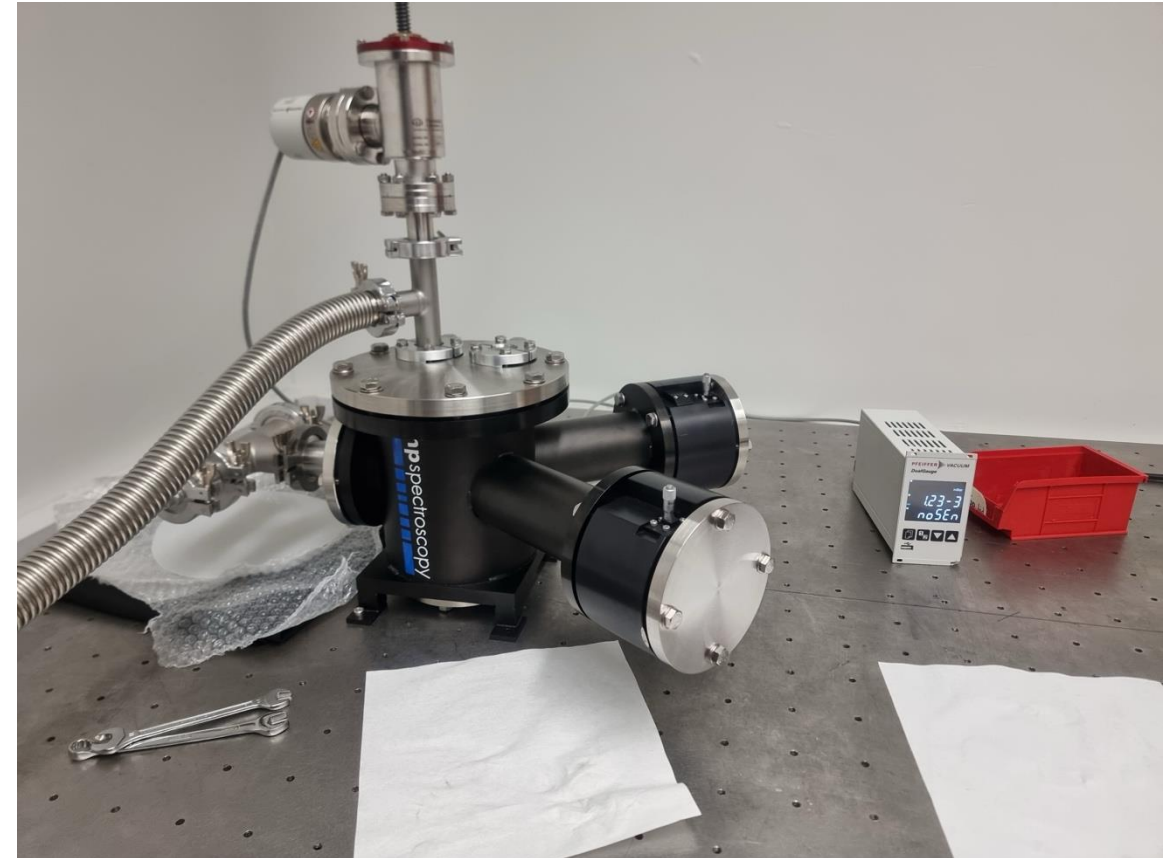


Project Update 08/07/26

Mathias Zurbriggen

Monochromator update

- Initial attempts and helium sniffer proved that monochromator did not reach vacuum
- All KF (klein flansche) flanges require thorough cleaning and low outgassing vacuum grease for a vacuum seal
- Grease purchased and applied
- System tested with helium sniffer returned no leaks

