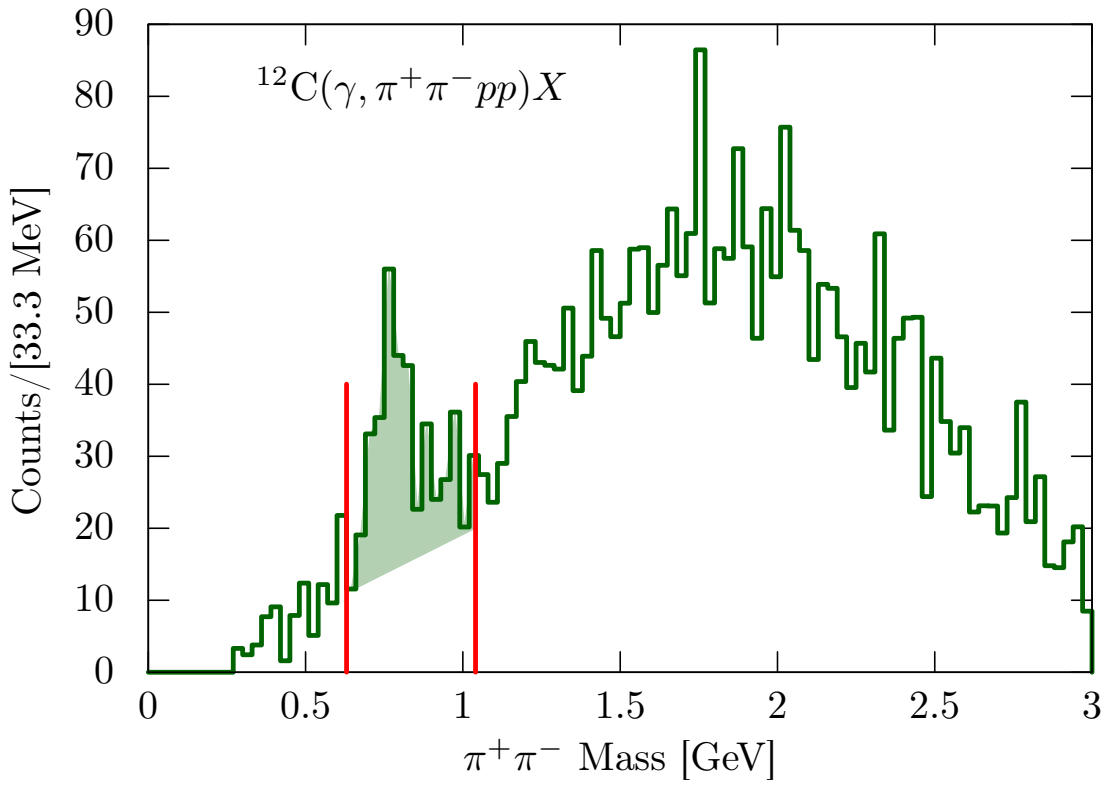
Executive Summary

- I have calculated the yield of $^{12}C(\gamma, \pi^+\pi^- pp)X$ three different ways.
    - Trapezoid Subtraction
    - Sideband Subtraction
    - Gauss Approximation with linear background

