Packing Fraction Update

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Method to Extract PF

$$Y = \frac{\rho l A}{M}\sigma \qquad A = \frac{\#\text{ of counts in cut}}{\text{total }\#\text{ of counts in fit}}$$

$$Y_{pf} = Y_{^{14}N} + Y_{^{4}He} + Y_{^{27}Al} + Y_{H_3}$$

Need simulation to determine σ_H

$$Y_{pf} = l_{tg} pf (A_N \frac{\rho_N}{M_N}\sigma_N - A_{He}\frac{\rho_{He}}{M_{He}}\sigma_{He}) + Y_{dummy}$$

$$\sigma_C = \frac{M_C}{\rho_C l_C A_C}(Y_{carbon} - Y_{empty})$$

$$\sigma_N = \frac{Y_{pf}}{Y_{carbon}}\sigma_C$$

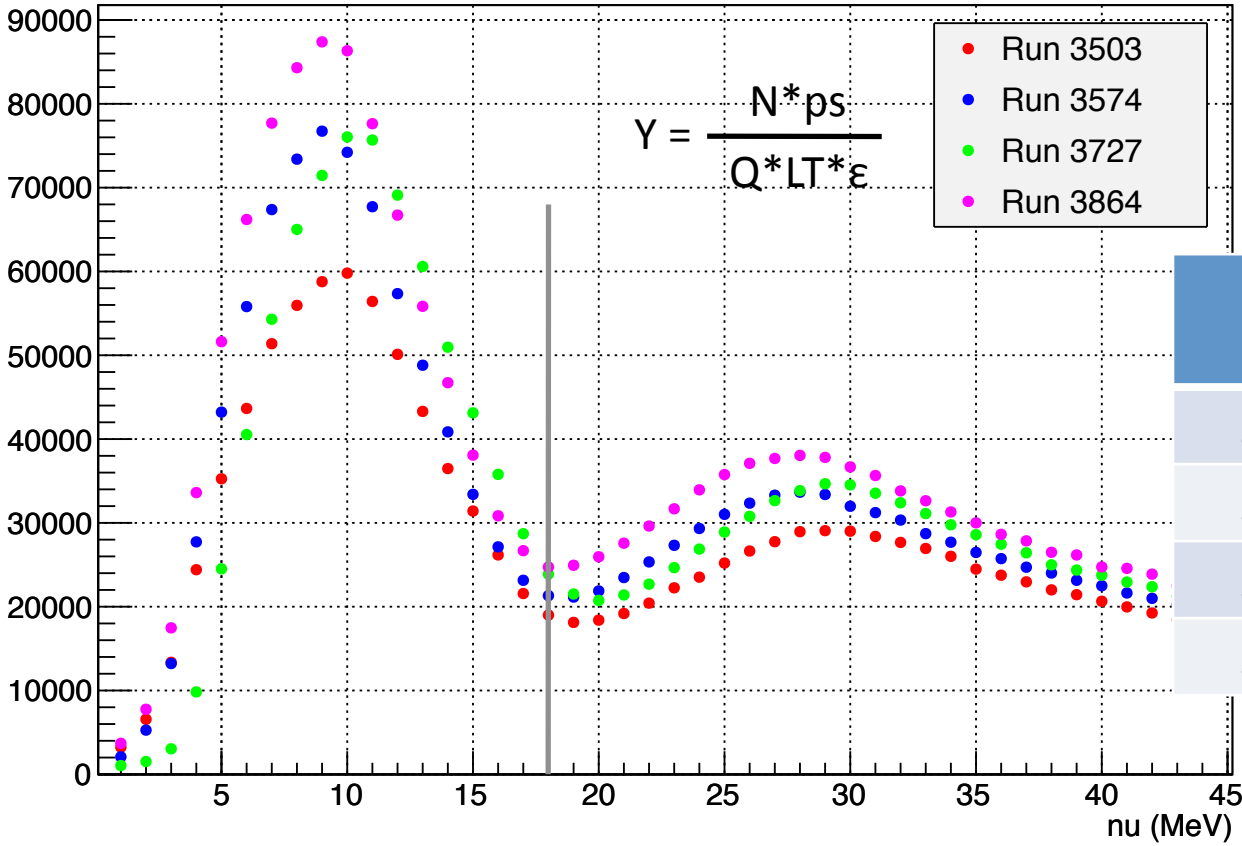
$$\sigma_{He} = \frac{M_{He}}{\rho_{He}(l_{tg} + l_{out})A_{He}}Y_{empty}$$

