

uf TS/PDF processing / analysis update

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Overview

- last significant update to process was implemented in December
- there are now parameters to potentially play with

December Update

- added normalisation to OGT-IMP for best effort attempt at primary beam normalisation
- absolute solid angle correction to remove the arbitrary scale factors between detectors
- removal of the low-Q section of JF4 which often seems to be shadowed

Primary beam normalisation

Karen proposed the OGT-IPM device for normalisation

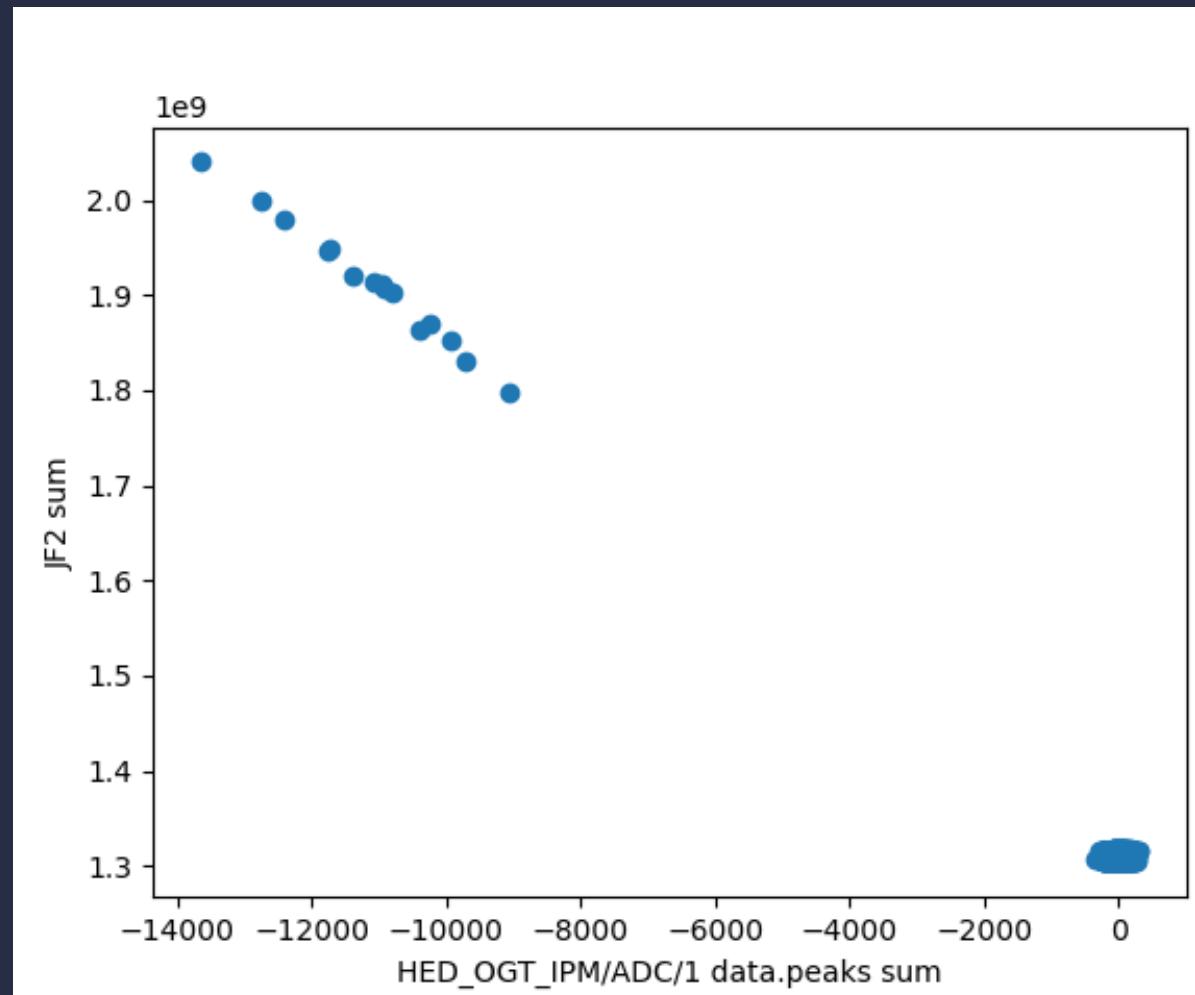
- this is a quadrant detector placed after attenuators
- can be extracted from device

```
run.get_array(f"HED_OGT_IPM/ADC/1:channel_6.output", "data.peaks")[:,0]
```

