

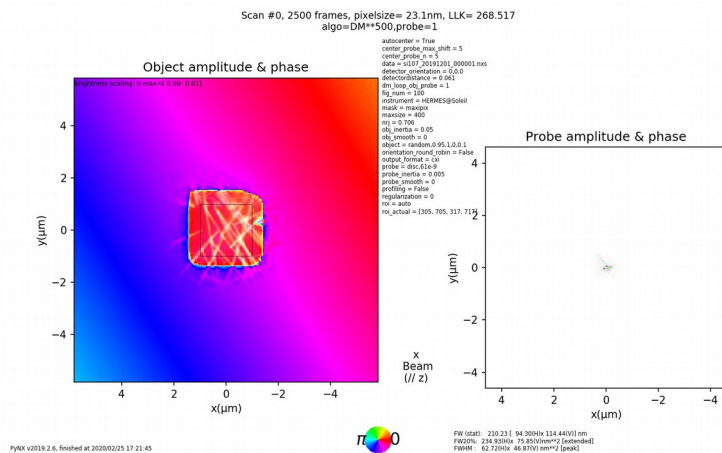
Pynx test: 26.02.2020 – Jaianth Vijayakumar

All the tests are carried out keeping the detector distance at 61e-3 m, pixel size 11.6 e-6 m, size of the frame = 400 * 400 pixels, algorithm : DM ** 500, probe=1, beam diameter: 61 nm. Output files are located in “/home/experiences/hermes/com-hermes/Desktop/test-pynx/pynx/ptycho/scripts/ResultsScan0000” as of 26.02.2020

Test run 1 : keep parameters same and repeat reconstruction

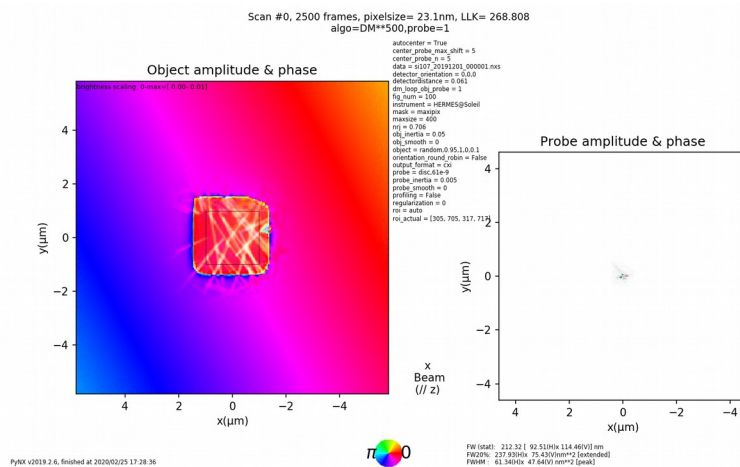
Run 112.

LLK value – 268.5



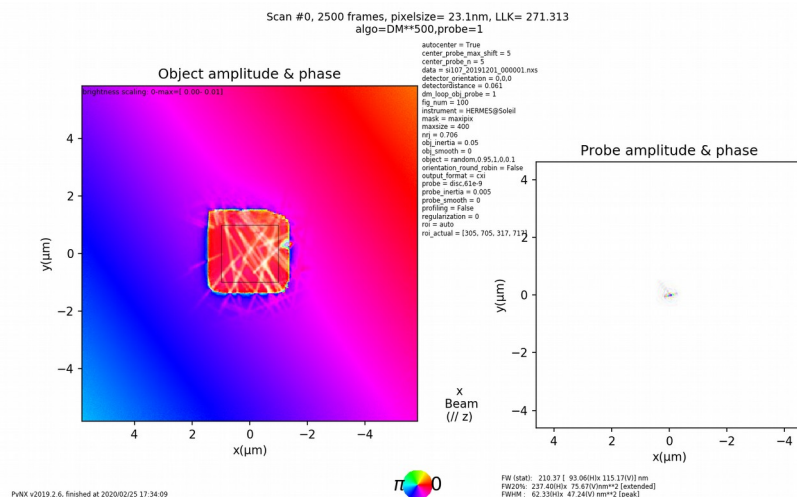
Run113.