Run	w/out Accept.	w/ Accept.
3503	0.276	0.319
3574	0.442	0.530
3727	0.395	0.483
3864	0.582	0.679

Packing Fraction Runs for Material #7

2.2 GeV, 2.5T, Transverse

Normalized Yields (with electron cuts applied)



Yields are not consistent!

Run	Peak Location	Area (0-18)
3503	8.024	606230
3574	7.811	732731
3727	9.038	703172
3864	7.739	849059

Good Electron Cuts

2.2 GeV, 2.5T, Transverse, Material #7

PF Run	1-0	2-0	3-0	4-0	5-0
3503	0.321	0.319	0.318	0.316	0.319
3574	0.532	0.529	0.520	0.519	0.530
3727	0.486	0.481	0.489	0.488	0.483
3864	0.681	0.676	0.677	0.675	0.679

1-0:
abs(L.tr.r_x) < 0.5
abs(L.tr.r_y) < 0.05
abs(L.tr.r_th) < 0.05
abs(L.tr.r_ph) < 0.05
abs(L.gold.dp) < 0.035

2-0:
L.cer.asum_c > CerCut
(L.prl1.e)/p > PR1Cut
(L.prl1.e+L.prl2.e)/p > SumCut

3-0:
L.tr.n==1
L.vdc.*.nclust==1

4-0:
All Cuts

5-0:
No Cuts

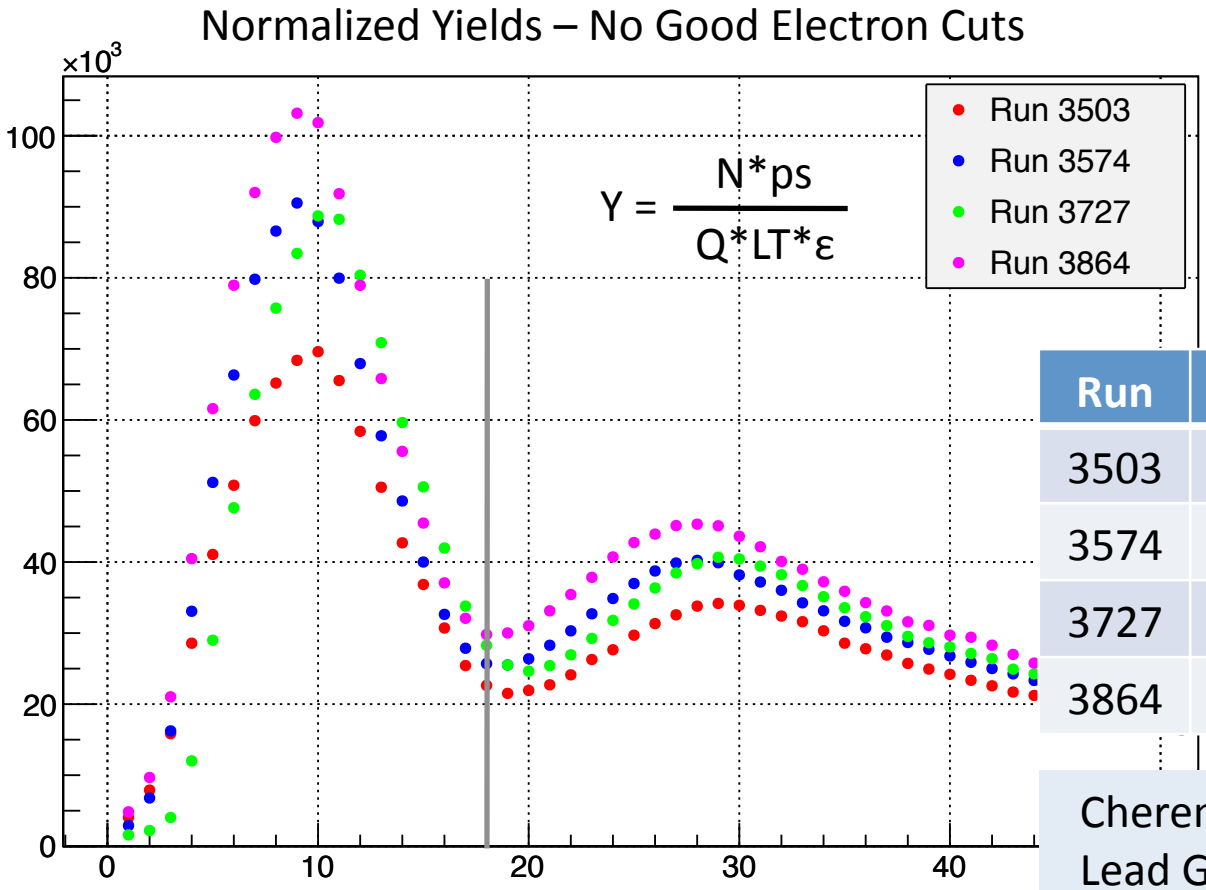
Check with Helicity-Gated Quantities

2.2 GeV, 2.5T, Transverse, Material #7

	4-0: All Cuts		5-0: No Cuts	
PF Run	+	-	+	-
3503	0.343	0.317	0.341	0.321
3574	0.562	0.537	0.565	0.548
3727	0.532	0.501	0.519	0.498
3864	0.615	0.591	0.615	0.600

Packing Fraction Runs for Material #7

2.2 GeV, 2.5T, Transverse



Normalization Values

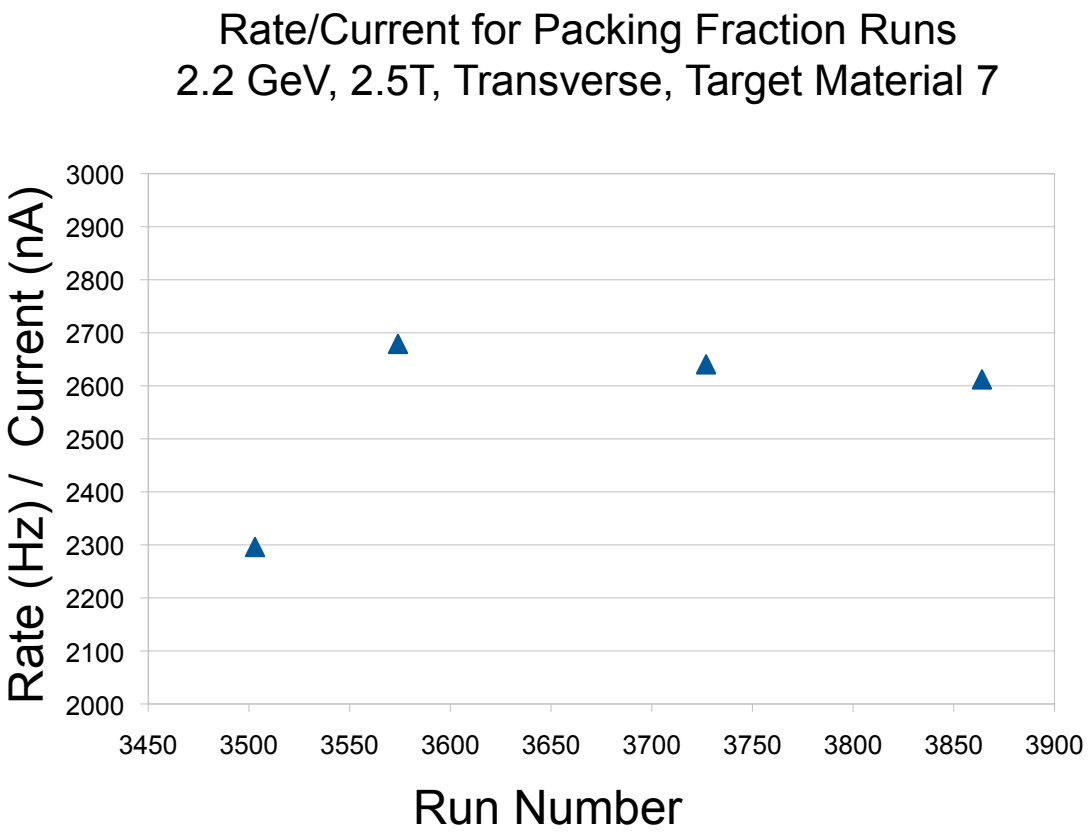
Run	ps3	Q	LT
3503	15	14.377	0.915
3574	20	18.804	0.944
3727	18	16.587	0.941
3864	20	8.131	0.857