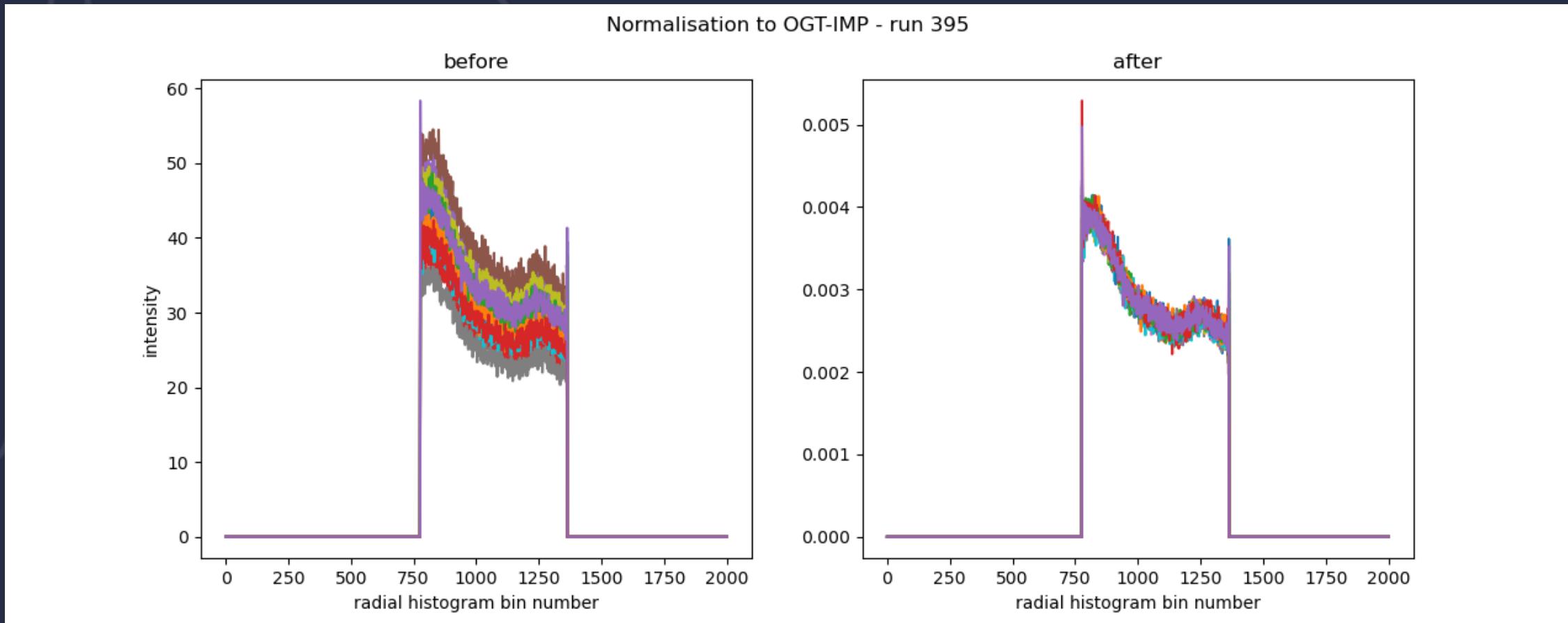
for channels 6,7,8,9

Efficacy of OGT-IPM

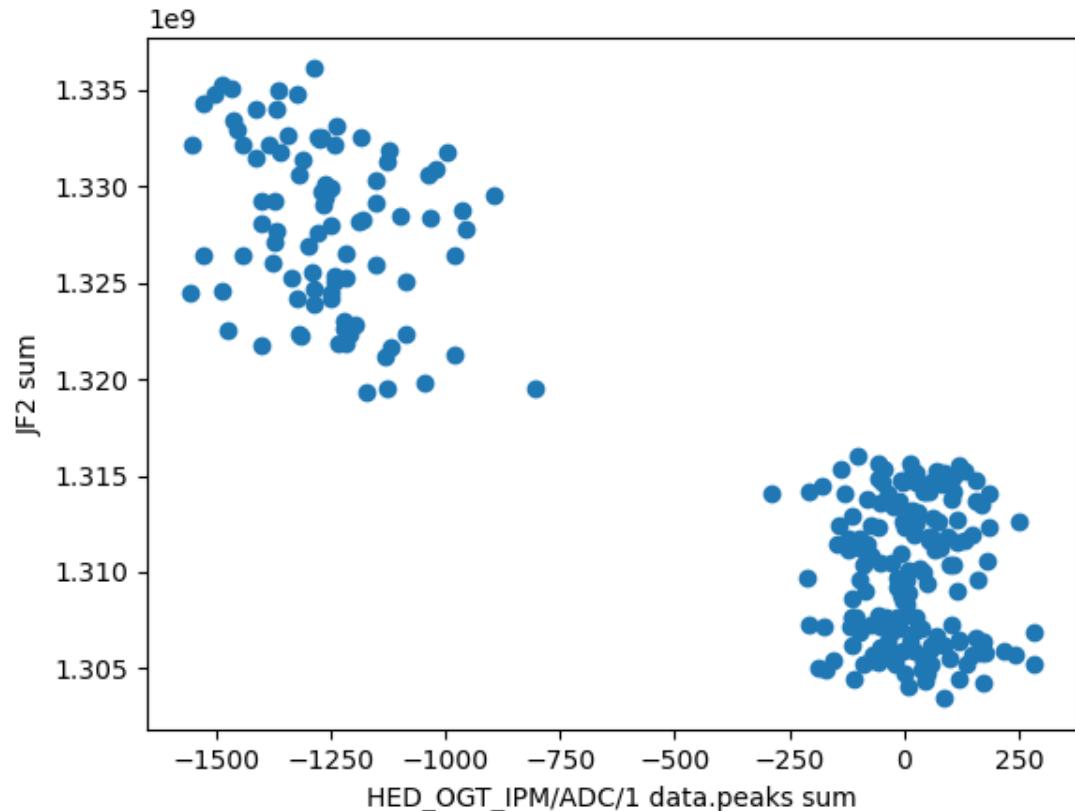
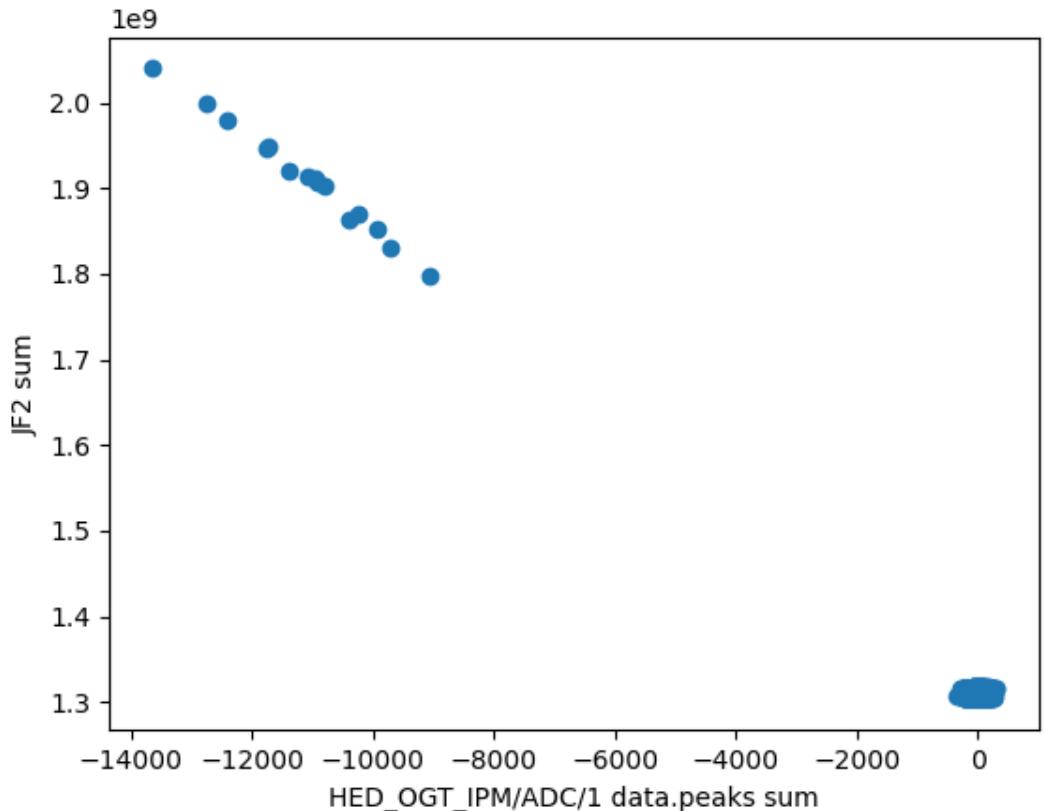
- For runs with no attenuator it appears to be quite linear



Efficacy of OGT-IPM at 100% flux



Comparison of 100% and 10% flux



Absolute Solid Angle Correction

```
integrate1d(data, npt, filename=None, correctSolidAngle=True, ...)
```

Calculate the azimuthal integration (1d) of a 2D image.

Multi algorithm implementation (tries to be bullet proof), suitable for SAXS, WAXS, ... and much more Takes extra care of normalization and performs proper variance propagation.

