

Analysis Progress

for the d_2^n analysis meeting

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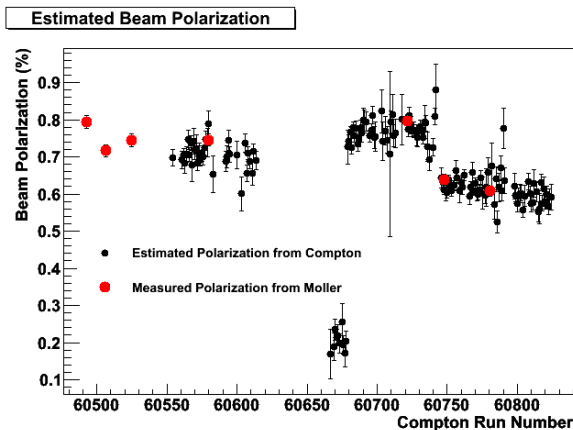
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Estimated Analyzing Power

- Michelle Ntampaka has extracted estimated Compton analyzing powers from simulations
 - 5-Pass: 0.0471
 - 4-Pass: 0.0387
- These numbers are preliminary and may move around a bit. We still need to include:
 - Collimator misalignment (cuts out low-energy photons)
 - PMT non-linearity effects
- These effects are visible in the Compton spectra taken during d_2^n , so we can check our work

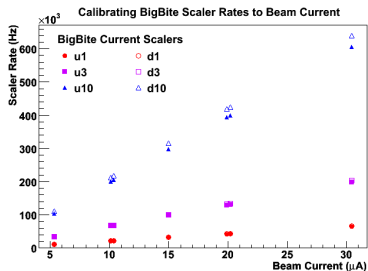
Estimated Polarization

- We can use these preliminary numbers to estimate the beam polarization seen by the Compton
- A *preliminary* comparison to the Møller:



A Slight Change of Plan

- There was an error in the BCM calibration process I presented last week
- BCM frequency signals are not linear down to $0\mu A$, so the $0\mu A$ data point should not be part of the linear fit! (Instead, it's used purely for the offset.)
- This change yields slight changes in the slope (Hz/ μA) and big changes in the offset (Hz)



Scaler	Slope (Δ)	Offset (Δ)
u1	2101 (-10)	396 (+370)
u3	6480 (-30)	453 (+493)
u10	19731 (-101)	771 (+1349)
d1	2152 (-9)	154 (+133)
d3	6658 (-26)	133 (+156)
d10	21008 (-63)	293 (+964)

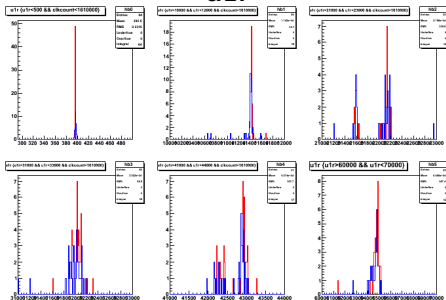
A Home for the Coefficients

- BCM calibration coefficients are not encoded in any DB files
- Instead, they are hardcoded into the NormAna classes (BB and THa)
 - e.g. $I = \text{off_u1} + \text{calib_u1} \times u1r$
- NormAna functions can be run on a file, after it has been replayed, to produce:
 - Histograms of beam current during the run
 - Printout of total accumulated beam charge during the run
- Or we could write our own code that does this ...
- Cuts on beam current window will need these calibration numbers hard-coded as well.
 - e.g. a cut for " $(\text{bbite_u1r} - 396)/2123 > 10$ "
- I have updated the coefficients in my copies:
 - analyzer/src/THaNormAna.C
 - d2n/BBNormAna/BBNormAna.cxx

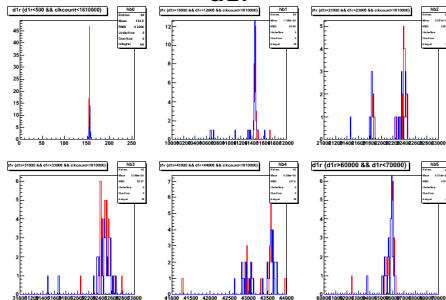
BB and LHRs Scalers: Gain=1

- Scalers in BB and LHRs arms should be reading the same signal
- Let's confirm that they behave the same way by plotting them together
 - BigBite: Red
 - LHRs: Blue

u1r



d1r

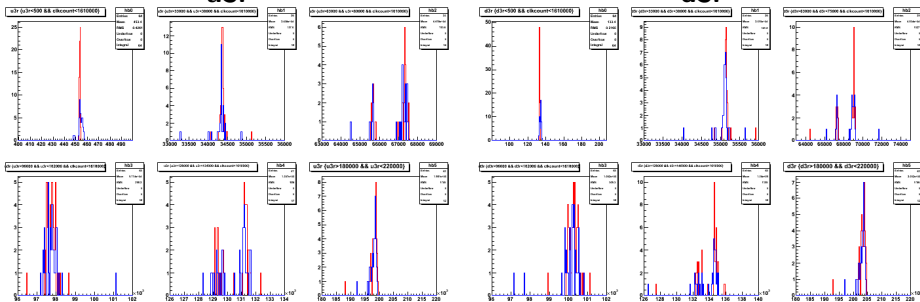


BB and LHRs Scalers: Gain=3

- BigBite: Red
- LHRs: Blue

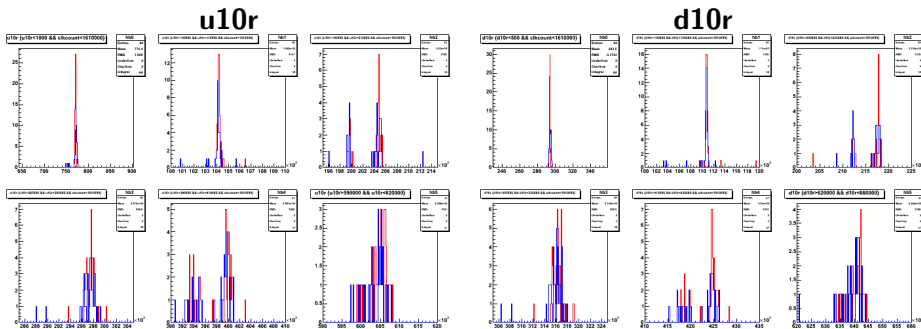
u3r

d3r



BB and LHRs Scalers: Gain=10

- BigBite: Red
- LHRs: Blue



- Looks as though the two sets of scalers really do behave much the same way ...

What's Next?

- BB Optics
 - Finish BPM calibration
 - Raster calibration
 - Double-check...
- Compton
 - Small corrections to analyzing power
 - Systematics