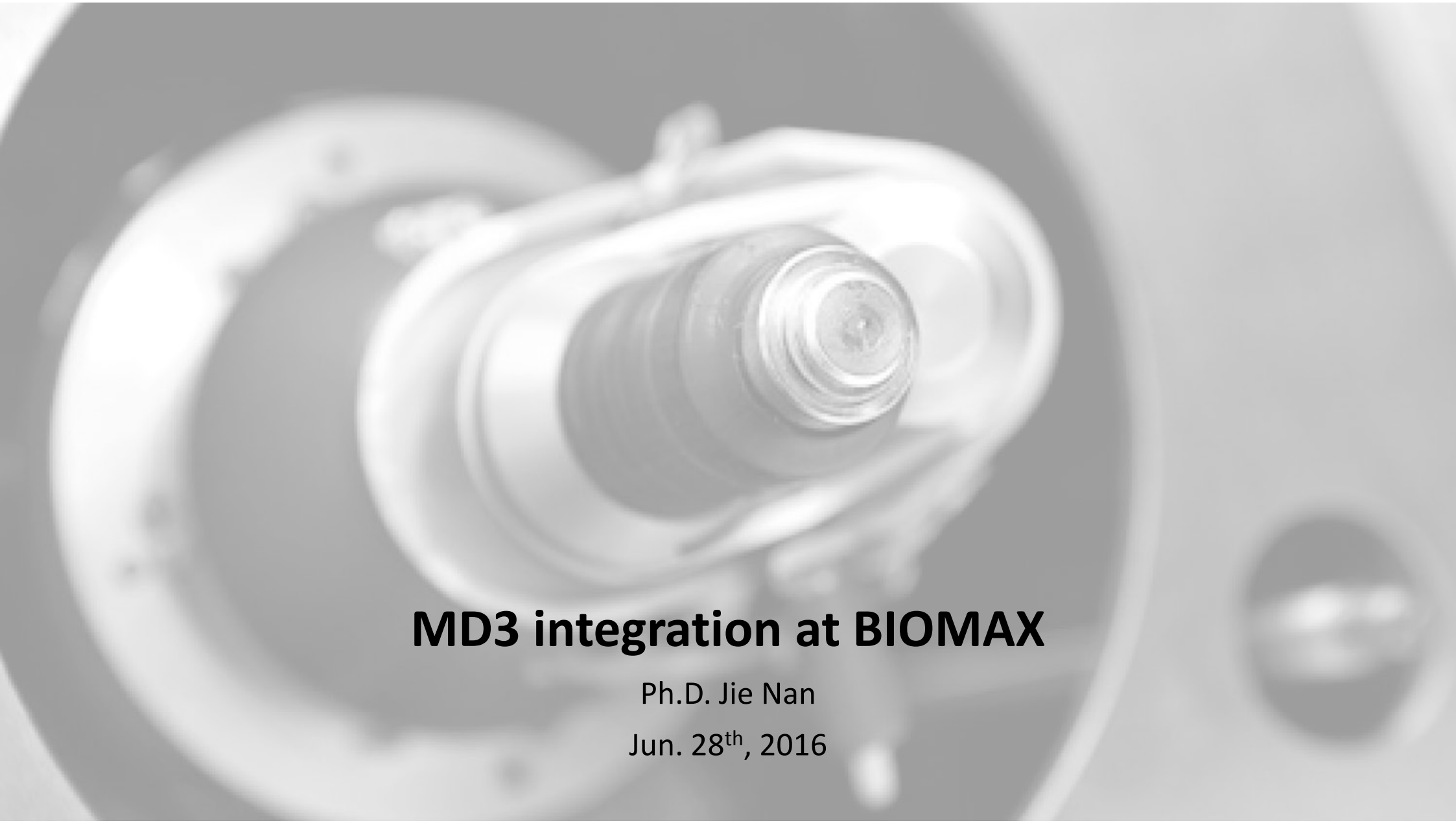
