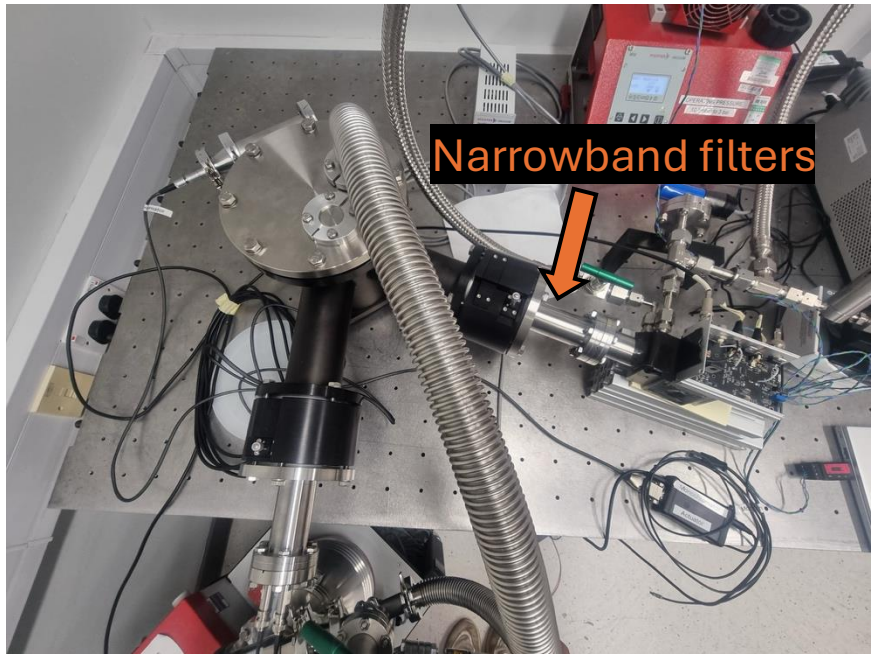
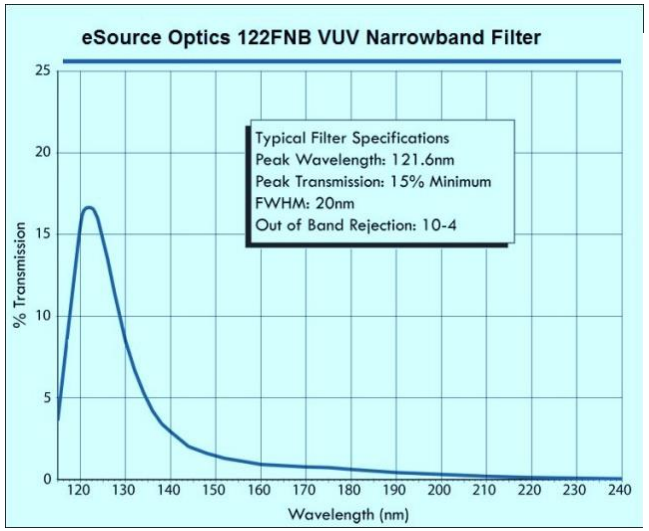
Project Update 09/09/26

