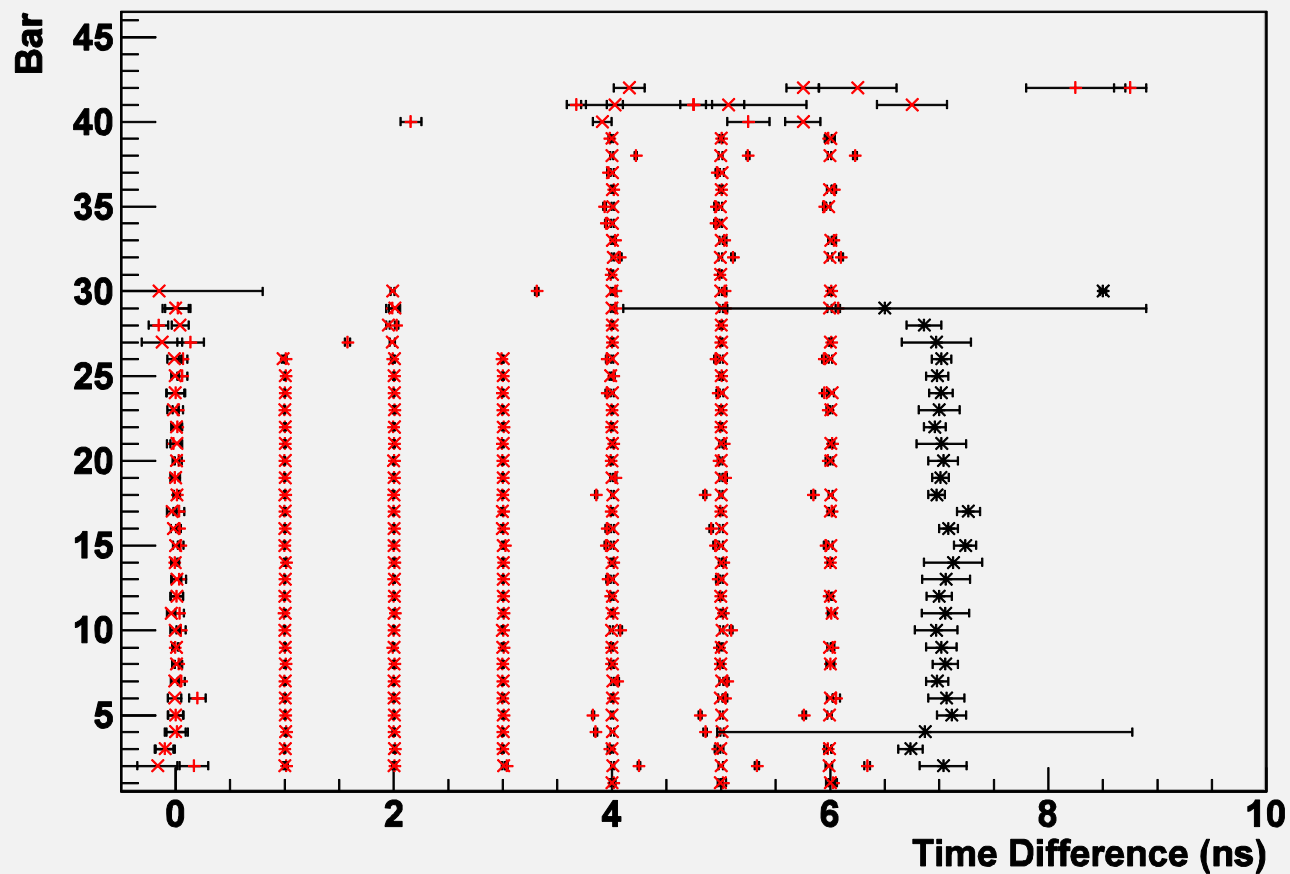# Collaboration Meeting: Callibration

Jonathan Miller

Goals of Calibration

- Improve time of flight resolution of neutron arm.
  - Implement amplitude correction in model form.
  - Improve time of flight resolution of individual arms.
- Improve Veto time resolution.

Calibration Results - Summary

Amplitude Correction

$$FinalTime = CorrectedTime - Parameter*(ADC)^{Exponent} + Parameter*(Reference)^{Exponent}$$

- **Used all of the available kinematic 3 statistics (~1/3 of statistics)**
- **Calibrated first plane relative to Big Bite.**
- **Calibrated later planes relative to first plane.**
- **Reference in the above formula is set to have 0 contribution.**

