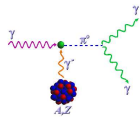


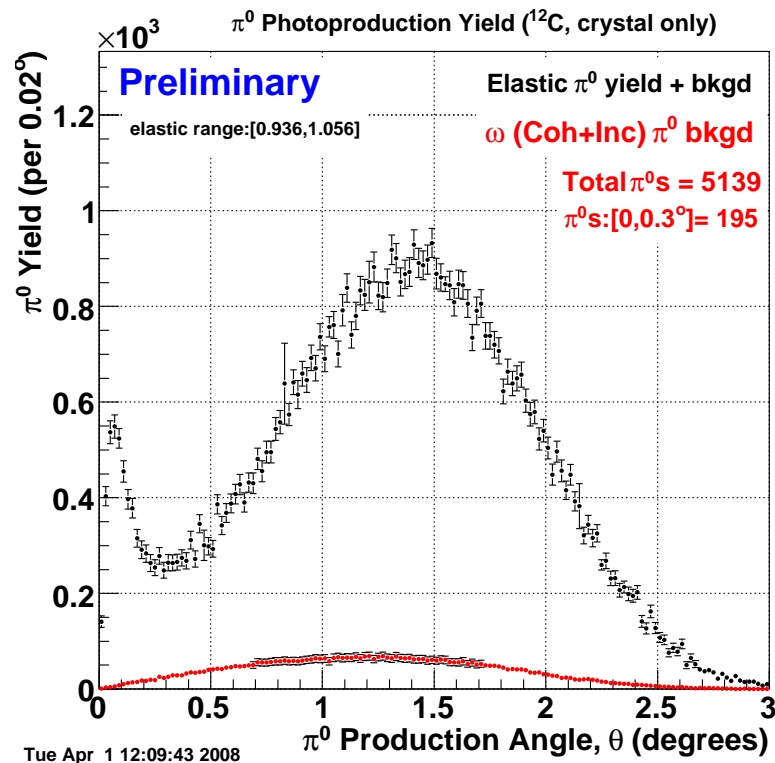
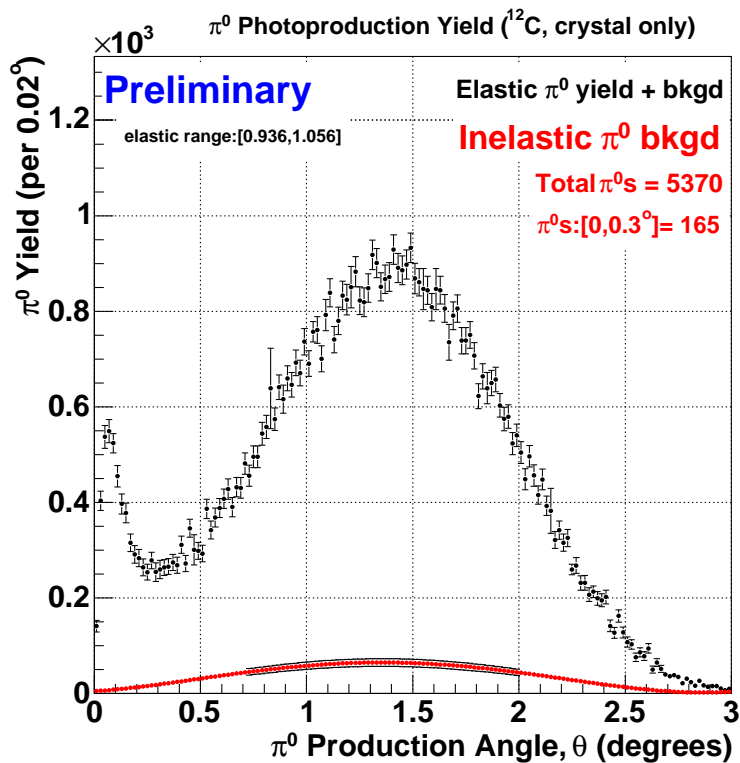
π^0 Lifetime Analysis for ^{12}C and ^{208}Pb