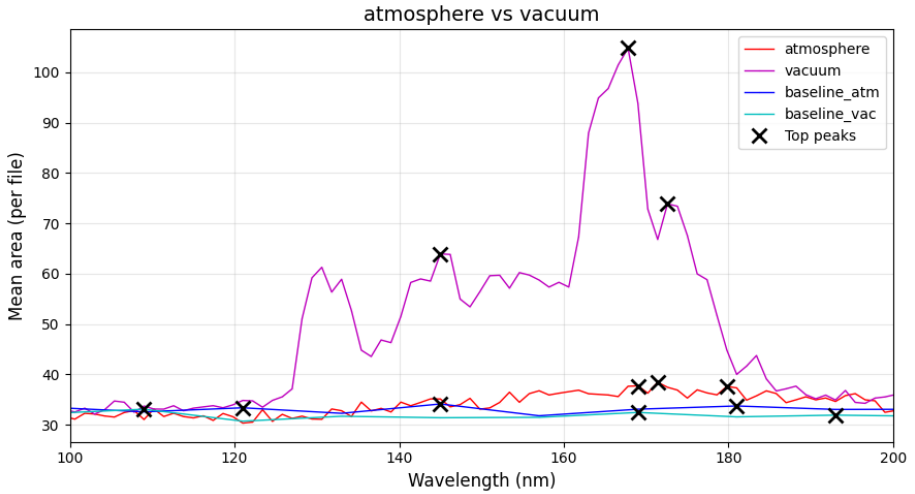
Mathias Zurbriggen

Flashlamp double filter

- Following the success of single filter
- 130nm is the wavelength of interest
- a 2nd 125nm narrowband filter added
- One in front of the other
- Single filter state: spectrum of 125nm to 185nm
- Goal: to attenuate wavelengths higher than the 130nm peak





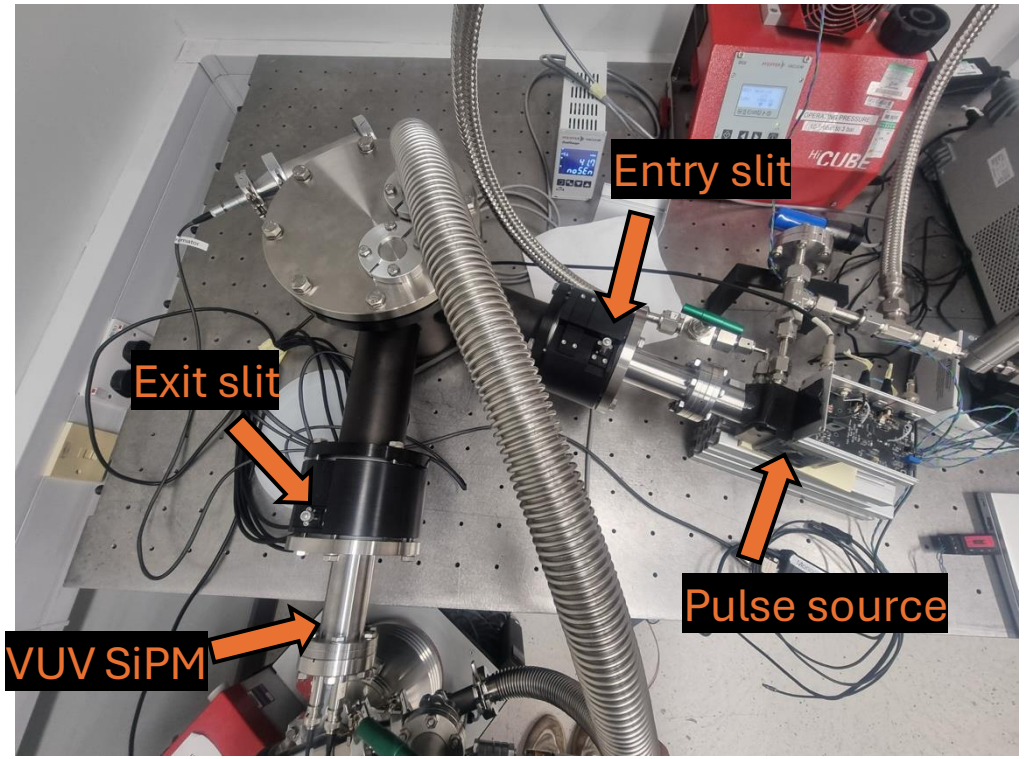




x2

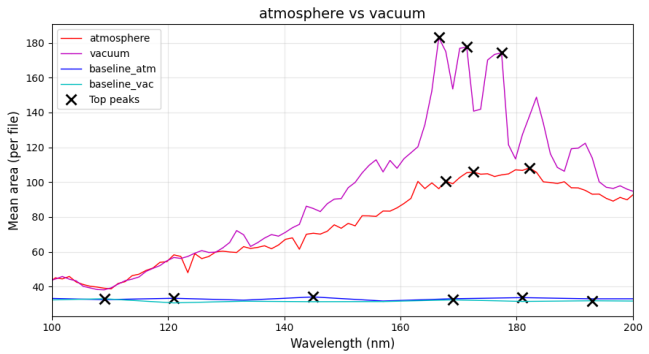
Method

- Expected flux to decrease by nearly an order of magnitude at 130nm
- Relation to slit openings has not been mapped yet
- Goal: to achieve signal in the 100nm-200nm range that is at least double the baseline noise while keeping the sidebands close to the baseline noise
- Signal, the error bar of which starts above the error bar of the baseline
- Sidebands: 100nm-120nm and 190nm-200nm