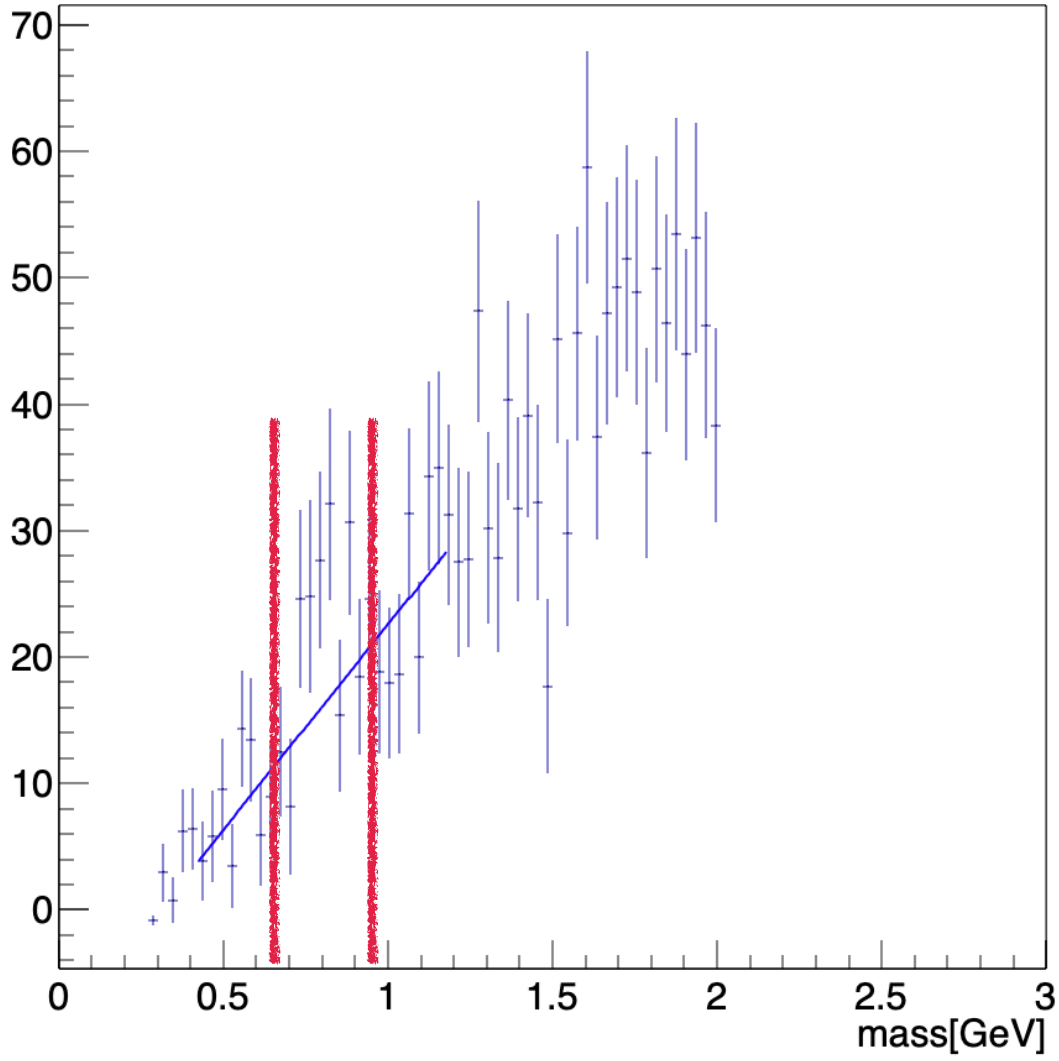
Trapezoid Subtraction

- Method: Integrate in signal region, subtract out background that makes trapezoids with red lines.
- Error is sum of integral error (bin errors) + error of left and right most bin.



