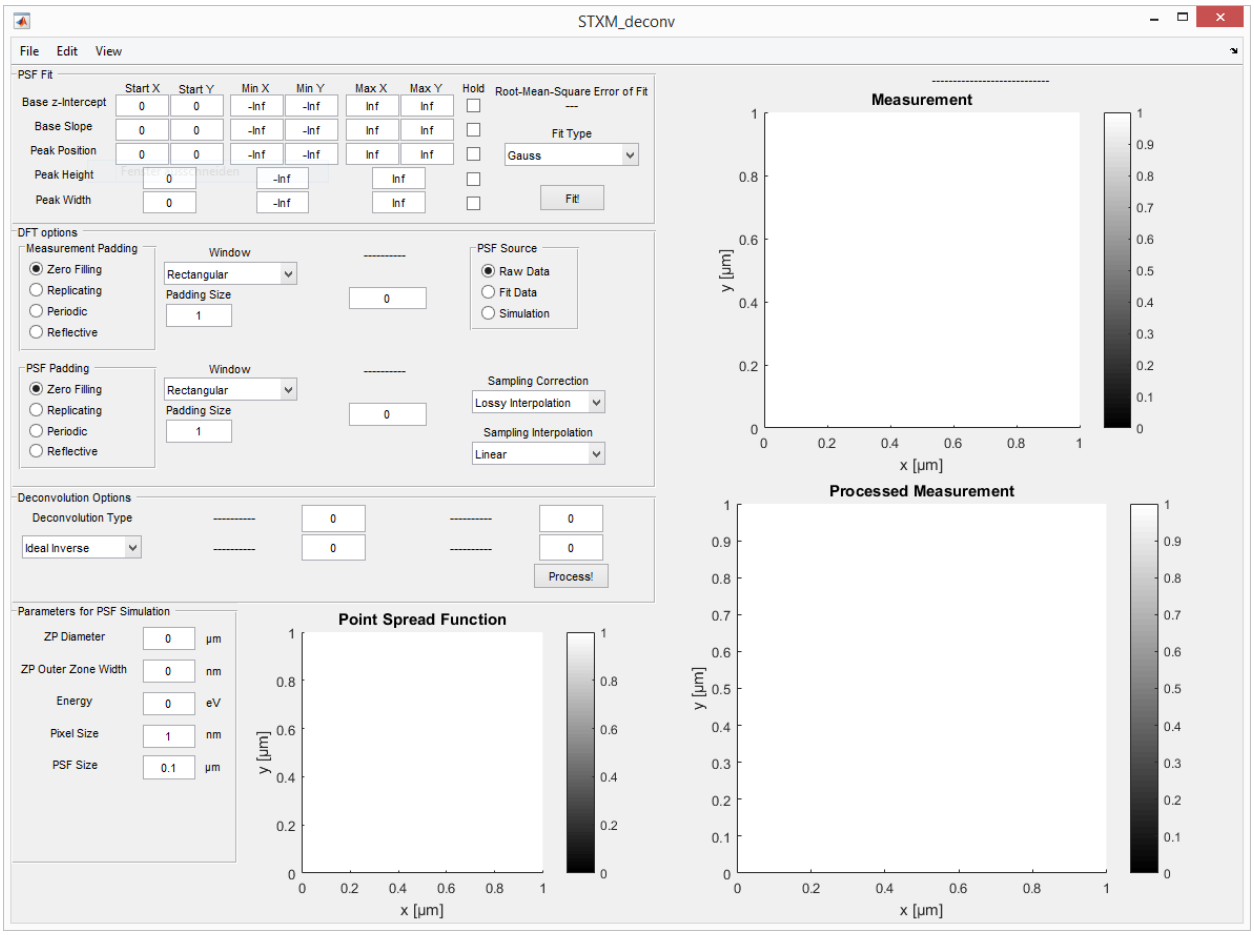
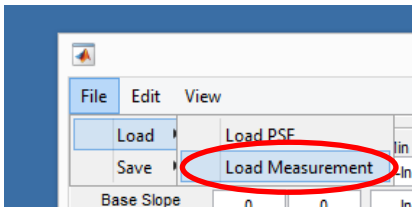
STXM_deconv – Short Tutorial

- Double click the STXM_deconv icon 

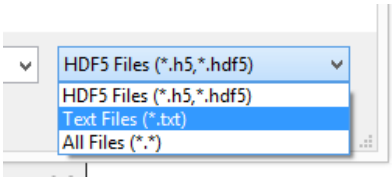
- The STXM_deconv GUI opens.