Calibration

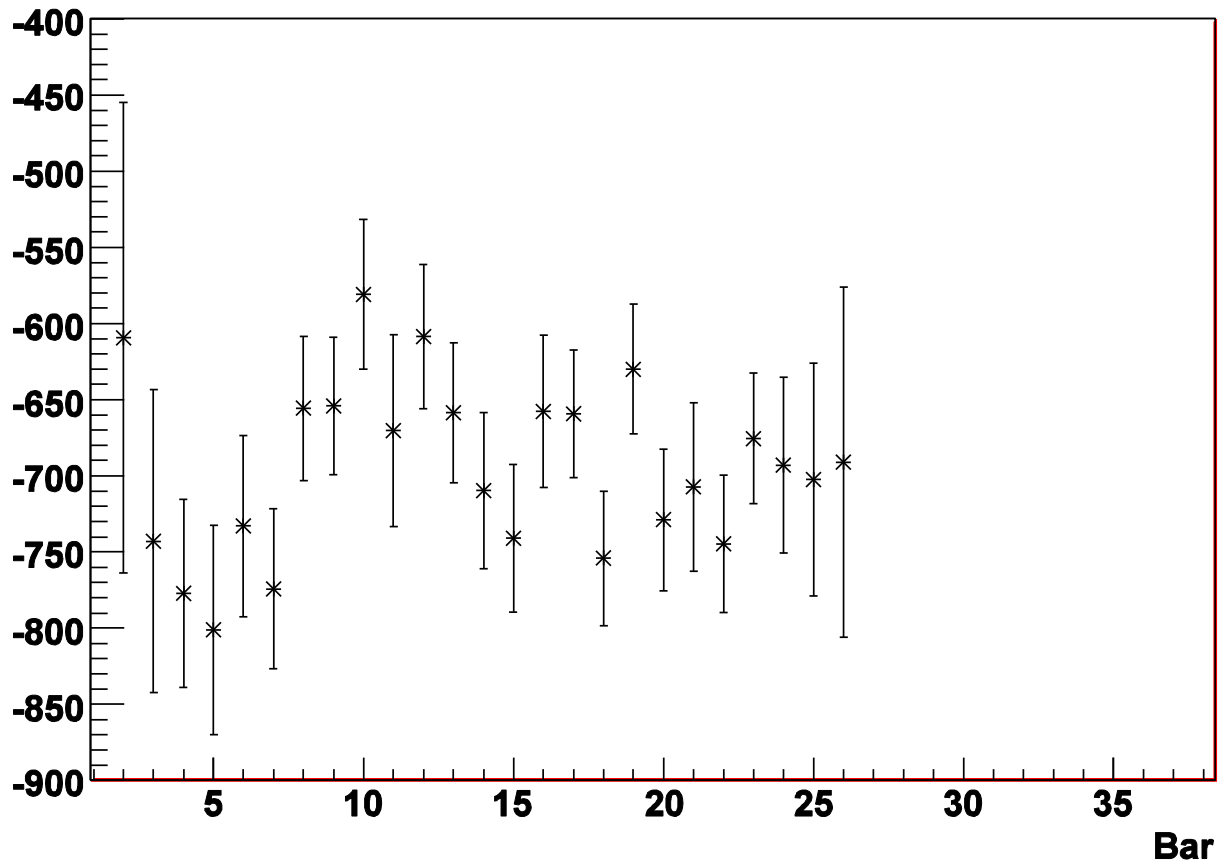$$T_{m,c} = \frac{C_0}{2}\left(\frac{1}{A_L} + \frac{1}{A_R}\right) + C_2 + \frac{C_1}{2}\left(-\frac{\Delta Y}{A_L} + \frac{\Delta Y}{A_R}\right) \tag{1}$$

These delta Y are adjusted in relation to the y position of the hit. This function was minimized using Minuit.
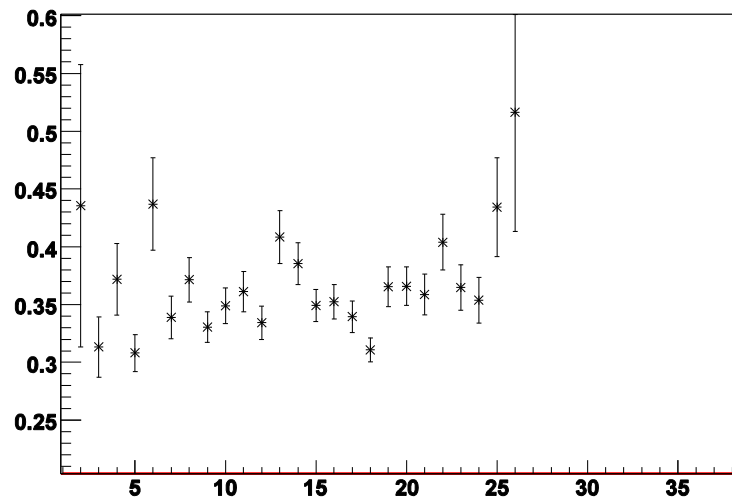
C1 constant - Undetermined

