$$\Delta T = T_{He3} - T_{He4}$$

Temperature uncertainty from the discrepancy between He3 and He4 manometer readings at each point.

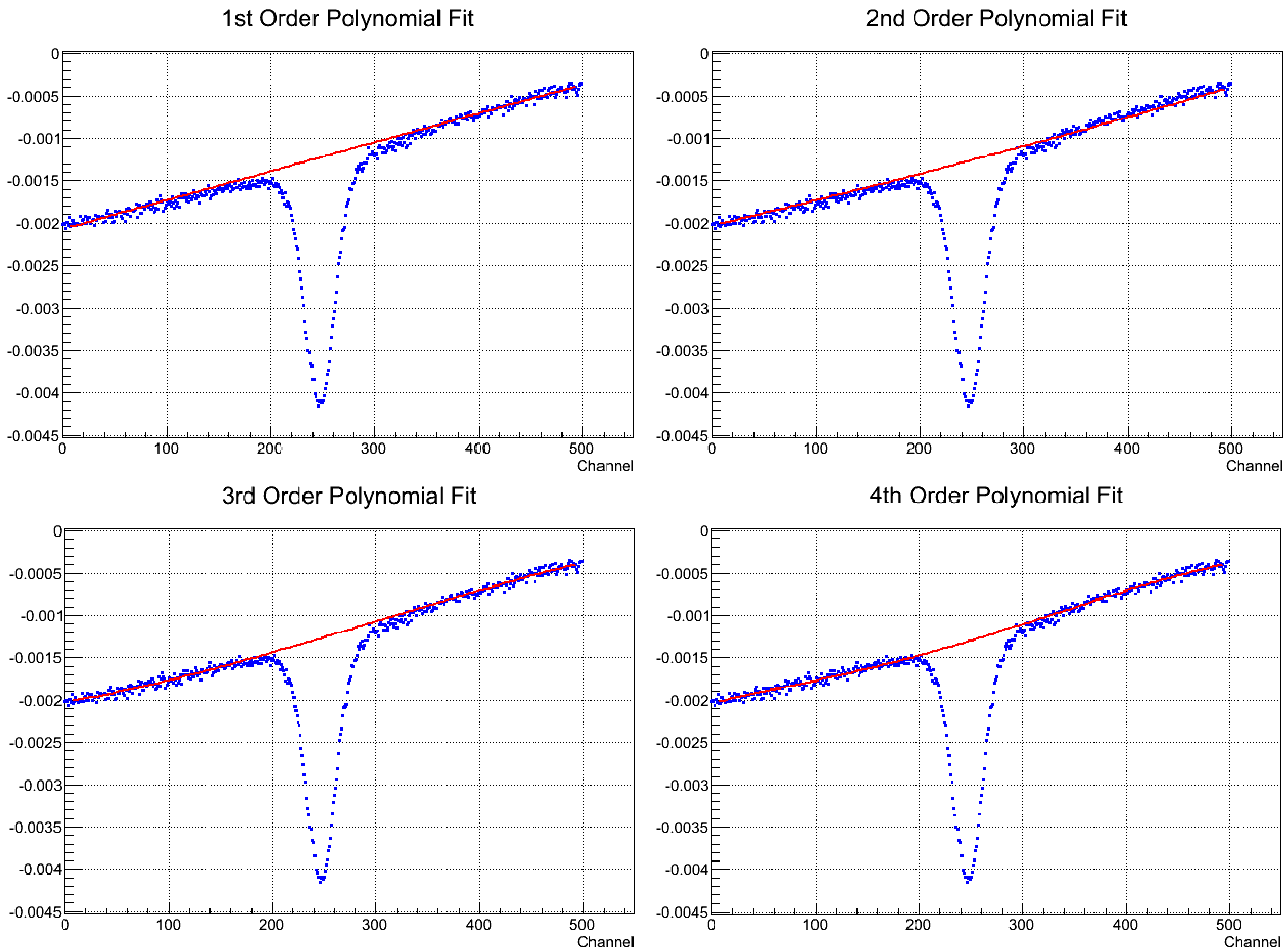
$$\Delta B = 0.00022B$$

B-field uncertainty from the setability of the magnet power supply.

$$\Delta P_{TE} = \frac{\mu}{KT} \cosh^{-2}(\frac{\mu B}{KT})[\Delta B + \frac{\Delta T}{T}]$$

$$\frac{\Delta P_{TE}(\Delta B, \Delta T)}{P_{TE}(B,T)} \approx 10^{-5} \longrightarrow$$

Extremely small relative uncertainty (error bars too small to see in TE plot when ignoring fit uncertainty!)


