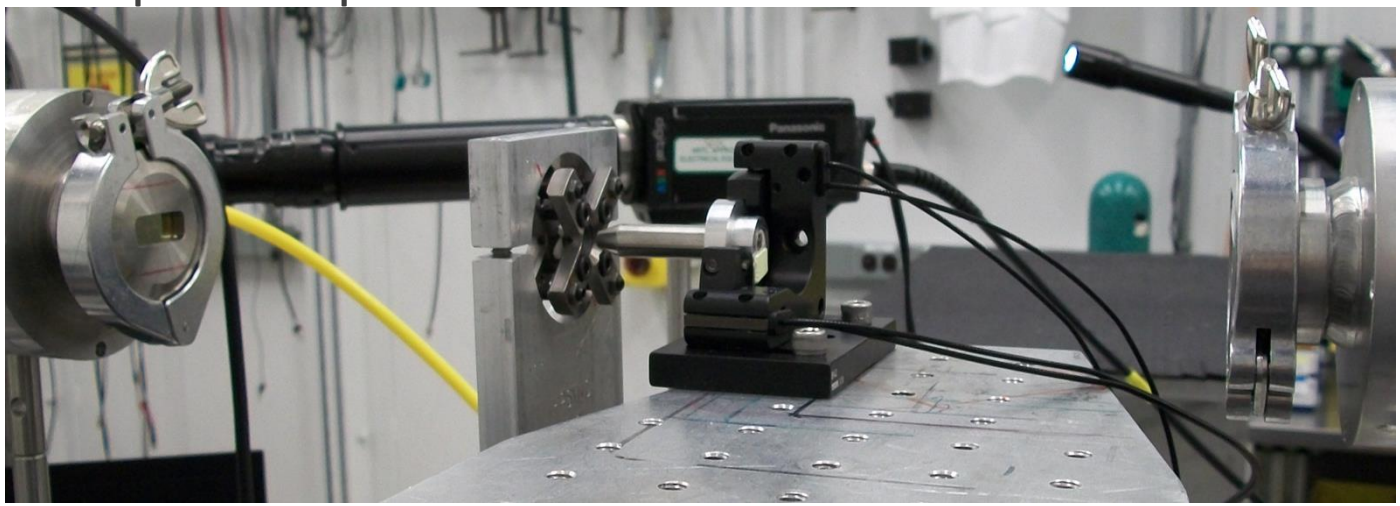
Recent additions to the focusing options at Sector 20

- Polycapillary focusing for DAC experiments
- Combining our toroidal mirrors with KB mirrors
- New experimental station for 20-ID-C