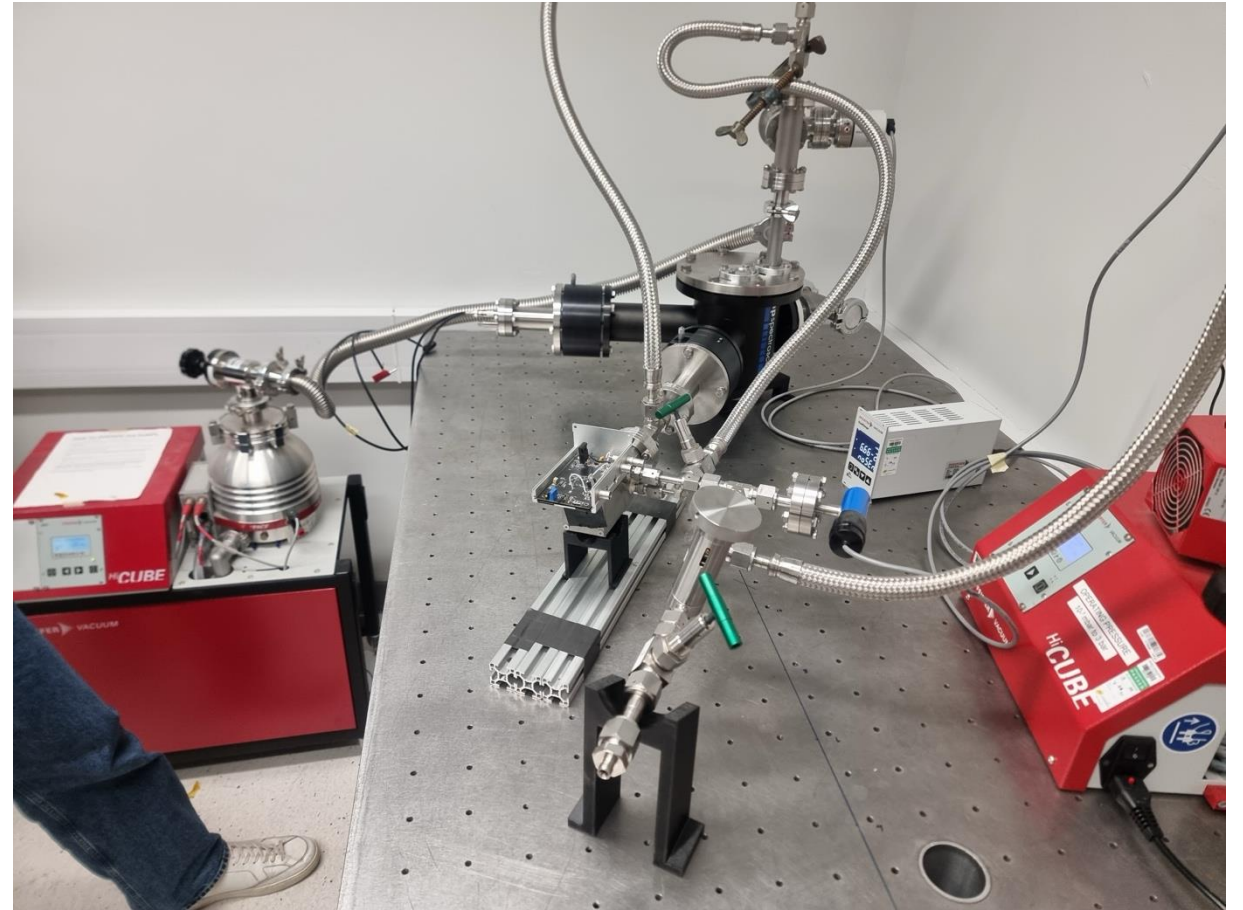
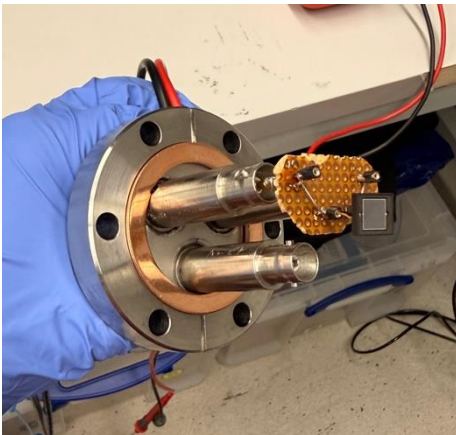


Plan for testing

- Build and reach vacuum with the monochromator system 
- Connect flashlamp 
- Gain a spectrum using both current and waveform acquisition 
- Collect data using the deuterium lamp 
- Use known peaks in the deuterium lamp to calibrate the flashlamp spectrum 

