

Study Pi0 Yield of Carbon Target

Lingling

12/6/2013

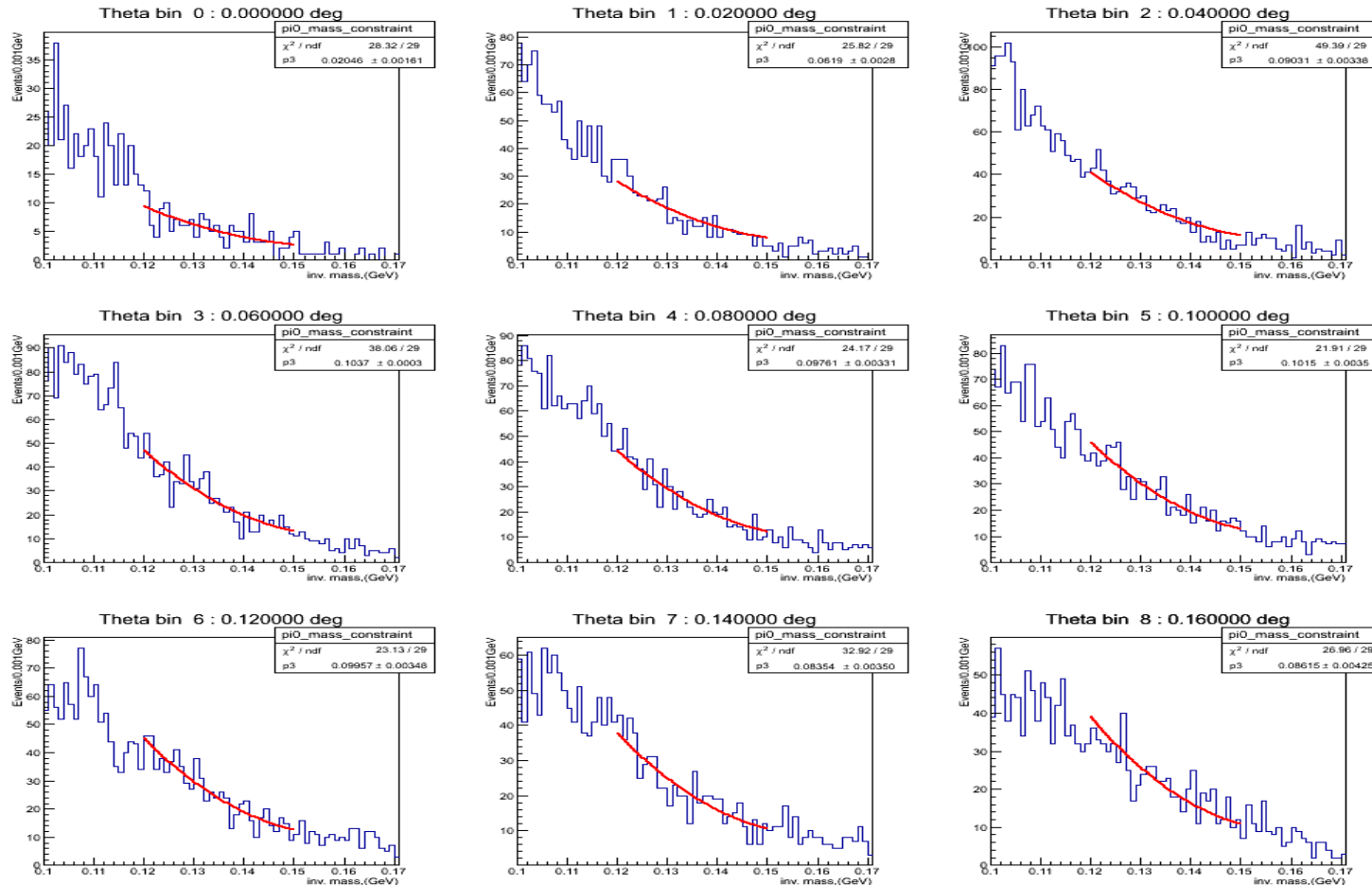
Empty target background subtraction:

- 1) For each angular θ bin, the beam background is estimated by fitting the invariant mass distribution of empty target data.

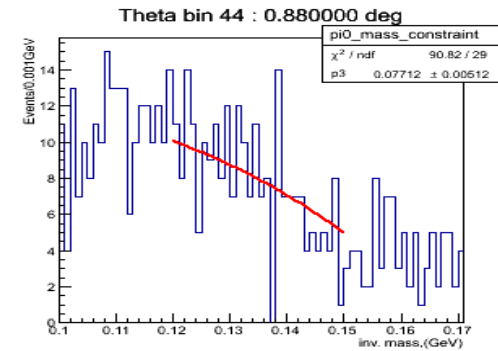
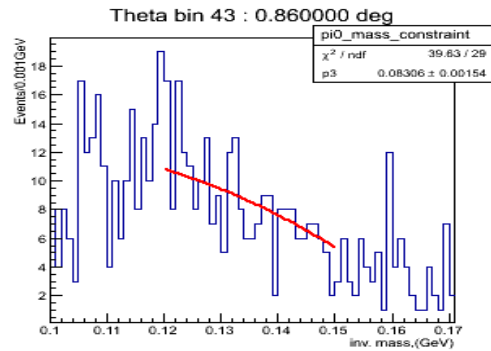
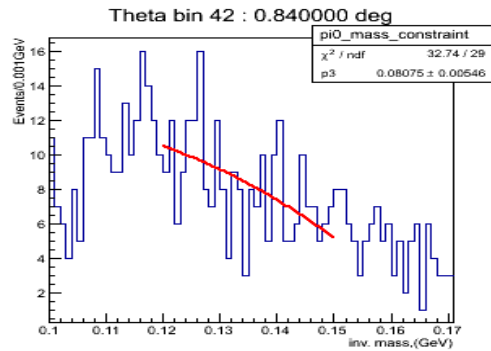
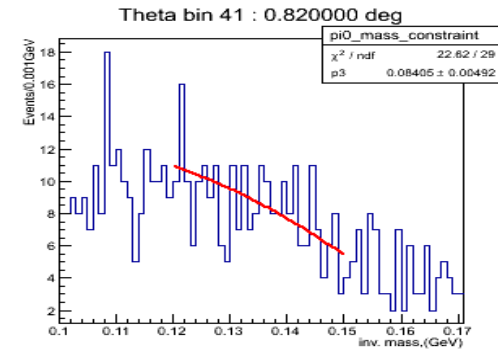
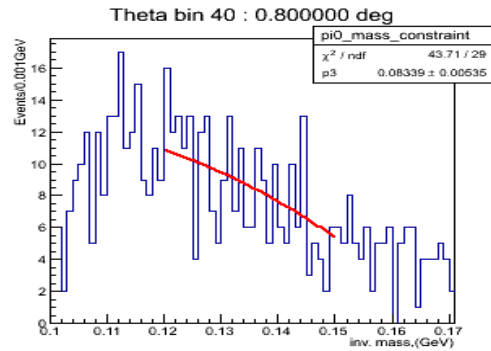
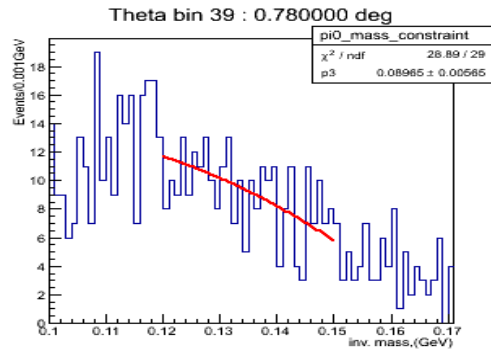
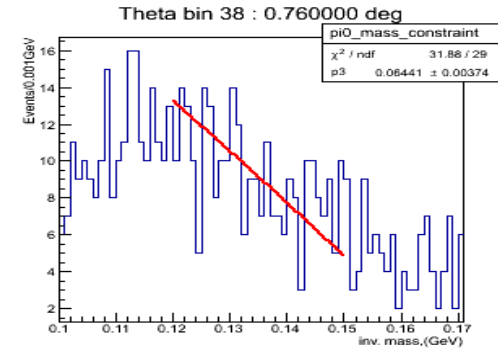
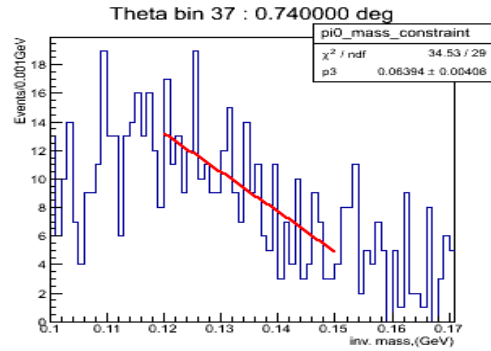
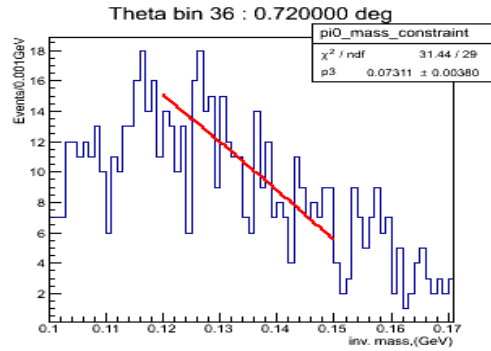
fitting function: 2nd polynomial

fitting range: [0.12,0.15], the same fit range as pi0 data events

Invariant mass in primakoff region (Empty target data)



Invariant mass in nuclear coherent region (Empty target data)



2) For each angular theta bin, the beam background scaled by flux ratio is subtracted from invariant mass of pi0 data.