Sideband Subtraction

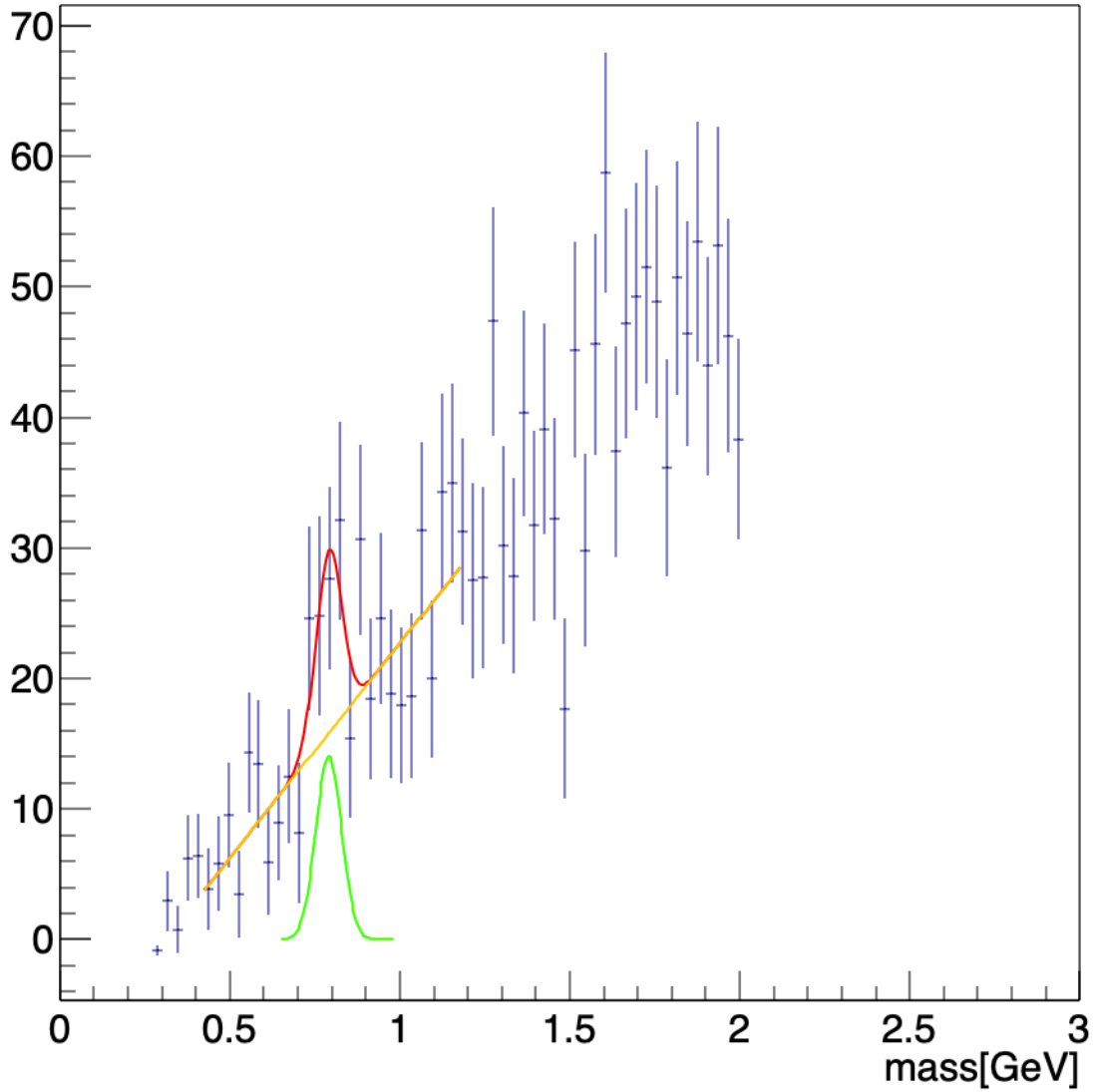
- Method: Fit line to the background, integrate in signal region, subtract
- Error is propogated from bin errors, assumed uncorrelated IntegralAndError
- Next step: Add in correlated errors



Gaussian Approximation Method

with linear background

- Method: Fit a gauss in the signal region, subtract linear background
- Error on linear background parameters comes from covariance matrix



C12 - 2p

pmiss (MeV)	Trapezoid	Sideband	Gaus
400-500	101 +/- 27	166 +/− 24 Chi2/Ndf = 35/13	138 +/− 25 Chi2/Ndf = 18/20
500-600	59 +/- 28	158 +/− 25 Chi2/Ndf = 32/13	154 +/− 29 Chi2/Ndf = 27/20
600-700	133 +/- 27	130 +/− 24 Chi2/Ndf = 24/13	140 +/− 32 Chi2/Ndf = 22/20
700-800	14 +/- 24	49 +/− 22 Chi2/Ndf = 19/13	44 +/− 18 Chi2/Ndf = 17/20

Next Steps

- Run $^{12}C(\gamma, \pi^+\pi^- p)X$ through this analysis and determine which method of yield calculation is best for $^{12}C(\gamma, \pi^+\pi^- p)X$.
- Take ratio of $\frac{^{12}C(\gamma, \pi^+\pi^- pp)X}{^{12}C(\gamma, \pi^+\pi^- p)X 0T + ^{12}\, C(\gamma, \pi^+\pi^- pp)X}$ for np-dominance test