

Quick updates on ADFOSC

17 Dec 2020

Based on preliminary analyses of the instrument verification data taken in December 2020, a quick update is released for immediate use of the science users:

1. **CCD linearity:** The sky-measured CCD response is seen linear (measurement accuracy $\sim 0.6 - 1.0\%$) over the full range of 16-bit register, after the controller update. Gain is near 1.
2. **Slit-widths:** The slit width measurements were completed with a phase-shifting interferometer setup in ARIES. The effective slit-widths are given below and also updated in the ICS (instrument control software) panel.

Label in ICS		width
Slit 1	=	1-arcsec
Slit 2	=	1.5-arcsec
Slit 3	=	2-arcsec
Slit 4	=	0.4-arcsec
Slit 5	=	3.2-arcsec

3. **Spectral calibration lamps:** The calibration lamp's intensities were dimmed, and a new Tungsten-LED combination lamp was added for continuum calibration. The lamps switch off automatically after 15 minutes but it is always advised to switch off lamps after use. The lamps are labeled as follows:

Lamp 1: Hg-Ar (Take a few frames around 0.01sec integration)

Lamp 2: Ne (Take a few frames around 0.01-sec integration)

Lamp 3: Tungsten-LED: (Take a few frames around ~ 1 -sec integration)

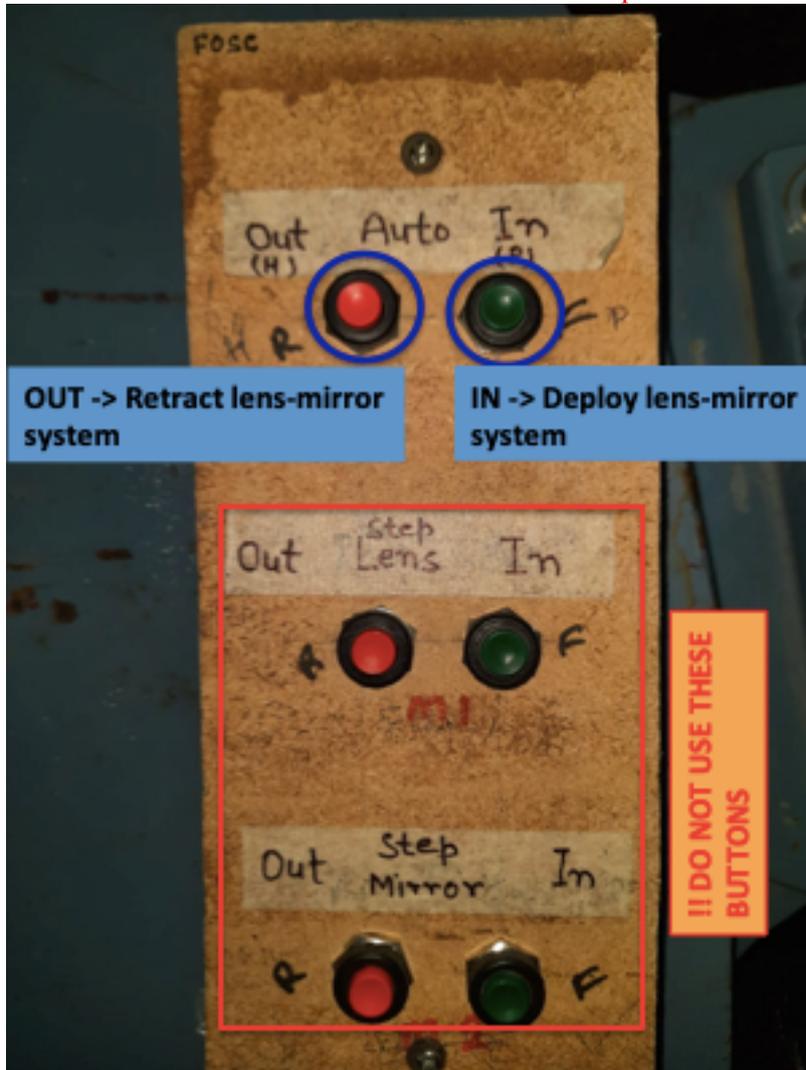
How to take spectral calibration frames: To use lamps, first deploy the lens-mirror system of the calibration unit in the field. The sequence is as follows

Lens-Mirror system deployment

Use the hand-panel provided on the ADFOSC dummy weight (on telescope). Press **Auto IN (green button - topmost)** for ~2 sec and release.