LLK value – 268.8

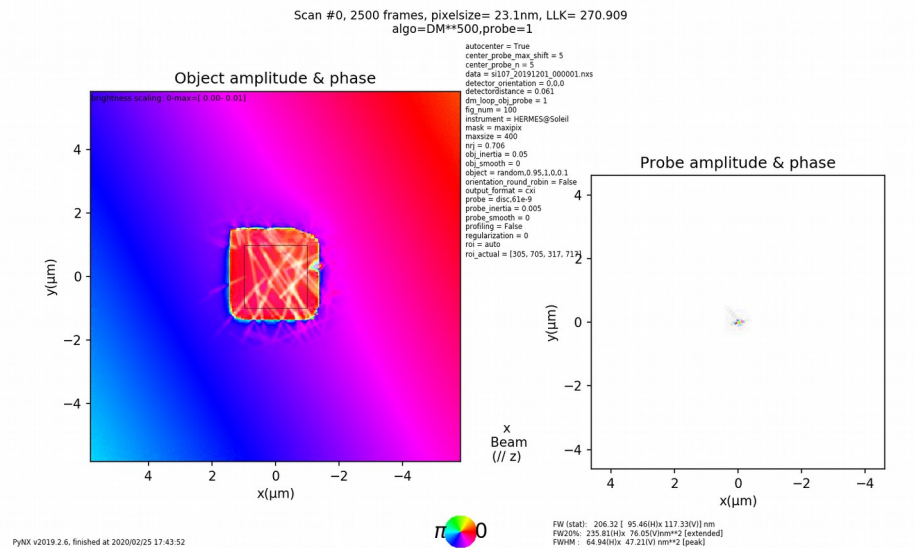


Run 114.

LLK value – 271.3

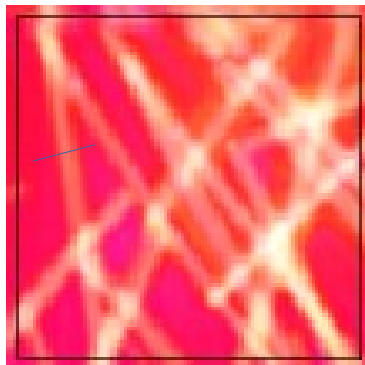


Run 115.
LLK value – 270.9



Intensity chang with runs

Image no.	Intensity of back ground	Intensity on the rod	Ratio (rod/background)
112 (LLK-268.5)	116.2	155.02	1.33
113 (LLK-268.8)	116.9	153.6	1.31
114 (LLK-271.3)	115.1	153.2	1.33
115 (LLK-270.9)	116.5	153.2	1.31



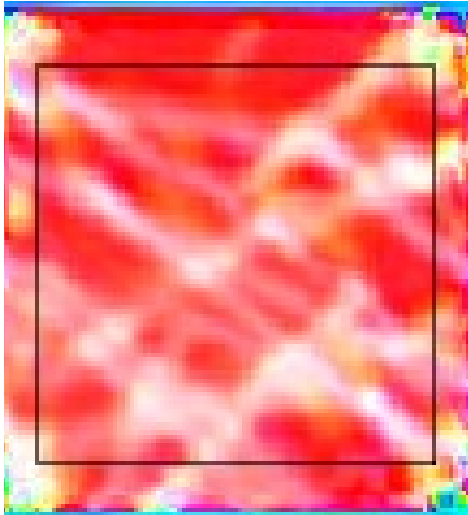
Conclusion: The intensity between background and the structure is almost same (change ~ 1%), therefore background can be subtracted for XMCD image analysis, an error bar of 1% should be mentioned in the report/manuscript.

Test run 2: Find which coordinate system works better

1. Assigning X and Y with input step size

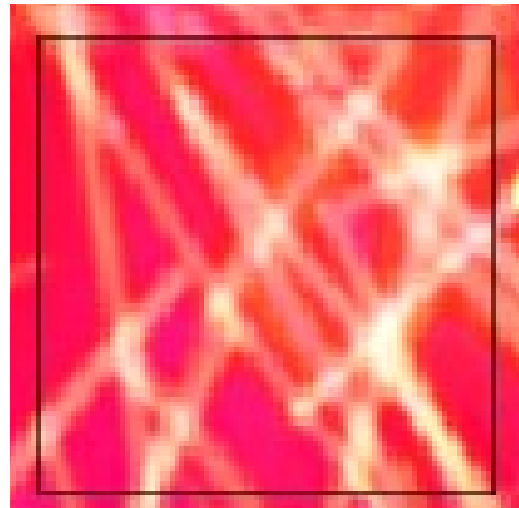
a. X= moving Y = constant (Run : No.111)

eg. (0,0), (1,0) (2,0).....(0,1),(1,1),(2,1)....



b. X= constant first Y = moving (Run. No 110)

eg. (0,0), (0,1) (0,1).....(1,0),(1,1),(1,2)....