1st Order Polynomial Fit
2nd Order Polynomial Fit
3rd Order Polynomial Fit
4th Order Polynomial Fit
0
-0.0005
-0.001
-0.0015
-0.002
-0.0025
-0.003
-0.0035
-0.004
-0.0045
0
100
200
300
400
500
Channel

$\Delta A =$ Maximum difference between all fitted functions.

$$\frac{\Delta A_{TE}}{A_{TE}} \approx 0.01 - 0.7$$

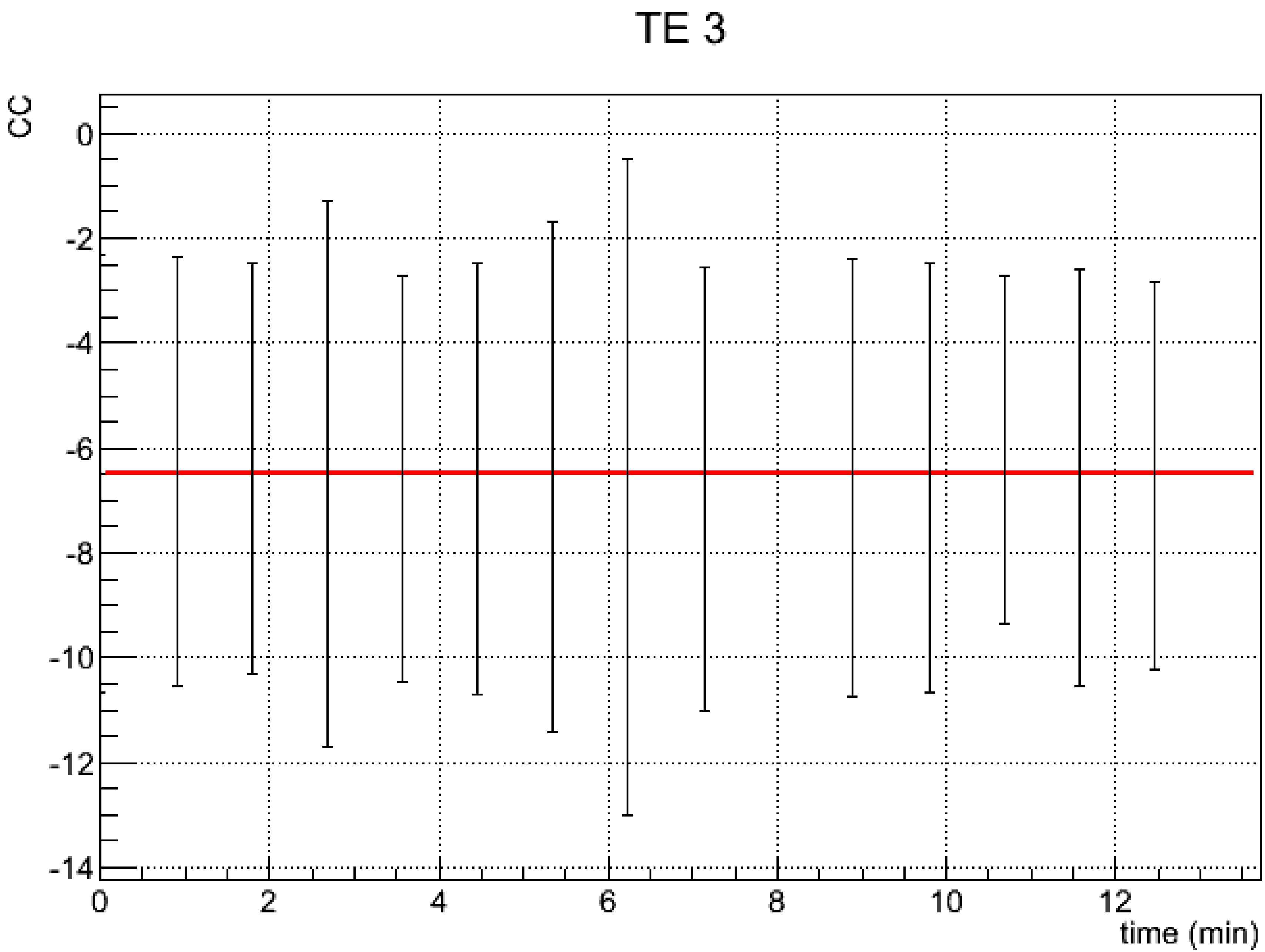
→

- Extremely high variation in uncertainty!
- Calibration constant uncertainty (below) completely dominated by area uncertainty.

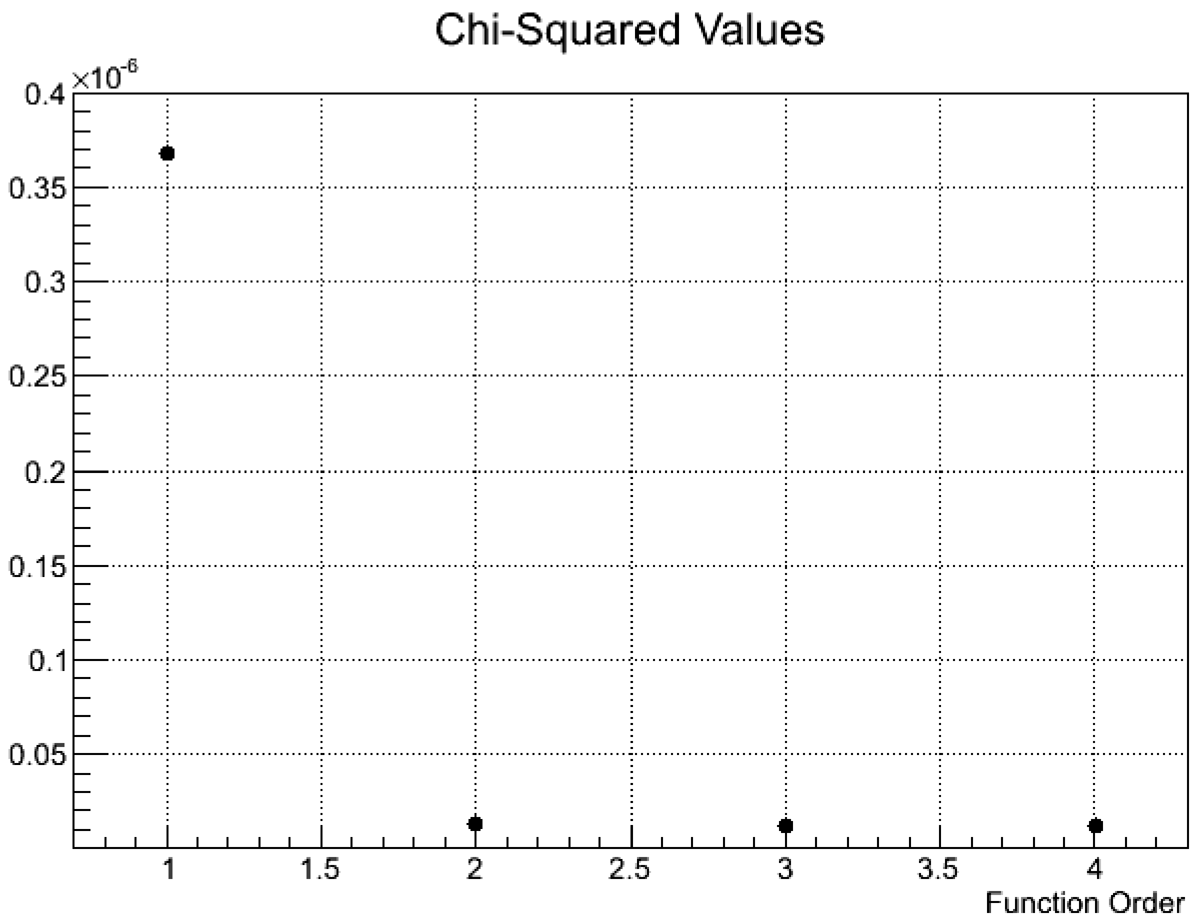
$$\Delta CC = \frac{\Delta P_{TE}}{A_{TE}} + \frac{P_{TE}}{A_{TE}^2}\Delta A_{TE}$$