Polycapillary focusing for DAC's

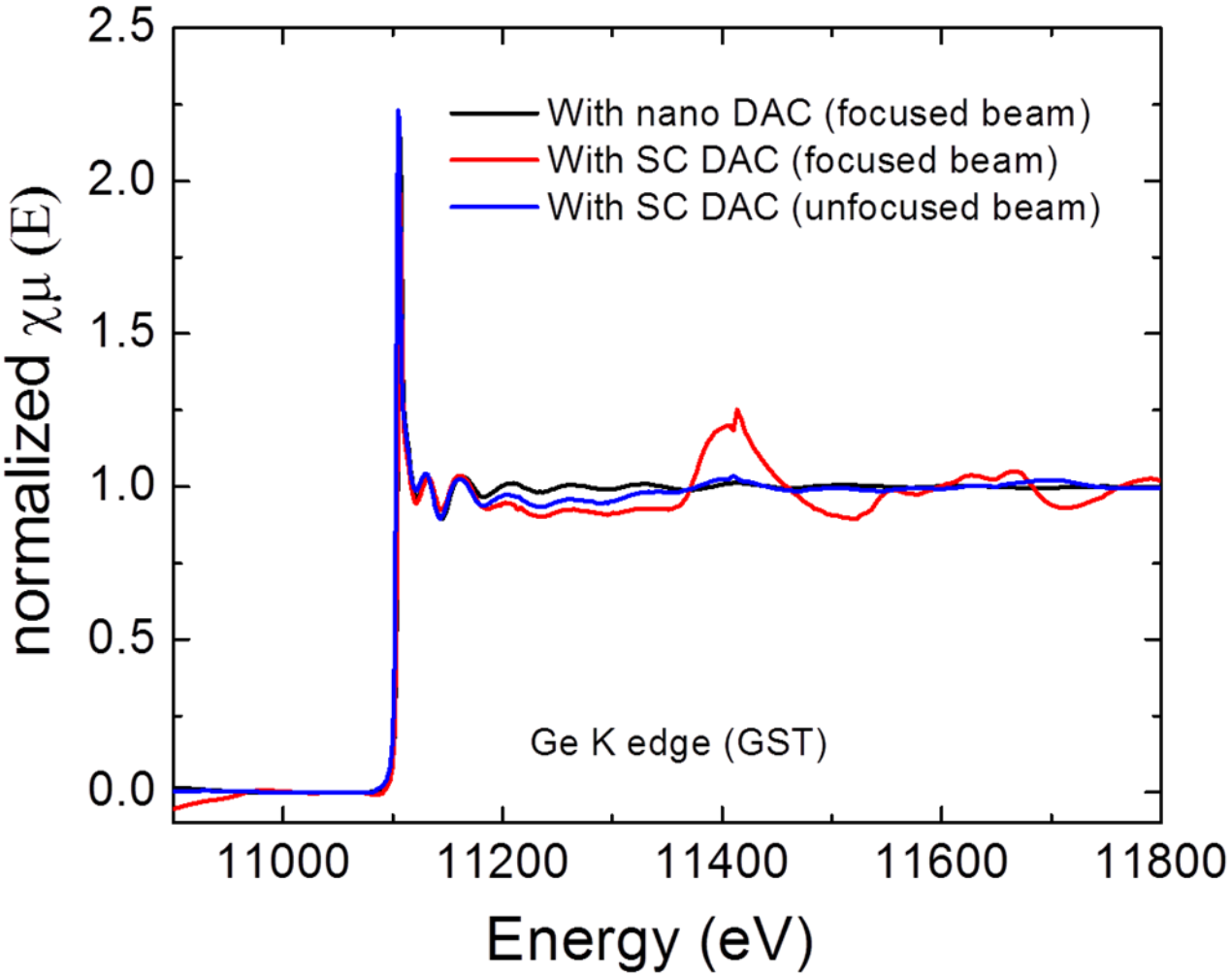
Simple setup



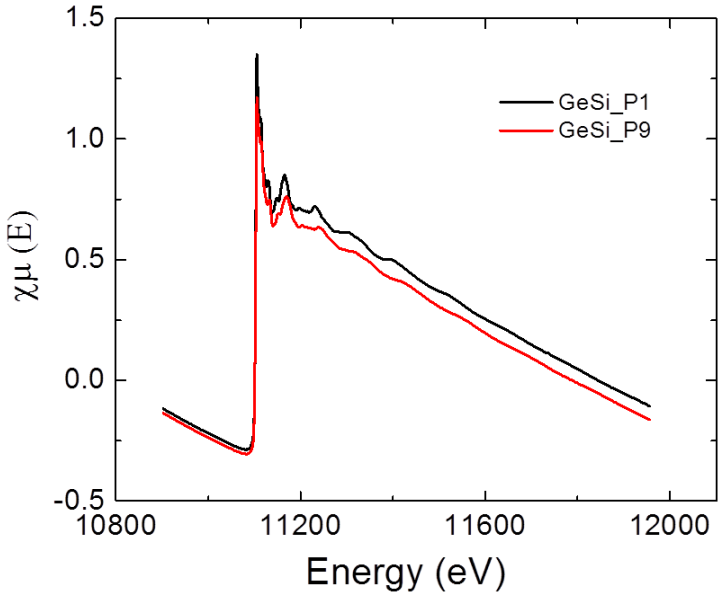
I DAC Polycap with angle alignment stage I_0

