

DC Calibration Update

Stephen Kay
University of Regina

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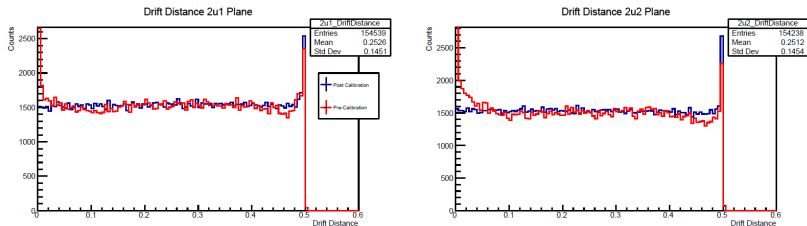
Introduction

- Took a closer look at DC calibration
- Checked script was actually working
- Also considered how to compare "stability" of the calibration once it has been done
- Followed suggestion Abishek made in his presentation (on redmine)
 - Check the drift distances and the residuals plane by plane after calibration

Calibration Check

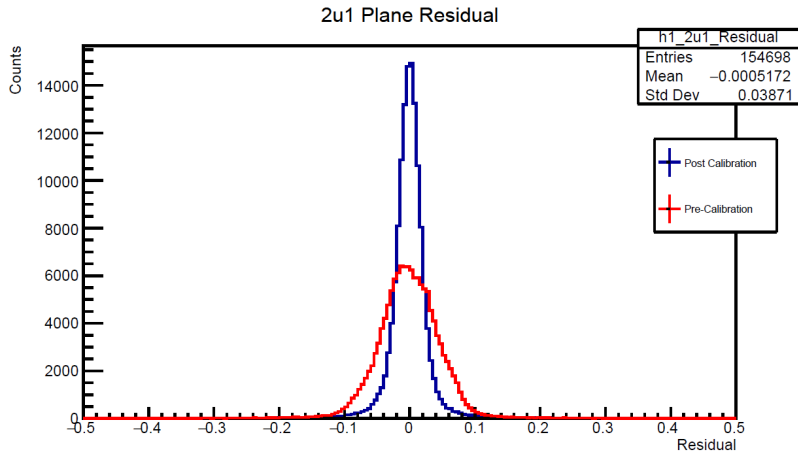
- Created simple script that looks at the final replay of the DC calibration and makes quick before/after plots of two key quantities -
 - Drift Distance by plane
 - Residual by plane
- The residual is a measure of the difference between the “final” track position and the hit location obtained on a plane by plane basis
- Done for each plane in each chamber and for each detector

Calibration Check - HMS Drift Distance Example



Drift distances before and after calibration for the 2u1 and 2u2 plane of the HMS drift chambers.

Calibration Check - HMS Residual Example

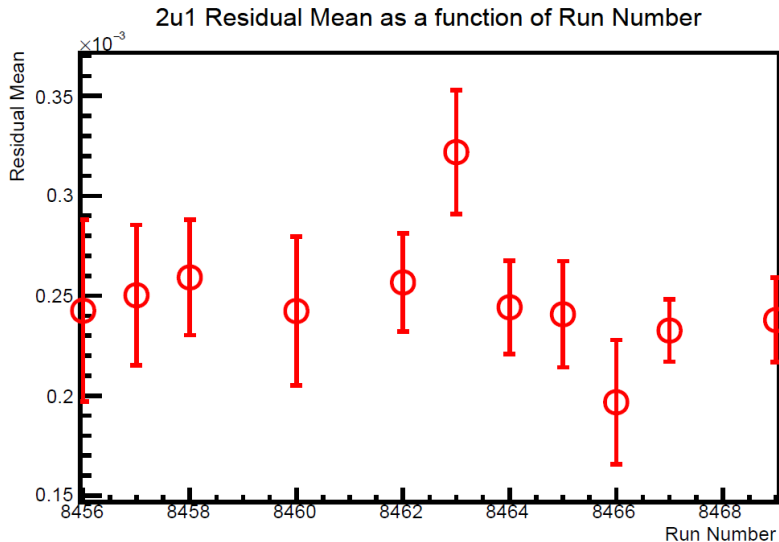


Drift chamber residuals before and after calibration for the 2u1 plane of the HMS drift chambers.