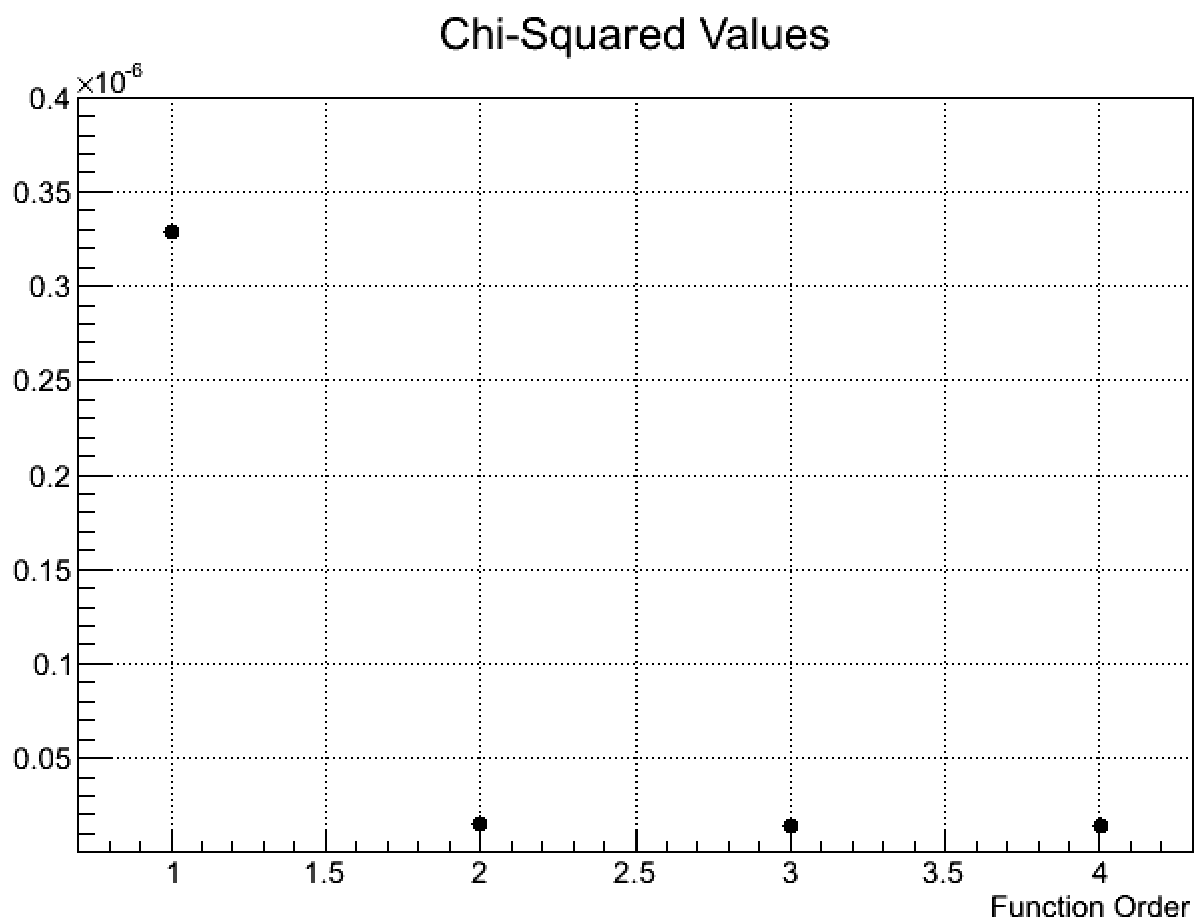
→ Calibration Constant uncertainty calculated using fit uncertainty (above) and polarization uncertainty (from slide 1)

Relative uncertainty so large using this method it is meaningless.