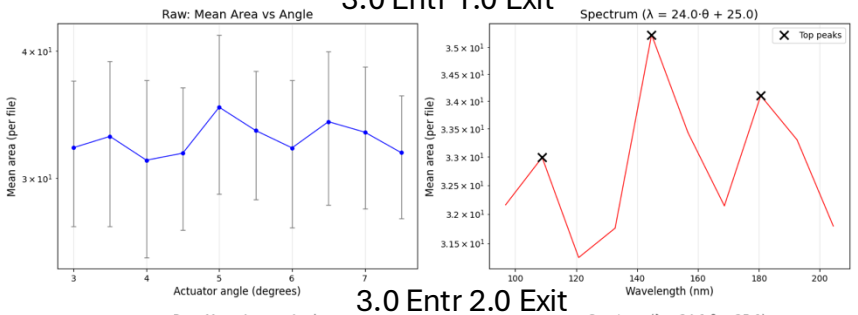


Method

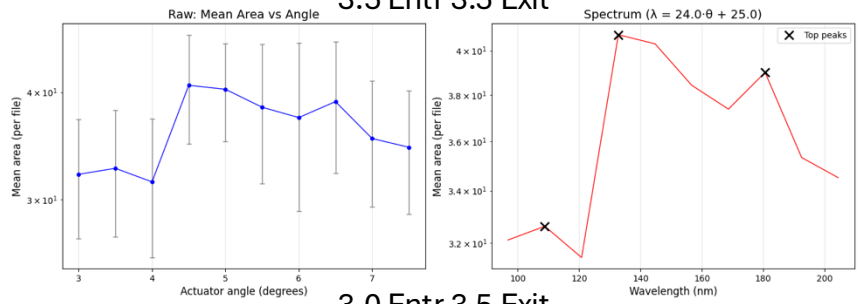
- Starting point from single filter: 3mm Entry slit and 1mm Exit slit
- Opening the Entry slit would allow more artifacts
- Opening the Exit slit would worsen the resolution
- Initially opening the Exit slit incrementally and only further opening the Entry slit slightly
- Initial thought, 3.0mm Entry and 3.5mm Exit is the best one