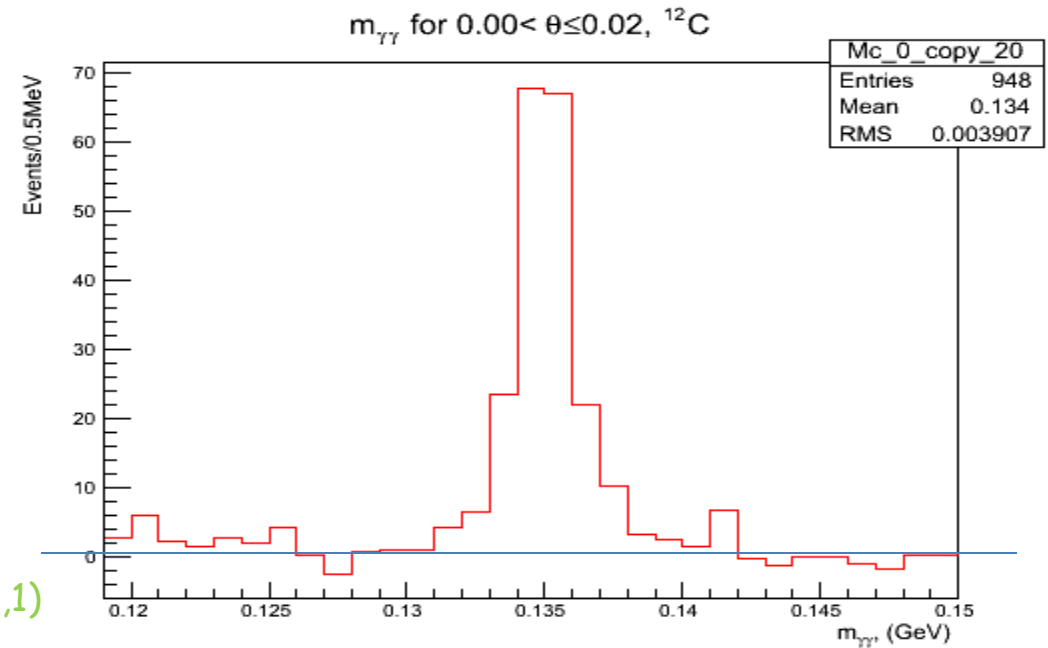
Question :

- 1) negative bins
- 2) How sensitive of beam background subtraction to pi0 decay width

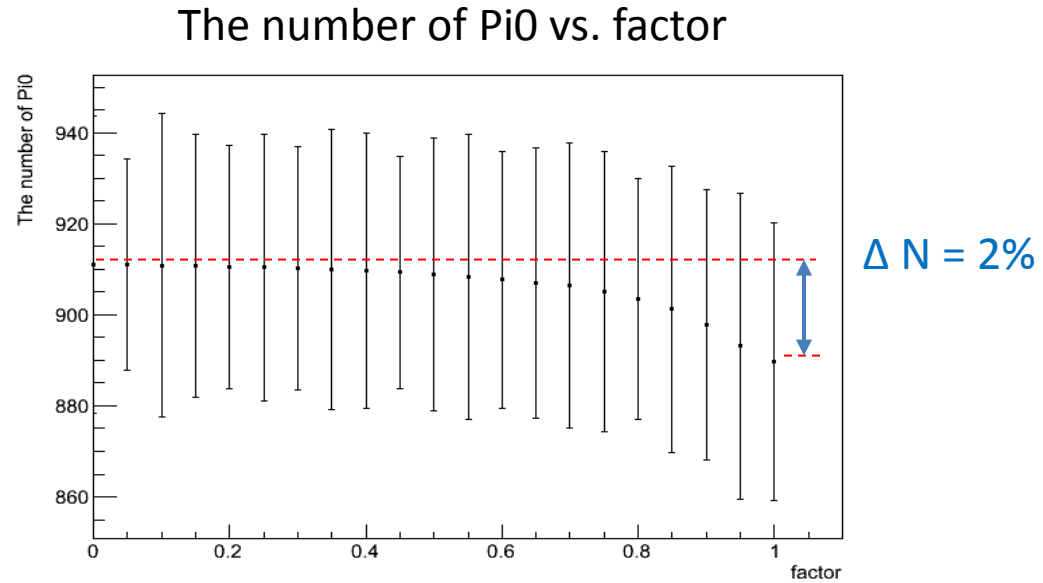
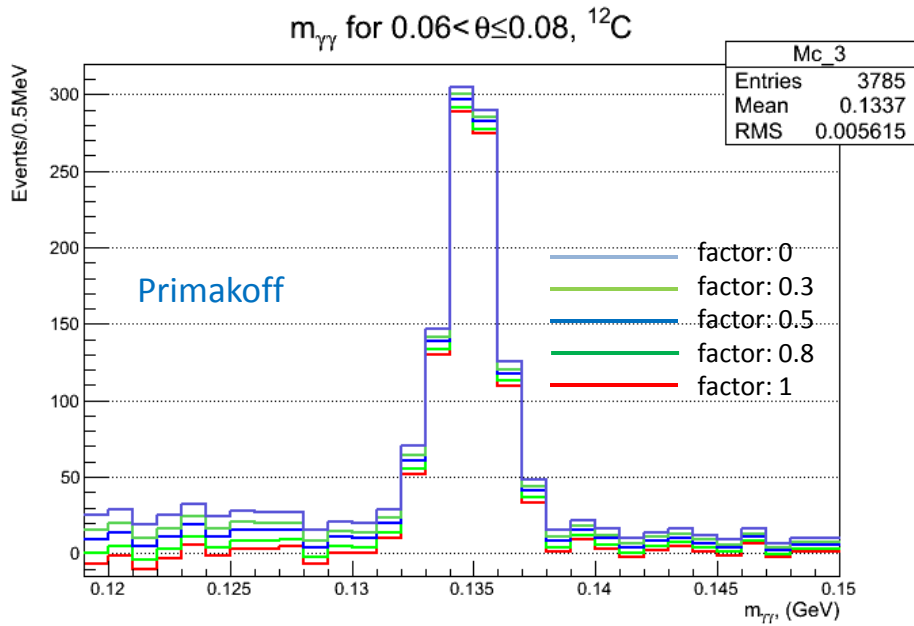
Study method:

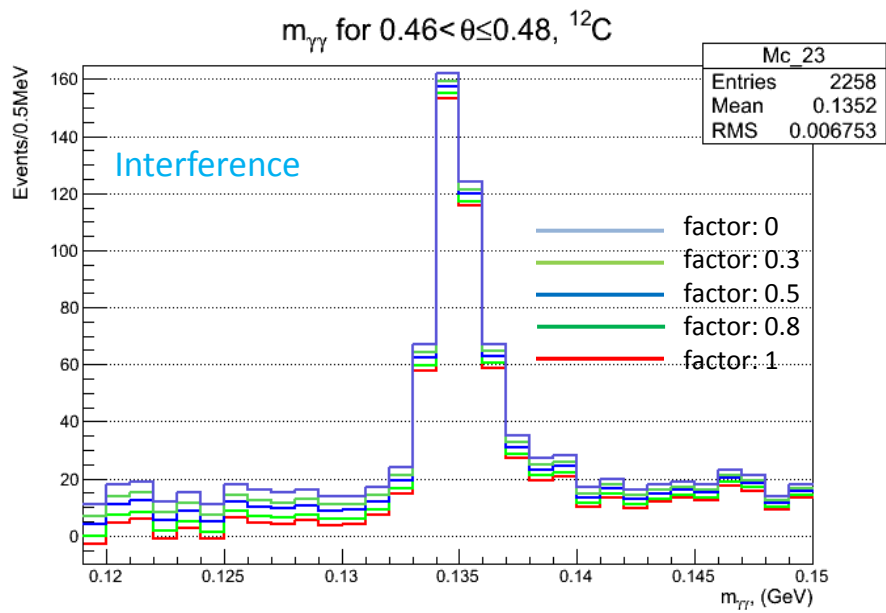
background is scaled by :

flux ratio* factor (factor = 0, 0.05, 0.1, 0.15, 0.2,...,1)