Cherenkov Detector Efficiency
Lead Glass Detector Efficiency
Trigger Efficiency

All > 99.9%

Rate/Current Check

2.2 GeV, 2.5T, Transverse

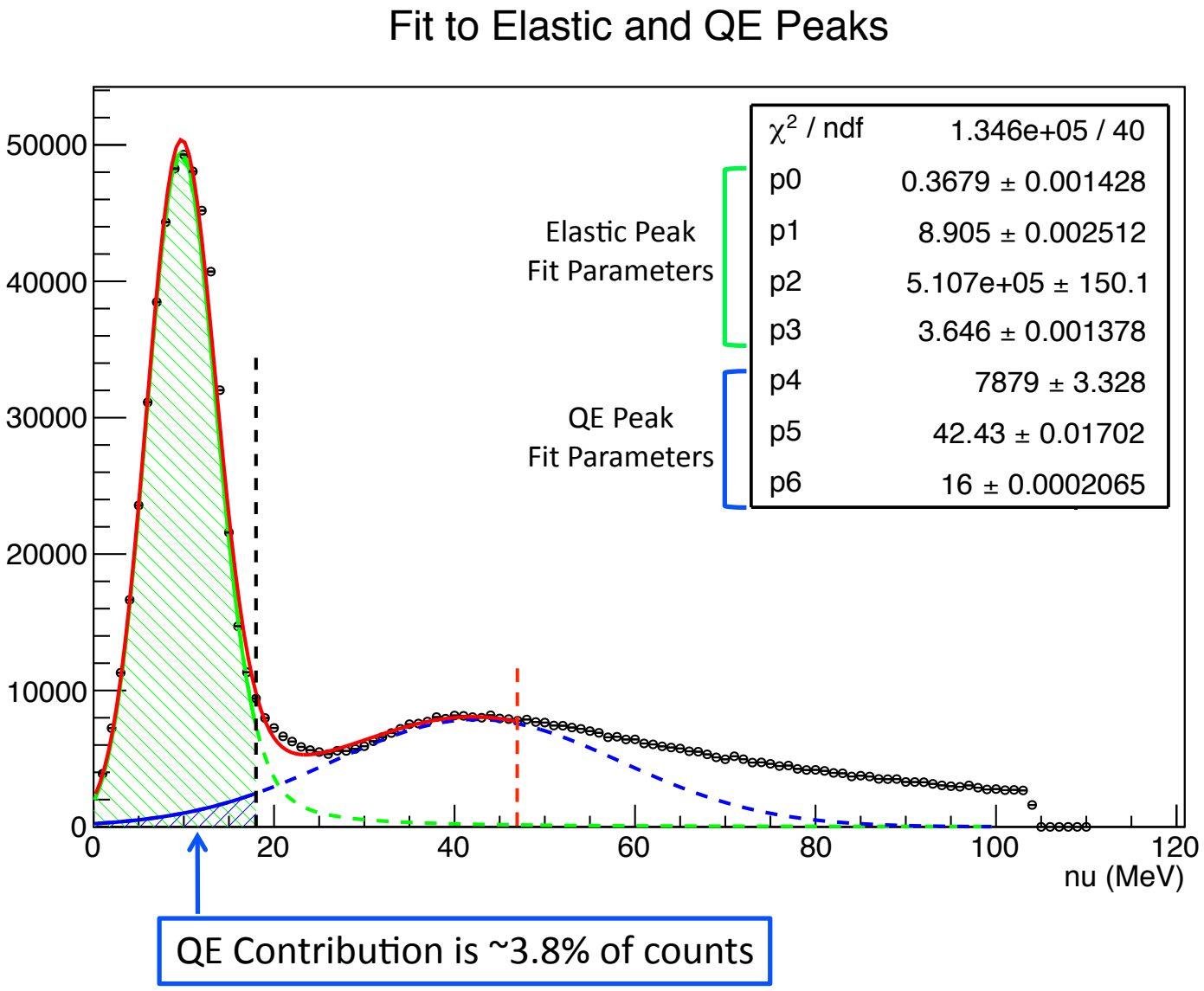


Run	T3 Rate (Hz)	Avg Current (nA)
3503	93911.0	40.9005
3574	117374.8	43.8123
3727	103115.9	39.0521
3864	107841.1	41.2853