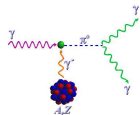
Dustin McNulty
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April 4, 2008

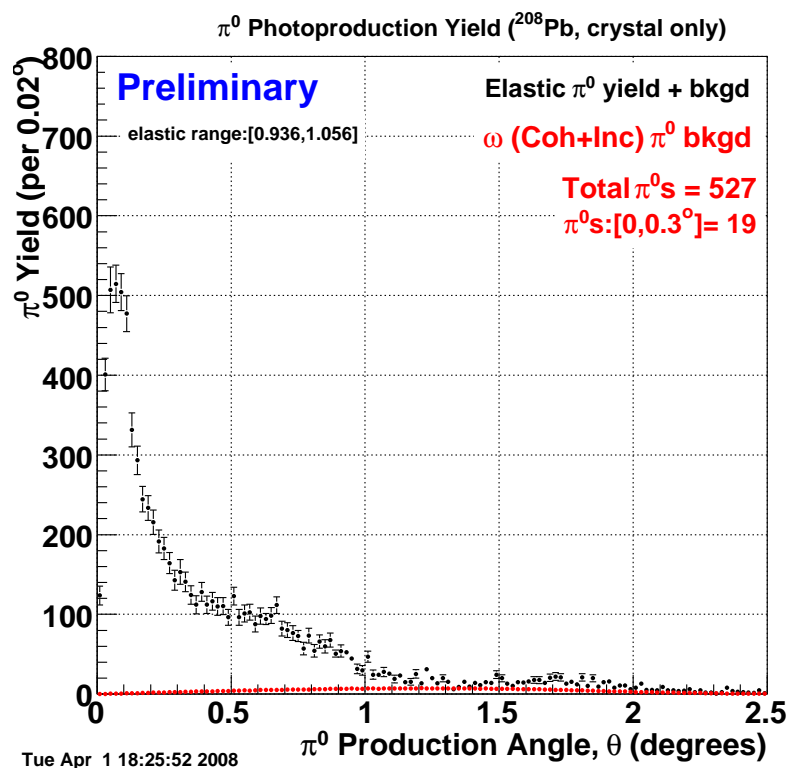
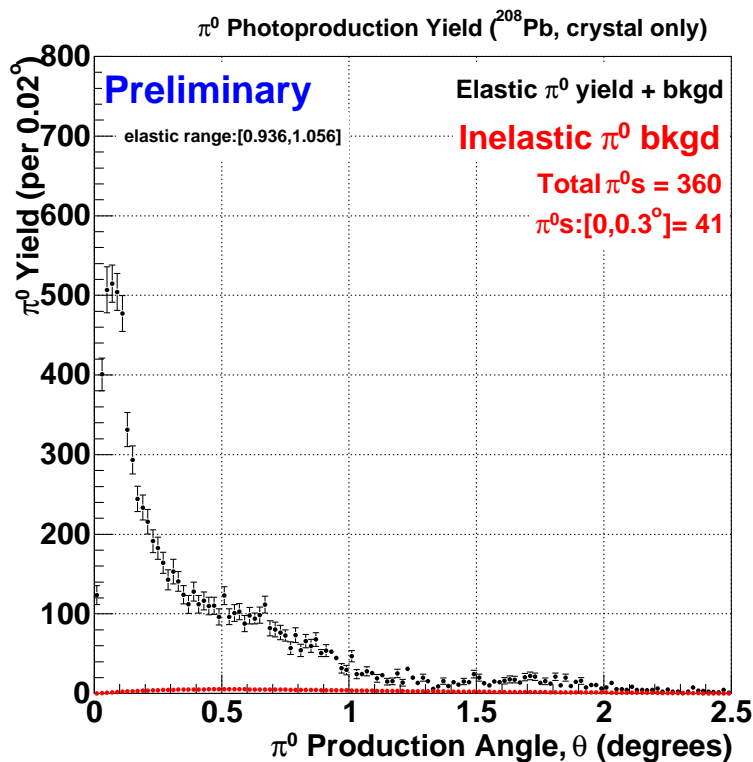