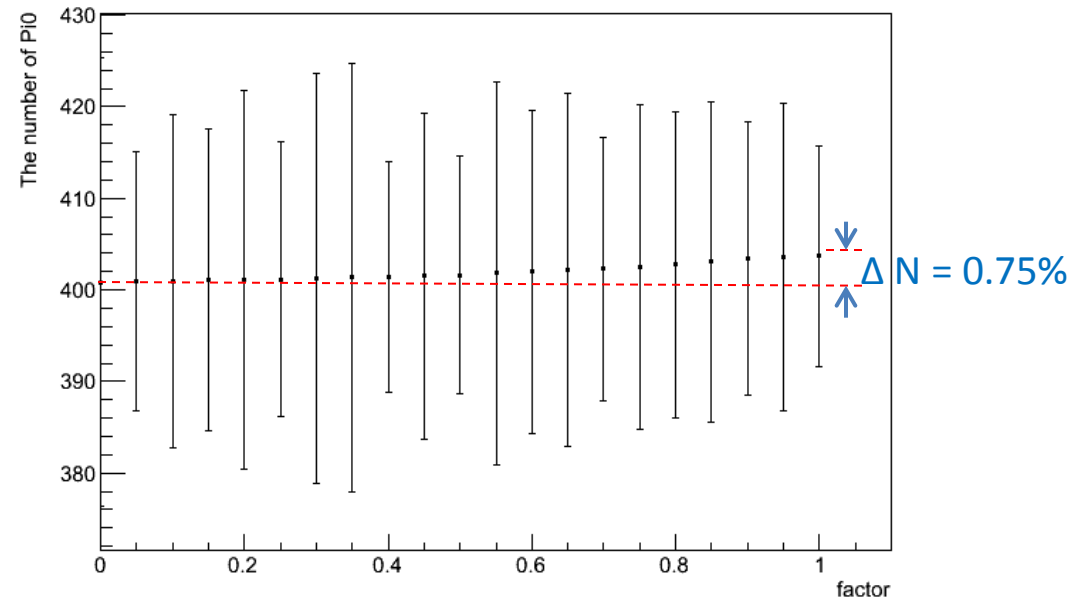


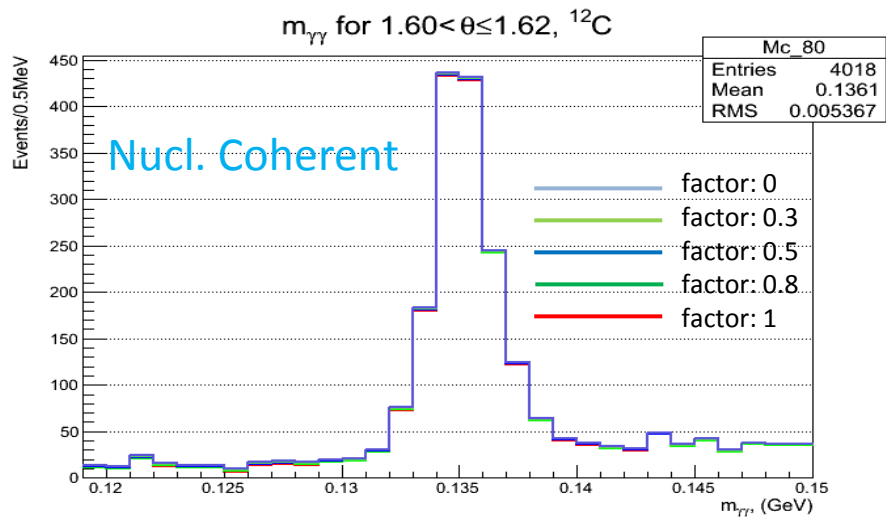
background is scaled by : $(\text{flux_C}/\text{flux_empty}) * \text{factor}$ (factor = 0, 0.05, 0.1, 0.15, 0.2,...,1)