2. Using coordinates given
with 50 by 50 array (Run No. 117)
hdf tree - entry1/counter0/sample_x

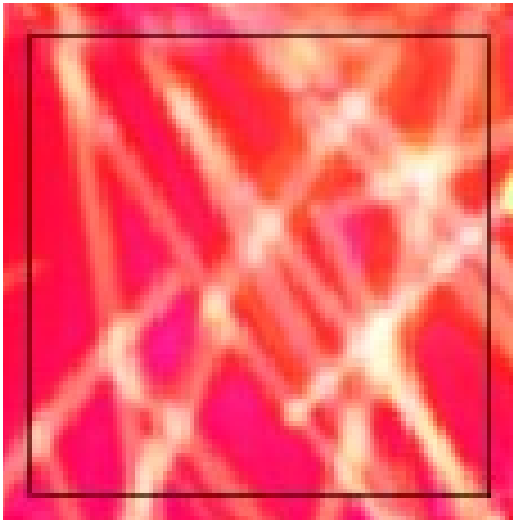


3. Using Interferometer coordinates (Run No. 118)
hdf tree - entry1/instrument/counter0/sample_x/data

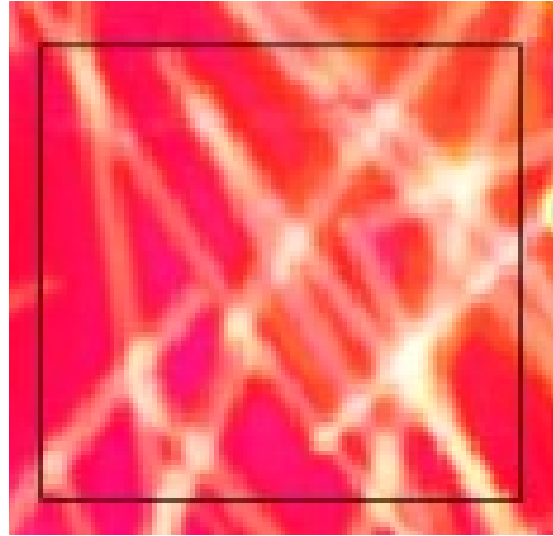


4. Exchanging X and Y

a. Using coordinates given
with 50 by 50 array (Run No. 120)



b. Using Interferometer coordinates(Run No. 119)

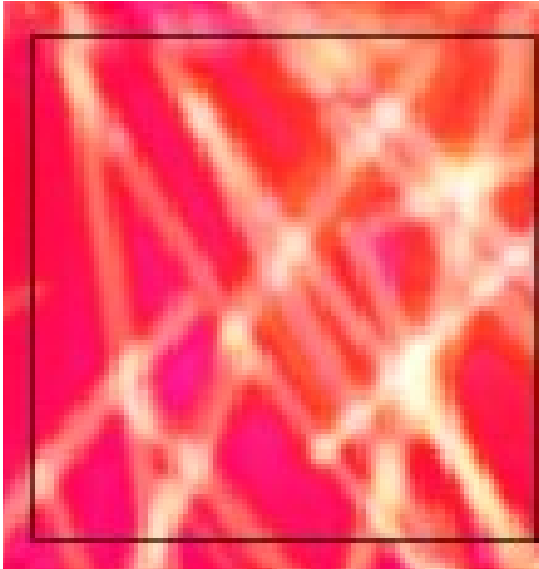


Coordinate type	LLK value
1. Input stepsize X constant,Y moving (Run 110)	273.4
2. Input stepsize X moving, Y constant (Run 111)	465.8
3. Using coordinates 50 x 50 array (Run No. 117) (x and y same as hdf file)	461.1
4. Using coordinates 50 x 50 array (Run No. 120) (x and y interchanged)	268.7
5. Using Interferometer coodinates(Run No. 118) (x and y same as hdf file)	528.8
6. Using Interferometer coodinates(Run No. 119) (x and y interchanged)	272.9

