

If first pass is available or we can get it, we should take the following data on both HRS's in negative polarity with and without sieve slits:

12C(e,e') HRS(L) and HRS(R)

$E_{in} = 1162 \text{ MeV}$

$P(e')$ $\Theta_{L}(e')$ $\Theta_{R}(e')$

1204.2 15.0 -15.0
1181.1 15.0 -15.0
1157.9 15.0 -15.0
1134.7 15.0 -15.0
1111.6 15.0 -15.0

This data may not be necessary for the triple coincidence experiment, since it will be statistics limited. However, it will be best for the $4\text{He}(e,e'p)$ channel. We do have some good databases from the $3\text{He}(e,e'd)$ experiment up to 3 GeV/c in momentum. But we need to make sure we have all the necessary survey information and the mispointing of the spectrometers for each angle.

For the production running, about 4 GeV/c into the left HRS, we should follow what Peter did for the missing energy calibration. The optics at high momentum is different than for low momentum. I will have to look closer into this part to find out what special data if any is needed.

The carbon elastic at 2nd pass will be too small for a good calibration.

We tried for e'd at 12.5 degrees. On the other hand, we can use 12C(e,e'p) QE for the position and angle optimization. Plus with the QE peak, the focal plane is mostly illuminated with one or two momentum settings. The only problem is that we need to make sure we do not have any significant punch-through the sieve slit, and the momentum is not as easy to calibrate.

Using the left HRS to detect the proton and the right for the electron here are the kinematics either using 12.5 or 15 degrees for the electron:

$E_{in} = 2262 \text{ MeV}$

$P(e') = 2090.3 \text{ MeV}$, $\Theta(e') = 15.0^\circ$

$P(p) = 592 \text{ MeV/c}$, $\Theta(p) = -65.8^\circ$

or

$P(e') = 2139.9 \text{ MeV}$, $\Theta(e') = 12.5^\circ$

$P(p) = 493 \text{ MeV/c}$, $\Theta(p) = -69.5^\circ$

We could move the QE peak across the HRS focal plane by selecting the HRS central momentum to be +/- 2% of the electron momentum. This will provide better acceptance coverage, since the QE will not illuminate the entire momentum acceptance equally. We will need to check the maximum left HRS angle we will be able to reach in case any of our equipment or cables are in the way.