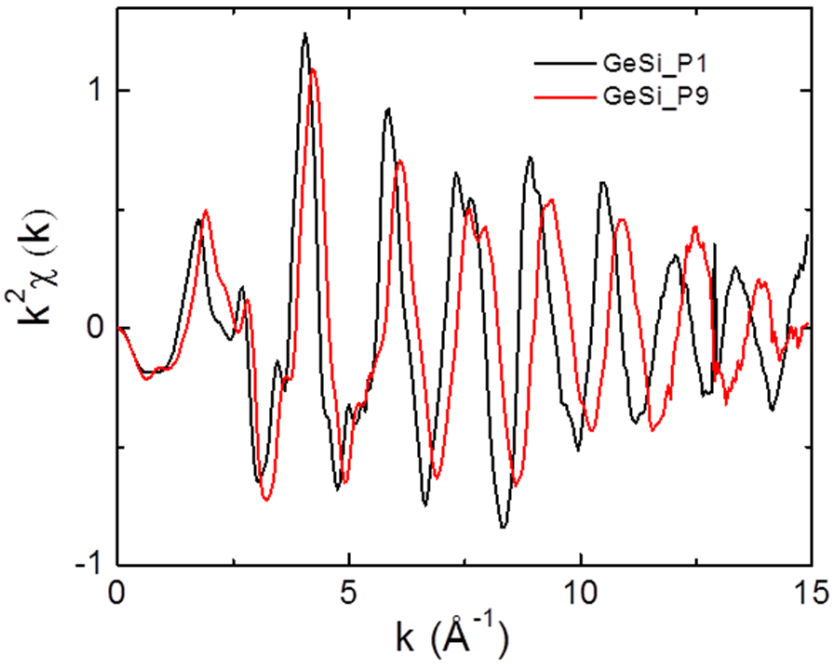
Working distance: 10 mm
Focal spot: 25 micron
Efficiency(8 keV): 30% (higher along central axis)
Divergence angle: up to 15°