Backup

Fitting Routine

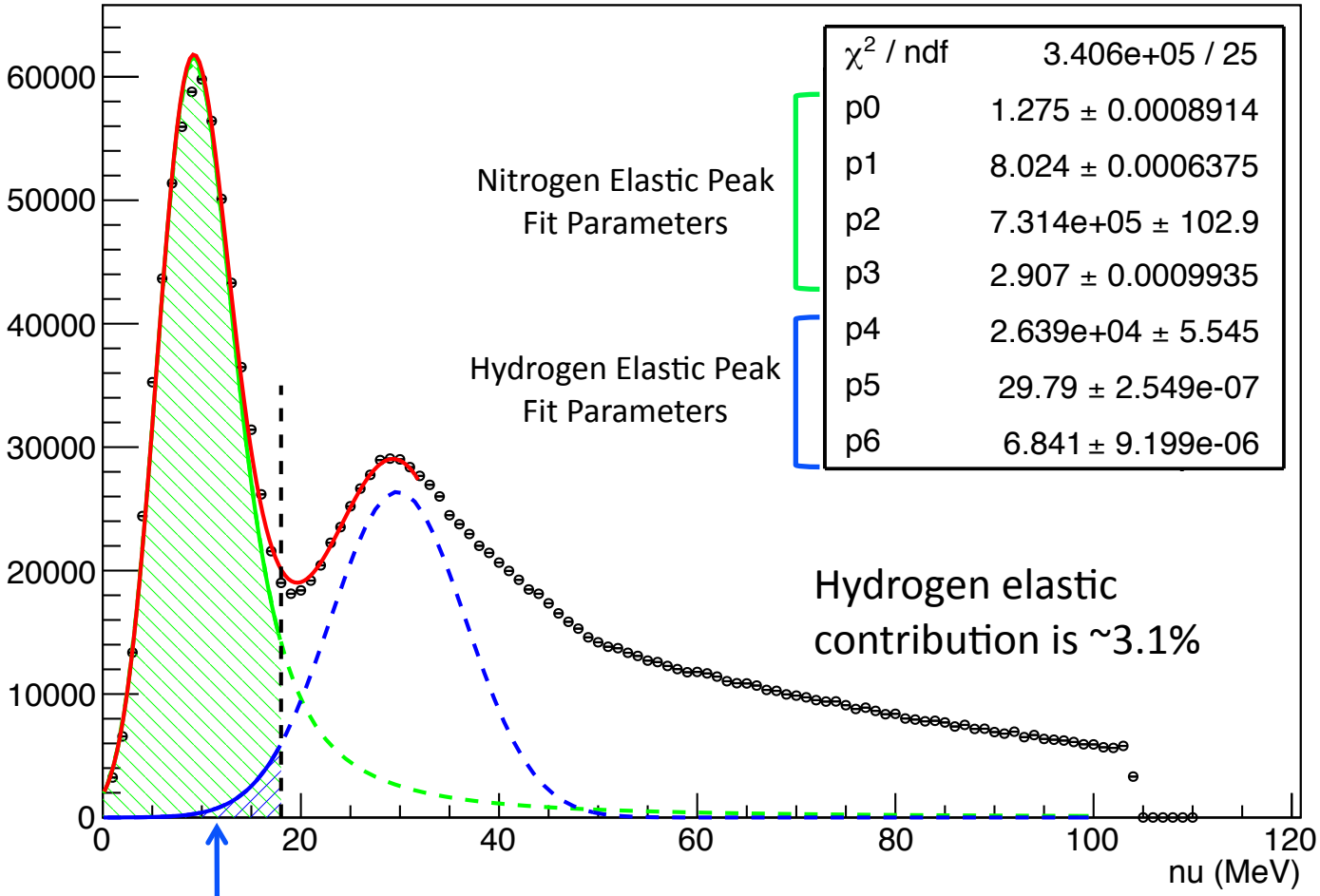
Carbon Run 3447



Fitting Routine

