G_E^n Analysis Progress

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May 16, 2007

BigBite Scintillator Calibration

Calibration Procedure

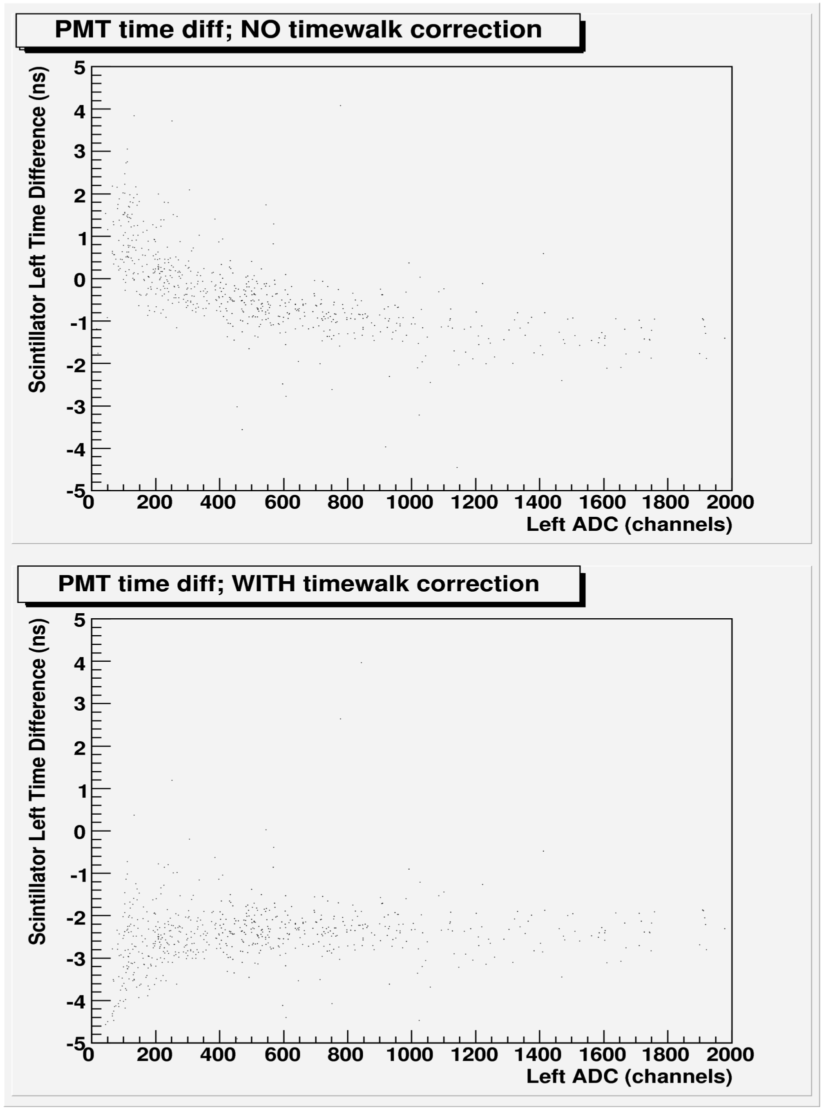
- Align left PMTs and right PMTs for adjacent paddles separately
- Plot the time and ypos variables for adjacent paddles and see how well they are aligned.
- If required, align the time variable further.

