Field reversal

- Compare decay rates for positive and negative polarizations. This is likely negligible.

Magnetic Field Drift

- A measure of the deviation in magnetic field strength between the time of a TE measurement and the last point that used the corresponding calibration constant will give a variance in the B-field due to drifting.

Material Contamination

- Target material contamination ($^{15}\mathrm{NH}_3$, others) can contribute to the polarization as measured by NMR.
- This effect is proportional to the ratio of ^{15}N polarization to proton polarization with a correction for the EMC effect.

$$C_1^p \propto \frac{P_N}{P_p} g_{EMC}(x) < 0.1\%$$

NMR Drift

- Polarization normalized to Q-curve central value might give a good idea of how NMR signal drift affects the polarization?

Contributions to σ_{CC}

- Magnetic field power supply precision

  $\sim 0.01\%$

- Field strength accuracy in target material

  Needs to be determined: variance between ideal current for field setting and true current (from centered Q-curve)

- ^4He manometer accuracy (temperature)

  $\sim 0.53\%$

$$P_{TE} = \tanh\left(\frac{\mu B}{kT}\right)$$

- Baseline fit

  Varied error from χ^2- minimization fit

- Riemann sum integration ($Area_{TE}$)

  Any contributing error?

$$CC_{TE} = \frac{P_{TE}}{Area_{TE}}$$

Yale Gain Voltage

- Ratio of Yale card gain between TE signal and enhanced signal deviates from unity because of a polarization dependant voltage input.
- Extensive Yale card study done by D. Keller gives $(\sigma_G/G)_{MAX} \sim 0.1\%$
- Uncertainty is maximized since the study was done at 90% target polarization.

Source	Uncertainty (%)
B-field power supply precision	0.01
B-field uniformity	undetermined
He^4 manometer precision	0.53
Baseline fit	varies
Fit integration?	?
B-field drift	undetermined
NMR drift	0.47
Yale gain voltage	0.10
Others?	

Contribute only to ΔCC_{TE} (first five rows)