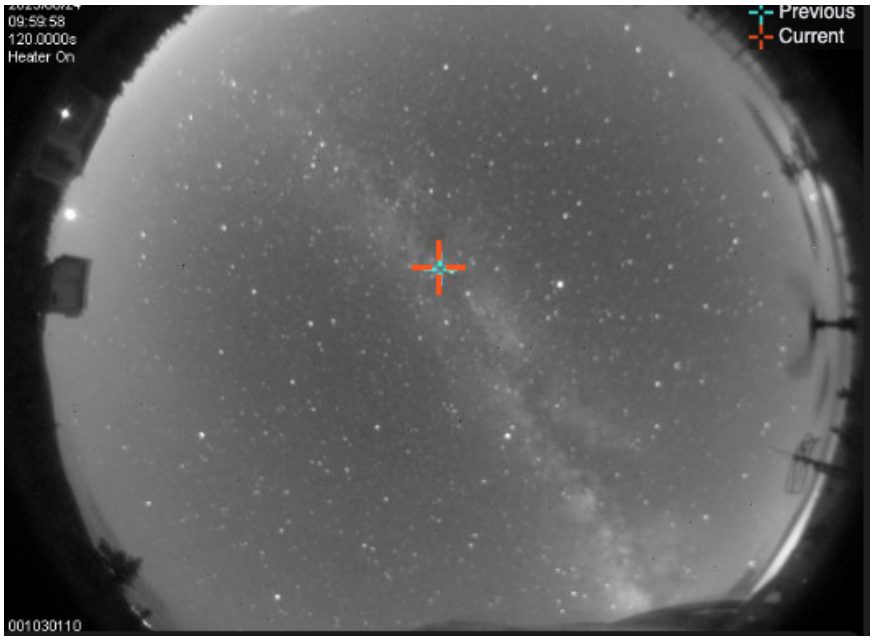


09:50 UT The companion is not visible in singe exposure. The team is launching a second set of 180s exposures. Some clouds passing through to the west.

09:53 UT With possible clouds (although mostly clear), the team will opt to execute a 4 passes of this target to ensure completion. We are crossing the meridian memntarily, which means we get ADI set for free.

10:03 UT Launching the another OB for meridian crossing. Seeing 0.98 line of sight.

- TNs: 100557, 100609, 100621



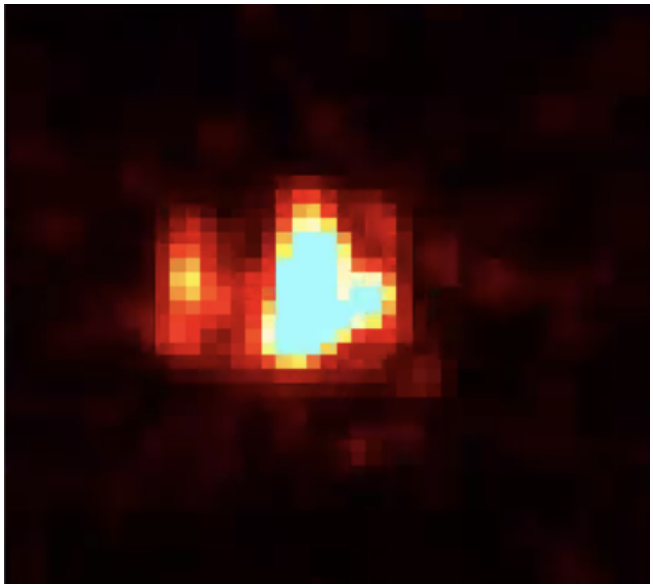
10:10 UT Fernando suggest to take some additional data past the meridian. The team noted that the NCPA looks poor. They believe there may be some temperature dependence with the NCPA and that they may need to generate winter and summer tables.
During the upcoming run, some time may be needed to redetermine NCPA with the warm temps.

HIP103624 (10:18-10:43)

10:18 UT Preset to HIP 103624

- IE/CA 32/102.5
- Mag 6.77, OCAM magnitude 8.96
- NCPA applied
- Moved to center with baysides: -40.8, -49.1, -43.3
- TN: 102503, 102519, 102533

Companion easily visible in exposures.



10:30 UT played with Z6 a little. Found quite a bit of z6 needed to improve IQ, but limited it to 45 for loop stability and to not stress the mirror. More than 50 really needed. Created new temporary NCPA file:
SV_Lmirc_warm_UT20250624.fits

Zernike Index#	Z4(Focus)	Z5(Ast1)	Z6(Ast2)	Z7(Coma1)	Z8(Coma2)	Z9(Trefoil1)	Z10(Trefoil2)	Z11(Spheric)
Applied (nm)	0.0	-3.0	45.0	-10.0	-10.0	10.0	5.0	-1.0
New Input(nm)	0.0	-3.0	45	-10.0	-10.0	10.0	5.0	-1.0

10:31 UT 18 degree morning twilight

HIP 103360 Take2 (10:43-11:09)

10:43 UT Preset back to HIP 103360 for more data. Data on previous target considered sufficient.

- IE/CA 27/102.5
- Seeing 1.2” line of sight, then up to 1.36” after closing
- NCPA applied with 45 z6 instead of 35.
- TN 105011, 105027, 105039

11:04 UT Loop opened. Seeing blew up. Seeing is up to 1.4. Reclosed. Thin cirrus as well.

- TN 110654, 110708, 110731

11:07 UT Seeing has blown up to 1.7”
11:09 UT 12 degree morning twilight. Stopping AO. “Shark team has collected lots of photons” and will collect darks. Josh is taking us down to close up.
12:08 UT Sunrise

Calibrations:

UVa nirjets Imaging Flats

G11_imaflat_J_H.xml
Counts in J are too Low. The PI did not use the correct times for these cals, but rather put the same times for both LUCI1 and LUCI2for H instead of the time needed for J which is double. The different lamps and different filters require different exposure times to get sufficient SNR.

Made a new script from the OT libraries that just runs through all NIRJETS filters:

Pbeta:
Luci1.20250624.0113-122
Luci2.20250624.0119-128

FeII
Luci1.20250624.0123-132
Luci2.20250624.0129-138

H2
Luci1.20250624.0133-142
Luci2.20250624.0139-148

BrG
Luci1.20250624.0143-152
Luci2.20250624.0149-158

J
Luci1.20250624.0153-162
Luci2.20250624.0159-168

H
Luci1.20250624.0163-172
Luci2.20250624.0169-178

K
Luci1.20250624.0173-182
Luci2.20250624.0179-188

OSU XMD Lamps and Arcs:

1” LS G200 zJspec@1.17 Lamps and Arcs:
Luci1.20250624.0183-

Luci2.20250624.0189-206
Ne lamp did not come on for luci1 or luci2.
Not on in image: luci1.20250624.0195 toggled on immediately after and retook ok.
Luci2.20240624.0201 and 202 the lamp did not come on. Had to go back and repeat after script completed. Luci2.20240624.0207 & 208 have Ne lamp on, Ne lamp off for 209 & 210

Toggled on and off and it did