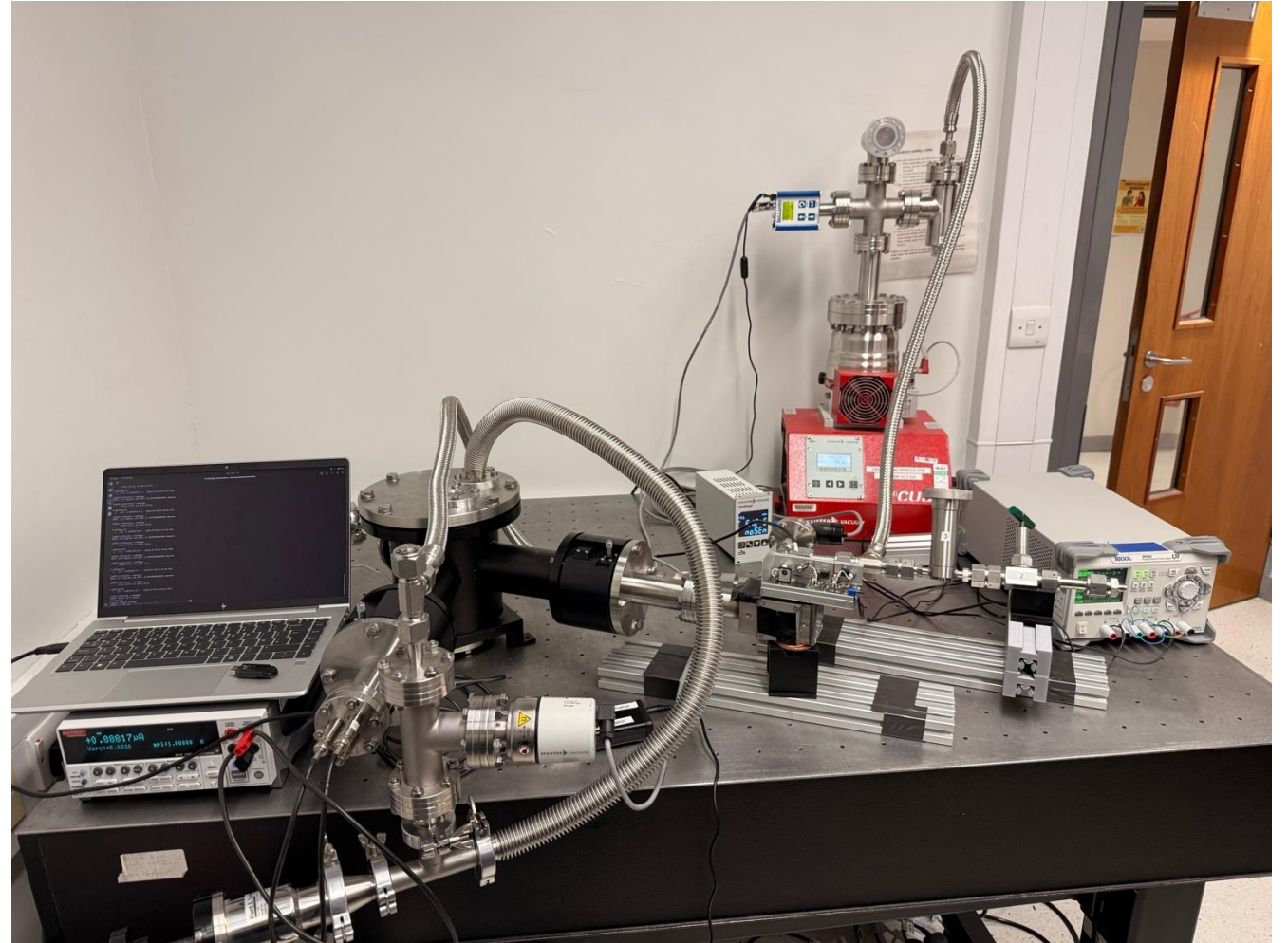
Monochromator + flashlamp

- Intended to run as two separate vacuum systems
- Flashlamp has been easy enough to move
- Vacuum connections needed rearranging