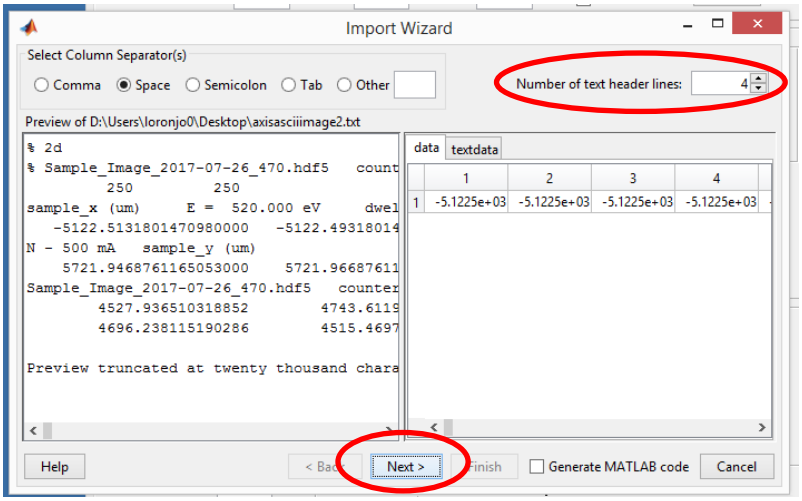
- To load a measurement choose “File -> Load -> Load Measurement”.



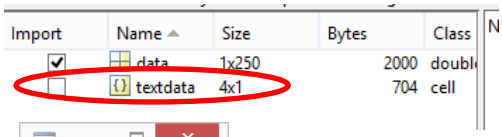
- You can choose between *.txt or *.hdf5/*.h5 files (only NeXus *.hdf5 files are supported).



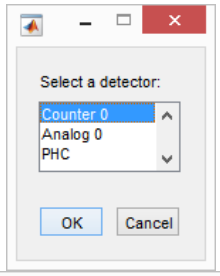
- If you import a text file (e. g. generated with aXis2000), you have to first choose the line defining the x-vector, then the line defining thy y-vector, then the part defining the intensity values using the opening import wizard windows.



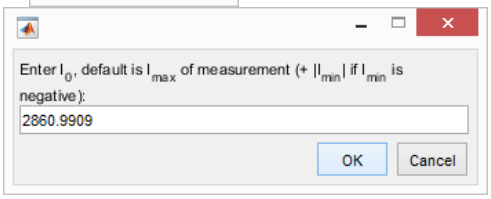
- Deselect the checkboxes for textdata, only select the data arrays in each of the three steps.



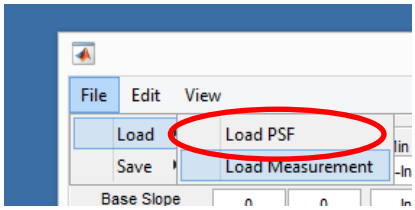
- When importing a NeXus-HDF5, select a detector.



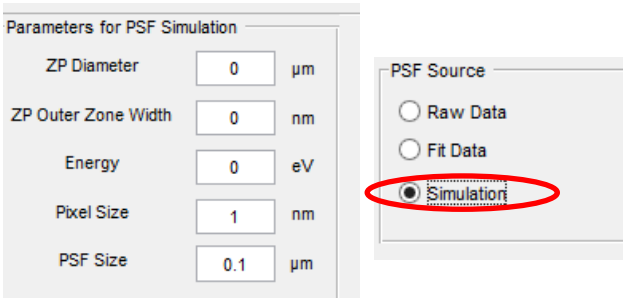
- After opening a NeXus file or importing a text file, enter the I_0 value for normalization. If entering 1, the original intensity values are preserved.



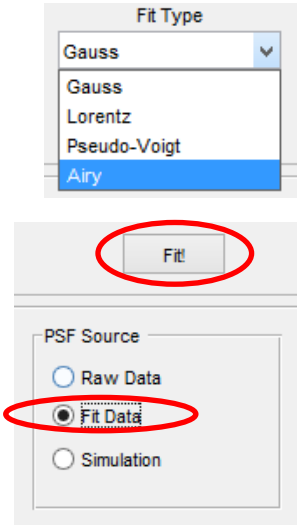
- To load a PSF choose “File -> Load -> Load PSF” (only required if PSF source is supposed to be raw data or fit data).
- If you import a *.txt PSF, first choose the line defining the x- and y-vector, then the part defining the intensity values using the opening import wizard windows.
- Donot forget to deselect the checkboxes for textdata.