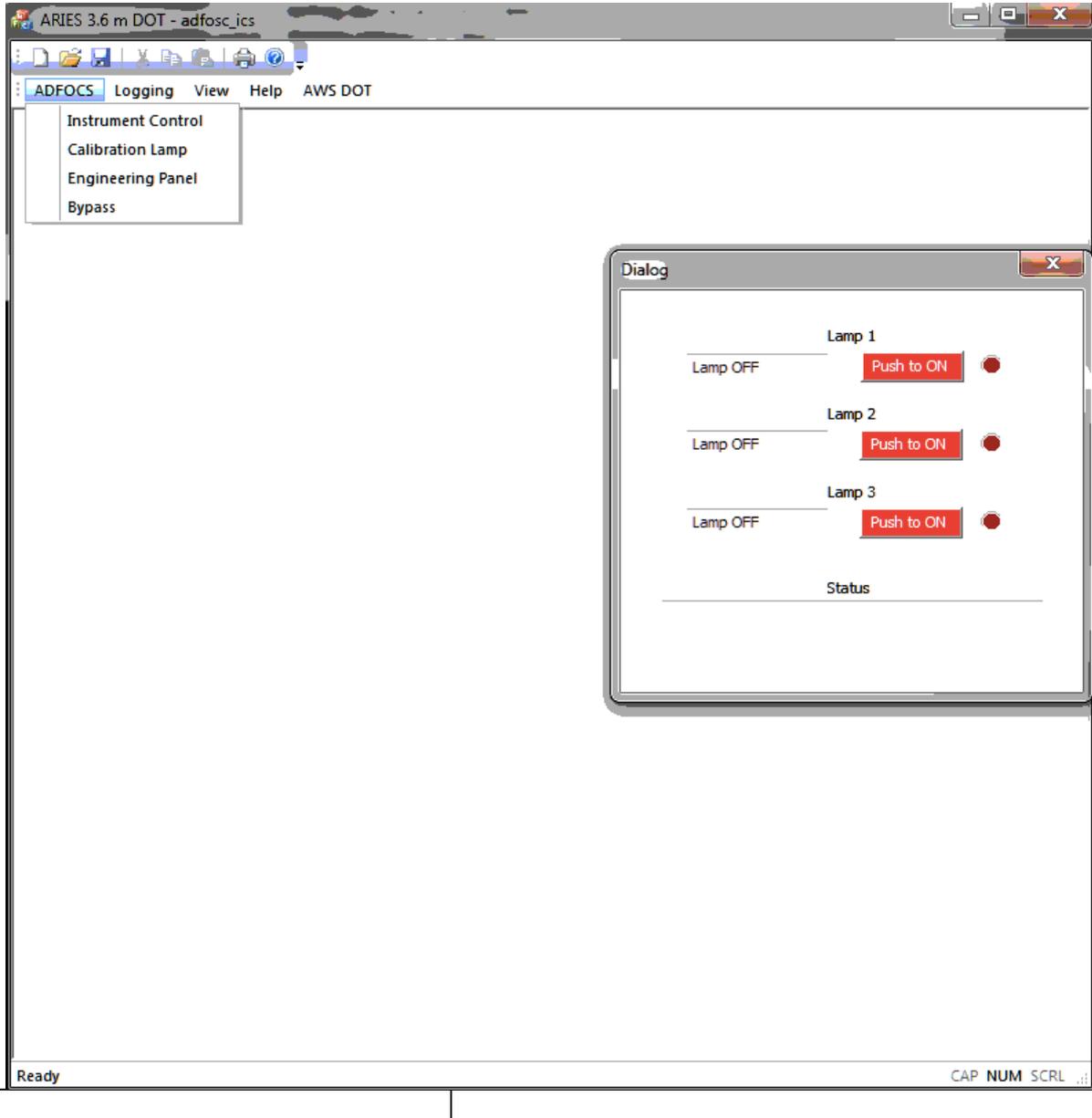
Important: Press **Auto OUT (red button - topmost)** for ~2 sec to take the lens-mirror out of the field before resuming sky observations, after calibration observations are completed.

It takes about one minute for the movements to complete.



Lamp operation:

Switch ON the lamp from Main ICS panel and click ADFOCS -> Calibration lamp. It opens up one window showing Lamp control. Press 'Push to ON' – the button turns green. Do not forget to switch off the lamps after use.



Known Issues

The following technical issues are noticed and are listed below along with their solutions, if any.

1. ADFOSC wheel control becomes un-responsive

[Occurrence: occasional; Reason: Devasthal Network]:

The system intermittently hangs or gets reset due to some ongoing local network issues at Devasthal. If it happens, the filter movements will not take place as that can be seen from the log (it does not get updated and stops responding) in the ICS control panel. **The only solution is to reset the network power of ADFOSC cabinet.** The method is given below:

THIS PROCEDURE TO BE PERFORMED BY AN AUTHORIZED PERSON WHO CAN SAFELY HANDLE ELECTRICAL PROCEDURE: Go to telescope floor and locate ADFOSC wheel control box (gray color covered box mounted sideways on dummy weight structure). Use the key provided there to open this box. The single-pole MCB switch as shown below should be switched OFF – wait 10 sec – switch ON.





2. Shifts in Grism position

[Occurrence: Always; Reason: Unknown]:

It is noticed that grism positions do not exactly repeat and gets a small angular offset that can be seen as a small tilt in the spectrum (horizontal x-axis of CCD frame). We advise that to overcome this situation – each time a grism needs to be positioned follow this sequence –

‘Home’ grism wheel and then move to the desired grism position from the ICS GUI panel.

3. Dirt on the slits

[Occurrence: Always; Reason: Natural]:

Some of the positions on the slits may receive and trap dust particles from open atmosphere, which cast a shadow (reduced response) in the spectrum at that location.