Parameters:

data (ndarray) – 2D array from the Detector/CCD camera

npt (int) – number of points in the output pattern

filename (str) – output filename in 2/3 column ascii format

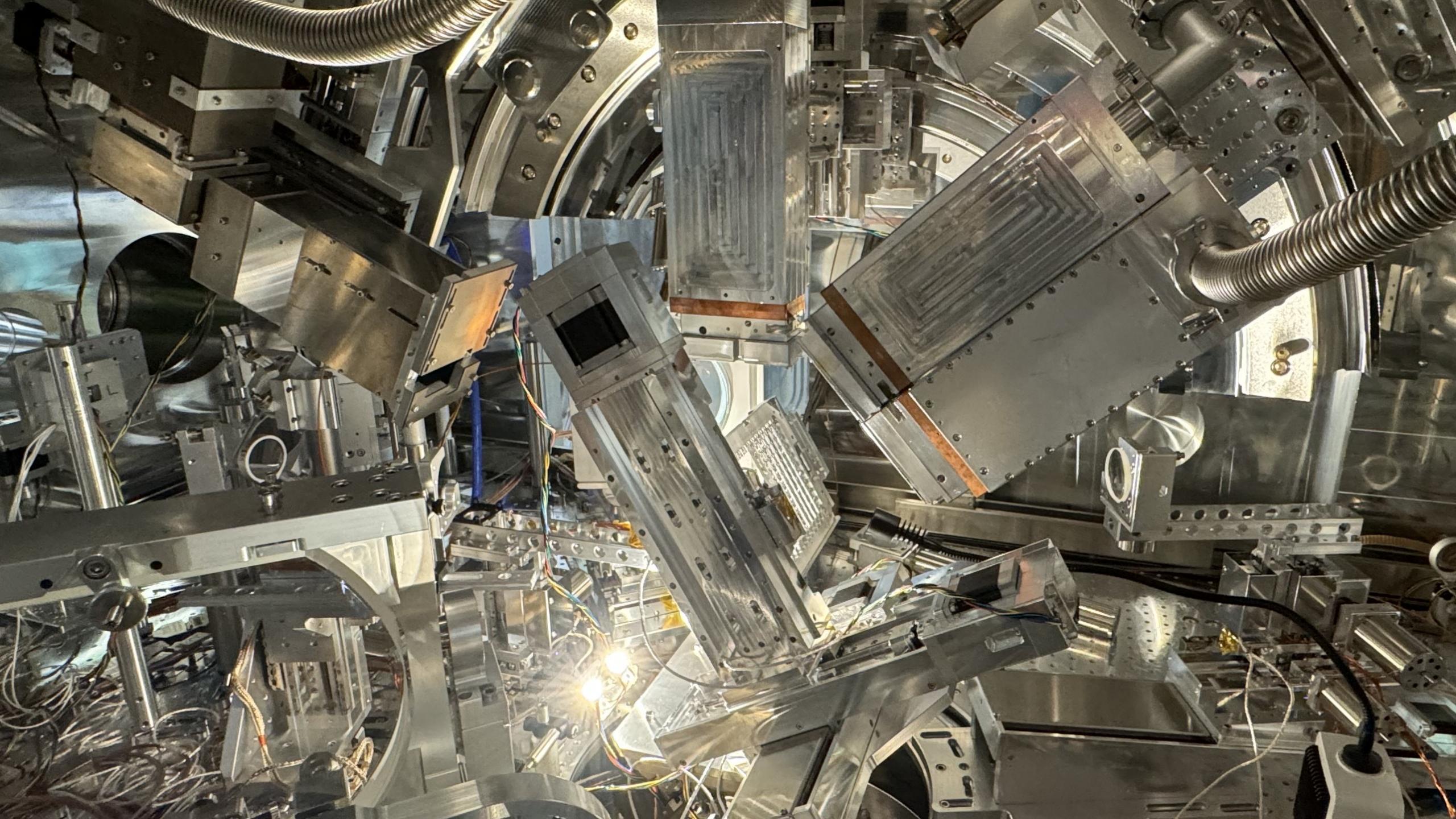
correctSolidAngle (bool) – correct for solid angle of each pixel if True

