

BL practice@BL37XU

X-ray fluorescence analysis using microfocusing optics

BL37XU is a hard X-ray undulator beamline that is mainly used for studies of X-ray micro-spectrochemical analysis such as XRF imaging, XAFS, TXRF and XRF holography. This beamline has two branches of the standard undulator-beamline optics branch (branch A) and newly designed high-energy branch (branch B). For standard branch (branch A), both experimental hutches (EH) 1 and 2 can be used.

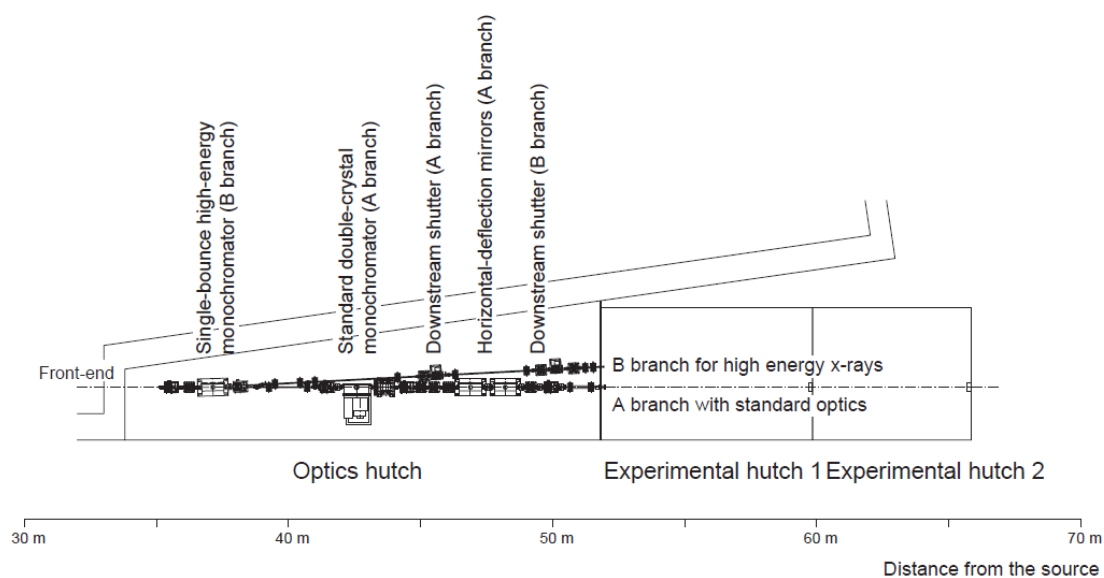


Fig.1. The schematic view of the beamline

Practice: Evaluation of microfocusing at high-energy X-ray region

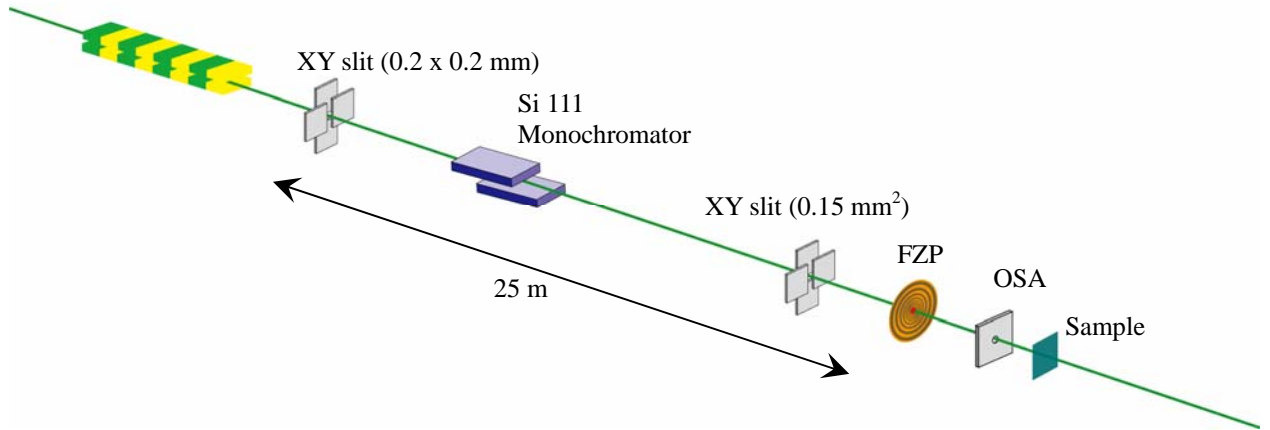


Fig. 2 A schematic of experimental setup for FZP optics.

Calculate the focal length and the expected beam size !!