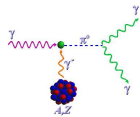
^{12}C Yield: Standard and Omega Bkgds





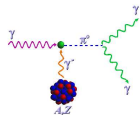
^{208}Pb Yield: Standard and Omega Bkgds



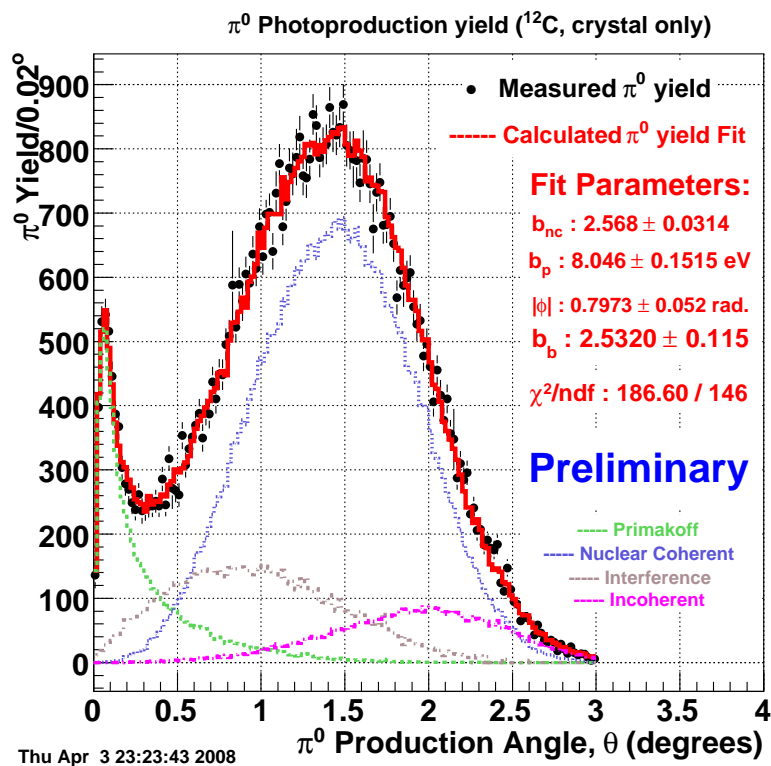
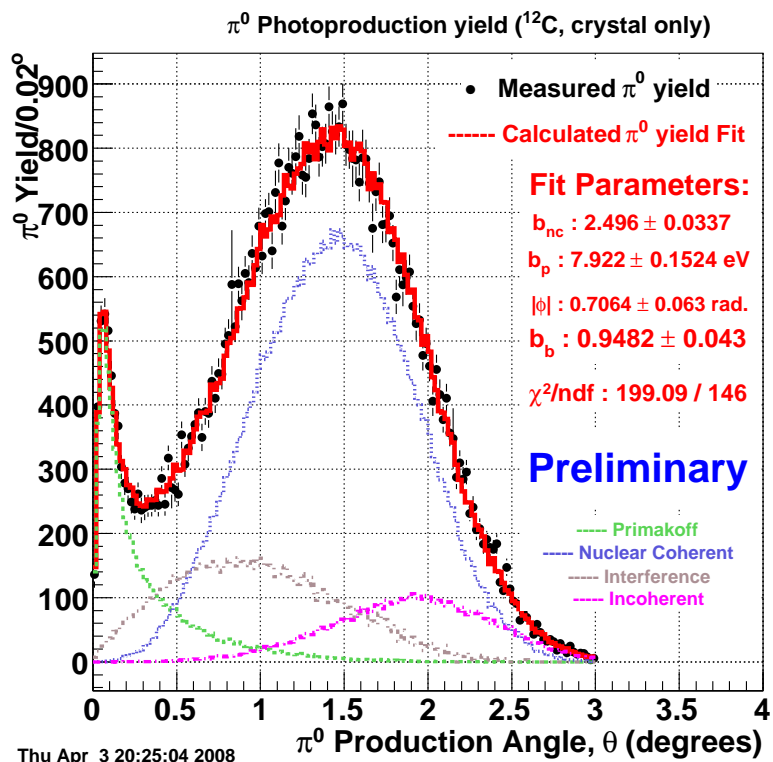