$time \equiv (L+R)/2$

$ypos \equiv L-R$

BigBite Scintillator Calibration

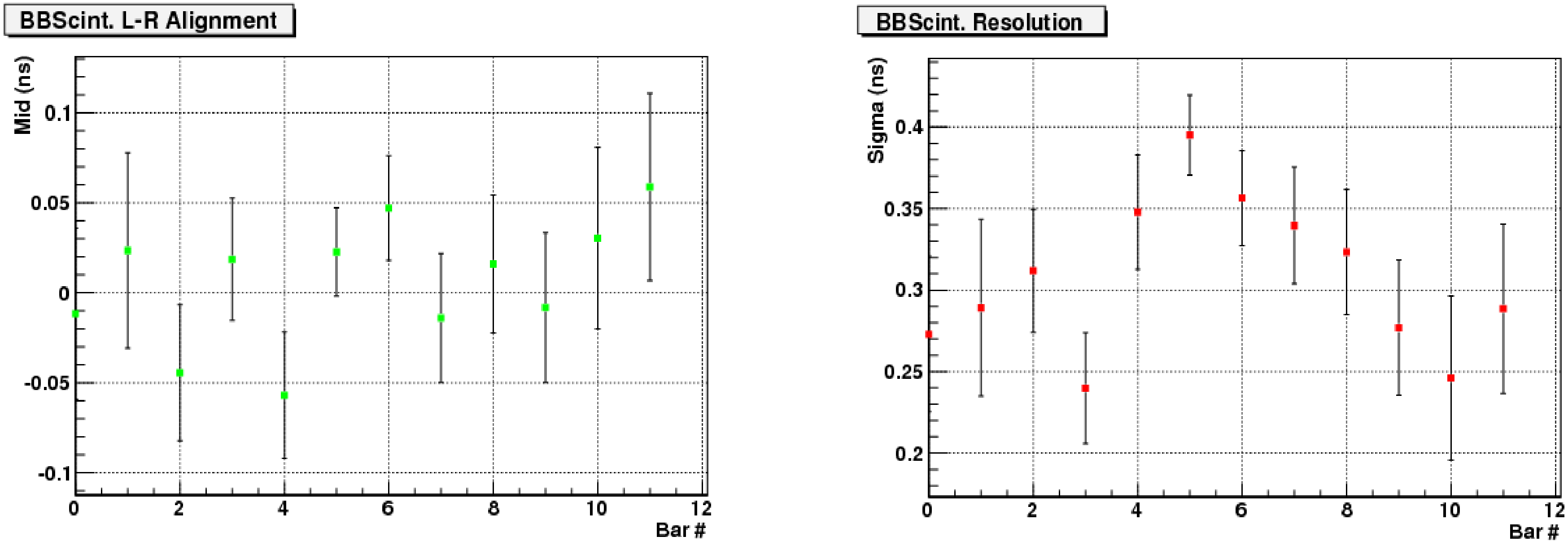
Time-walk Correction



$$t_{tw} \sim \frac{C}{(ADC)^{1/2}}$$

BigBite Scintillator Calibration

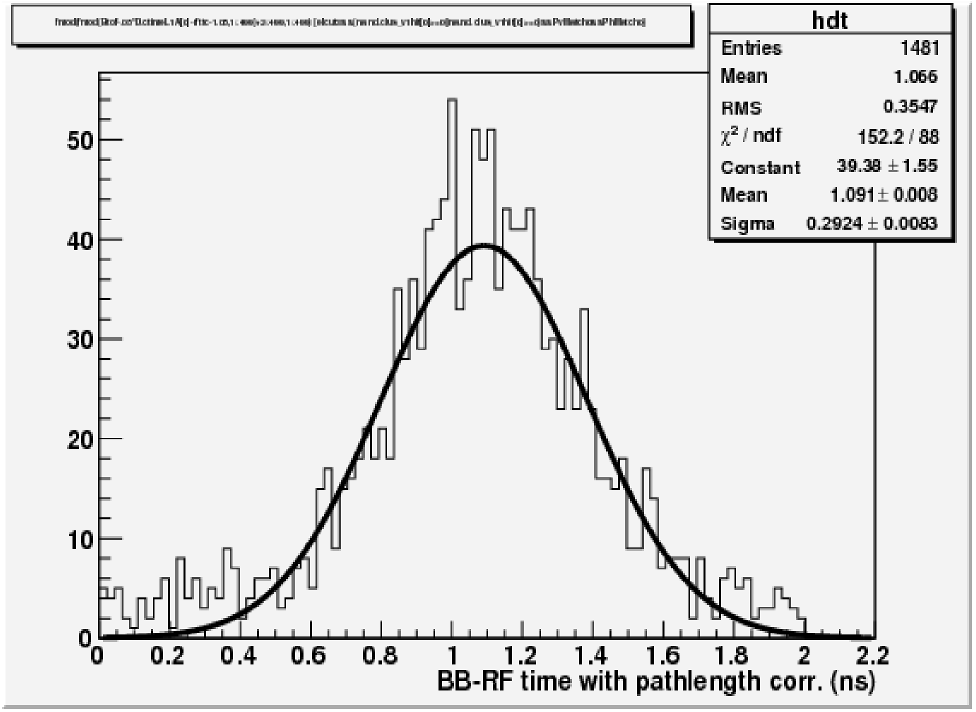
Results



BB Scint. Calibration: Alignment and Resolution for elastic run 4364 (kin3)