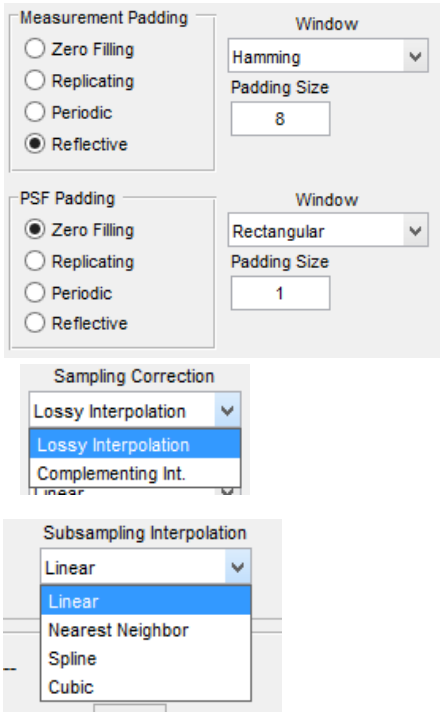
- For using a simulated PSF enter the diameter and outer zone width of the used zone plate and the used energy of the measurement into the designated textboxes and select “PSF Source -> Simulation”.



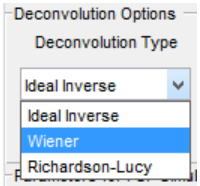
- To use a fitted PSF type at least a start value for peak height and width into the designated textboxes and choose a fit type. You can choose between a Gauß peak, a Lorentz peak, a Pseudo-Voigt peak and a Airy pattern.
- Afterwards press the Fit!-button or select “PSF Source -> Fit Data”.



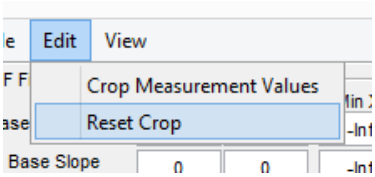
- After selecting the PSF source choose the padding size and filling for measurement and PSF (best results often achived with replicating or reflective filling for measurement)
  Warning! Too large padding will cause the RAM to overflow.
- Select then a window function. For information on the window types see the MATLAB documentation for window functions.
- The processing contains a subsampling correcture for either the PSF or the measured image. Select “Complementing Int.” for using the finer sampling on the courser sampled image or “Lossy Interpolation” for using the courser sampling on the finer sampled image. Afterwards select a interpolation type.
  Warning! Using a fine sampling correcture on a big image (several µm) combined with relatively high padding (~10 and higher) will cause the RAM to overflow. In this case use lossy interpolation.



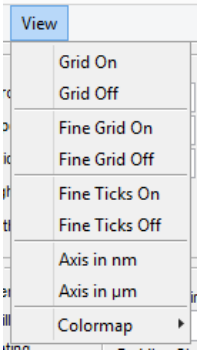
- After the selection of PSF and padding and subsampling options, choose the deconvolution algorithm. You can choose between ideal inverse filtering, Wiener filtering and the damped Richardson-Lucy algorithm. For information on the techniques see the MATLAB documentation for deconvolution. Press then the "Process!"-button.
  Attention! Doing a Richardson-Lucy computation of big measurement or PSF images with many iterations (30 and more) can take quite a while.



- If you only want to process a subsection of the image, you can select this prior to processing with "Edit -> Crop Measurement Values". You can reset the crop with "Edit -> Reset Crop".



- You can toggle the grids and ticks, select nm or µm axis units and change the colormap in the "View" menu.



- You can save a table with the fit parameters and the fit function if needed later either as *xlsx or as *.txt with "File -> Save -> Save Fit Function"
- You can save the processed image or the psf image as ASCII *.txt with "File -> Save -> Save Graphics as ASCII".
- You can save the processed image or the psf image as *.tif or *.png with "File -> Save -> Save Graphics as Image".
- If you opened the original image as NeXus-HDF5, you can also save the processed image as HDF5 with "File -> Save -> Save Processed Measurement as HDF5".