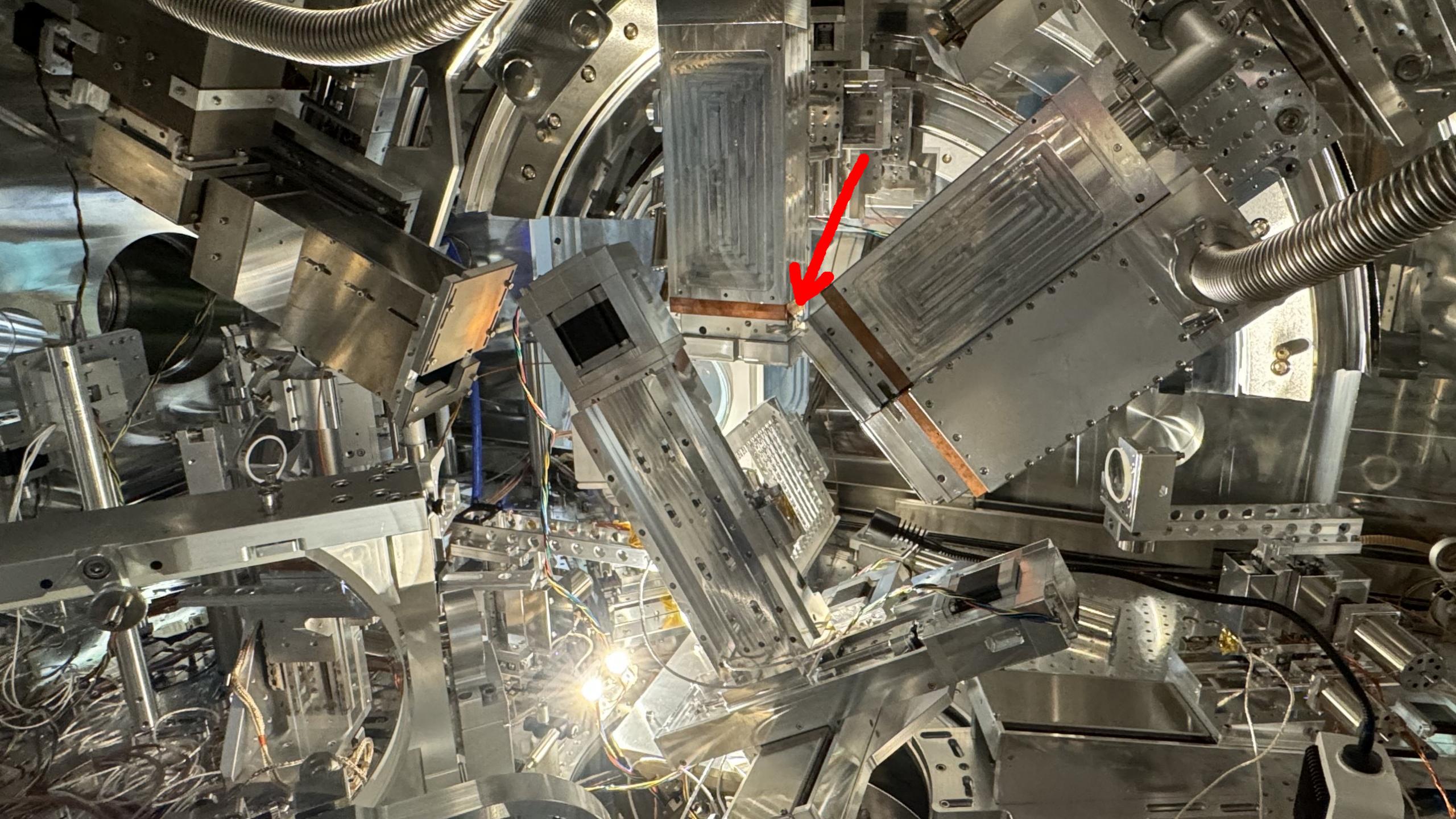
Absolute Solid Angle Correction

- What the docs *don't* state is that this is relative
- The pixel with the largest solid angle gets given a solid angle of 1
- For the 3 JFs this number is not comparable, hence a constant scaling offset between them
- now we normalise explicitly to the absolute solid angle

low-Q shadowing

- Dean does not currently understand this







THE ALL_CAPS_PARAMETERS

```
ALS_LAMBDA = 1e3 # the smoothness of the background, 1e9
```

is essentially linear, 1e2 will follow most diffuse scattering

```
ALS_P = 0.001 # the assymetry between 0 and 1, 0 being
```

strictly always below every point, 1 being basically a fit to the data

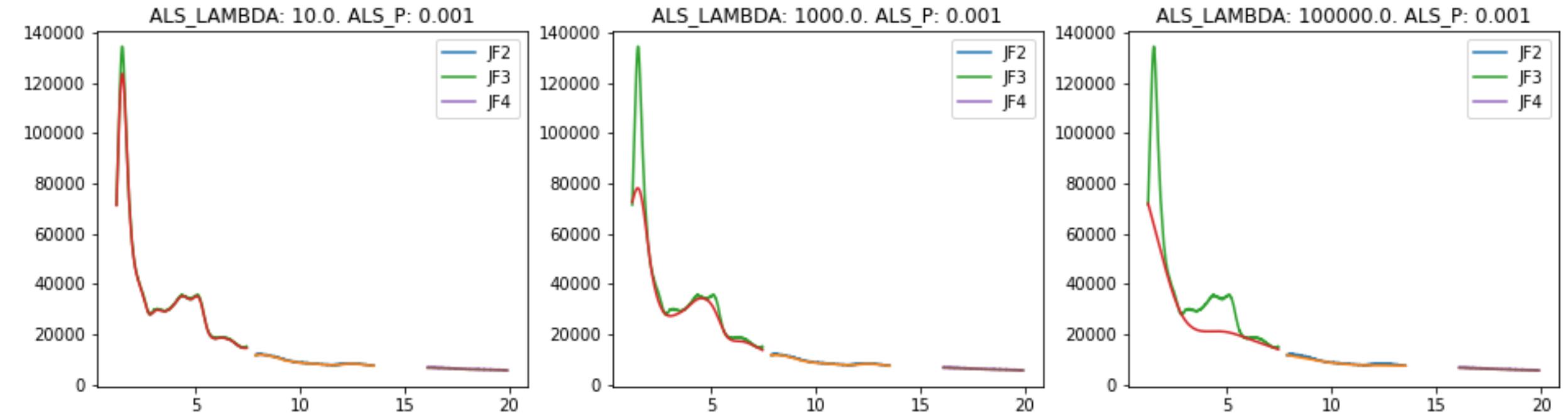
IGNORE_EDGE_N PTS = 10 # when fitting the background,
ignore these number of points from the edges