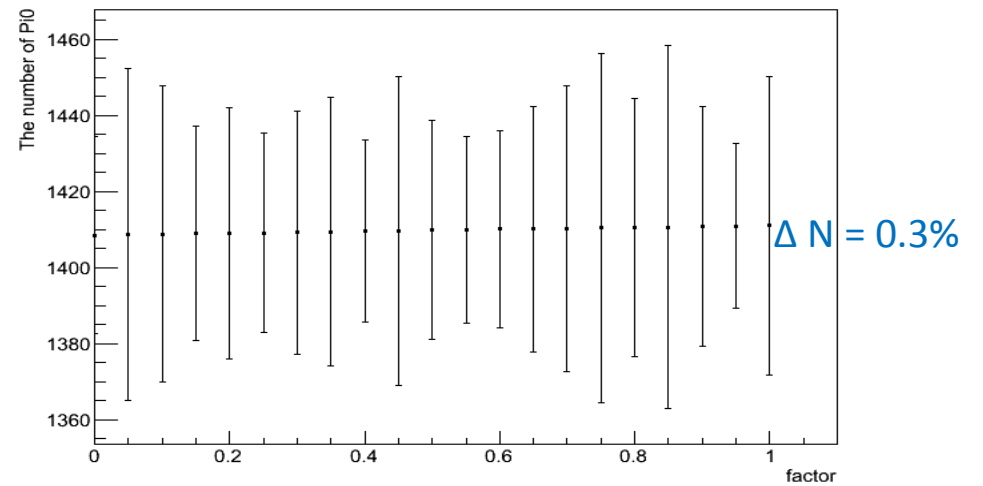


The number of Pi0 vs. factor

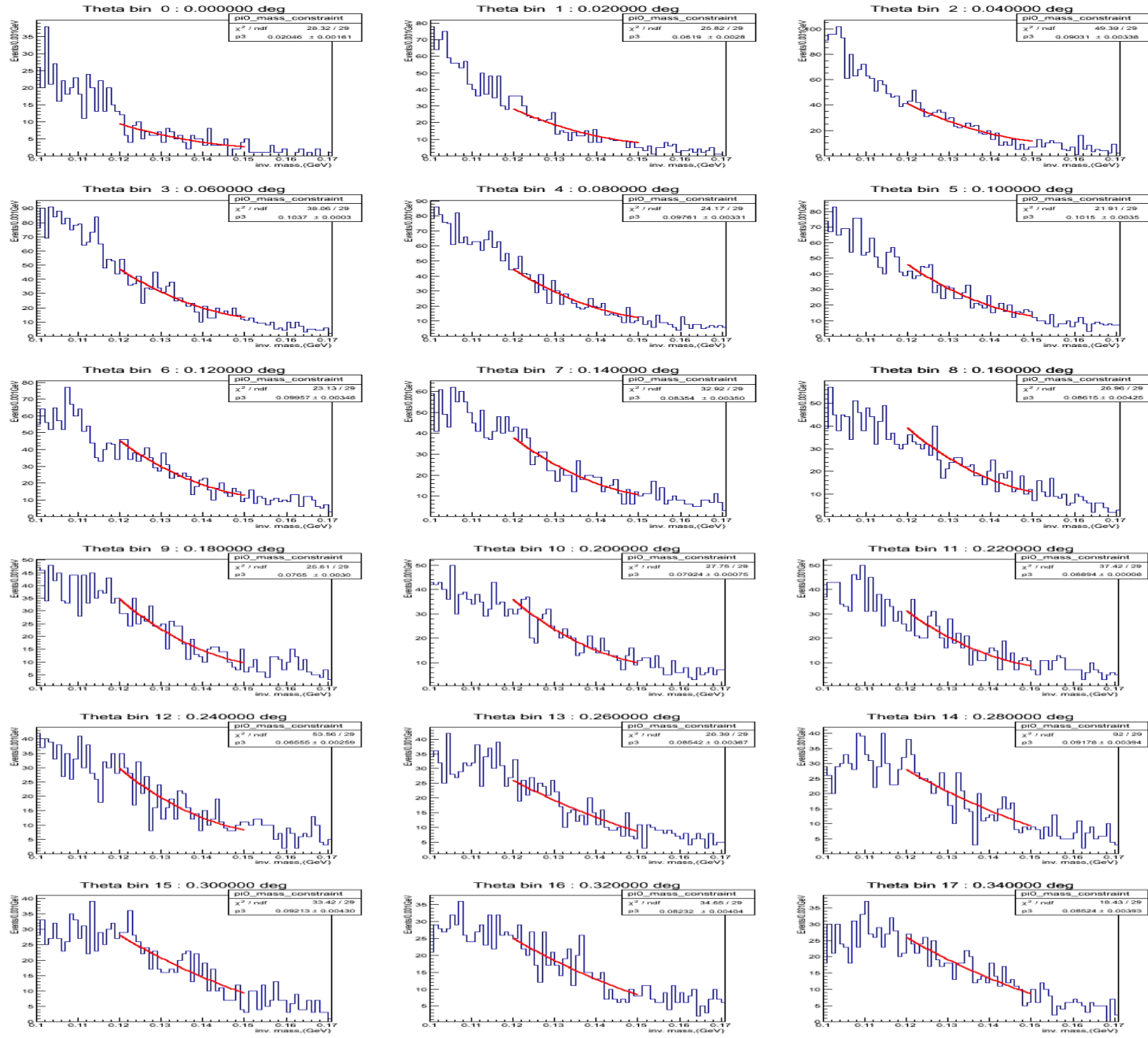


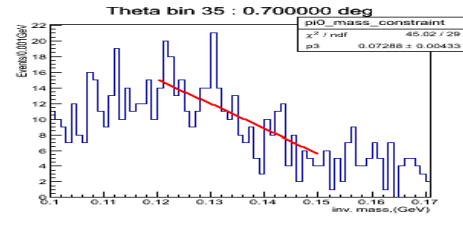
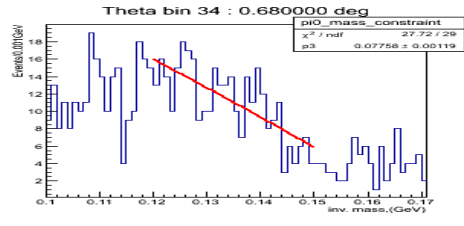
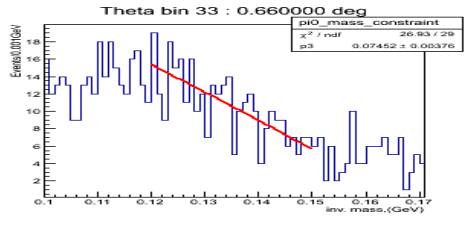
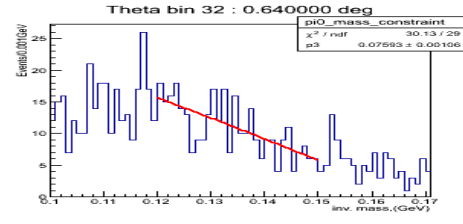
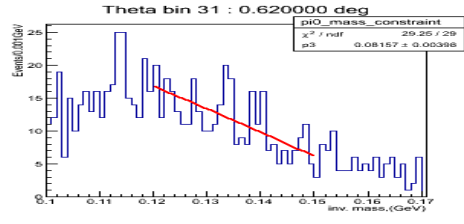
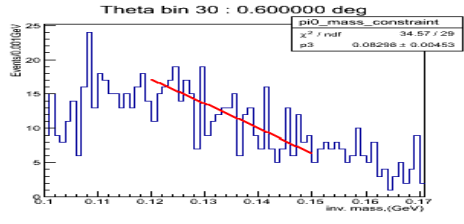
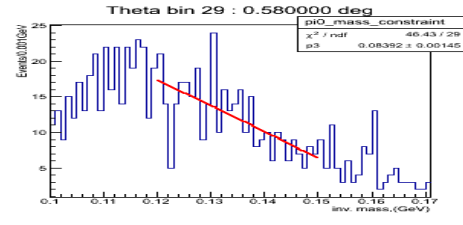
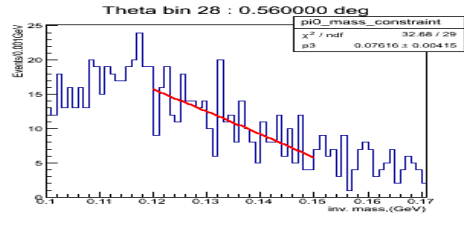
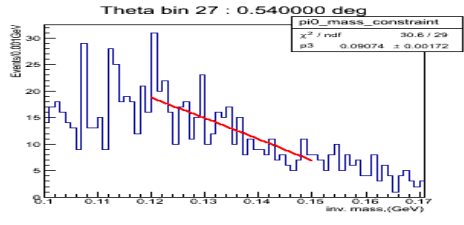
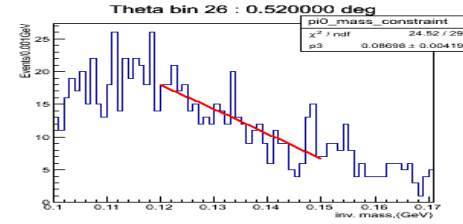
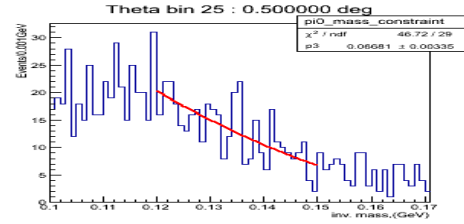
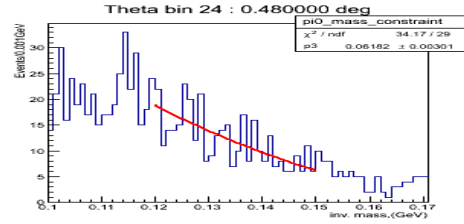
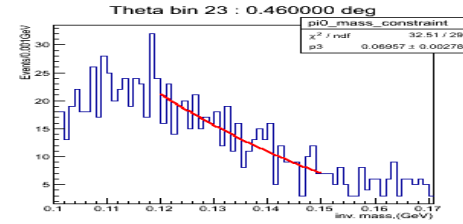
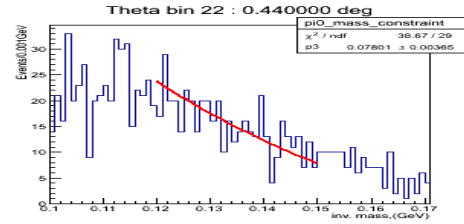
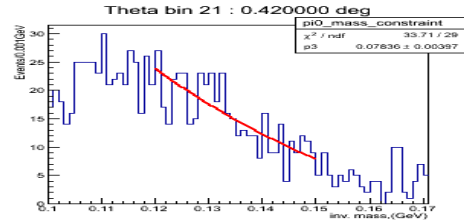
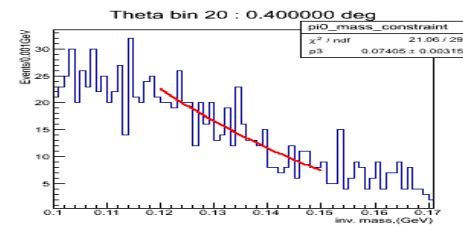
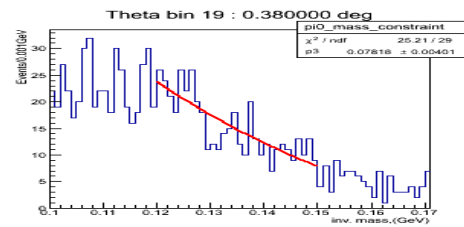
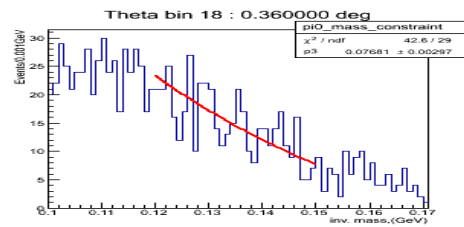