RF Analysis

Results



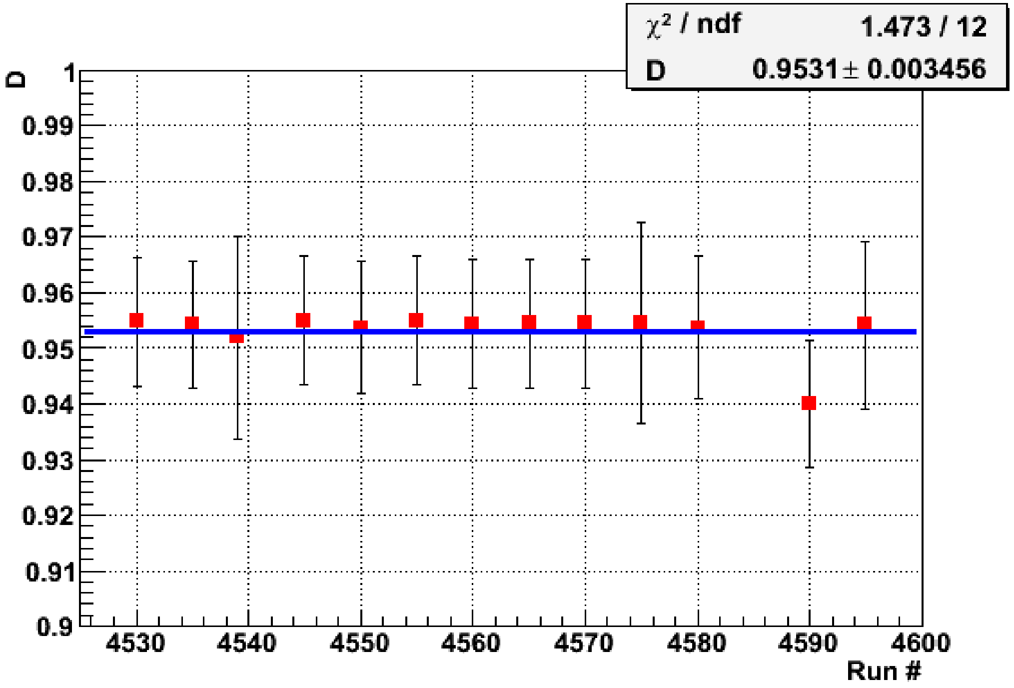
BigBite to RF phase check:

This is again for elastic run 4364. The same values as in kin.4 have been used for pathlength corrections.

* 1.05ns subtracted from the time to center the peak.

Nitrogen Dilution Analysis

Results



Values in the plot correspond to

|Ppar – q| < 250MeV/c;

Pperp < 150 MeV/c

0.8 < W < 1.15

These values will also be put into the MySQL database.

On the Database

Results

Currently on the database -

•Target polarization numbers (from Aidan's analysis)