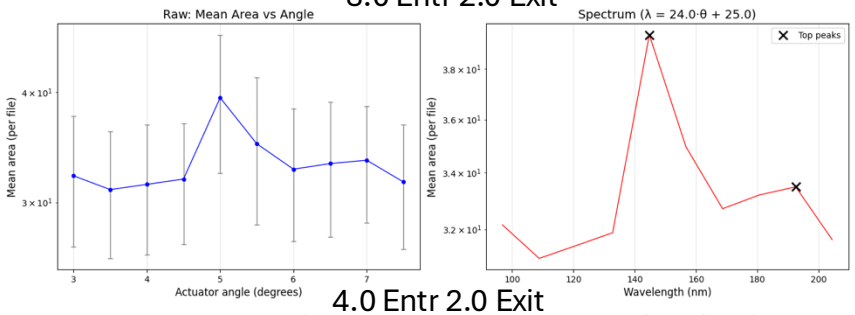
3.0 Entr 1.0 Exit



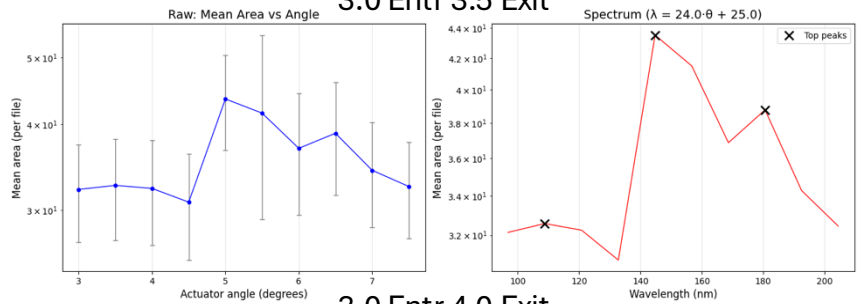
3.5 Entr 3.5 Exit



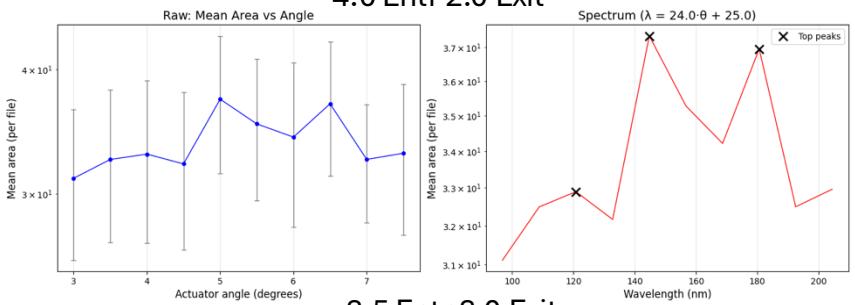
3.0 Entr 2.0 Exit



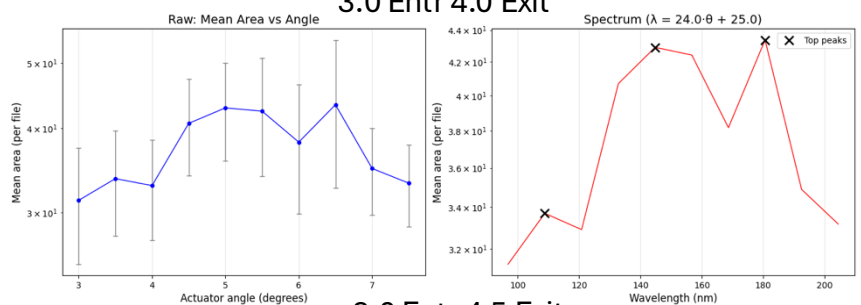
3.0 Entr 3.5 Exit



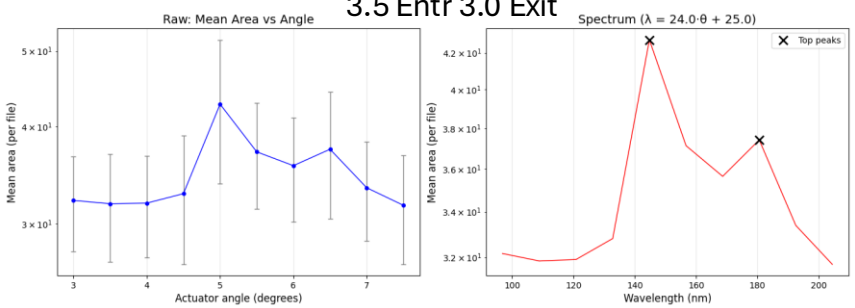
4.0 Entr 2.0 Exit



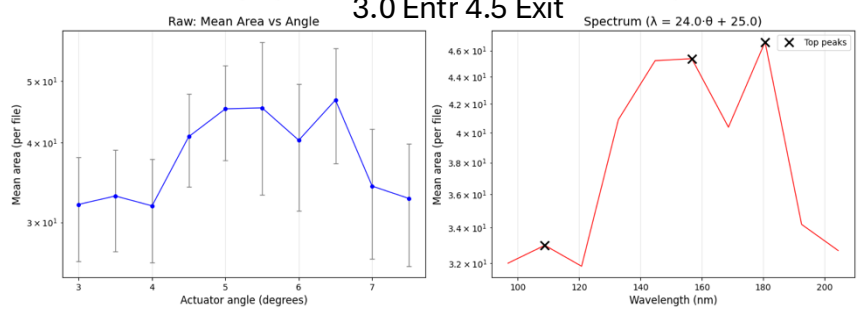
3.0 Entr 4.0 Exit