Polycapillary focusing for DAC's – results

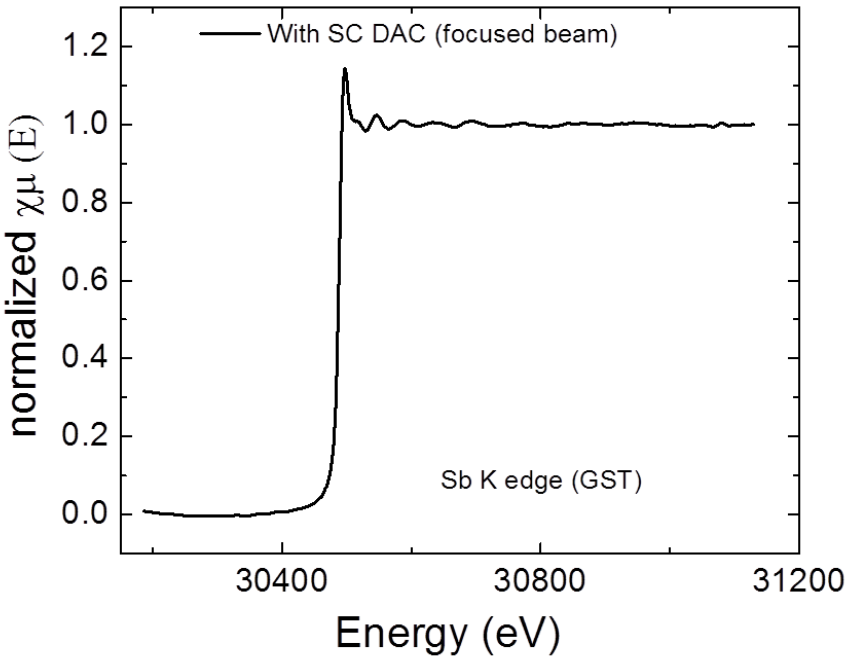


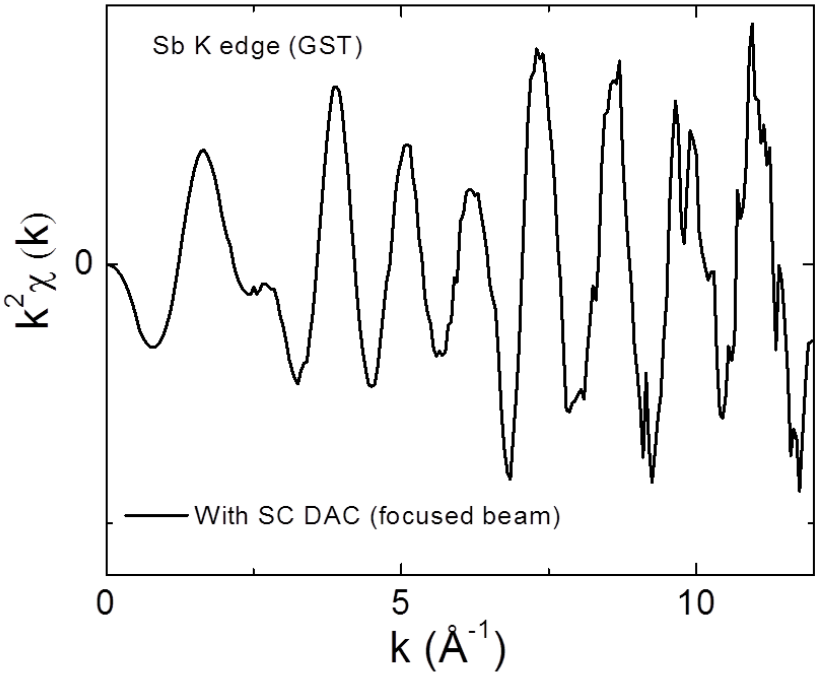
Polycapillary focusing for DAC's - results