To be put on the database as soon as all the runs are loaded -

•Target polarization by run-number

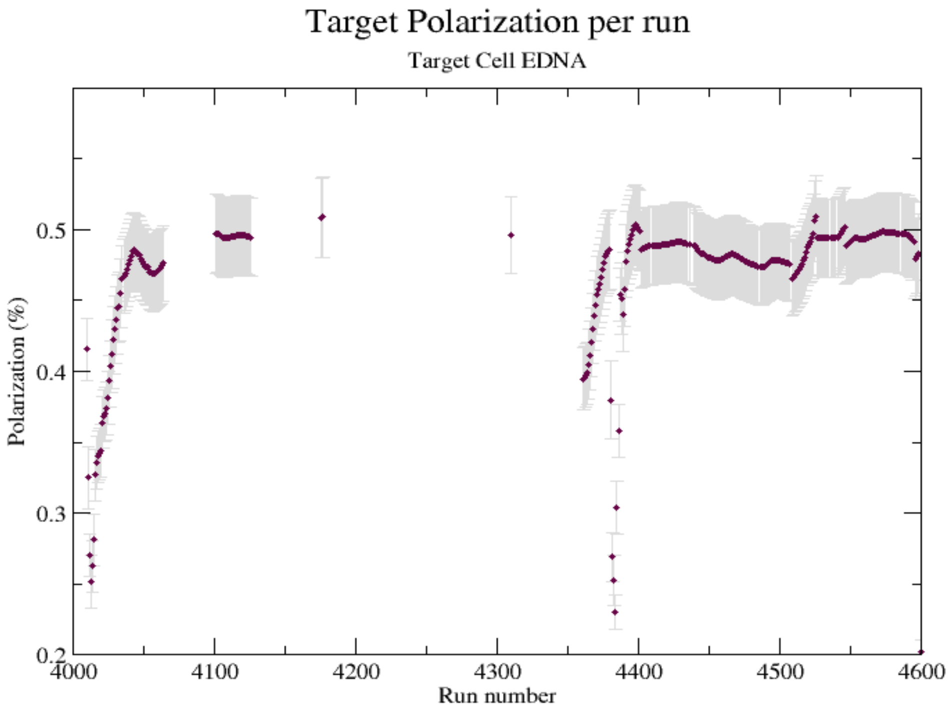
•Nitrogen density by run-number

•Nitrogen dilution factors for our usual p_{par}, p_{perp} and W cuts, by run-number.

Scripts and datafiles will be uploaded to the wiki too.