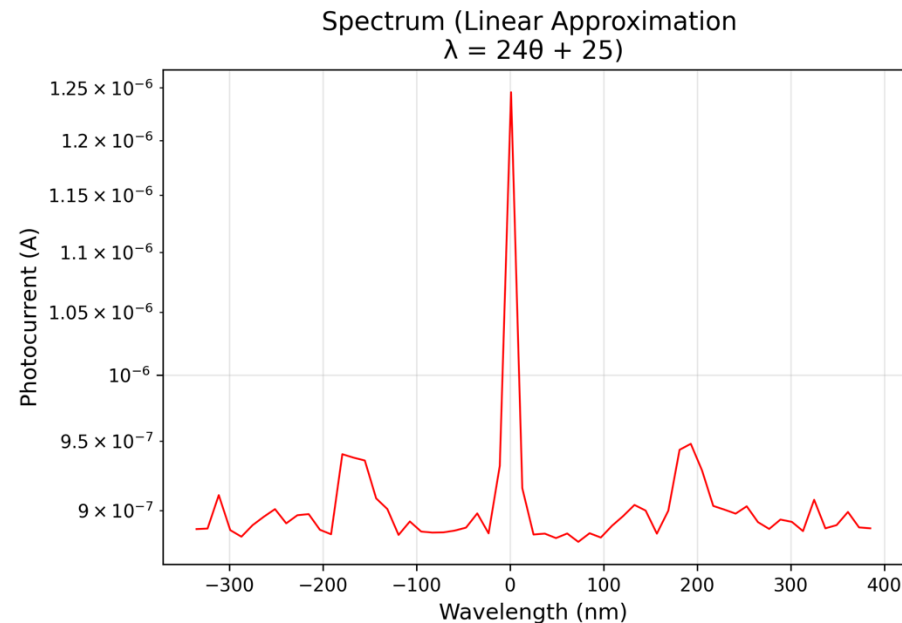
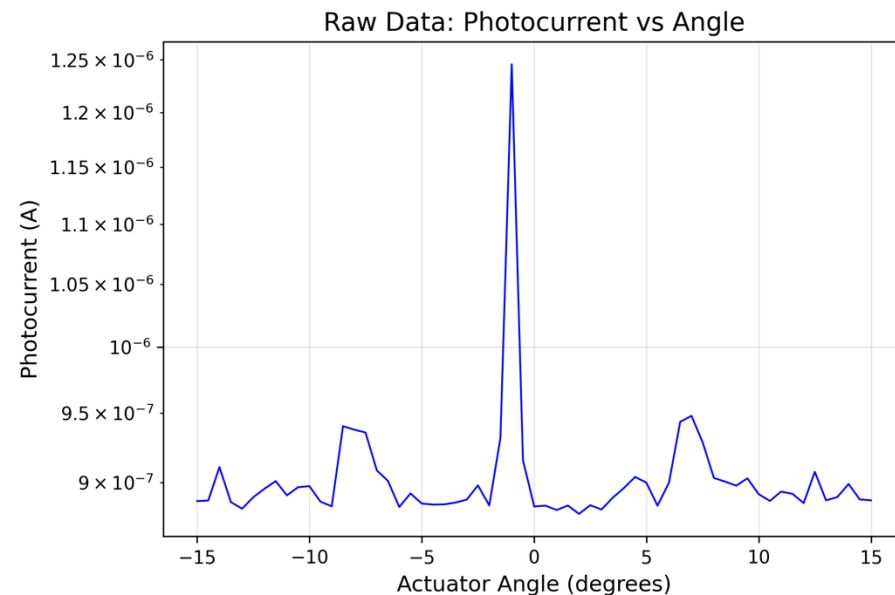
FL spectrum from current measurement

- Single SiPM connected to the output of the monochromator
- SiPM power and read out via the Keithley 2410 sourcemeter
- Python script available from Mphys calibration