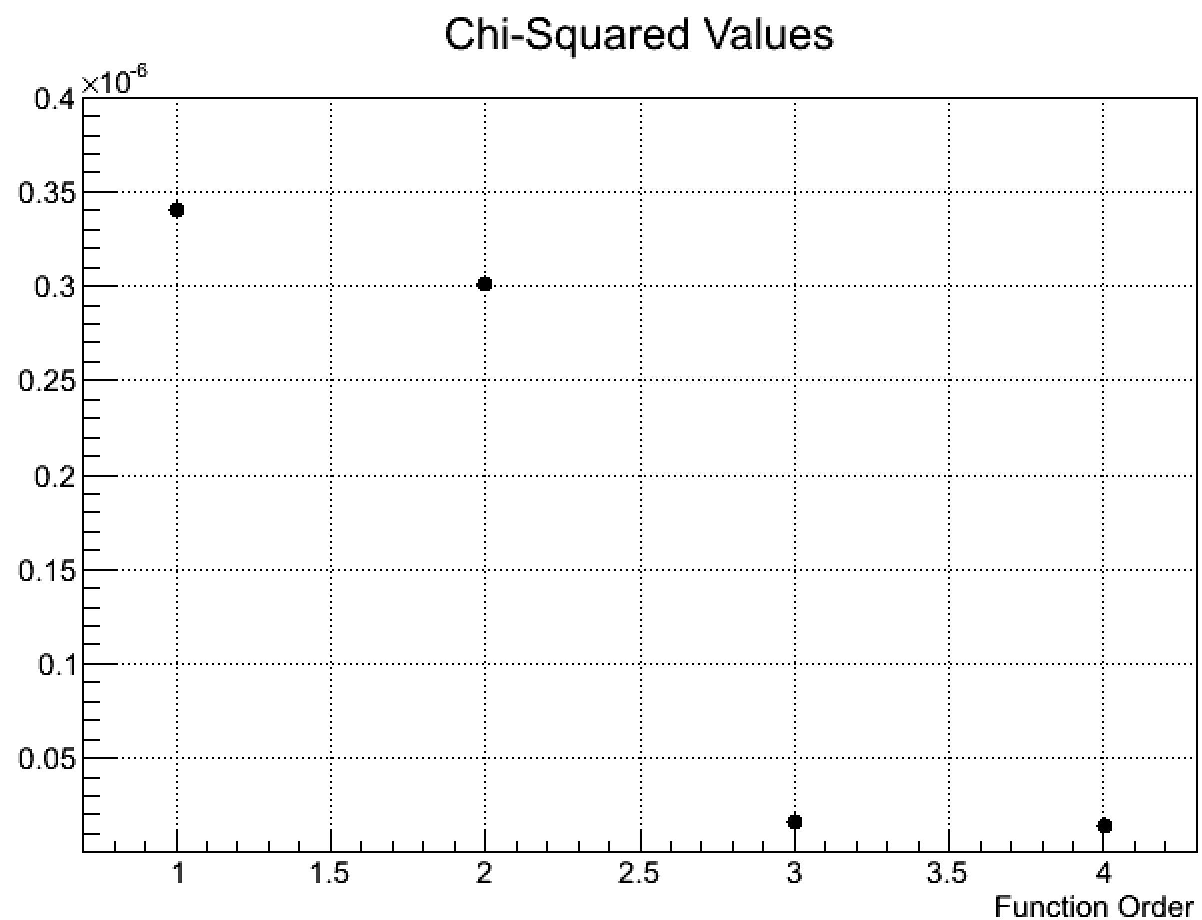

TE 3
CC
0
-2
-4
-6
-8
-10
-12
-14
0
2
4
6
8
10
12
time (min)