Packing Fraction Run 3503

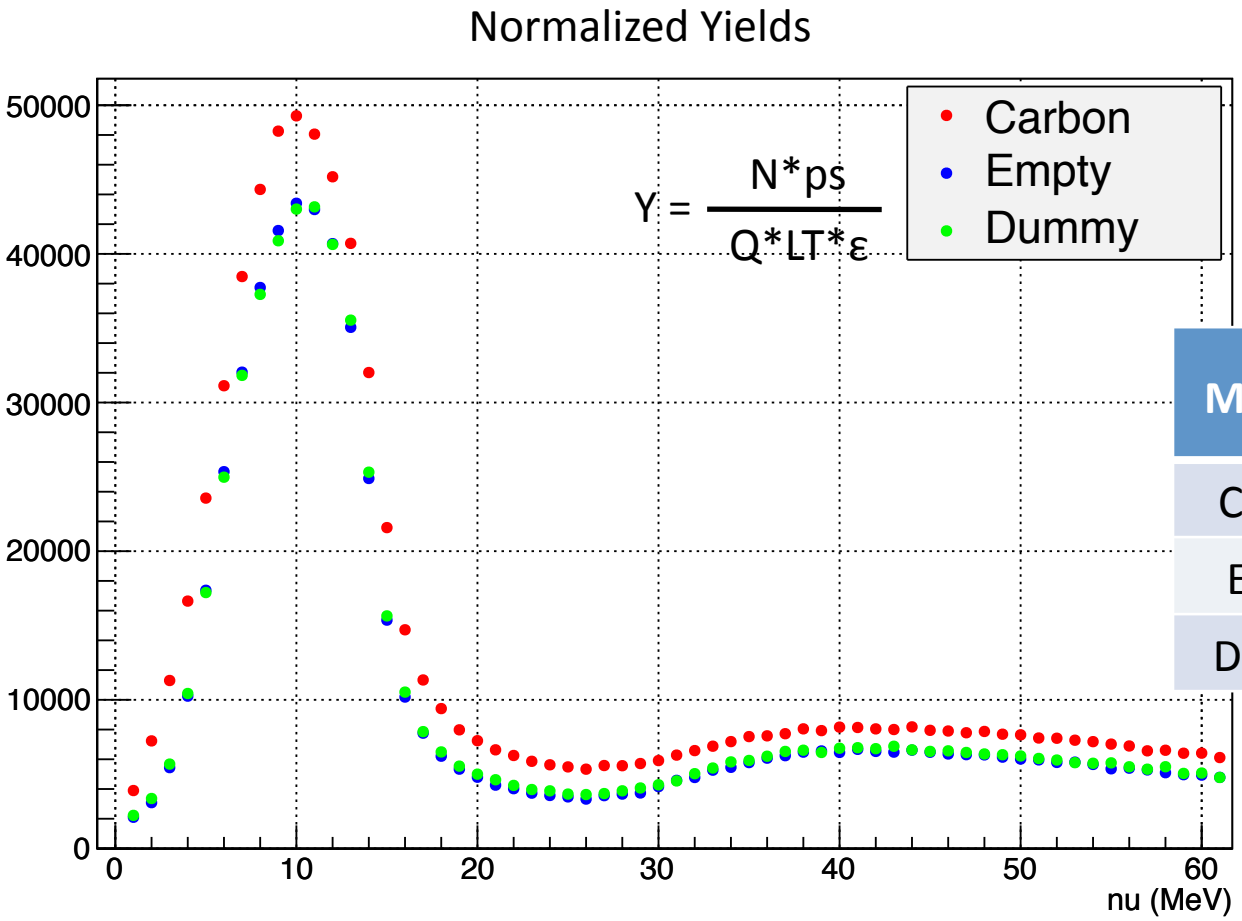
Fit to Nitrogen and Hydrogen Elastic Peaks



