Resonon stray light tests Track 6 and 7 only

Experiment to check performance of the stray light matrix on track 7 (and 6 if possible)

CCD Settings:
Speed- 2mHz
gain = 3
Accumulations = 1
Images = as listed below
Camera CCD set temp at -70 C. Confirm the temperature set point is reached and stabilize camera for 10 minutes before taking data.
Do not cover the camera – it needs free air flow to stay cool.
Use Exposure times of 0.1 sec or greater

Definitions:
Darked = fiber tip covered to block ambient and source light Darked is with the fiber caps off and the ends of the fibers stuck into the ~10" long Thorlabs 2" od tubing and covered with a fold of black cloth
BI = Background image = Dark image =CCD setting to take a dark image with the CCD shutter closed On the camera settings, this is "Disable Closed"
AI = Fiber Ambient Image = Image with some set of fibers exposed to sphere but light source is off, CCD shutter operating in "normal mode"
LI = Light Image = image with some fibers exposed to sphere with source on Shutter in "Normal mode"

Image set = A collection of associated images (light/dark/light etc.) in close succession

Leave room lights on or off, however you plan to have them during the work. We are working with the room lights off, inside the opaque soft wall clean room in the RSL

Tests 1 should be done each time the setup is moved or significantly reconfigured, though in the future only one or two long integration time images would likely be required to confirm the absence of light leakage. If you can confirm no light leakage, there is no need to perform ambient light measurements with each set of data.

Always cover the fiber optic ferrule at the Spectrograph end where the fiber pigtails go into the stainless steel ferrule. This light leak must be blocked if the housing is exposed to ambient light during the measurements. Wrap it with many layers of dark cloth or similar.

1. Check for Ambient light leaks with fibers darked. This tests for light leaks everywhere, the spectrograph and the camera. The sphere source should be turned OFF, the fibers uncapped looking in the sphere

a. Image sequence for this test: 1BI, 1LI By "1BI, 1LI" we mean take one with the CCD camera "disabled closed", 1 with the shutter in "normal" operation.
b. Take a 1BI, 1LI, image set @ 600 second Exposure time
c. Analysis
    i. Calc light – dark
    ii. Check for more ADU in the track area vs dark areas
    iii. Confirm no light leakage before proceeding

2. Source calibrations
    a. Use the CAS for all source calibrations
    b. Calibrate the Blue LED, White LED, OL420, PER filter, BG28
    c. Analysis: Calibrate each source for spectral radiance

3. Track 7 Calibration, OL420
    a. Track 7 only illuminated
    b. Measure Track 7 with OL420
    c. Image sequence for this test: 11 BI,11 LI, 11 BI
    d. Exposure set as needed to maximize scale

4. Track 6 Calibration, OL420
    a. Track 6 only illuminated
    b. Measure Track 6? with OL420
    c. Image sequence for this test: 11 BI,11 LI, 11 BI
    d. Exposure set as needed to maximize scale

5. Track 6 and 7 Validation, OL420
    a. Track 6 and 7 illuminated
    b. Measure Track6 and Track7 with OL420
    c. Image sequence for this test: 11 BI,11 LI, 11 BI
    d. Exposure set as needed to maximize scale

6. Repeat steps 3,4,5 above for each source: Blue led, White LED, OL420/PER, OL420/BG28. Also, shine a 632 HeNe laser into a sphere and measure it – 11BI, 11LI, 11BI. This source cannot be calibrated for spectral radiance but I want to see how the stray light correction algorithm does with a monochromatic source.

Analysis: We should be able to recover the correct source radiance values for any track regardless of the illumination state of the other tracks. We will start with Track 7 only and see if we can make sense of the data when adding in Track 6