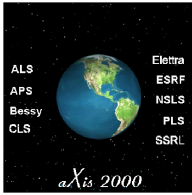


Aligning stacks

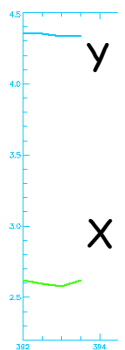
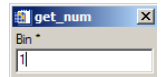
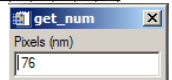
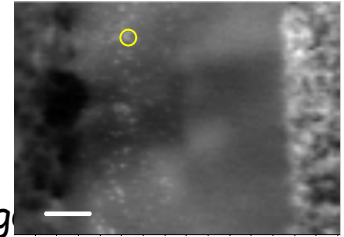
Options for aligning stacks

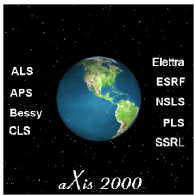
| method | Access by | Type | Comments |
|----------|--|--|---|
| Zimba | Stacks~analyze~zimba | 1-point linear shift | Many options; save the shifts ! |
| Jacobsen | Stacks~analyze~jacobsen | 1-point linear shift | Does not save the shifts ! |
| manual | Stacks~image alignment~shift | 1-point linear shift | Input:{ *###.nc}, Output: { s*###.nc} Shifts saved, but not in form to combine with preceding *.ncb file |
| manual | Stacks~image alignment ~stretch/shift | 2-point stretch & shift | Input:{ *###.nc}, Output: {t*###.nc} |
| manual | Stacks~image alignment ~stretch/warp | 4 or more point polynomial spline distrotron | |



Manual SHIFT alignment

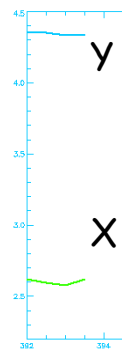
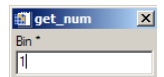
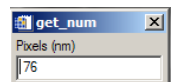
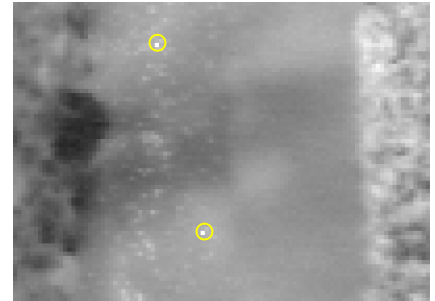
1. Convert *.ncb to set of *.nc files - must have names like 0_000.nc
stacks~analyze~axis binary
2. make sure all 9 buffers in axis2000 are empty
3. Start manual alignment routine stacks
stacks~image alignment~shift
 - 3.1 select first and last file
 - 3.2 select FIDUCIAL (1 characteristic point)
 - 3.3 Select (xmin, xmax, ymin, ymax)
in um units, so as to allow for drift of the image
(It is a good idea to pre-view to get a sense
how much to sacrifice at edges)
 - 3.4 Select pixel size (default is original)
 - 3.5 select any binning (bin-2, means 2x2 pixels -> 1)
 - 3.6 for each successive image, click on same fiducial
 - 3.7 at end, you must supply a **name**
(used for the X, and Y align files)
4. Read in the aligned a*.nc images via the **name.sl** file
stacks~analyze~axis
Do NOT select any alignment
- the a*.nc files are already trimmed
5. Write out the stack as *.ncb for further processing





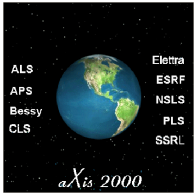
Manual STRETCH/SHIFT alignment

1. Convert *.ncb to set of *.nc files - must have names like 0_000.nc
stacks~analyze~axis binary
2. make sure all 9 buffers in axis2000 are empty
3. Start manual alignment routine stacks
stacks~image alignment~stretch/shift
 - 3.1 select first and last file
 - 3.2 select FIDUCIAL-1 (1st characteristic point)
select FIDUCIAL-2 (2nd characteristic point)
 - 3.3 Select (xmin, xmax, ymin, ymax)
in um units, so as to allow for drift of the image
(It is a good idea to pre-view to get a sense
how much to sacrifice at edges)
 - 3.4 Select pixel size (default is original)
 - 3.5 select any binning (bin-2, means 2x2 pixels -> 1)
 - 3.6 for each successive image, click on same 2 fiducials
 - 3.7 at end, you must supply a **name**
(used for the X, and Y align files)
4. Read in the aligned t*.nc images via the name.sl file
stacks~analyze~axis
Do NOT select any alignment
- the t*.nc files are already trimmed
5. Write out the stack as *.ncb for further processing



CAUTION: on the data set of interest (A101125058aoda.ncb) the shift routine is distorting the image and the stretch/shift crashes after 2 images - error message indicates it is a problem with a routine called 'make square' which is the way axis2000 deals with non-square pixels. The original data was recorded with square pixels (80x80nm)

Not sure why this is. Checked 7-mar-09 version of axis2000 - does the same thing. I will look into this



Error message from stretch/shift

```
read NSLS image from file: F:\XRM\stxm-cla\2010\10-11\11-
25\A101125058\0_002.nc
 100 x 72 pts. 0.0764 x 0.0726 um pixels. E= 393.000 eV. Dwell= 0.00 ms.
E = 393.000 eV pt-1 pt-2 x 45 33 y 16 59
XY scale: stretched by 1.000 X-shift: -0.887 Y-shift 3.139
Program caused arithmetic error: Floating illegal operand
Ilo 99 31
 data: -0.887253 3.13917
Ihi 99 71
 data: -8.45003 -2.01399
XMANAGER: Caught unexpected error from client application. Message follows...
Subscript range values of the form low:high must be >= 0, < size, with low
<= high: <No name>.
Execution halted at: MAKE_SQUARE 62 C:\axis2000\make_square.pro
                     PLOTBUF 155 C:\axis2000\plotbuf.pro
                     IMG_ALGN 292 C:\axis2000\img_algn.pro
```