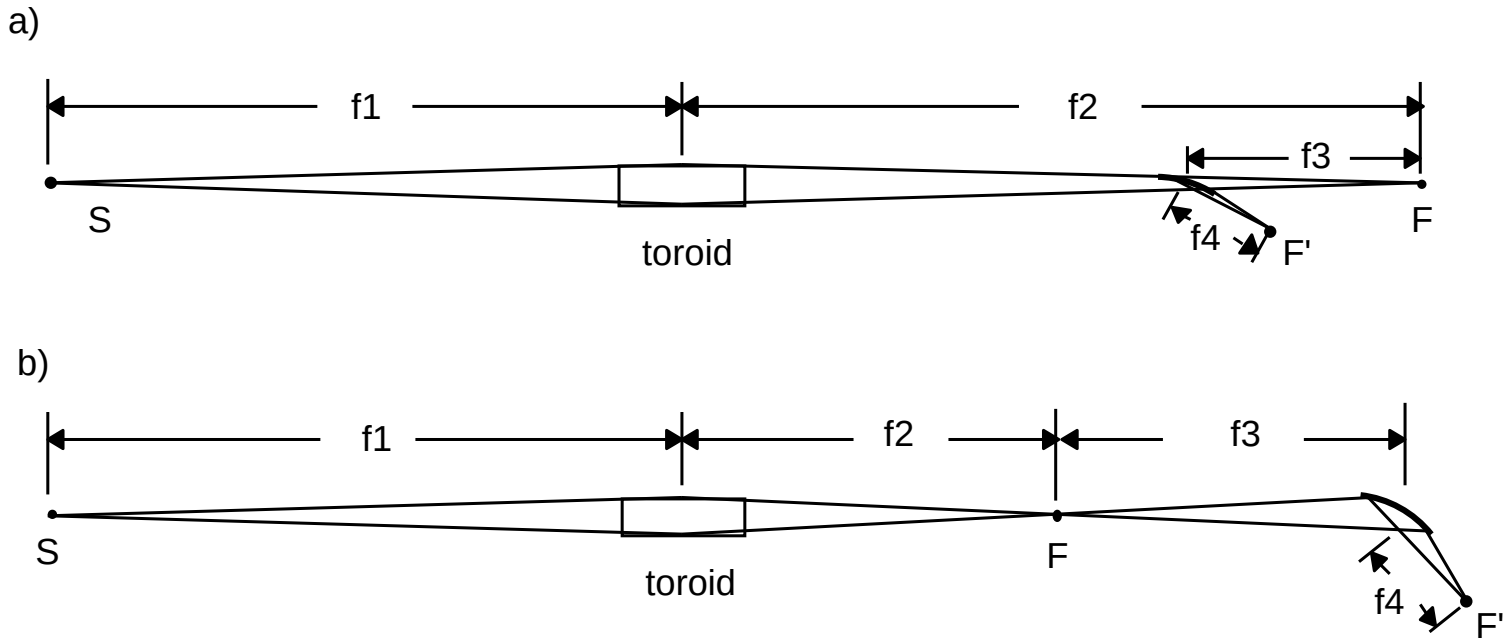


Polycapillary focusing for DAC's – results at high E





Intermediate focal point

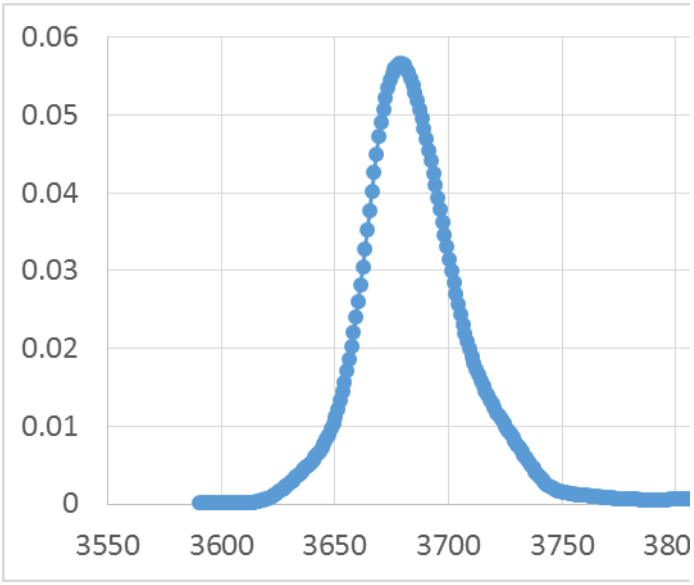


What happens if intermediate focus is at the KB mirrors (f3 = 0)?

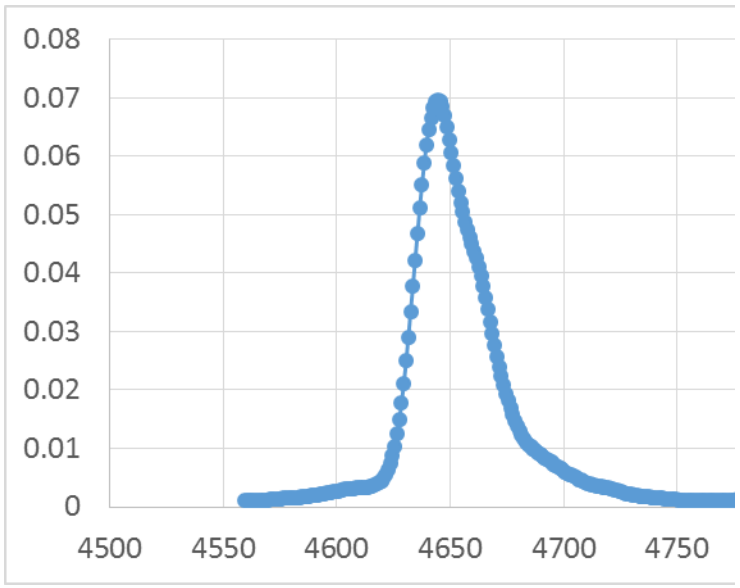
Knife edge scans - BM source

- 0.5 mrad horizontal divergence into Toroidal mirror
- 300 mm KB mirrors
- Working distance 250mm
- Flux at 12 keV – 1.2×10^{10}

