I'm working to get the quantitative basis images from the l-edge data you acquired last week.

My plan is to do a standard decomposition of the projection data into different materials (each with known u/p at the acquisition energies, leaving a weighted sum of density projections). A raw subtraction image, Δg, of the flat-field corrected sinograms could be modeled as

$$\Delta g = \Delta(\mu/\rho)_m A_m + \Delta(\mu/\rho)_o A_o \tag{1}$$

where $\Delta(\mu/\rho)$ is the change in mass attenuation coefficient between the two energies, A is a density projection $\left(\int_L \rho(x, y) dl\right)$, "m" stands for metal (U or Os) and "o" stands for all other materials.

At energies bracketing the L-edges of these metals, we expect $\Delta(\mu/\rho)_m \gg \Delta(\mu/\rho)_o$, so we can model the metal basis images as:

$$A_m \approx \frac{\Delta g}{\Delta(\mu/\rho)_m} \tag{2}$$

When I do this, there are some negative values in the image, indicating pixels where the other materials are dominating. My overall goal is to use these quantitative density maps to get a better estimate of the number densities in the phase term of the TIE - so negative values aren't helpful.

A more rigorous way would be to break the "other" category into further basis materials.