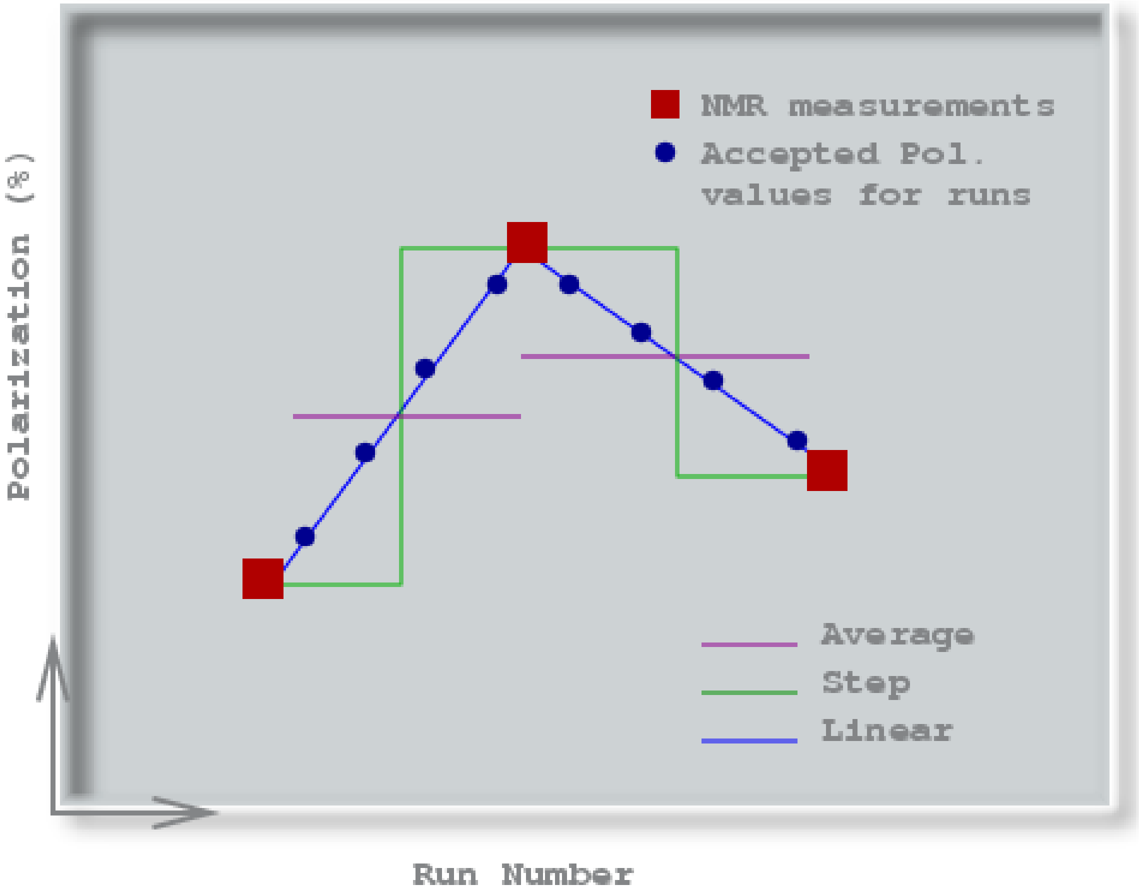
Target

Polarization by run-numbers



Target

Procedure



- Polarization was measured between runs.
- Linear interpolation was used to get polarization numbers for runs (as shown in the cartoon)

Target Polarization Direction

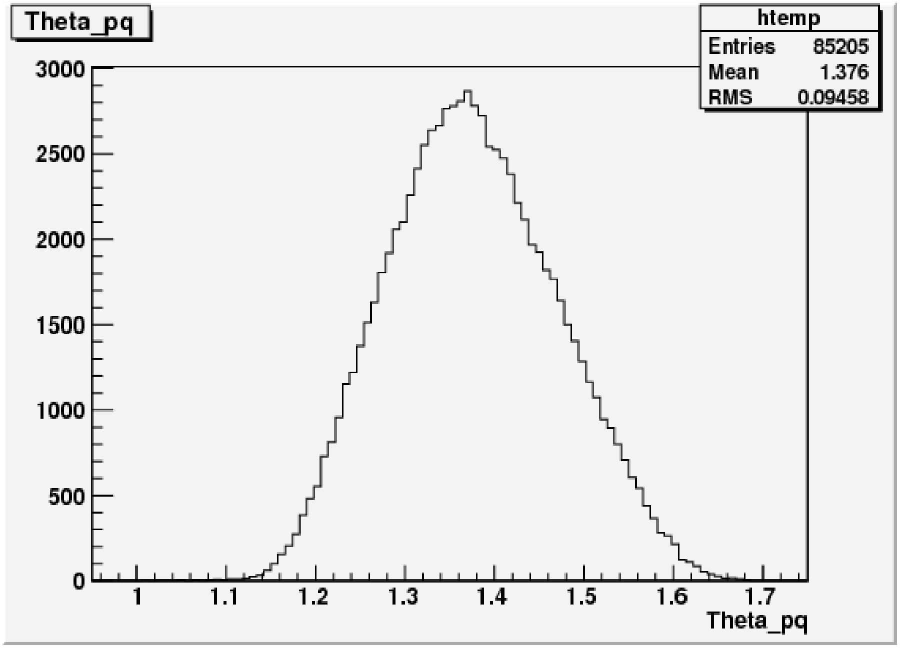
Compass Self Effects

- Bogdan's analysis, which calculates the flux from the compass magnet at the relevant distances, gives a change in direction (compared to result we would have gotten without this effect) up to 0.01mrad, which is very small and can be ignored.

- My analysis involving effect of magnetization induced in the iron of the magnet box (with $\chi_{Fe} = 3000$ - for very pure iron) gives a very very small number. The maximum effect is $(\text{negligible})^2$.

Acceptance Studies

P_{perp} dependence studies



- Theta_pq is the angle made by the outgoing hadron with the *q*-vector.
- For elastic hydrogen, this angle is zero.
- Correct detector geometry has been input (which includes the ND mispointing to ~173.4cm upstream of the target center.)
- More work is needed – e.g. apply cuts – *in progress*.

Asymmetry Analysis

Progress

- Codes and scripts 'ready' for final analysis – getting GEn from quasi-elastic events.
- Working on background corrections.
- Have a GEn value for kin.4, without the background corrections (like *pn* conversions, ...)
- Next, to replay kin.2 ...