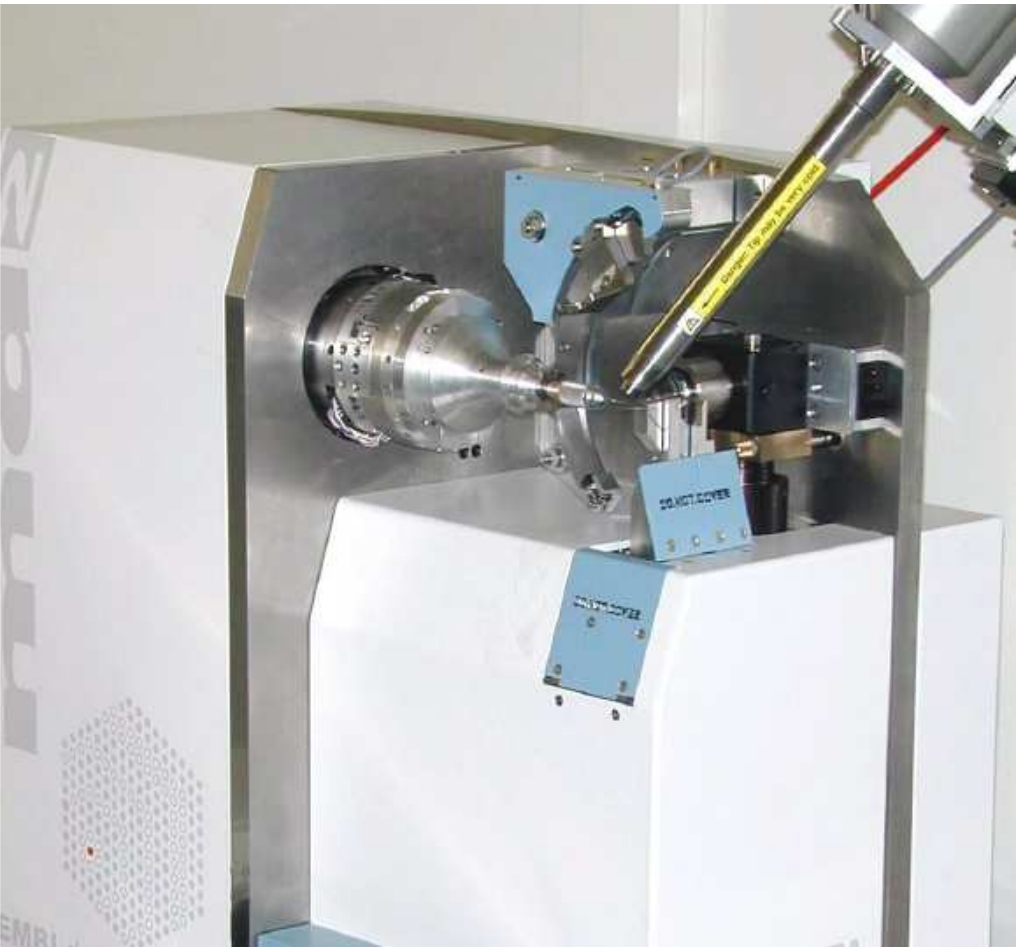