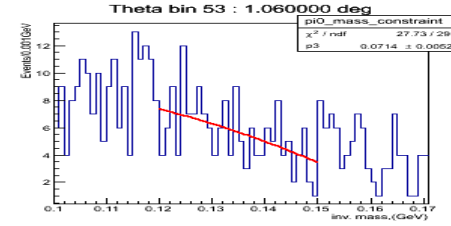
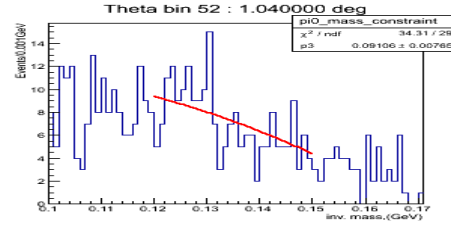
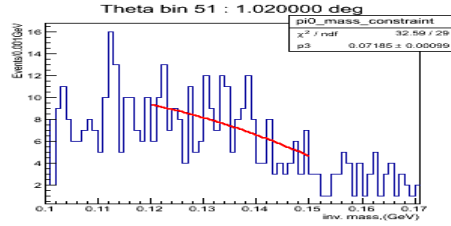
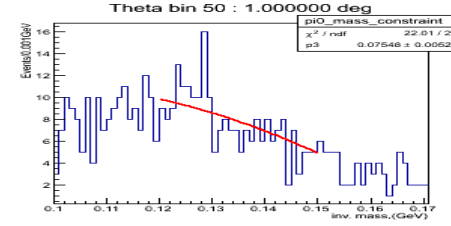
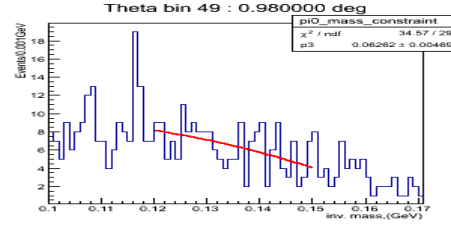
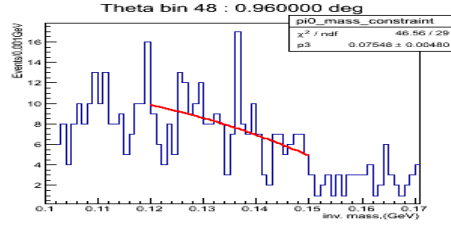
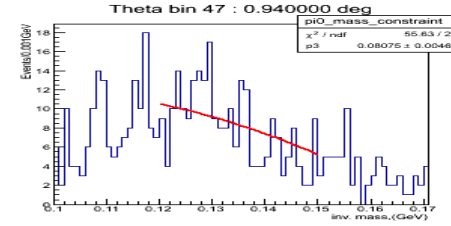
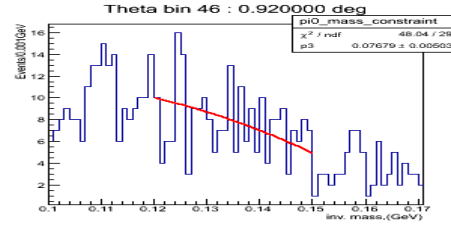
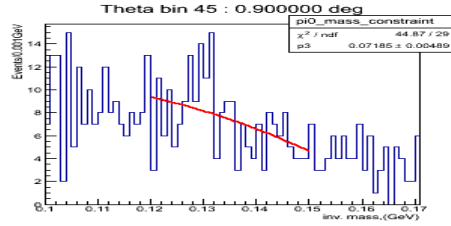
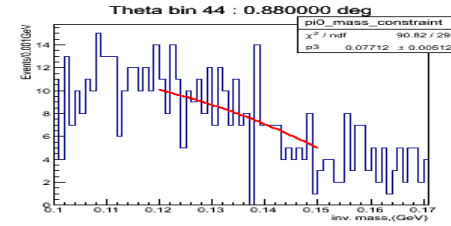
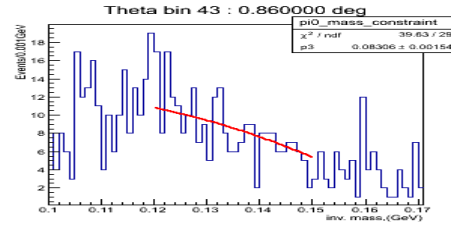
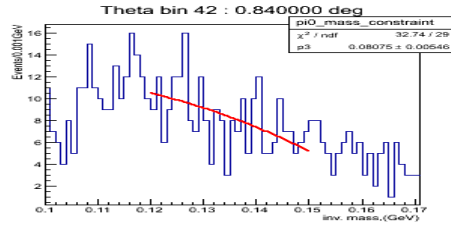
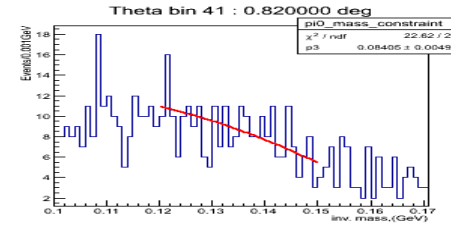
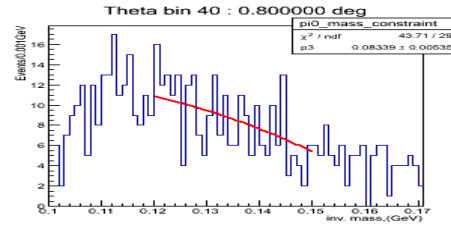
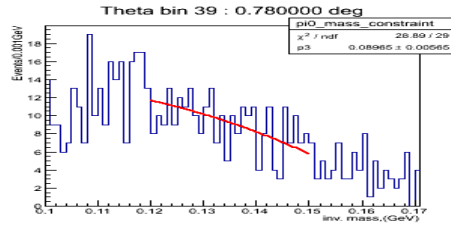
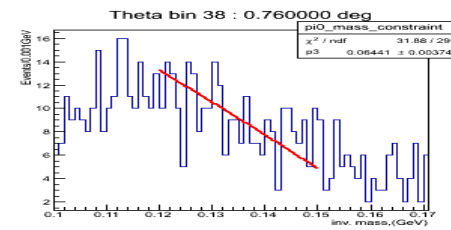
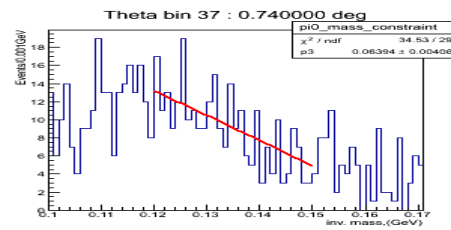
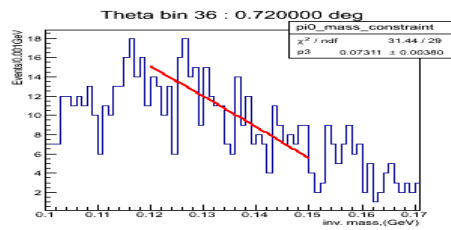
The number of Pi0 vs. factor

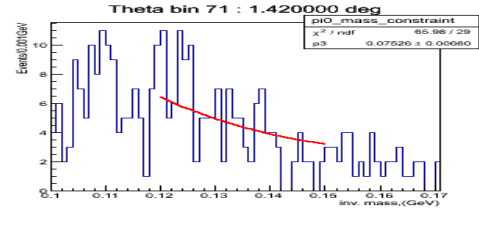
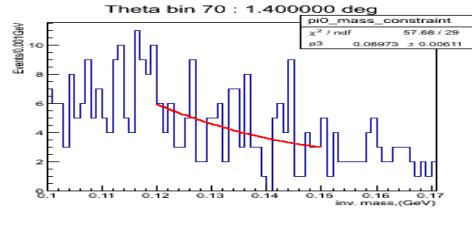
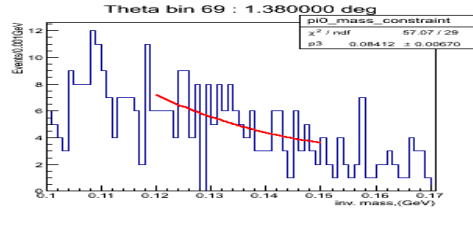
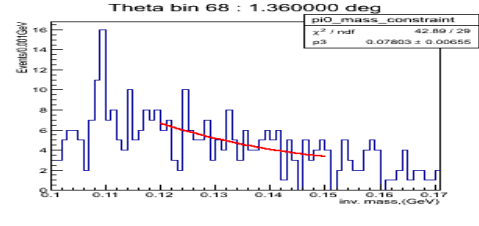
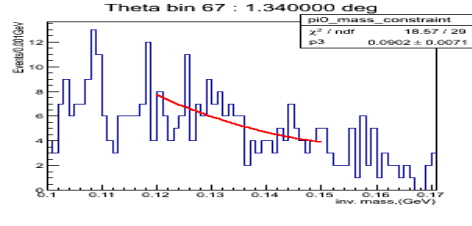
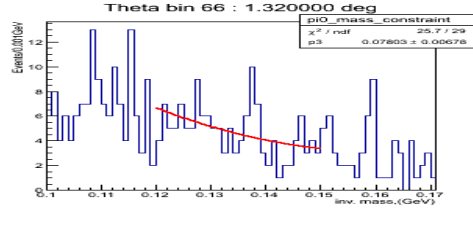
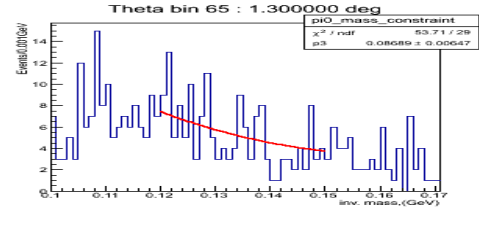
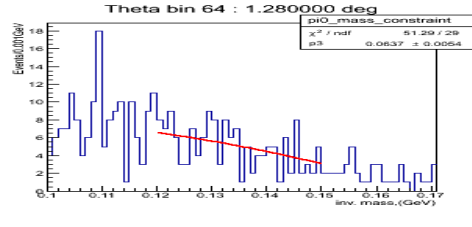
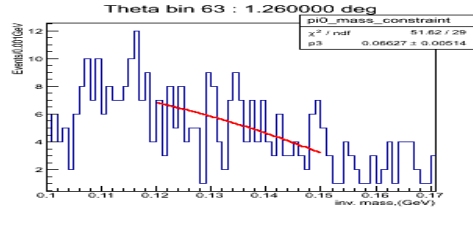
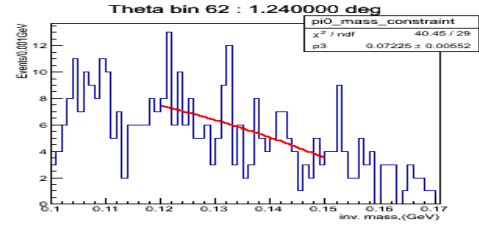
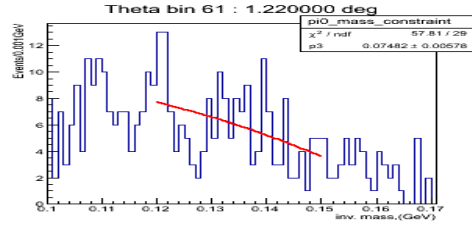
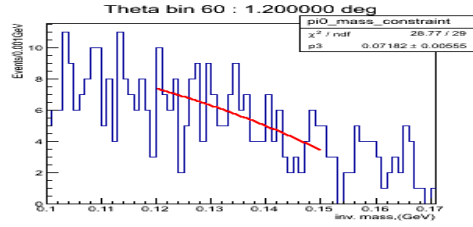
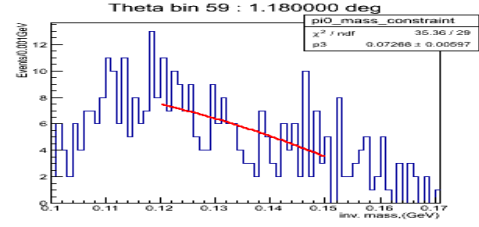
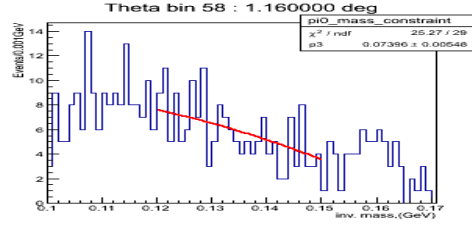
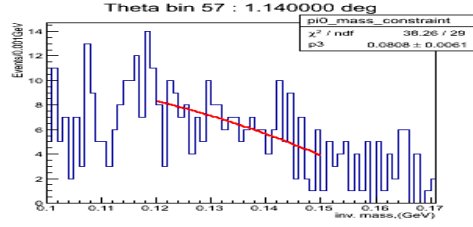
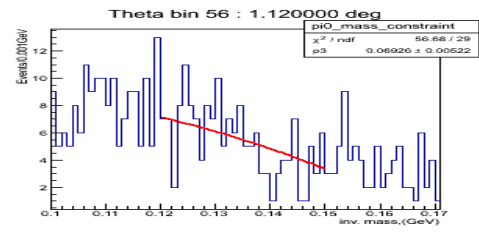
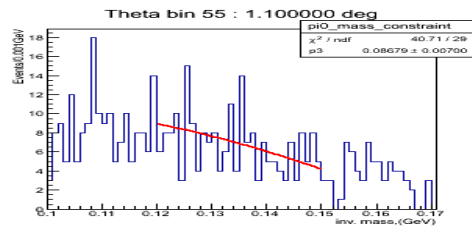
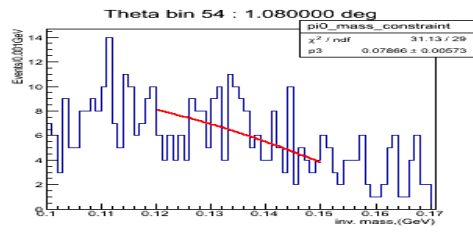