Graph
Plot of the C2 constant for Each Bar
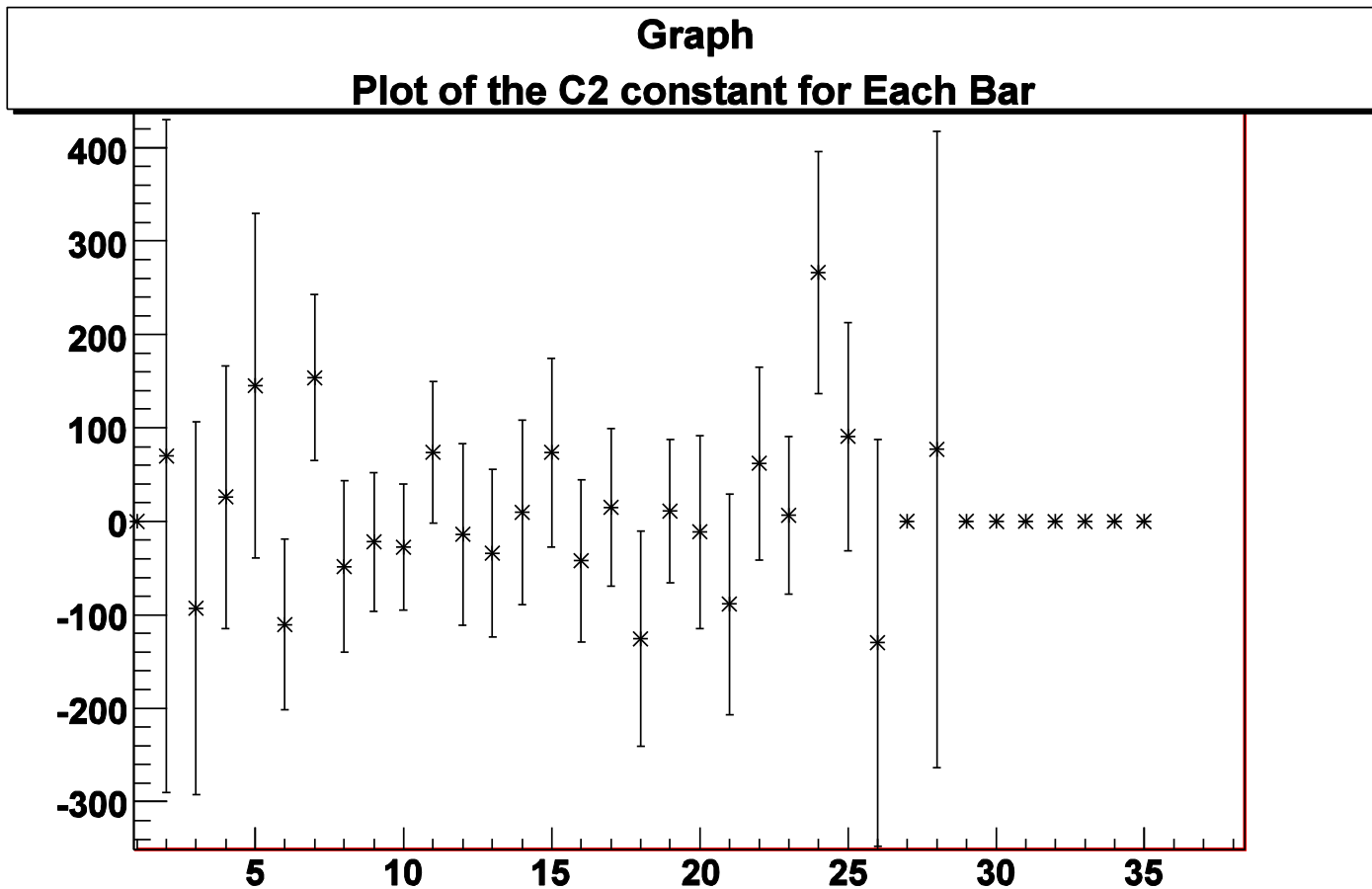
Example plot to determine the C0s
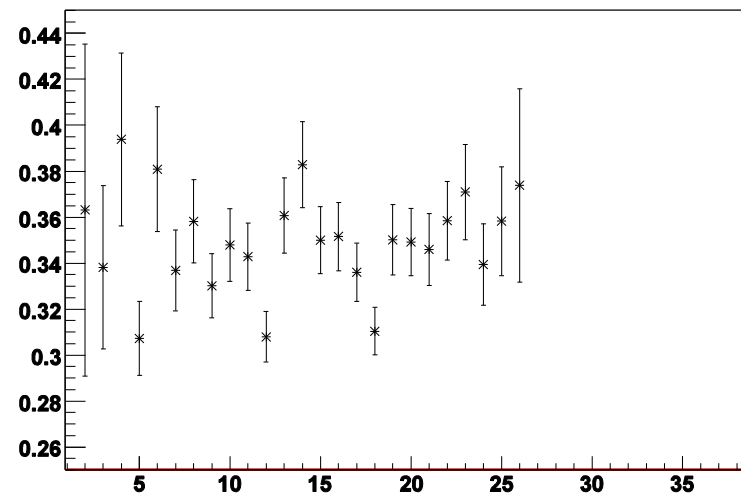
Results

Before

After

Veto Calibration

- Used long events and proton events to calibrate the veto planes.

- Each veto bar was separately calibrated relative to the first plane of the neutron arm.