

Analysis Progress

for the d_2^n analysis meeting

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1 Raster Calibration

- Sign and Coordinate Conventions
- Raster X
- Raster Y

2 Lessons Learned from Transversity

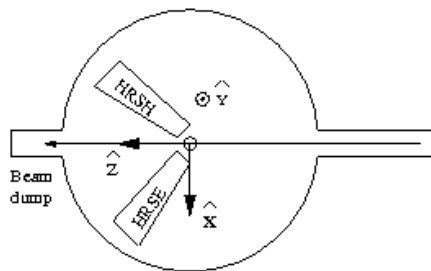
3 What's Next?

Raster Sign Ambiguity

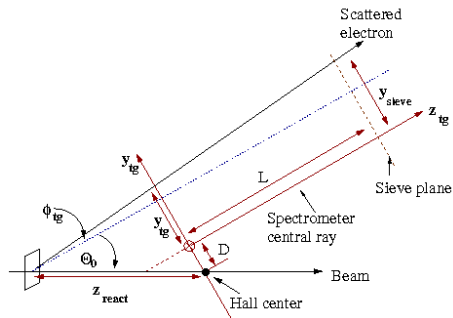
- The sign of raster current readouts is ambiguous
- X- and Y-signs are independent of each other
- Step 1 of raster calibration is therefore to determine the correct sign...

Useful Coordinate Systems

Hall A Coordinate System (BPM/Raster)



Target Coordinate System

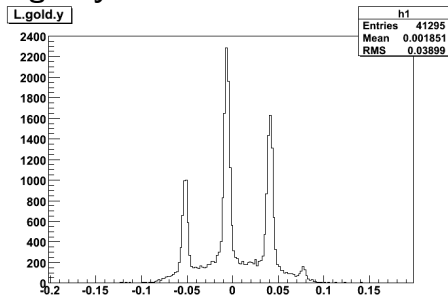


Both figures from JLAB-TN-02-012, N. Liyanage

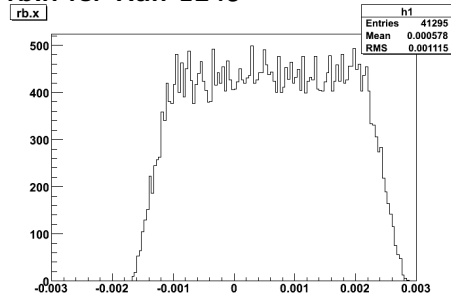
The Sign of Raster X (i)

- Positive x_{HCS} and y_{tg} both point to beam left
- Therefore, rasterX should be positively correlated to y_{tg}
- We can investigate this in optics data
 - ▶ Is central foil position in y_{tg} correlated to beam x position from raster current?

L.gold.y for Run 1249

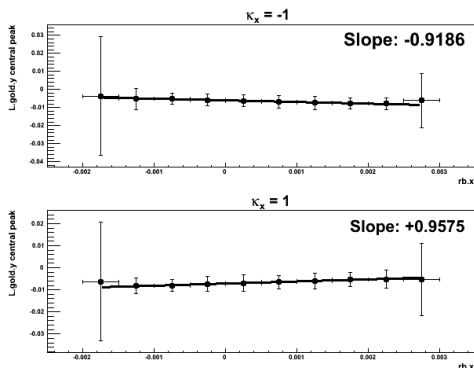


rb.x for Run 1249



The Sign of Raster X (ii)

- Assign the value ± 1 to the variable κ_x to change x sign
- For each κ_x value, we plot L.gold.y in 0.5-mm bins of rb.x
- In each bin, a Gaussian fit locates the central foil
- We then plot that location as a function of rb.x ...

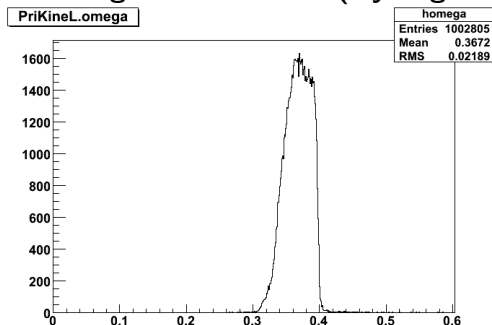


Looks like κ_x should be positive!

The Sign of Raster Y (i)

- RasterY is harder since it's in the spectrometer bend plane
- Suggestion from online analyzer documentation (Bodo Reitz):
 - ▶ Look at a sharp peak in energy spectrum (e.g. omega)
 - ▶ After extended target corrections, peak should be narrower
- Problem: Are we ready to make extended target corrections?
- Without them, rasterY sign change makes no difference...

PriKineL.omega for Run 1258 (Hydrogen target)



The Sign of Raster Y (ii)

- Alternative approach proposed in B. Craver's 2008 tech note for G_E^n
- Calculate p_{diff} , the difference between
 - 1 Observed momentum
 - 2 Momentum calculated from position of detected particle
- p_{diff} depends on rasterY because an error in vertical vertex reconstruction affects the calculated bend angle

- **Any ideas about differentiating these two momentum variables?**

Lessons Learned from Transversity

- I've finished going through Transversity progress reports through January 2010
 - List of questions, problems, solutions, etc on wiki page
 - I'll bring up a few common themes here:
- 1 **HAPPEX DAQ**: Do we need/want to do any analysis on our HAPPEX runs, as Joe Katich did for Transversity?
 - 2 **Target**: Do we have a plan for target analysis (wall thickness, frame bending, polarization, etc)?
 - 3 **Stability Checks** of calibrations over course of experiment
 - 4 **L1A issues**: Transversity saw effects of L1A problems on VDCs, scalars, even long-time-scale asymmetries
 - 5 **Monte Carlo**: Transversity used GEANT3 simulation of BigBite to improve PID, understanding of background

What's Next?

- Raster Calibration
 - ▶ Confirm sign of raster y
 - ▶ Identify run periods with stable beam positions
 - ▶ Perform raster calibration for each run period
 - ▶ Update relevant DB files
- BB Optics
 - ▶ Start on vertex corrections with magnet-on runs
- Compton
 - ▶ Analyzing power work continues in background
 - ▶ Systematics (Cavity State ID)
 - ▶ Photon detector resolution
- Cross-section calculation