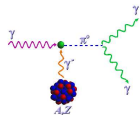
Recent Work

- Refined yield fit algorithm to use the predicted plus the fit interference phase angle.
- Performed yield fits with Sergey using Tulio's most recent incoherent cross sections.
- Incorporated π^0 background from coherent and incoherent omega production.
- Evaluated $\Gamma_{\gamma\gamma}$ for 5 different yields (with varying bkgd corrections):
 - Standard Bkgd Correction (sb)
 - No Bkgd Correction (nb)
 - Omega Bkgd Correction (ob)
 - Omega Bkgd Correction +20% (ob+)
 - Omega Bkgd Correction -20% (ob-)

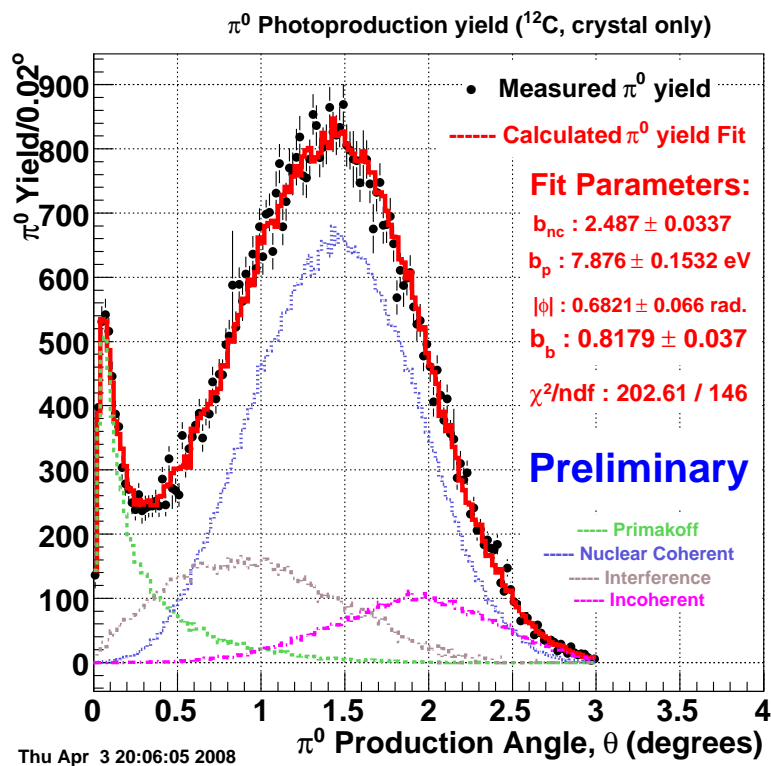
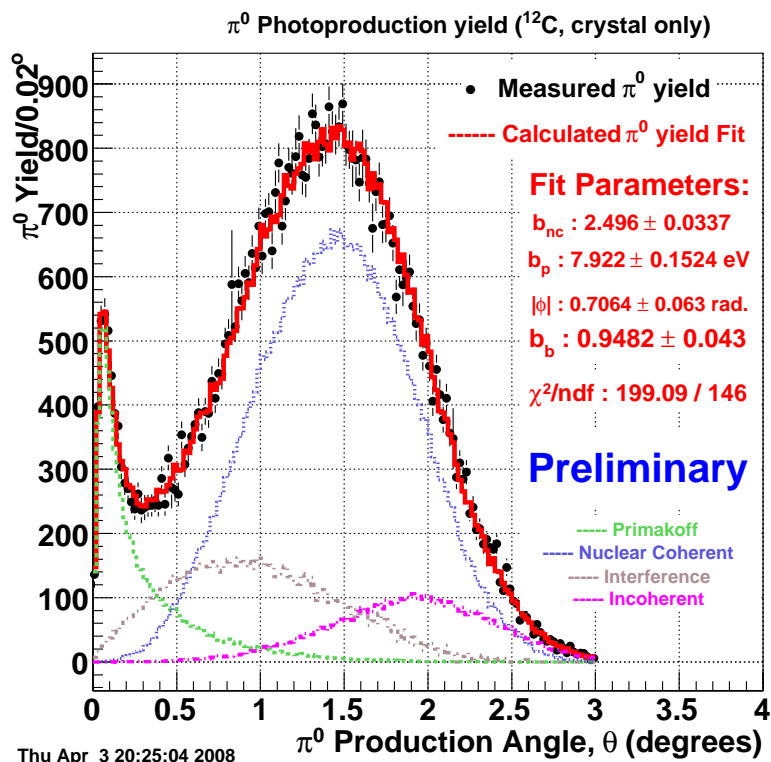