MD3 integration at BIOMAX

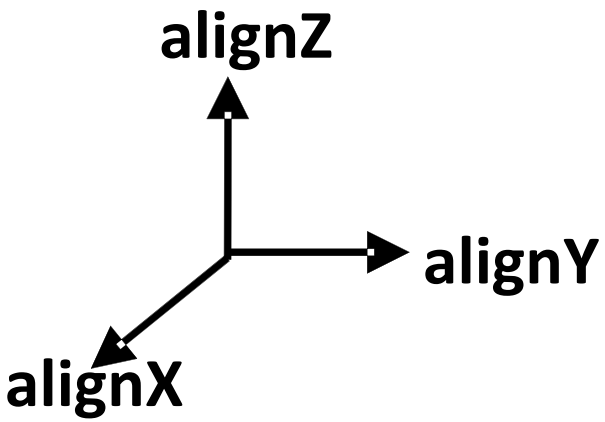
Ph.D. Jie Nan

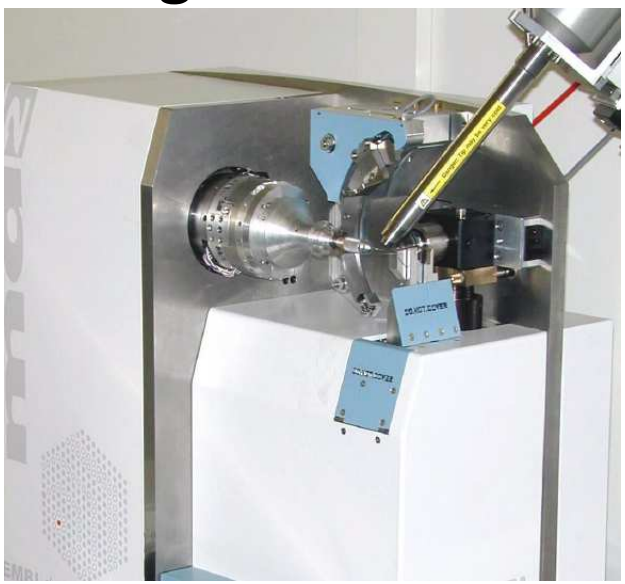
Jun. 28th, 2016

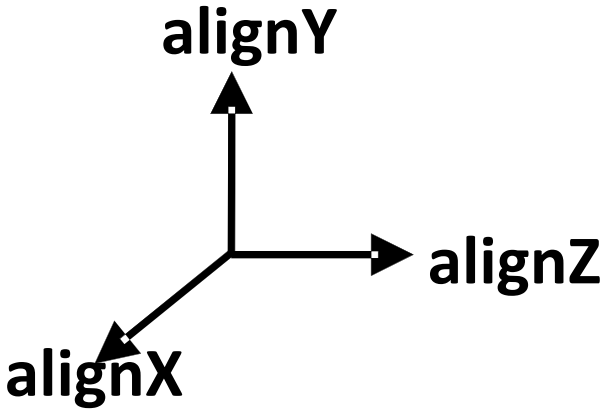
MD2



MD3


