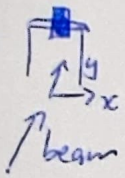
Crystal alignment @ QM2

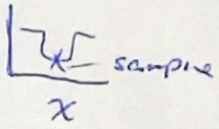
- axis need to be decoupled. (x, y does not depend on each other x, y movement ⊥ to each other)

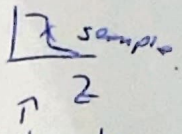
with only 90° ϕ rotation

- using beam to align.



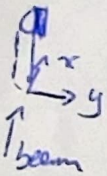
- Set x ⊥ to beam
- lap z & x to find sample.





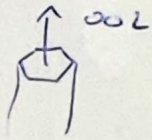
When beam decreased by ½.

- rotate phi by 90°
- Set y ⊥ to beam
- lap z & y to find sample.

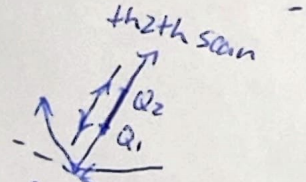


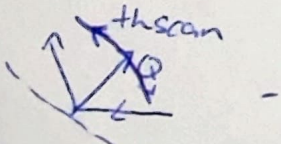
- Define lattice parameter (setlat)

Define orientation matrix, use CIO as example.



- Go to a know plane. (hkl) 00L
  - move tth to corresponding hkl (002)
  - move th to $(\frac{tth}{2})$
  - If you have an area detector, then see if you can see a peak.
    - If yes, move the peak to the detector center (ROI) by chi, tth, or th.
    - If not, tw th and/or chi
  - optimize peak
    - lup th, tth, chi, phi (might fix 1 DoF, 4 is redundent) do it iteratively
    - th2th scan (fix $\bar{Q}$ direction, move along same $\bar{Q}$)
      - check crystal quality. d-spacing. (lattice parameter)
    - hkl scan
      - check quality of crystal (grains)
  - Set or o.

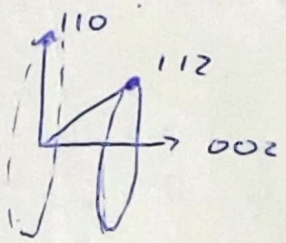




Note: choice of or - Strong I peak
- high angle peak is better

- With full rotation, define ori as a hkl ⊥ to oro
  - move χ 90°
  - move tth, and th = $\frac{tth}{2}$ to ori hkl
  - rotate around ϕ, you should see it on area detector.

- No full rotation, (fake ori method)
  - Onsim,
  - unvr chi or th by 90°
  - ca ori hkl to get tth. ca 1 1 0
  - wan tth $\frac{tth}{2}$
  - Set ori with new tth $\frac{tth}{2}$ chi phi.
  - off sim.
  - ca an accessible hkl (1 1 2)
  - ~~wan tth $\frac{tth}{2}$~~
  - ubr 1 1 2
  - move phi to find the peak.



Note: If the peak is too far off in wh, then it is probably wrong.

- Set as ori

Change lattice parameters st. oro and ori give very close numbers in hkl.

- check at least 3 points Not in the direction of ors to see if you identified or correctly.