BASELINE_INTERPOLATION_N PTS = 5 # use this number of
points from the baseline to extrapolate into the gap

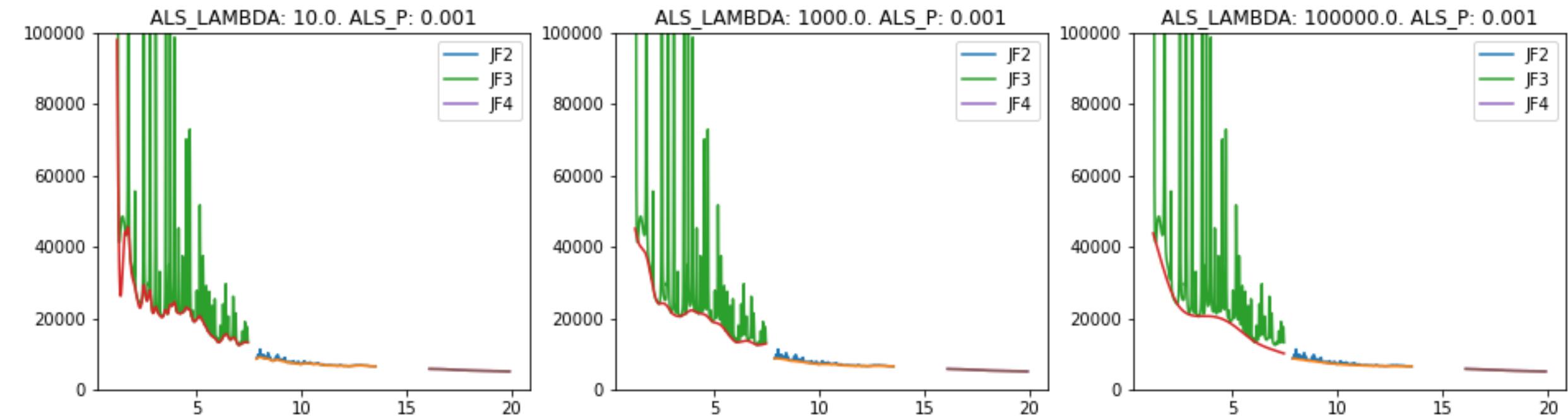
LOW_Q_TRIM_N PTS = 10 # the number of points to trim from
the low Q portion of the high Q detector when filling the gap

HIGH_Q_TRIM_N PTS = 30 # the number of points to trim
from the high Q portion of the low Q detector when filling the gap