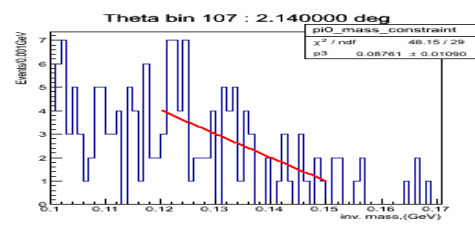
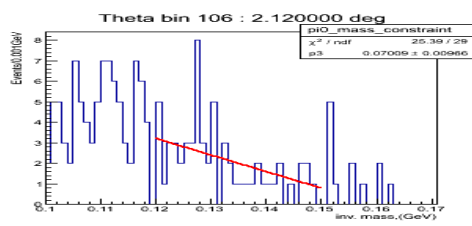
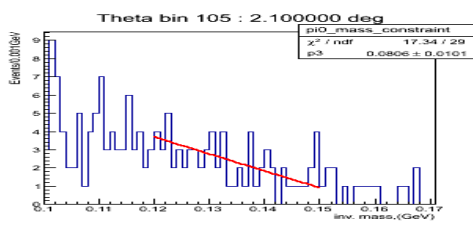
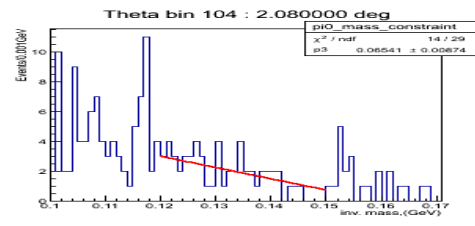
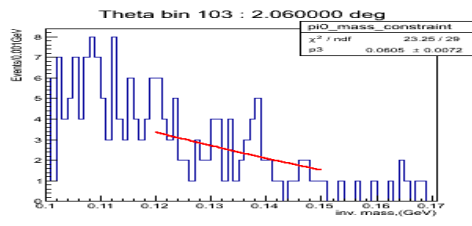
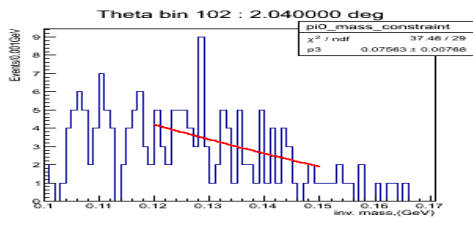
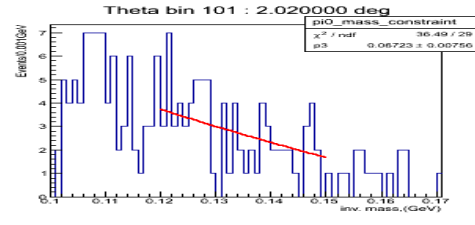
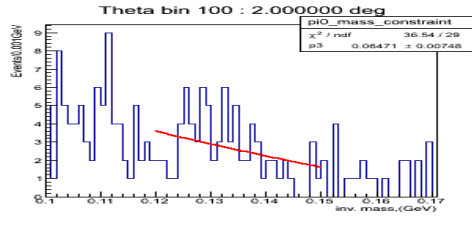
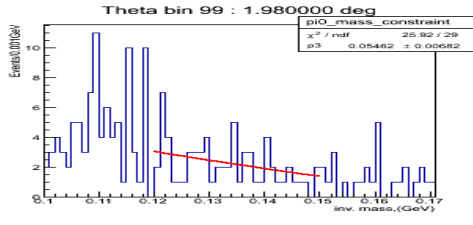
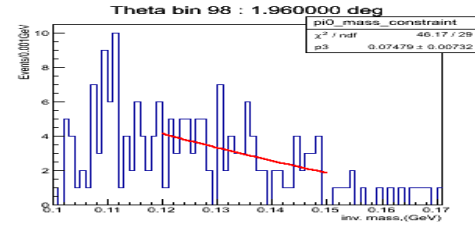
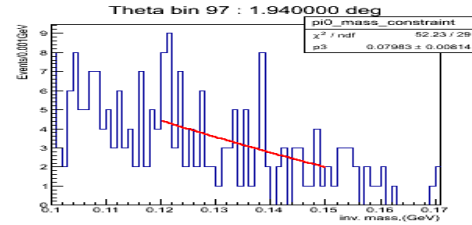
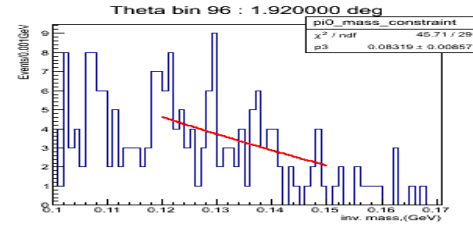
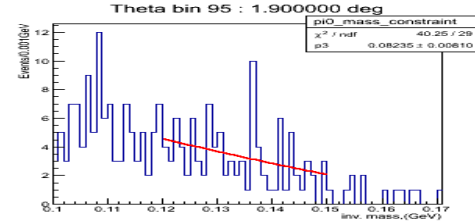
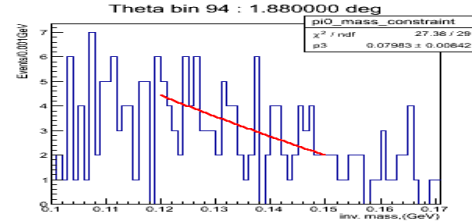
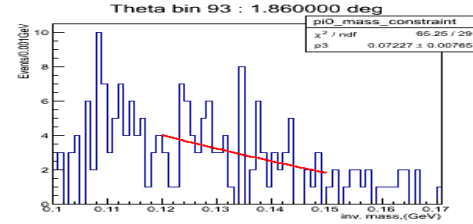
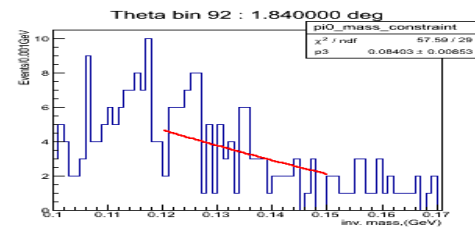
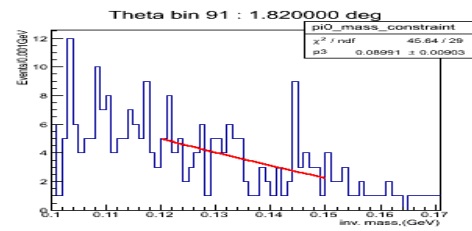
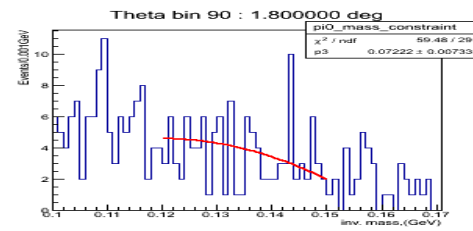
Invariant mass fitting of empty target run