- Focal length (cm) = (diameter)*(outermost zone width) / (wavelength)
- Source size= 0.2 mm, distance from the source to FZP= 25 m,

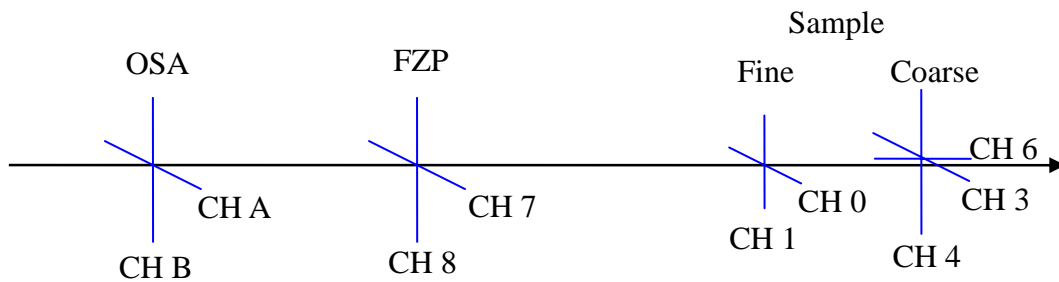


Fig. 3 Pulse motor axis assignment.

- Changing the energy and tuning @ 20.5keV
- Alignment OSA and FZP using X-ray
- Finding focal point by Ta knife edge scan
- μ -XANES measurement of Mo foil by transmittance mode

Specification of Fresnel zone plate

Diameter: 125 μm , Designed focal Length: 200 mm at 8 keV,

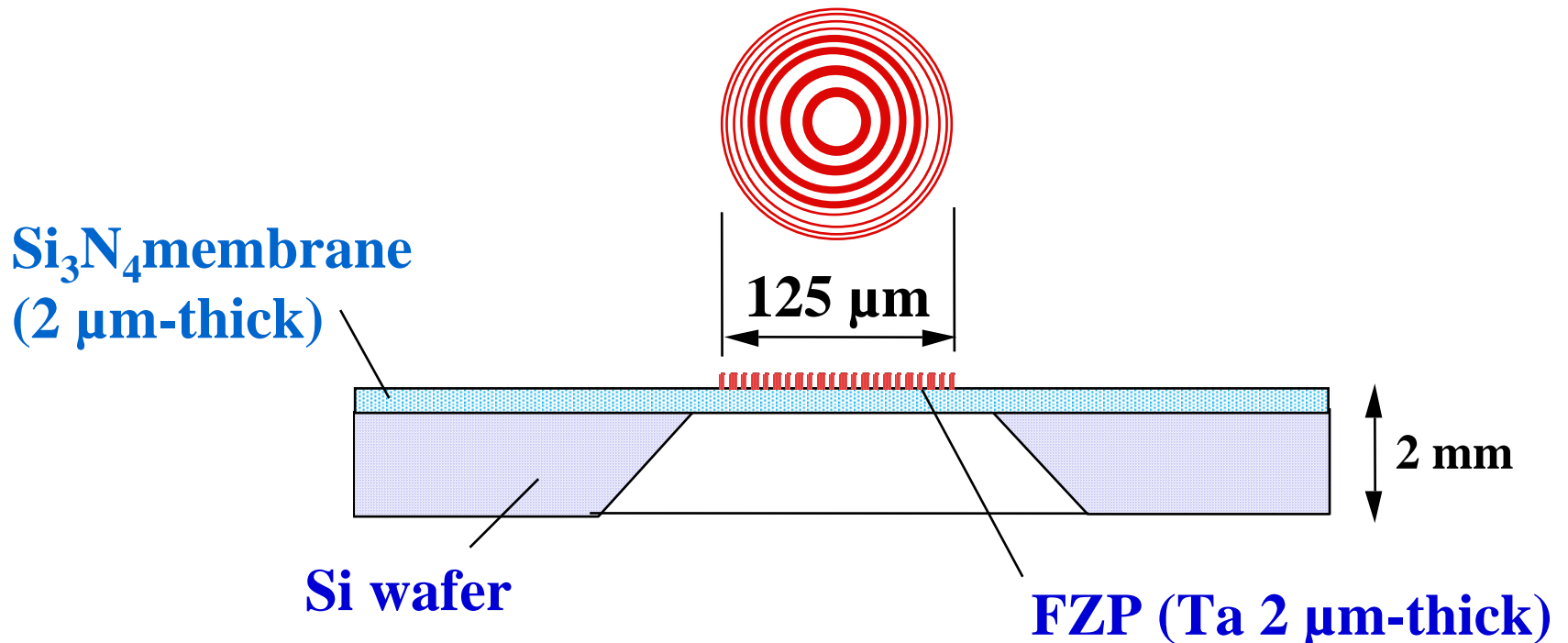
Outermost zone width (d_N): 0.25 μm .

Diffraction limit ($=1.22d_N$): 0.30 μm

Zone material: Ta, 2 μm -thick,

Supporting membrane: Si_3N_4 , 2 μm -thick.

Fabrication method: electron-beam lithography technique at NTT-AT



Schematic Drawing of Zone Plate Structure