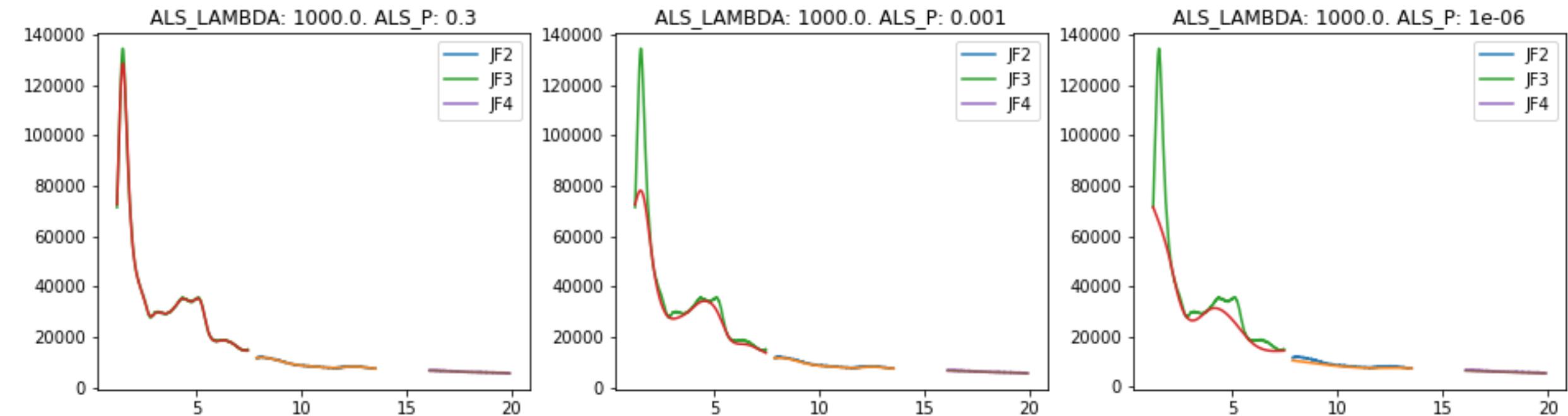
ALS_LAMBDA



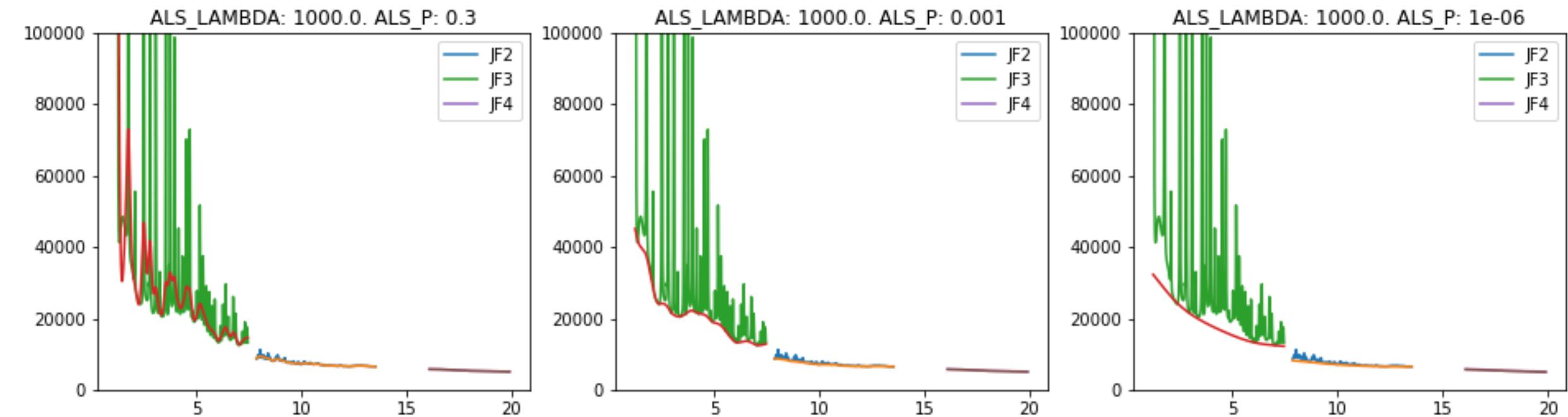
ALS_LAMBDA

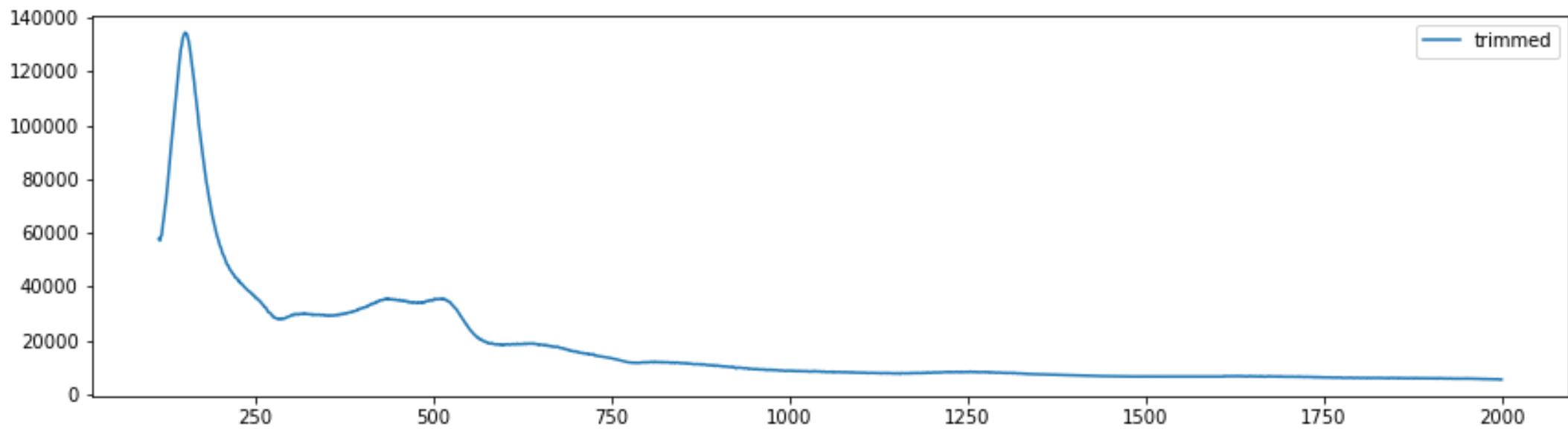
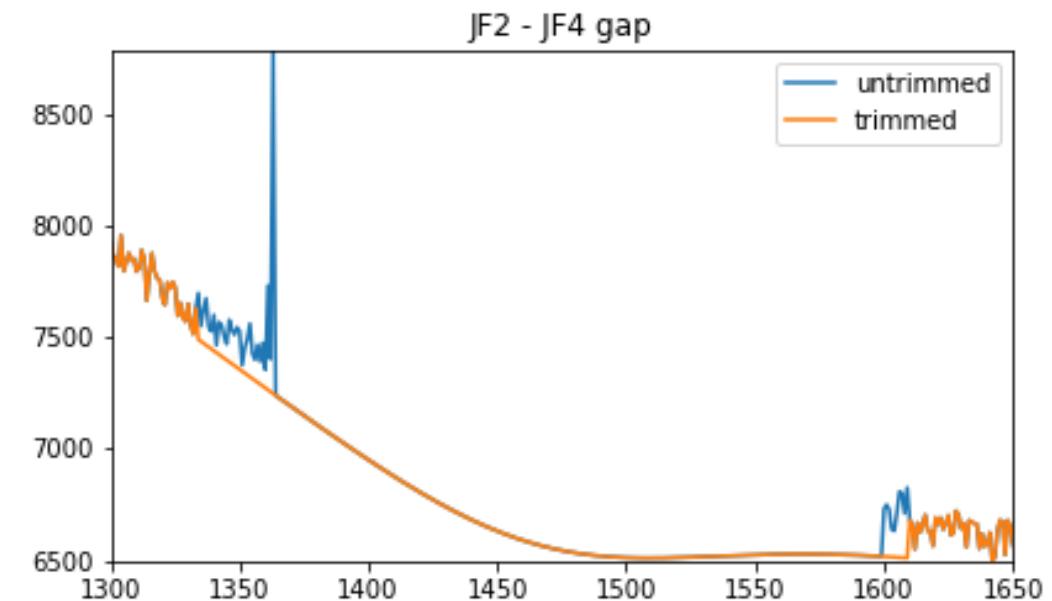
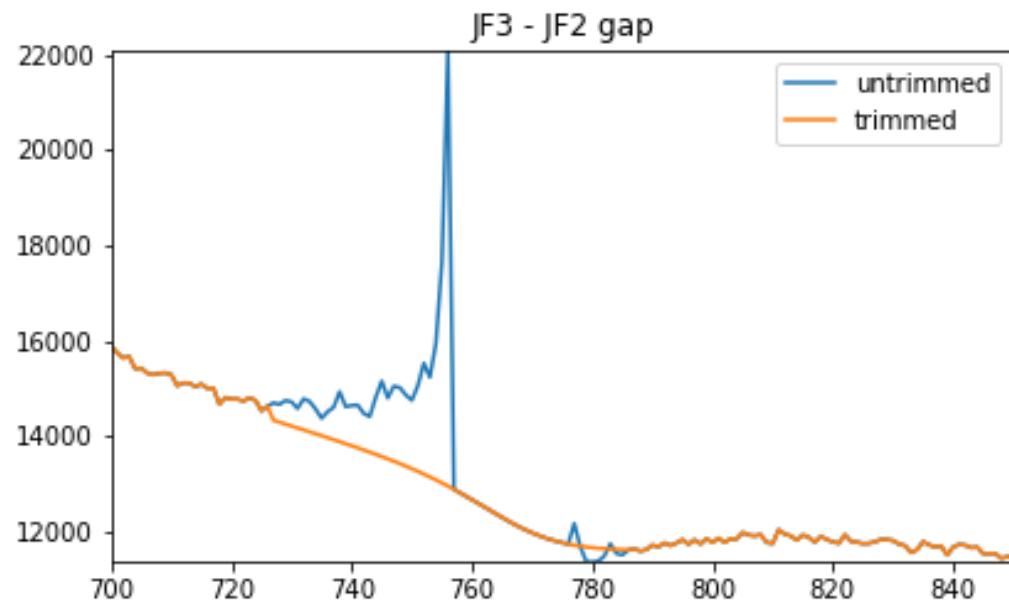


ALS_P



ALS_P





Other things that could potentially be worth thinking about

- Adding JF5 to the process
- connectivity is about to be 2FA

Improvements for next time?

- Quicker 2D feedback
- Better use of DAMNIT

Single Crystal?

C1L3 - 50um PP + 50um Si -- 10% transmission - try to see if we have TDS