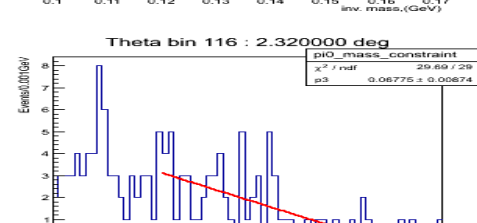
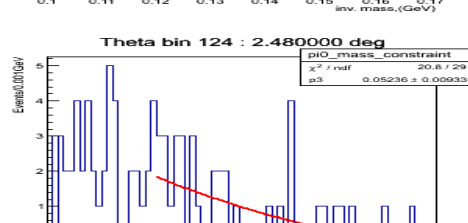
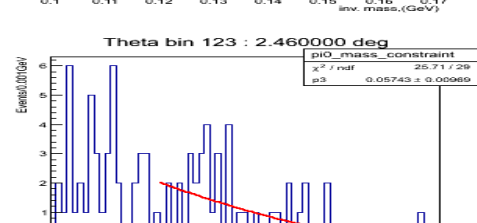
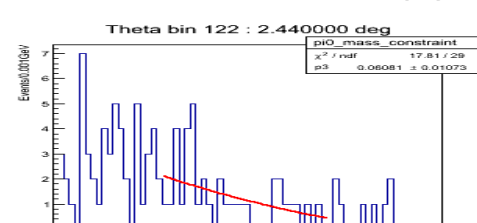
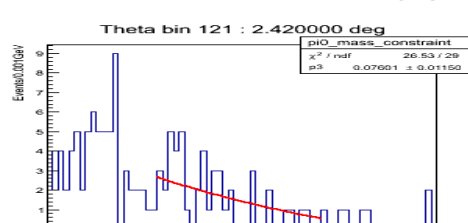
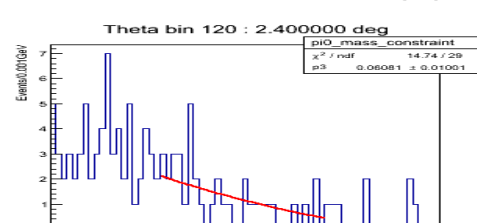
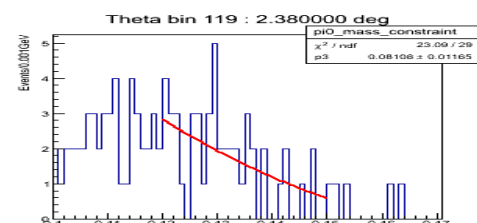
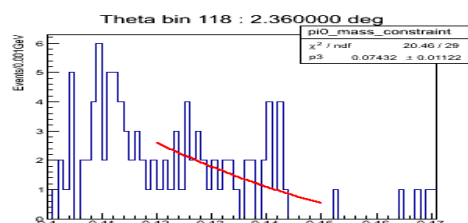
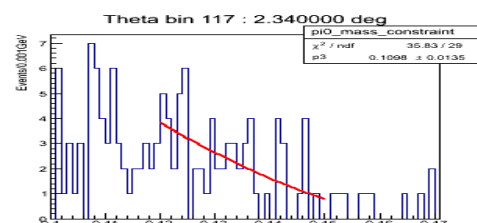
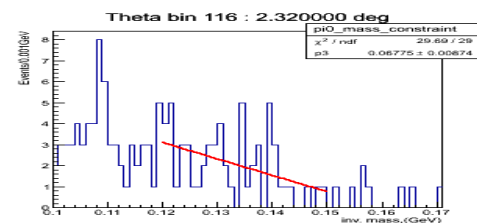
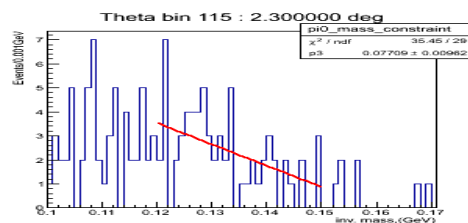
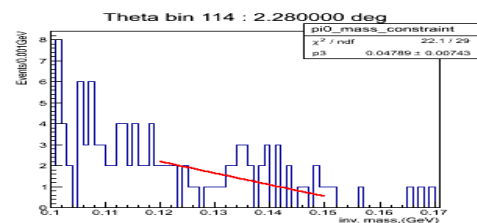
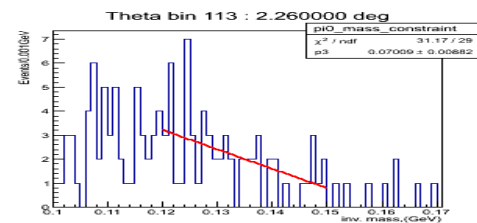
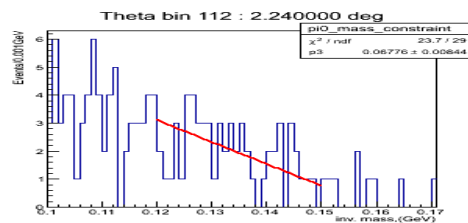
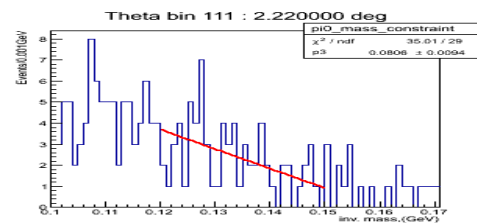
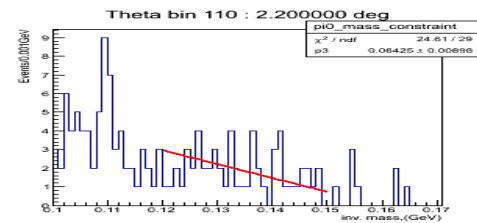
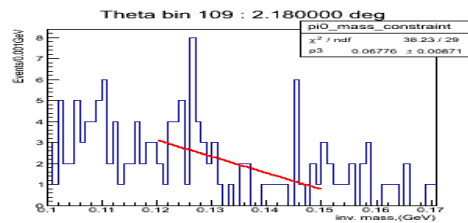
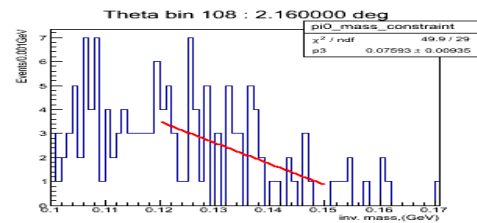


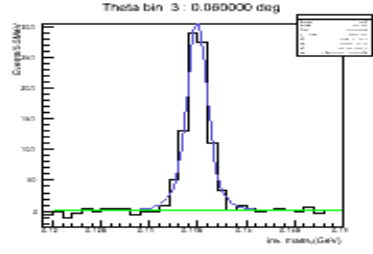
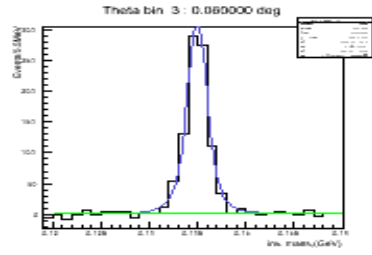
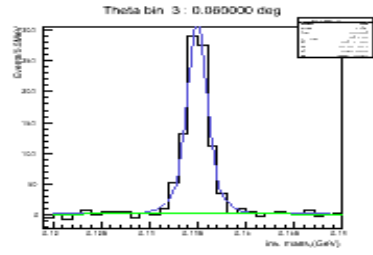
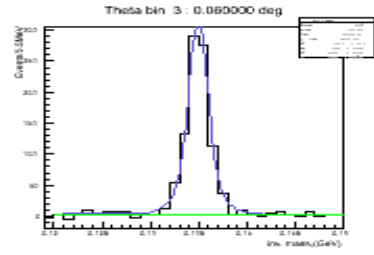
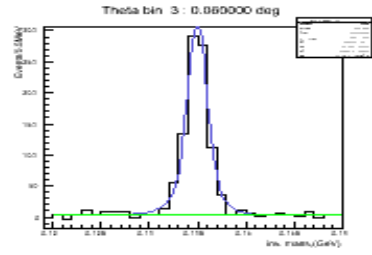
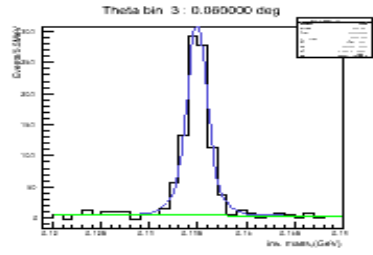
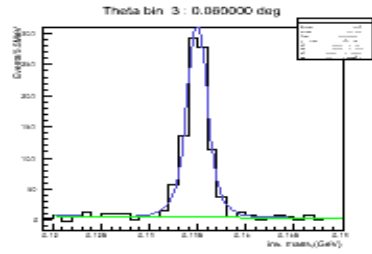
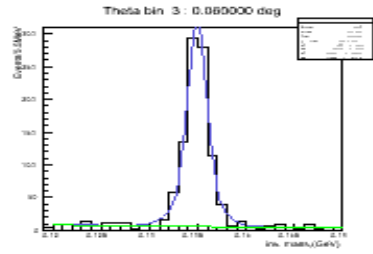
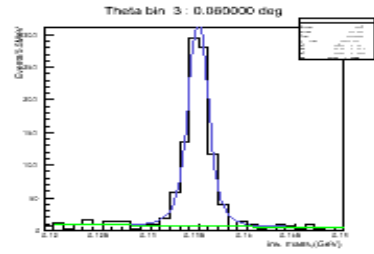
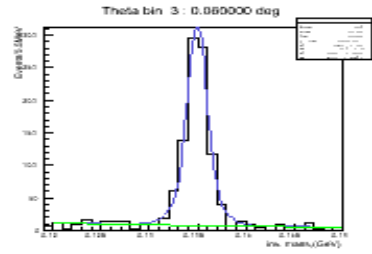
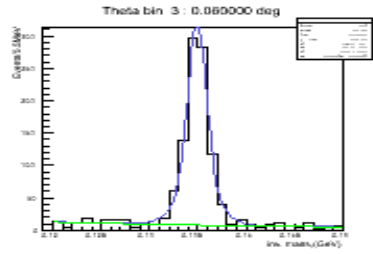
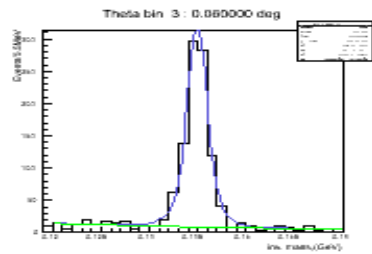
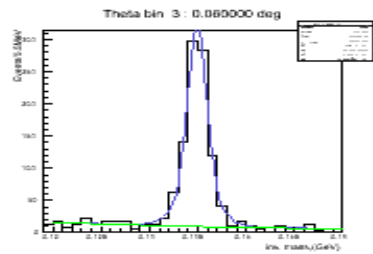
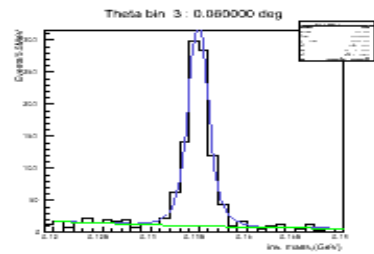
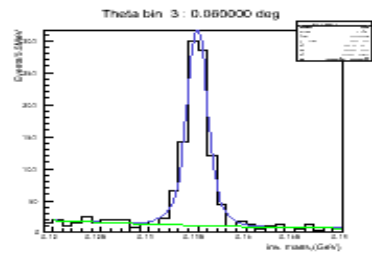
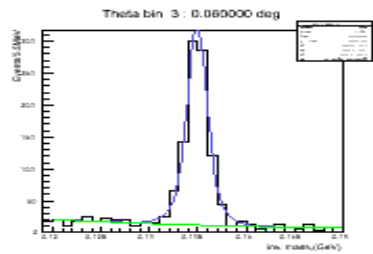
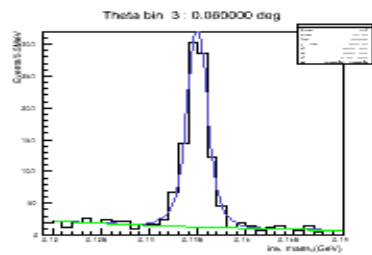
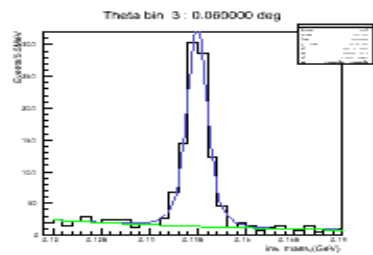
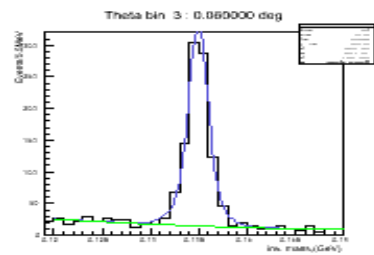
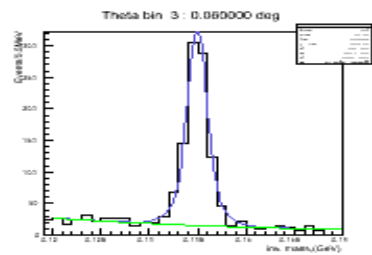
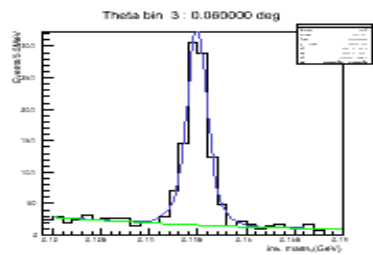