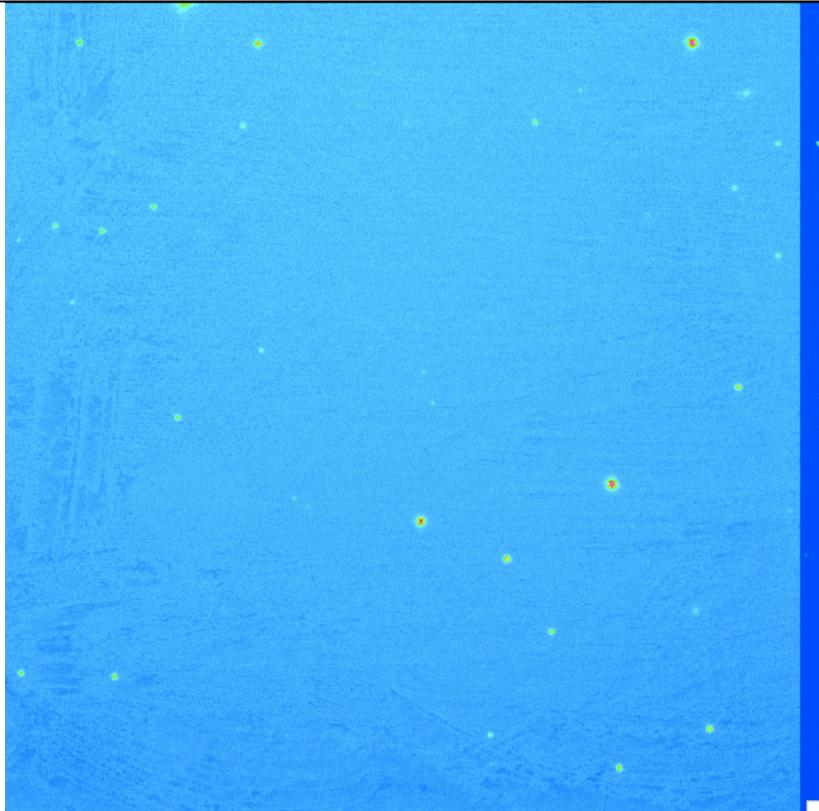
Avoid placing objects on the slit locations, which have dust particles.

4. Garbled CCD image

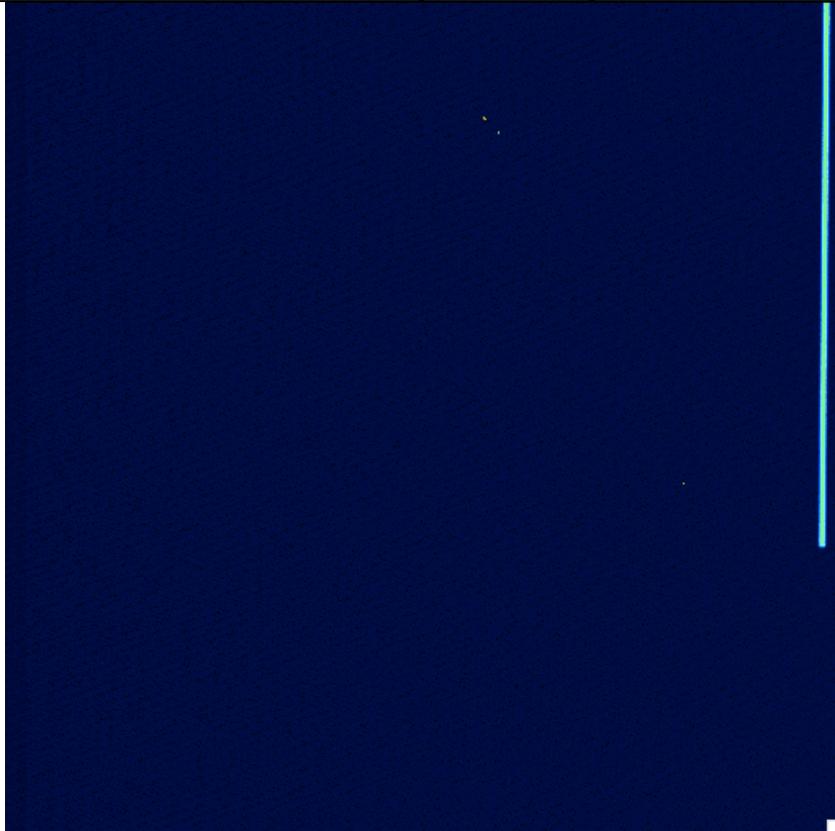
[Occurrence: rare; Reason: controller glitch]:

For some reasons, the CCD controller sometimes stitches pixel images with misplaced geometry. This effect is seen as some columns of the center section of image appearing at right edge with different contrast or if a slit is placed, the slit appears at the right edge. If you see images as shown below, reset the CCD software, which solves the problem.

Reset CCD by running CCD controller ‘setup’ sequence from OWL GUI.



Example of a garbled CCD image – see the changed contrast on the right side strip. Part of the full field is also not matching with the target field.



Example of a garbled CCD image – see the slit image shifted to right edge.