alignZ
alignY
alignX

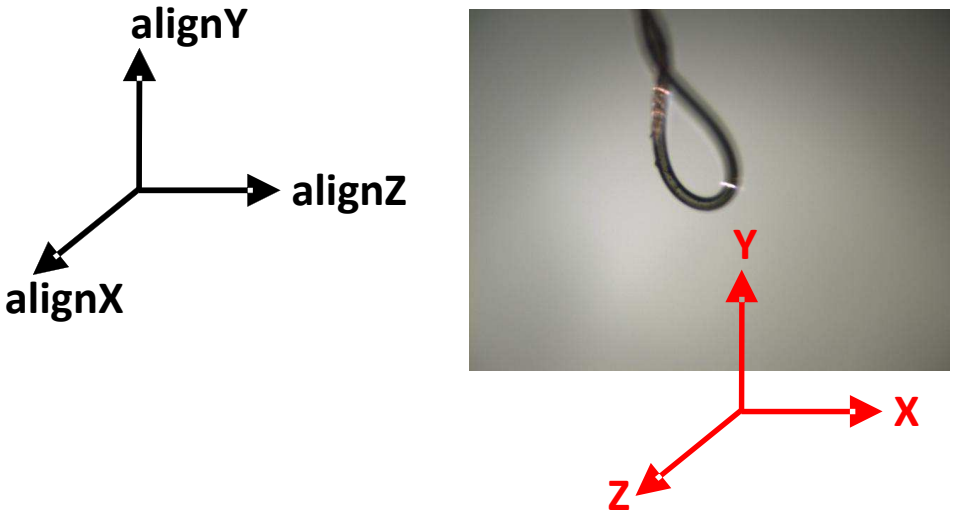



alignY
alignZ
alignX

Sample Centring

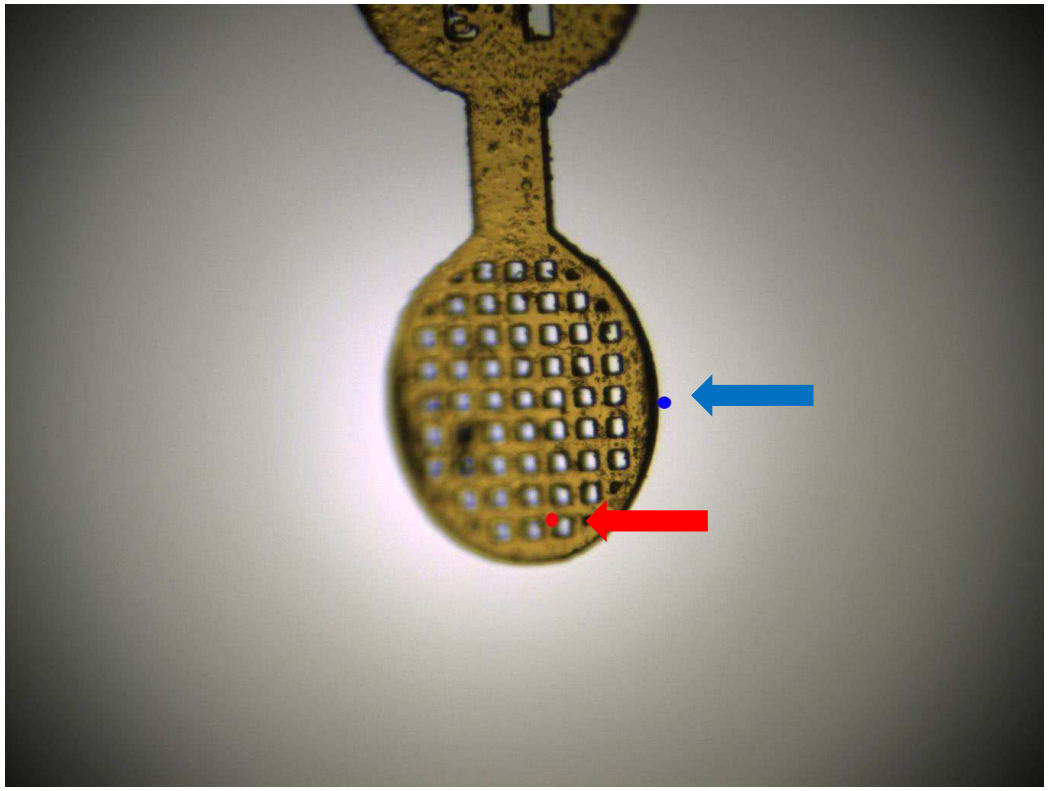
- Centring hwobj
  - sample_centring
  - centringMath