Hydrogen Elastic Contribution is ~3.1% of counts

Dilution Runs

2.2 GeV, 2.5T, Transverse

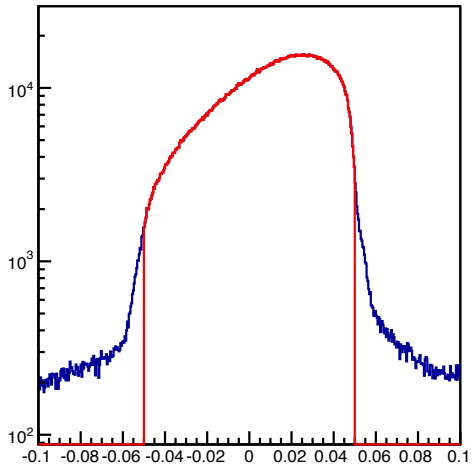


Material	Peak Location	Area (0-18)
Carbon	8.905	474834
Empty	9.024	391514
Dummy	9.021	391535

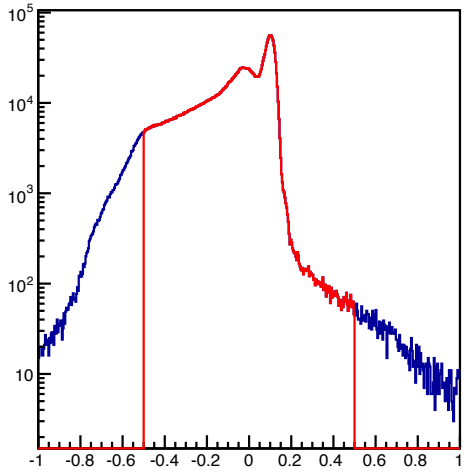
Loose Acceptance Cuts

PF Run 3727

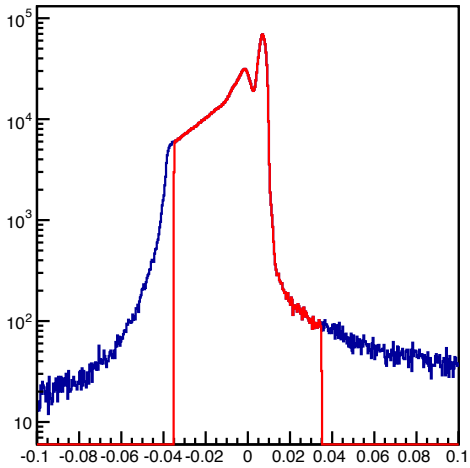
Y Cut: +/- 0.05



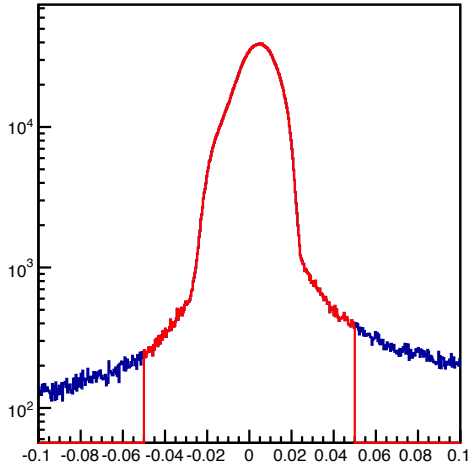
X Cut: +/- 0.5



dp Cut:+/- 0.035



Theta Cut: +/- 0.05



Phi Cut: +/- 0.05