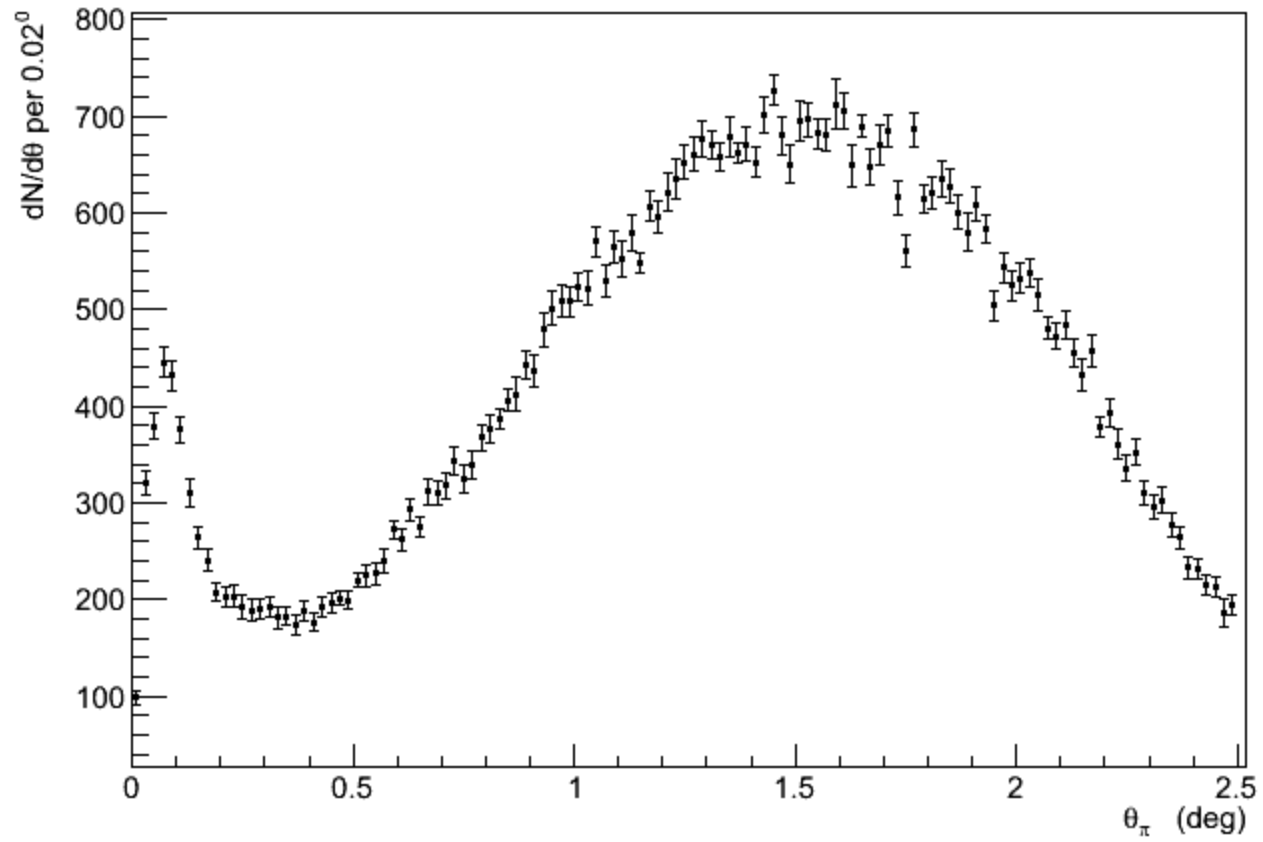






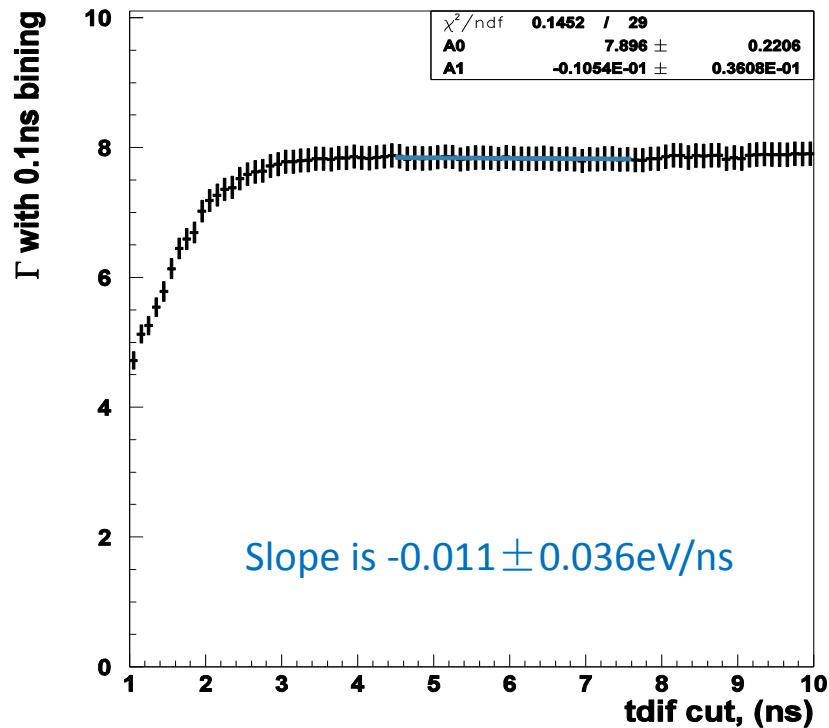


Pi0 Yield of carbon target



tdif cut: eff. & systematics

Fit parameters behavior VS tdif window



tdif simulated for PWO
(all ADCs uniformly populated)