Hor. FWHM: 40 µm

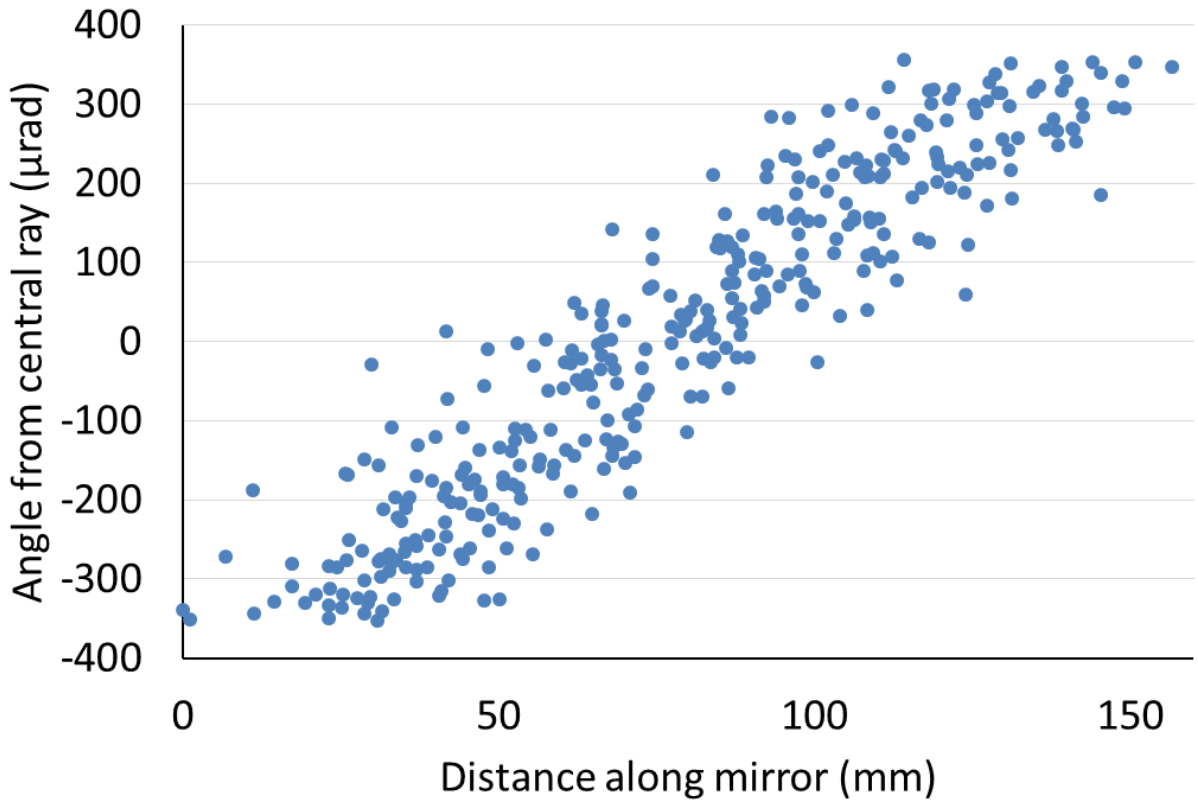


Vert. FWHM: 35 µm



Why does this work?