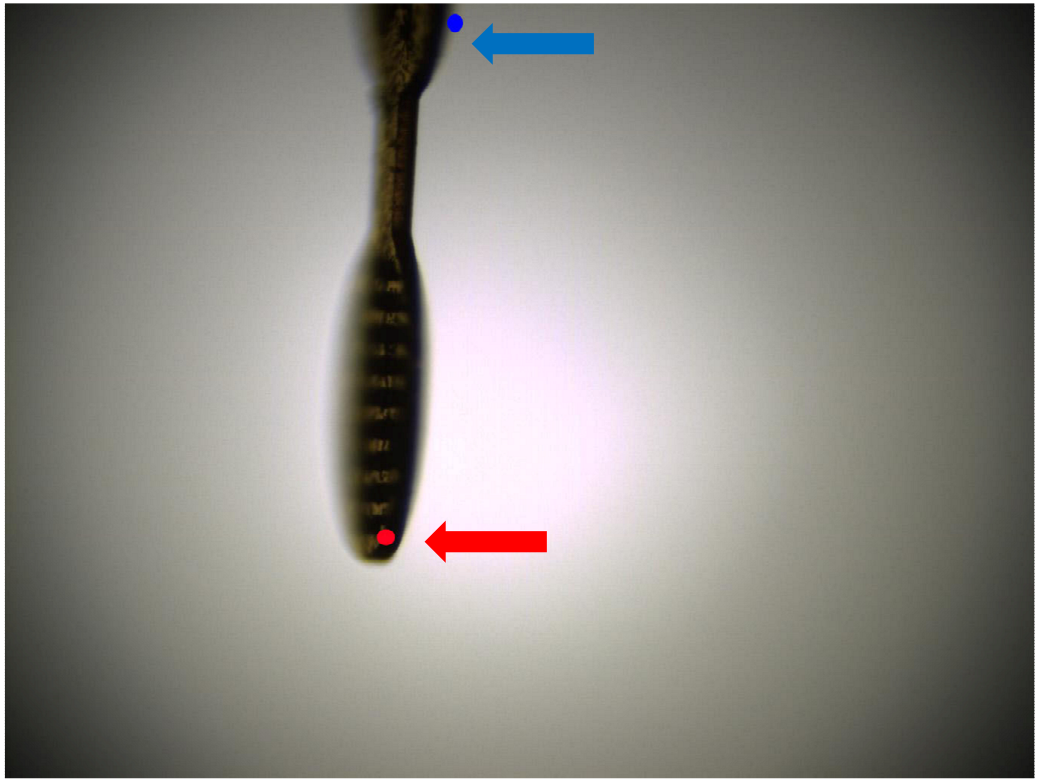
    use image coordination




```
<device class="CentringMath">
  <gonioAxes>
     <axis>
        <motorname>phiy</motorname>
        <direction>[0, 1, 0]</direction>
        <type>translation</type>
        <motorHO>/md3/udiff_phiy</motorHO>
     </axis>

     <axis>
        <motorname>phiz</motorname>
        <direction>[1, 0, 0]</direction>
        <type>translation</type>
        <motorHO>/md3/udiff_phiz</motorHO>
     </axis>

     <axis>
        <motorname>phi</motorname>
        <direction>[0, -1, 0]</direction>
        <type>rotation</type>
        <motorHO>/md3/udiff_omega</motorHO>
     </axis>

     <axis>
        <motorname>sampx</motorname>
        <direction>[0,0,1]</direction>
        <type>translation</type>
        <motorHO>/md3/udiff_sampx</motorHO>
     </axis>
```

Lucid2 with MD3 image





Lucid2 with original picture

Lucid2 with 90 rotation (CCW)

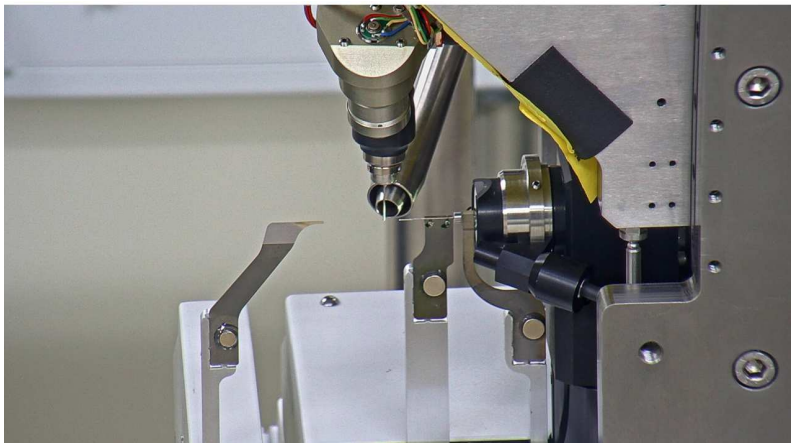
Current solution in MD3 hwobj

```
imgStr=self.camera.get_snapshot_img_str()
image = Image.open(io.BytesIO(imgStr))
try:
    img = np.array(image)
    img_rot = np.rot90(img,1)
    info, y, x = lucid.find_loop(np.array(img_rot,order='C'),IterationClosing=6)
    x = self.camera.getWidth() - x
except:
    return -1,-1, 0
if info == "Coord":
    surface_score = 10
    return x, y, surface_score
```

def find_loop(input_data,IterationClosing=6, loopOrientation=(0, -1,0))