Calibration Stability

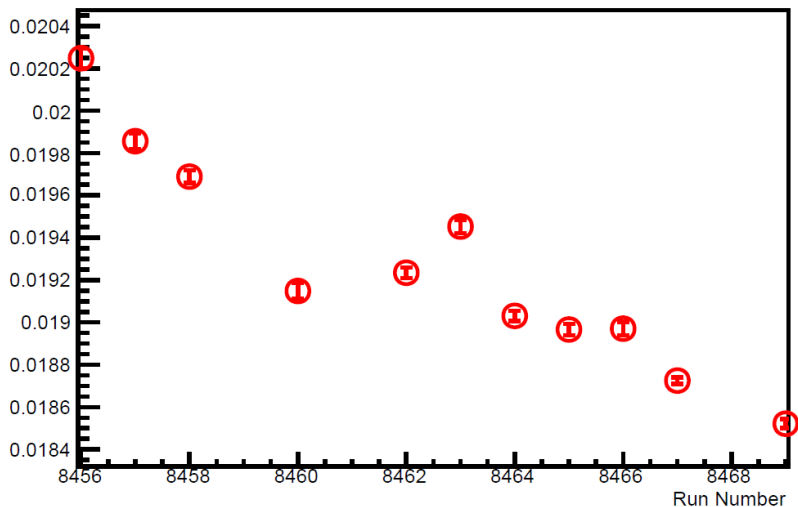
- Once calibrated, how “stable” are the new calibration constants?
- Test this by looking at how position and width of peak in the residual spectrum changes over subsequent runs
- Take a set of carbon runs, replay all of the runs with the calibration from the first run in the set
- Fit simple Gaussian to residual peaks and see how the mean/SD move

Calibration Stability - HMS Residual Mean Example



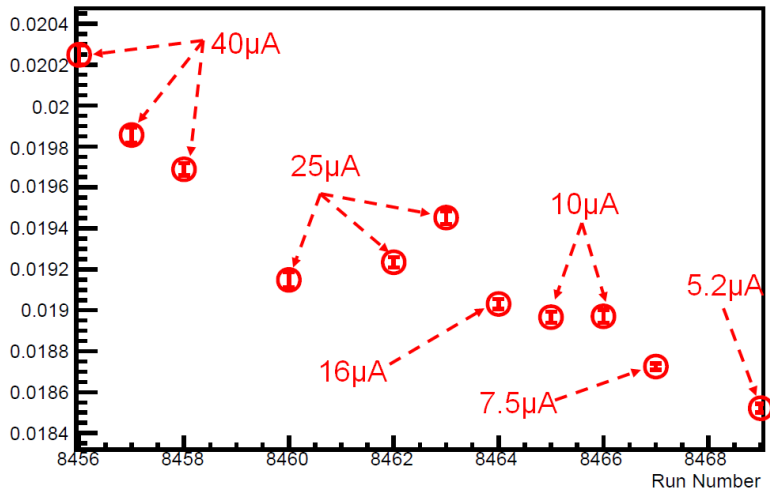
Calibration Stability - HMS Residual σ Example

2u1 Residual σ as a function of Run Number



Calibration Stability - HMS Residual σ Example

2u1 Residual σ as a function of Run Number



Summary and Conclusion

- Calibration seems to improve things quite a lot
- Once calibrated it looks *relatively* stable
- Going to add to the code to make that statement a bit more quantitative
- *But*, this is looking at a small sample of runs
- Need to look at a broader range
 - Easy for HMS since we always have electrons
 - SHMS will be a little trickier but still should be fairly straightforward with hadronic events
- So, getting there!