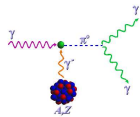
Sample Yield Fit for ^{12}C : SI (left) and TI (right)



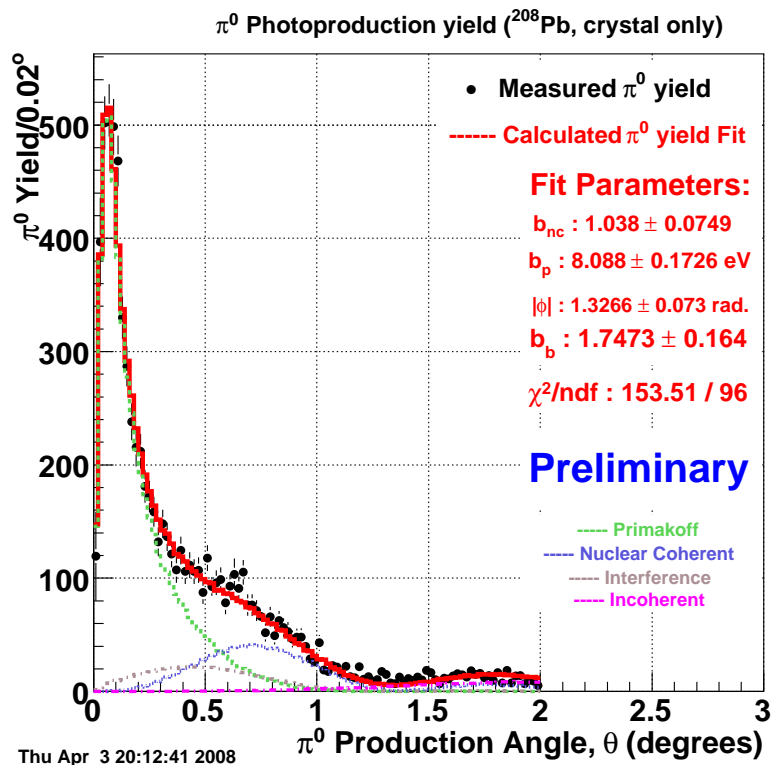
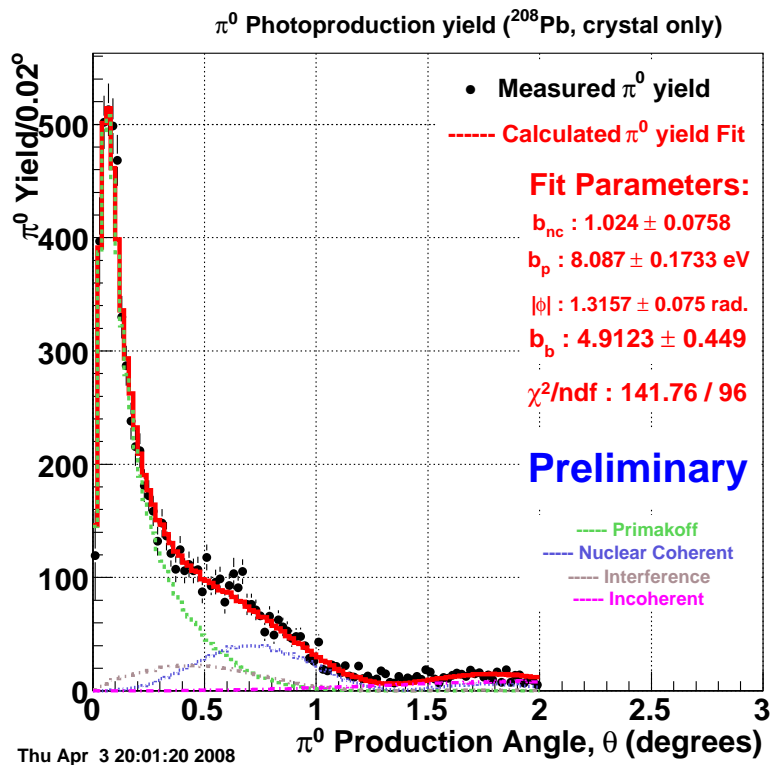