3.5 Entr 3.0 Exit

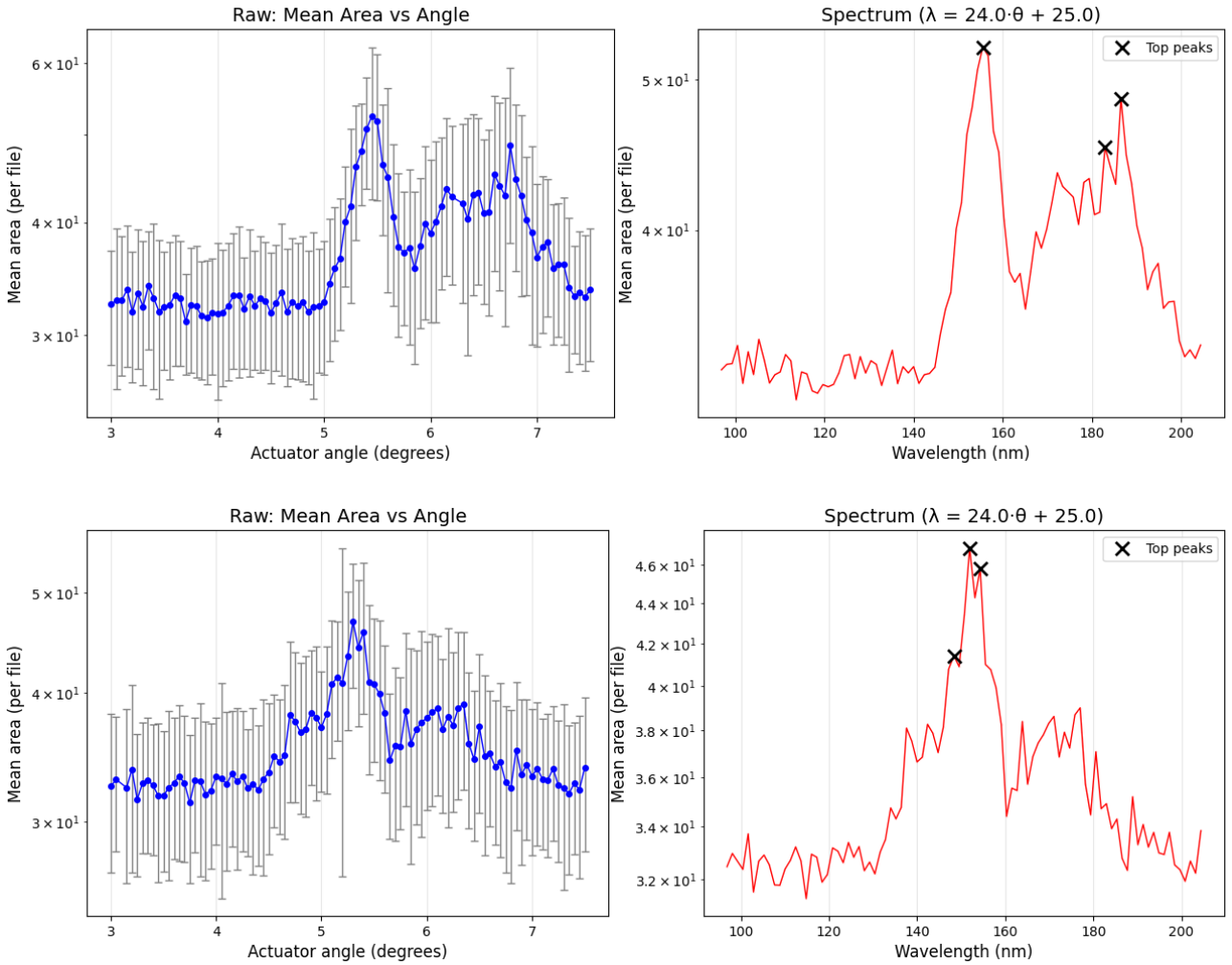


3.0 Entr 4.5 Exit



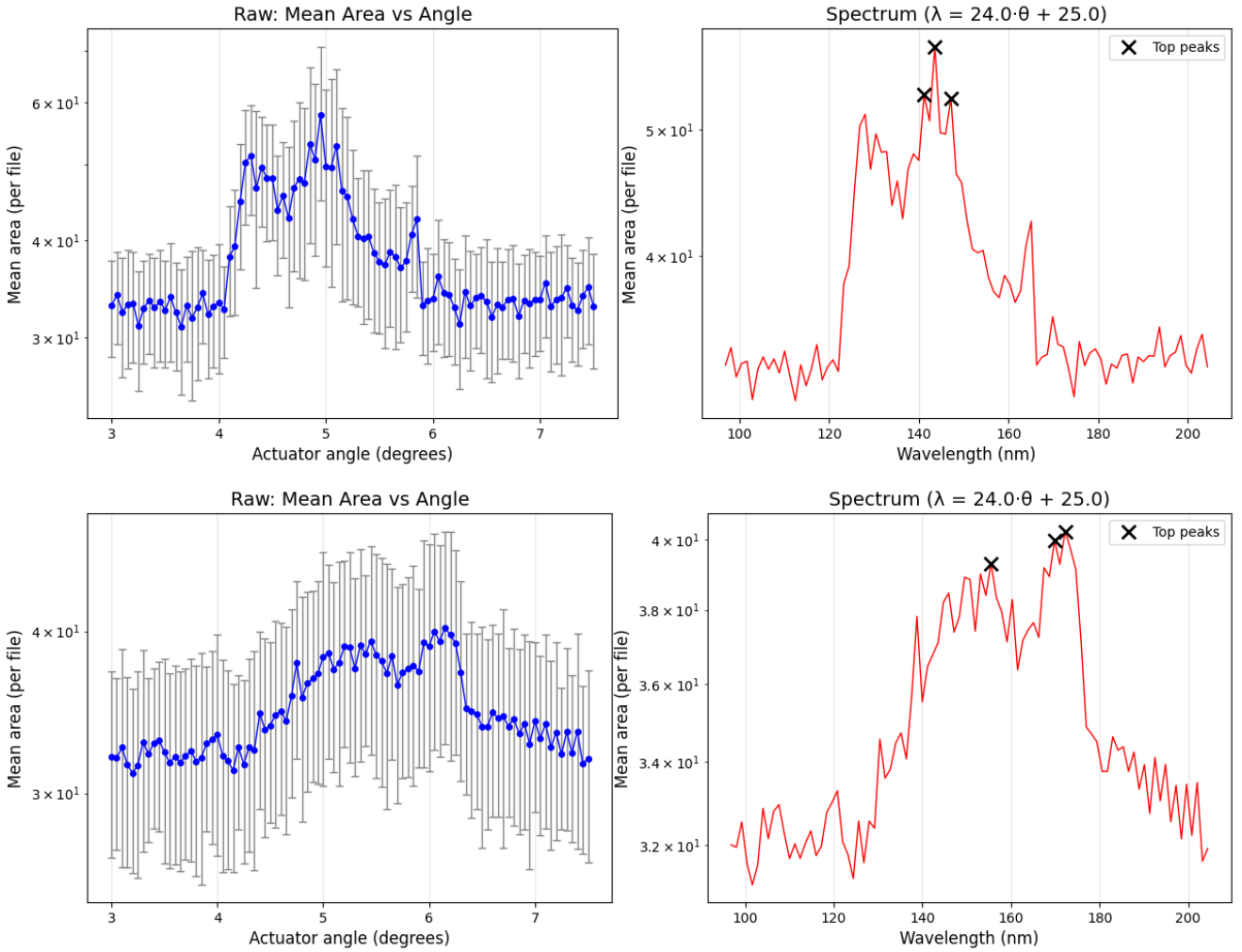
Results

- Initial results consistent
- Unfortunately, not the desired result
- This is with 3.0mm Entry and 3.5mm Exit slit openings



Results

- As a cross-check, slit openings of 3.5mm Entry and 3.0mm Exit could be used as they had similar quick runs
- Somehow have signal at 130nm
- This was repeated the same day
- Being repeated today using negative angles to rule out error in motor position in that range



Next up:

- Single 125nm filter measurement
- Single filter measurement at multiple Exit slit openings
- Possible spectra using broadband filter instead of narrowband would allow finer resolution and higher max flux

