

Analysis ideas

- Normalisation of images
 - Simplest suggestion is to normalise highest beam position central pixel count to 100%, and scale all others
 - Take care with dead pixels
- Background subtraction
 - Believe there to be a primary beam spot (approx 6 um) and a secondary wide distribution (few 100 microns).
 - Need to fit this secondary component and subtract from all counts.
 - Suggestion –
 - select beam positions in central pixel in which there should be no charge sharing to neighbours (e.g. positions in centre of pixel will have no charge to either side pixel, positions on right of central pixel will have no charge sharing to left pixel etc..)
 - make 2D image of background distribution by plotting counts in neighbouring pixels as a function of the beam position.
 - Fit (and/or smooth) 2D distribution and subtract this from all images to correct counts for this background
- Smooth Images
 - Smooth by interpolating between beam positions to obtain smooth distributions.
- Fit for centre/edges of pixel to allow comparison of images
 - central pore in 3D detectors or edges / corner pores should provide features for a good fit.
- Check symmetry of images
 - Suggestion that there could be a difference in x,y planes
 - If so, could be due to beam size being different
 - Or to misalignment
 - Symmetry best checked from fits of distributions
- Make nicer versions of the Aaron sum plots where counts in neighbouring pixels are added into main pixel
- Make plots to indicate charge sharing properties
 - First idea, plot counts in neighbouring pixels as a function of beam position in central pixel distance from an edge (and corner)
- Make subtraction / ratio of images
 - For different voltages
 - For 3D this is interesting as have inter-column depletion and depletion to backplane
- Deconvolve pixel response
 - Current image is convolution of pixel response and beam
 - Could deconvolve to get pixel response

- – check what Matlab code David already has
- – look at section in Statistical Data Analysis by Glen Cowan (should be a copy in my office assuming nobody has nicked it!)

To Do List

Upload relevant papers – Aaron, Dima, Chris....

Check thickness of planar – Eva

Check alignment results – chris

Prepare picture and description of beam profile measurement – Nicola & Kawal