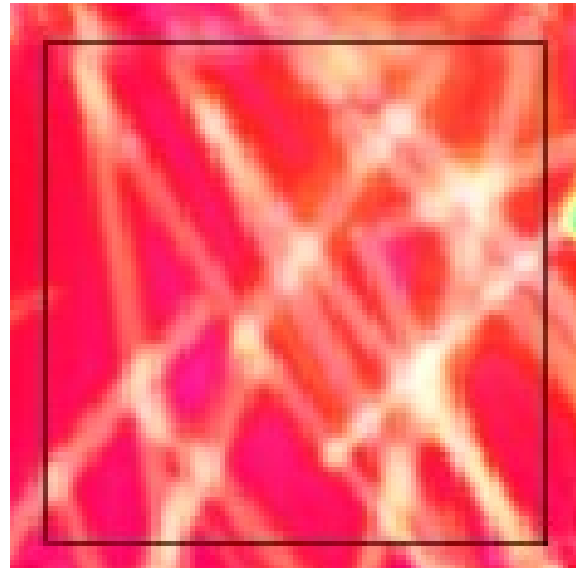
Conclusion: To have better quality image LLK has to be the lowest! Any coordinate type 1,4,6 can be used in the pre processing, based on TTK value no. 4 can be a good choice.

Test 3: Orientation of the image (diffraction pattern)

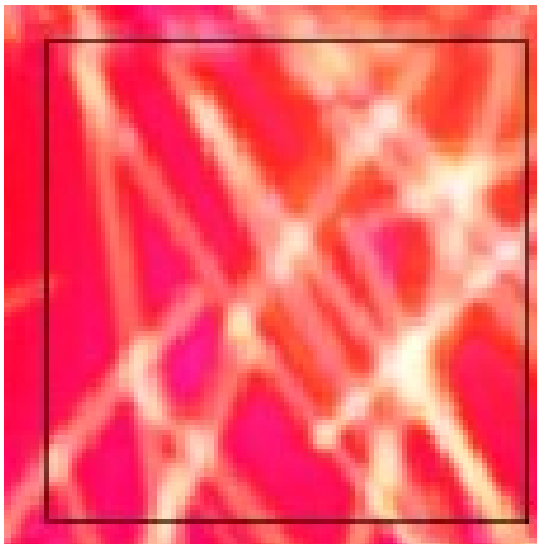
1. Without flipping up down
– rotate 270 degrees (Run: 121)
- LLK = 275.3



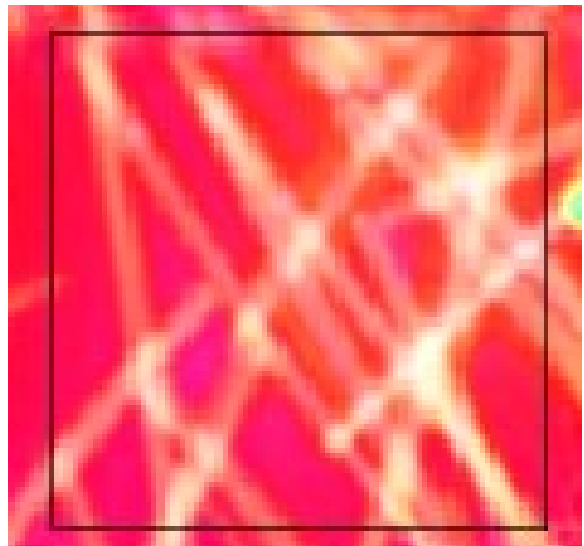
2. Without flipping up down
– rotate 180 degrees (Run: 122)
- LLK = 270.4



3. Without flipping up down
– rotate 90 degrees (Run: 123)
- LLK = 268.1



4. Without flipping up down
– rotate 0 degrees (Run: 124)
- LLK = 268.6



Conclusion: Rotating the images made no significant changes in the LLK value. The coordinate system and other physical parameters such as detector distance/ pixel size etc have some clear changes on the images and on the LLK value. In the preprocessing code we can still flipud and rotate 270 degrees to be consistent with the detector orientation.