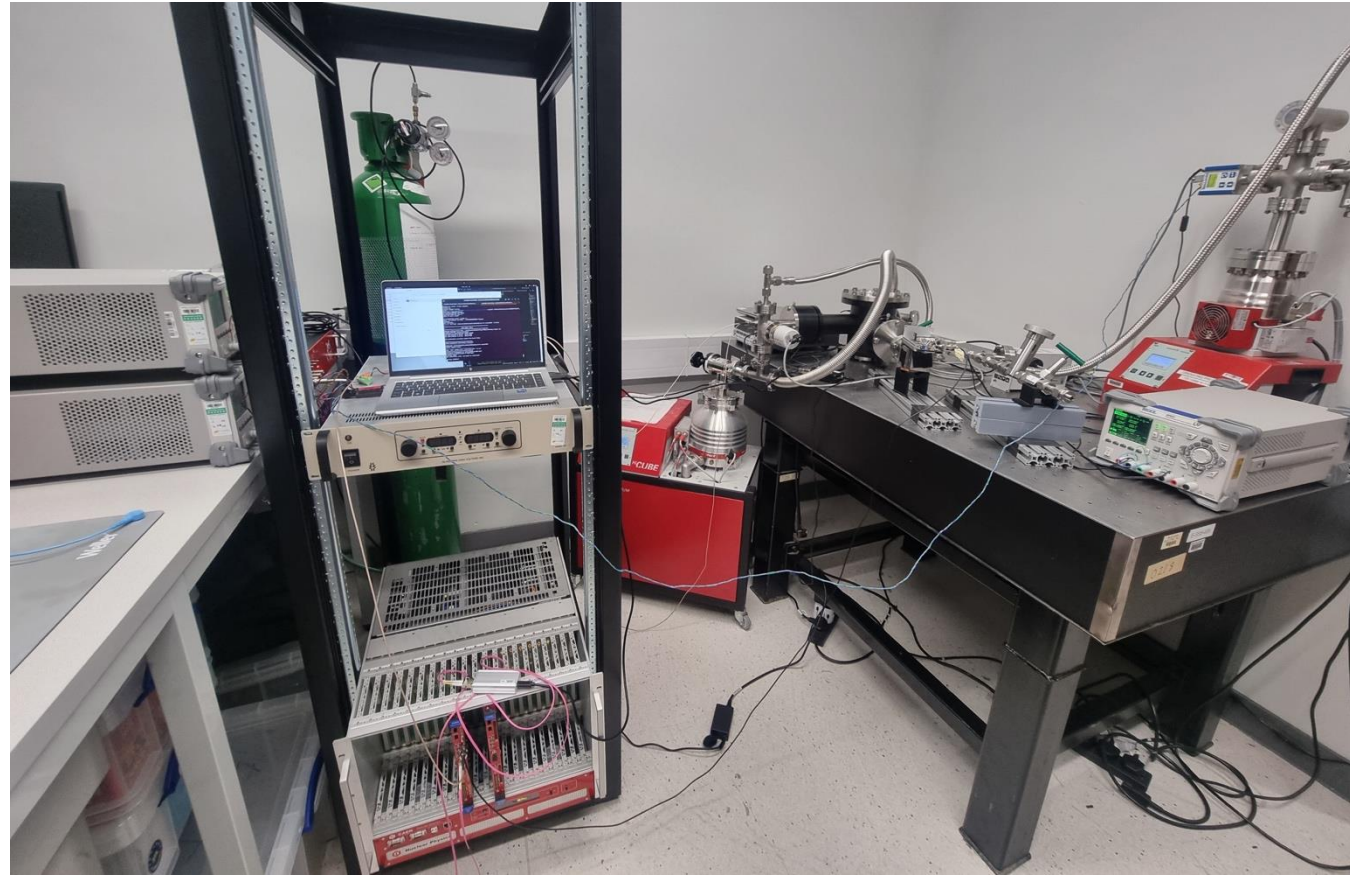
FL spectrum from current measurement

- Runs taken with varying exit slit size
- Main issue is that the Keithley has no way to trigger directly from the flashlamp
- Integration window increased but only allows max of 1-2 flashes to be captured
- Mostly samples the baseline