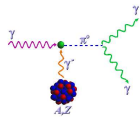
Sample Yield Fit for ^{12}C : SI (left) and S2I (right)



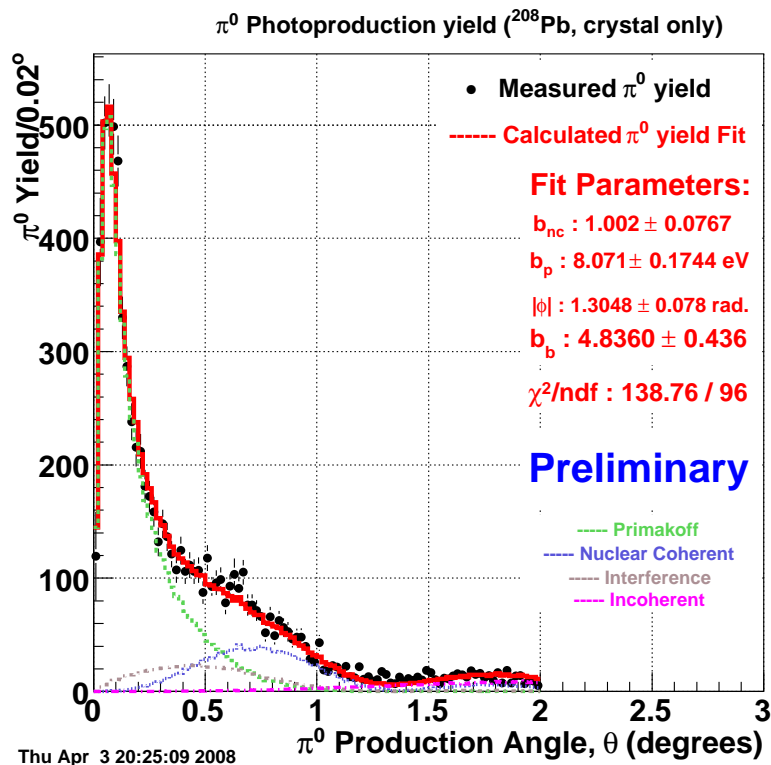
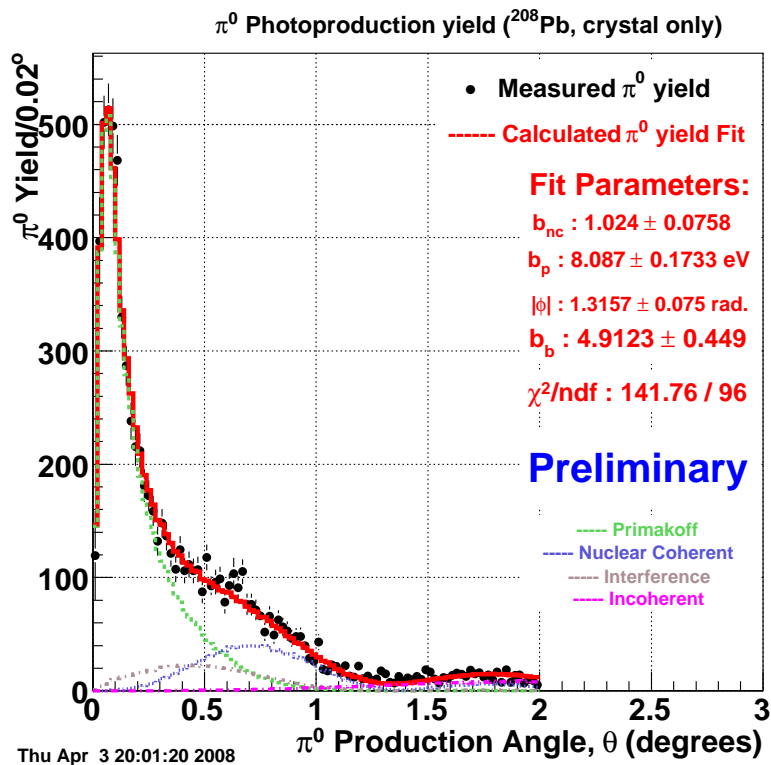