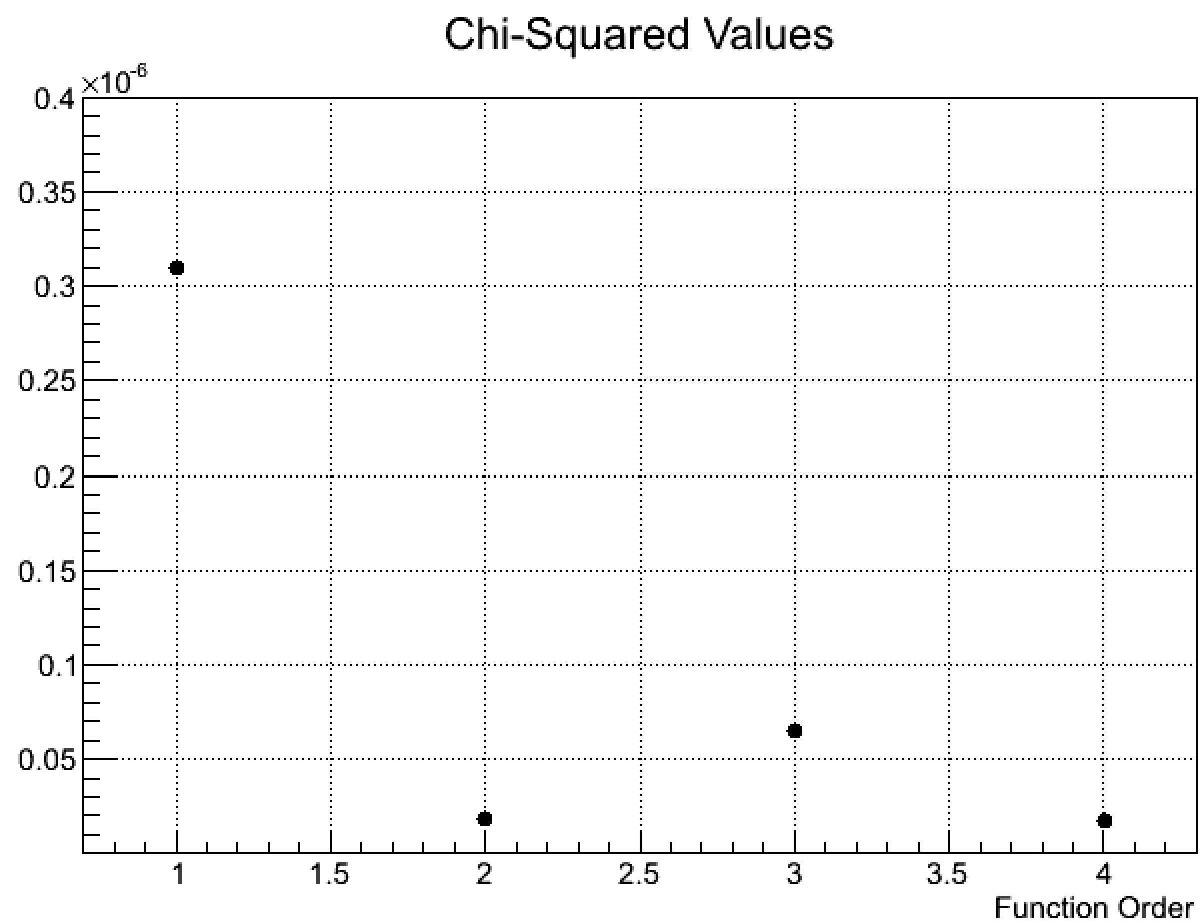
Look at chi-squared values of each fit:



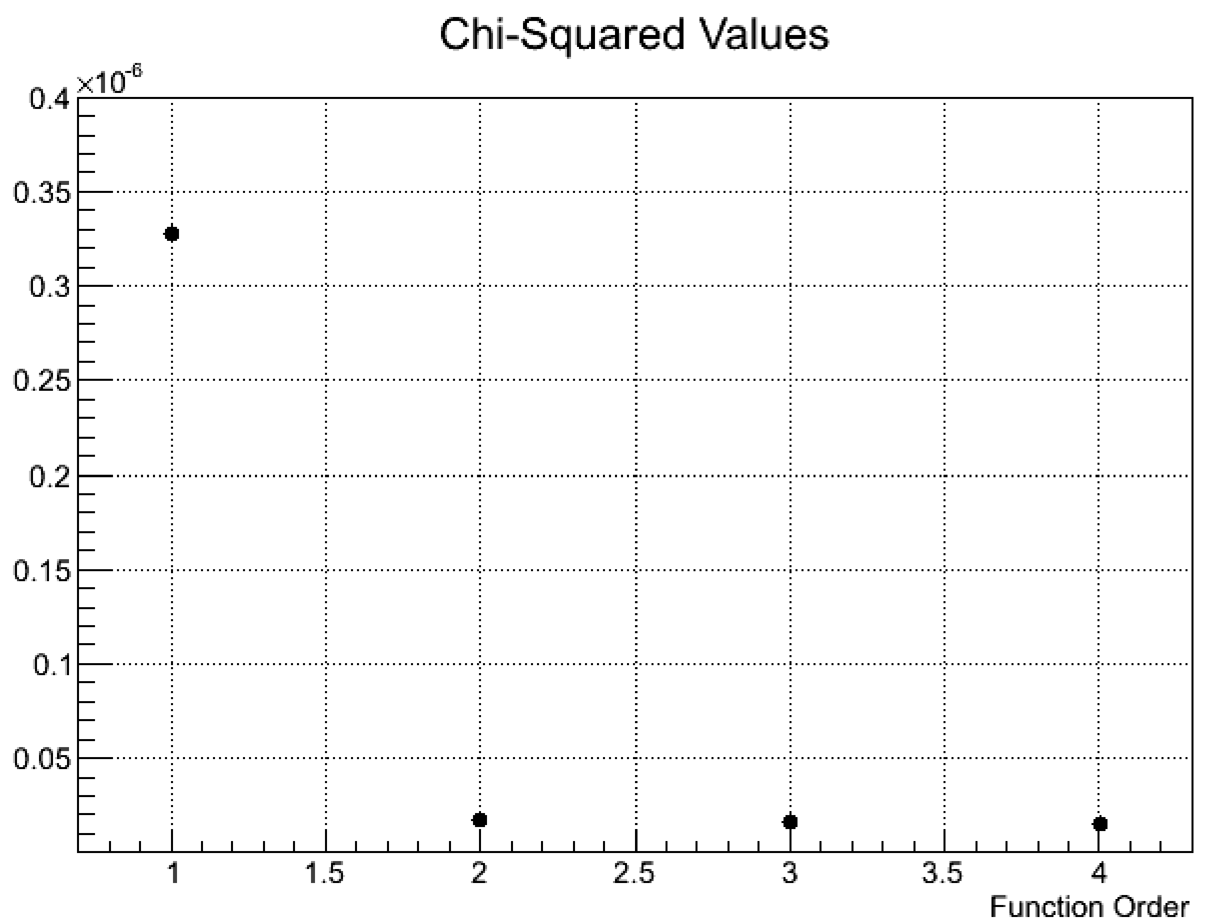


Chi-Squared Values
×10^-6
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
1
1.5
2
2.5
3
3.5
4
Function Order


Chi-Squared Values
×10^-6
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
1
1.5
2
2.5
3
3.5
4
Function Order



Chi-Squared Values
×10^-6
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
1
1.5
2
2.5
3
3.5
4
Function Order



Chi-Squared Values
×10^-6
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
1
1.5
2
2.5
3
3.5
4
Function Order

- For TE3 I should probably eliminate 1st order fit, but the chi-square quality changes from TE to TE.
- Keeping a generalized fit difference for all TE's introduces unreasonable uncertainty!
- Possible solution: 0th order fit on chi-square plot and eliminate large deviations (might not be possible)
- Suggestions?