Zoom lens problem identification:

* Zoom lens is the part that most likely to get in trouble during usage
* If any of 3 stages cannot be connected in Kinesis even after manual connection, go to turn off **cubes**
* If cubes turned off properly, then turn on the cube after about 10s and try Kinesis again. Problems should be resolved. Following next section to set the “closed position”
* If cubes do not turn off, then turn off the **controller hub**. Cubes will be forced off, wait for 10s and turn on the controller hub and then turn on individual cubes. Try Kinesis again to see if communication can be established properly. If yes, then following next section to set the “closed position”
* If communication of any cube cannot be established properly after restarting the controller hub, then turn off **cubes and controller hub**, reboot the computer. Then turn back on controller hub and cubes. Then follow the next section to set the “closed position”
* **Whenever turning on a cube, make sure to wait until its starting-up procedure is completed.** “Completed” or “disabled” message indicate proper restart. “Phase error” indicates starting-up failed, it usually caused by the linear stage too close to the upper/lower limit. Gently move the stage a bit towards middle point and restart the cube again.

Manually setting zoom lens to “closed position”:

* The “closed position” is carefully selected to prevent crash of stages during movement
* Open Kinesis
* Enable one fo the 50 mm stages; Test to see if it holds position, to figure out which unit is being enabled.
* Zoom stages do not coordinate with Kinesis order; 50 mm stages are lens 1 and 3 (labelled DD050 on the screen).
* ON ZOOM LENS 1, (50mm stage): set to home. then set to 50
* Enable Zoom lens 2 (100 mm stage): set to home; move to 70
* On Zoom Lens 3 (50 mm stage): set to home, set to 0
* On Zoom Lens 2 (100 mm stage AGAIN): set back to 0 (this procedure avoids crashes)
* On Zoom lens 1: set this to 20
* SO FINAL POSITION: lens 1: 20mm; Lens 2: 0mm; Lens 3: 0mm – this is the CLOSE POSITION.
* Close Kinesis

Thorcam troubleshoot:

* Occasionally, Thorcam software will freeze and not respond
* Try close the software in Task Manager and reopen the software, problem is usually resolved
* If not, reboot the computer and the problem will be resolved

Abnormal laser power:

* Currently, all lasers are set at constant power mode without any complex modulation
* Occasionally, the laser power will jump to 1mW and stay there
* Turn off the laser, set the power to the desired value and turn the laser back on. Problem is usually resolved

Laser COM port cannot be connected:

* This is most likely caused by double opening the control software. Make sure you are not opening the software again while it was running already
* If this is not caused by the double opening, then unplug the signal wire and reconnect
* If reconnecting the signal wire does not resolve the problem, unplug power supply for laser. Make sure all laser has been turned off before unplugging. Reconnect the power and the problem should be resolved

Camera communication cannot be established:

* Check if camera is turned on
* Check if there is another software occupying the communication port (MicroManager, Matlab or Python)
* It is also possible that the camera was not closed properly in software last time (only happens when writing code and debugging). In this case, go to Matlab and run the following code
* When writing and testing the code, it is common that the camera is opened properly, and your code fails before it’s been closed. **Be sure to close the camera in command window before proceeding to debug**

addpath('C:\Program Files\MATLAB\R2021a\toolbox\AndorSDK3')

[rc] = AT\_InitialiseLibrary();

AT\_CheckError(rc);

[rc] = AT\_Command(hndl,'AcquisitionStop');

AT\_CheckWarning(rc);

[rc] = AT\_Flush(hndl);

AT\_CheckWarning(rc);

[rc] = AT\_Close(hndl);

AT\_CheckWarning(rc);

[rc] = AT\_FinaliseLibrary();

AT\_CheckWarning(rc);

disp('Camera shutdown');

Severly clipped image:

* It is most likely caused by Iris not been fully opened. Check all Iris in the light pathway to make sure all of them are opened entirely