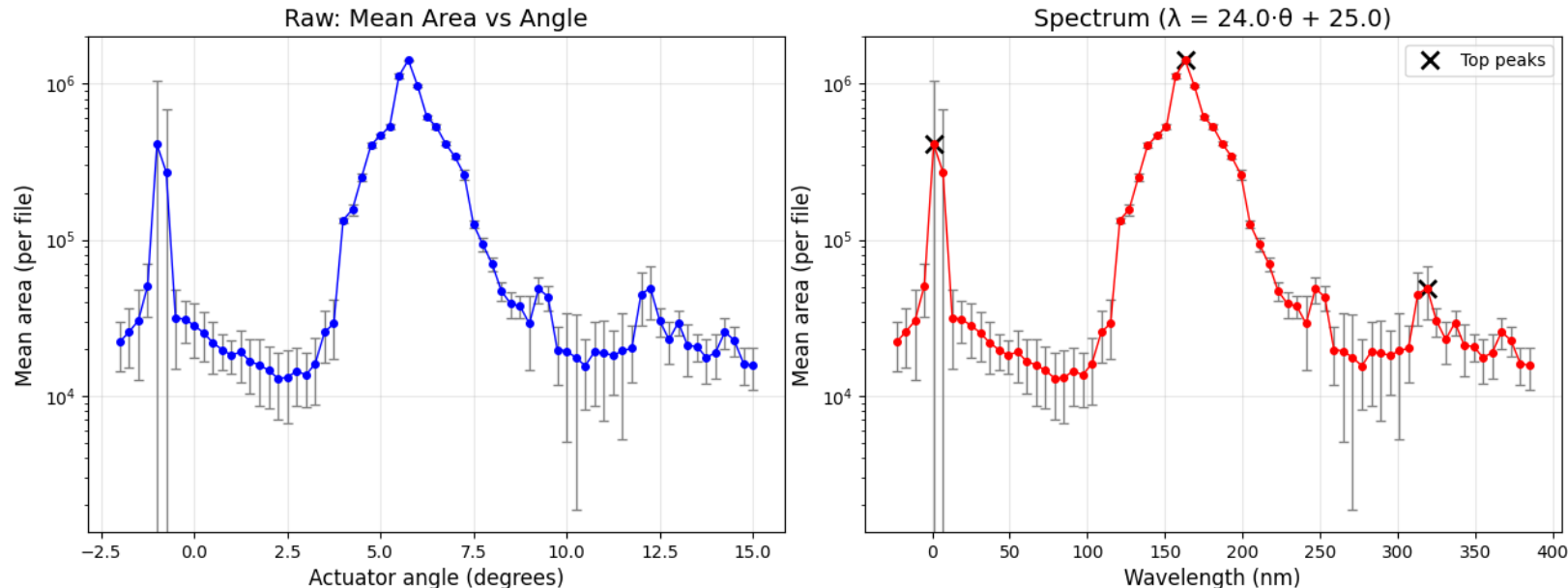
FL spectrum from waveform acquisition

- Digitizer can trigger directly from the flashlamp
- Automation script available from previous FL repeatability work
- Increased complexity but mostly mitigated by previous work
- Increased daq time



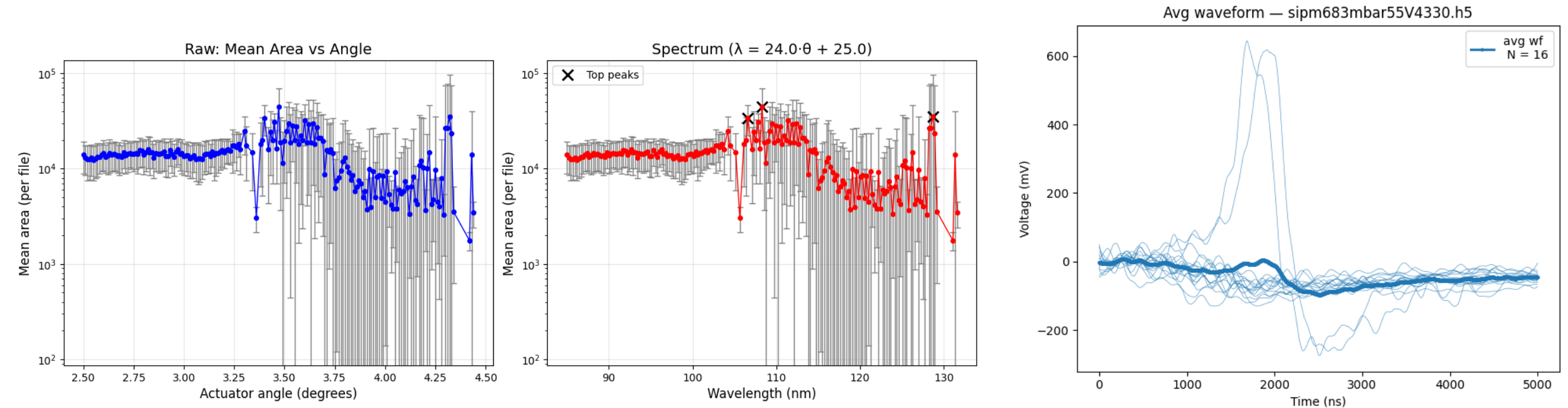
FL spectrum from waveform acquisition

- Approx 100 wfs per point
- Each wf integrated around its peak
- Integrated wf distribution plotted at each point
- Gaussian fit of distribution used for spectrum and error
- Finer scan to be attempted today



FL spectrum from waveform acquisition

- Large signal from SiPM in waveforms around the 130nm region
- Flashlamp instability results in trigger variability with the data lost on the last scan yesterday



FL spectrum considerations

- For a final measurement:
 - Repeated scans
 - 55V dark count area contribution
 - 50V crosstalk area contribution
 - Temperature, moisture, and bias voltage stability needs to be measured
 - SiPM PDE corrected
- New calibration with the correct FWHM of a known line