Backlight at DataCollection Phase

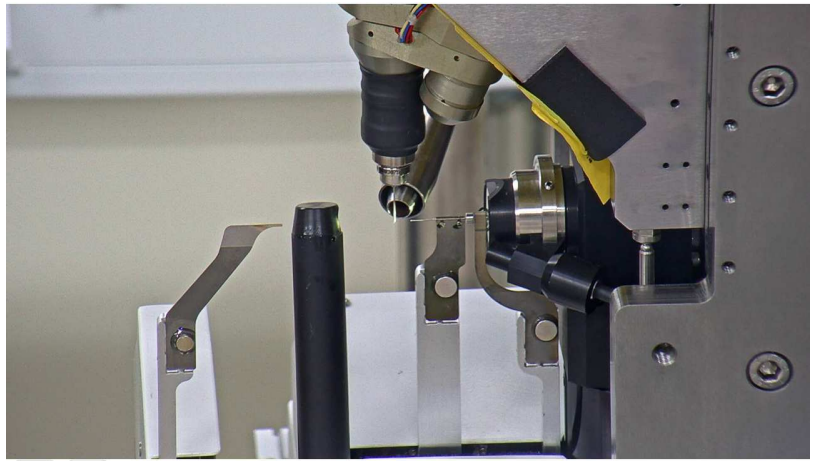
- Four phases, SampleTransfer, **Centring, DataCollection**, BeamLocation
- After Data collection, what to do for Centring !?
- Backlight is not available at data collection phase
- Centring → Data Collection phase, 7 s
- Data Collection Phase → Centring phase, 10s
- No backlight due to anti-collision interlock



Data Collection phase, beam_x 20 mm

Backlight at DataCollection Phase

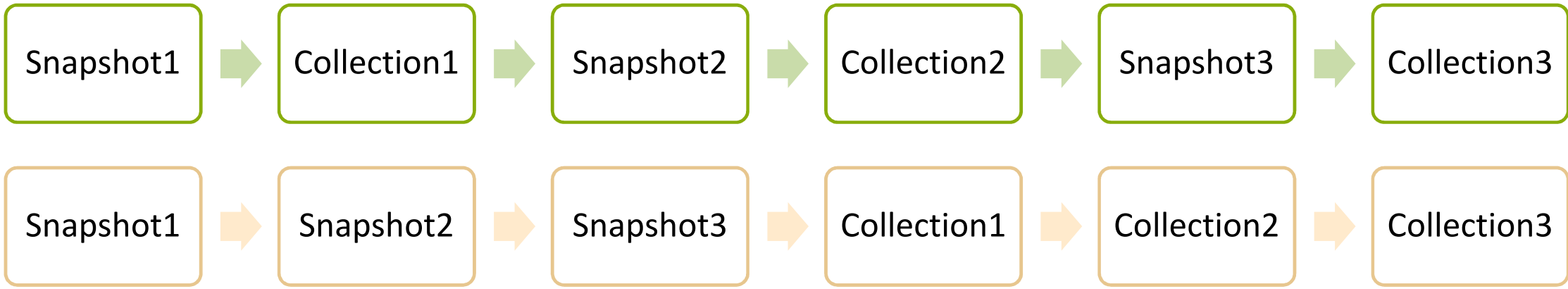
- Four phases, SampleTransfer, **Centring, DataCollection**, BeamLocation
- After Data collection, what to do for Centring !?
- Backlight is not available at data collection phase
- Centring → Data Collection phase, 7 s
- Data Collection Phase → Centring phase, 10s
- Due to anti-collision interlock, beam_x 37 mm, current set is 20mm



Data Collection phase, beam_x 37 mm

Possible approaches for optimization

- Taking snapshots before all data collection
- Moving away the beamstop and remain in the DataCollection phase
- In MD3, optimization of MD3 phase change !?



Thanks for your attention!

Questions?