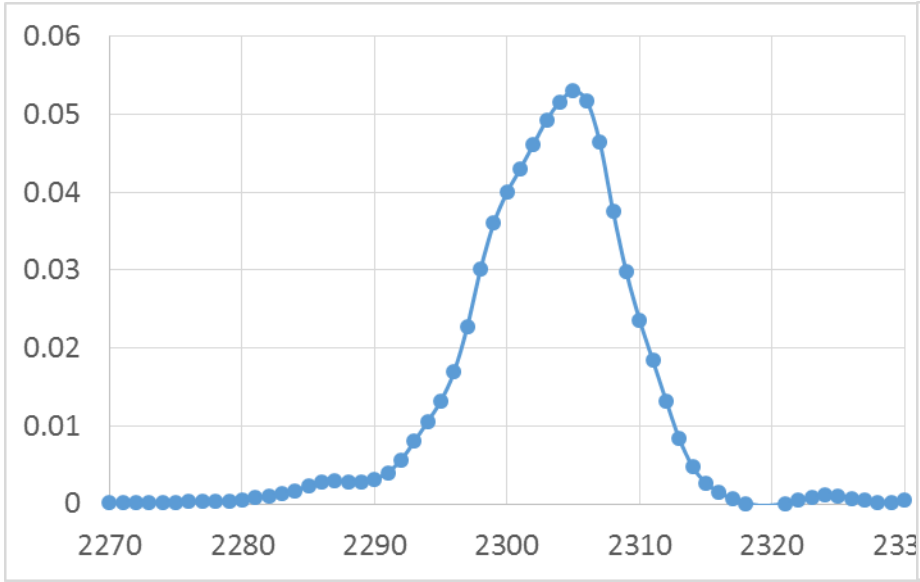
There is still a correlation of the position on the KB mirror and angle of the rays



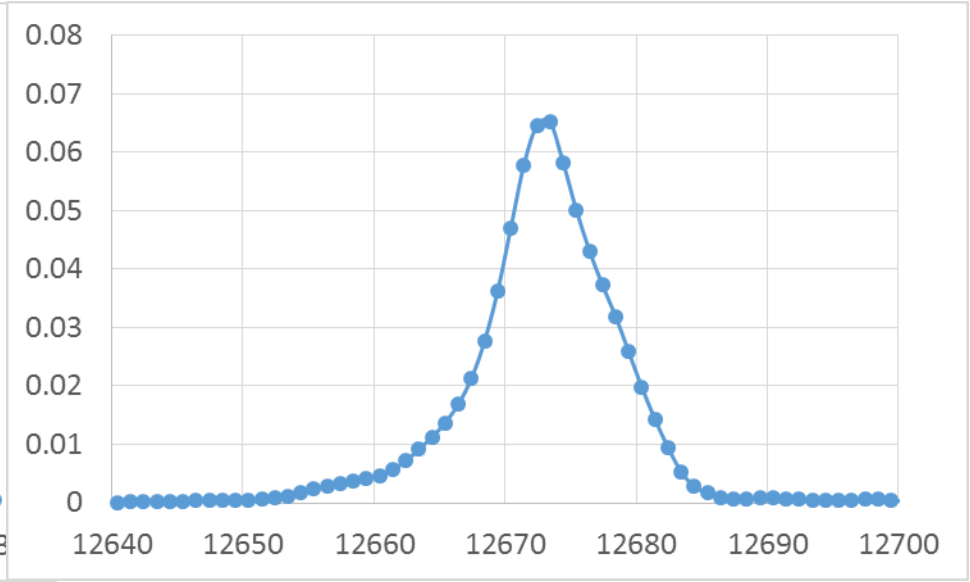
Knife edge scans - ID source

- Toroidal mirror ~1:1 focusing
- 200 mm KB mirrors
- Working distance 430 mm
- Flux at 9 keV – 3.5×10^{12}

Hor. FWHM: 13 μm



Vert. FWHM: 10 μm



New 20-ID-C station

- Set up for experiments needing smaller beams with high flux
  - High Pressure cells
  - MiniXS emission spectroscopy
  - Non-standard XAFS needing high brilliance (can be set up with 20-ID-B operating)