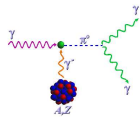
Sample Yield Fit for ^{208}Pb : TA (left) and SA (right)



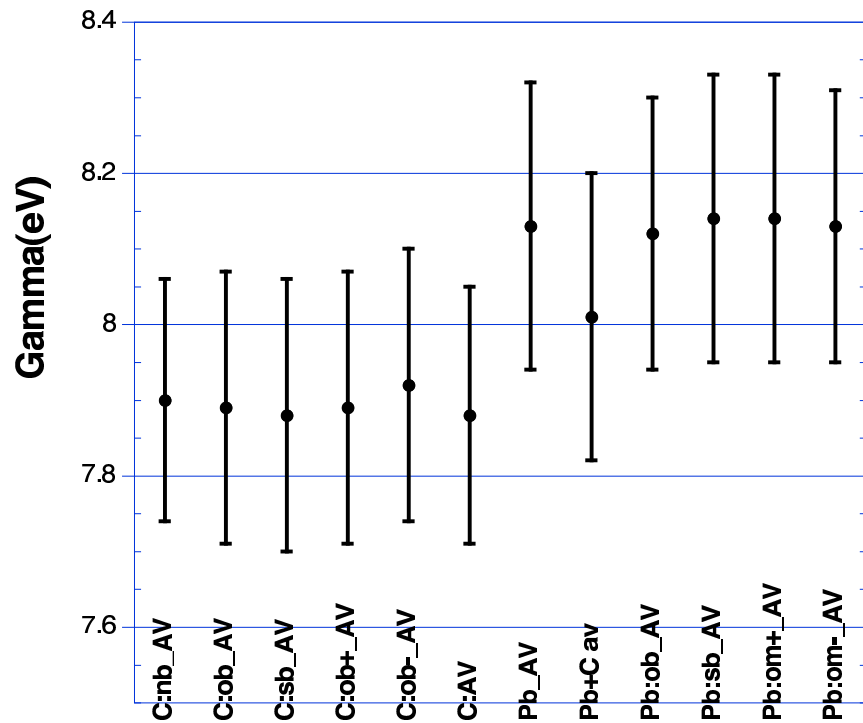


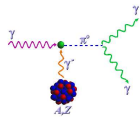
Sample Yield Fit for ^{208}Pb : TA (left) and T2A (right)





$\Gamma_{\gamma\gamma}$ Results: $\alpha = 2$ with ^{12}C and ^{208}Pb averages





Preliminary Result Summary

target	$\Gamma_{\gamma\gamma}$	fitting (stat) error	model error	syst error	total error
C: av	7.90	0.15(1.9%)	0.09(1.1%)	0.18(2.3%)	0.25(3.2%)
Pb:av	8.13	0.17(2.1%)	0.07(0.9%)	0.19(2.3%)	0.26(3.2%)
Pb+C av	8.01	0.12(1.5%)	0.15(1.9%)	0.18(2.3%)	0.26(3.2%)

Table 1: Average extracted value of $\Gamma(\pi^0 \rightarrow \gamma\gamma)$ and the errors in eV(%). The averages were taken over all of the fits. The total error adds in quadrature the fitting, model, and the systematic error.