

# Threshold study using the photons generated from single electron

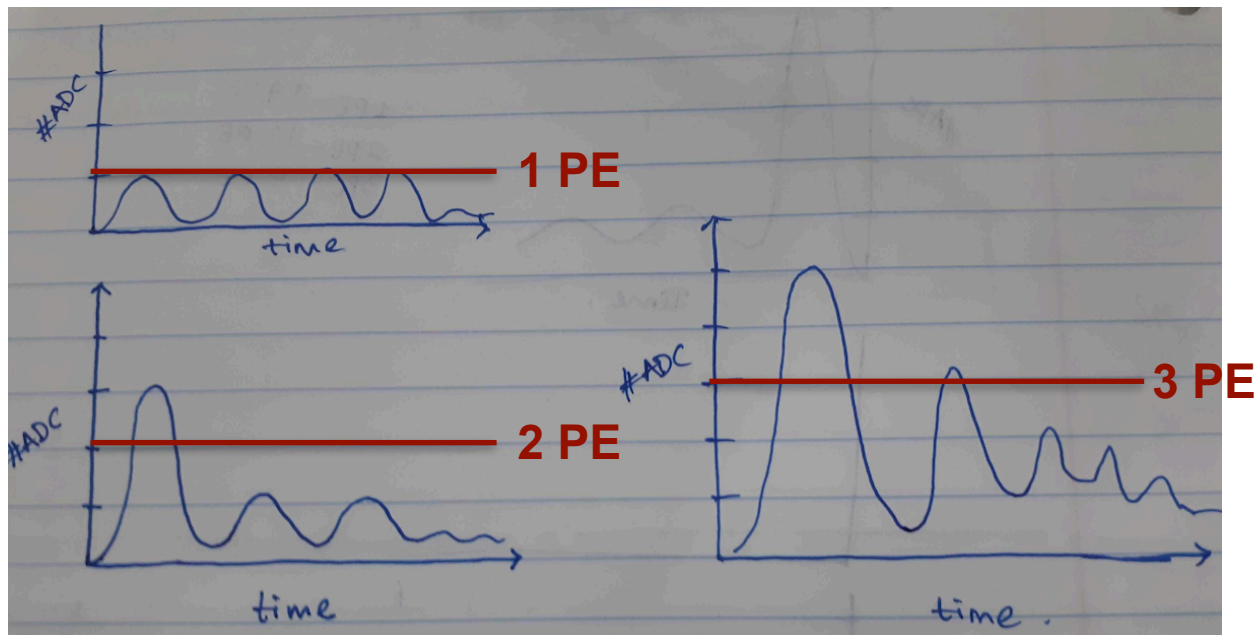
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Colorado State University  
May 15, 2019

Electronics and Physics Simulation Combine meeting

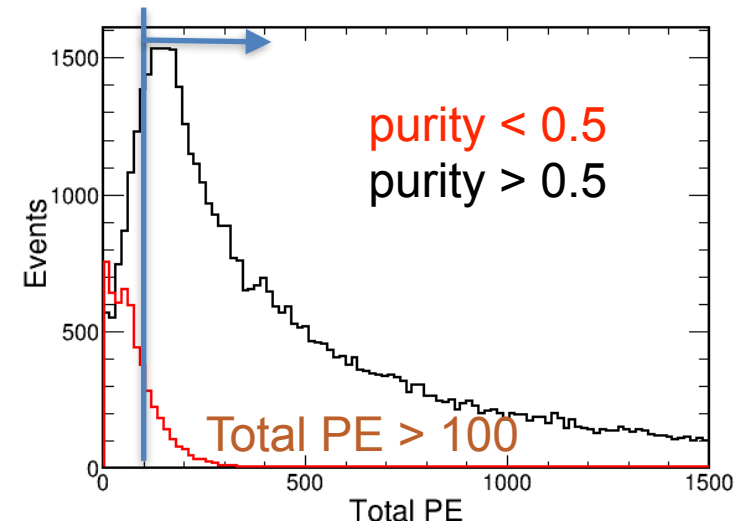
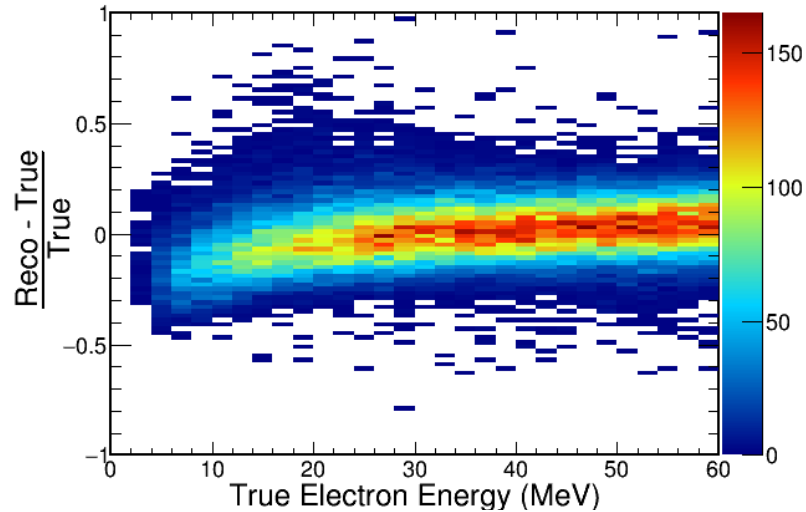
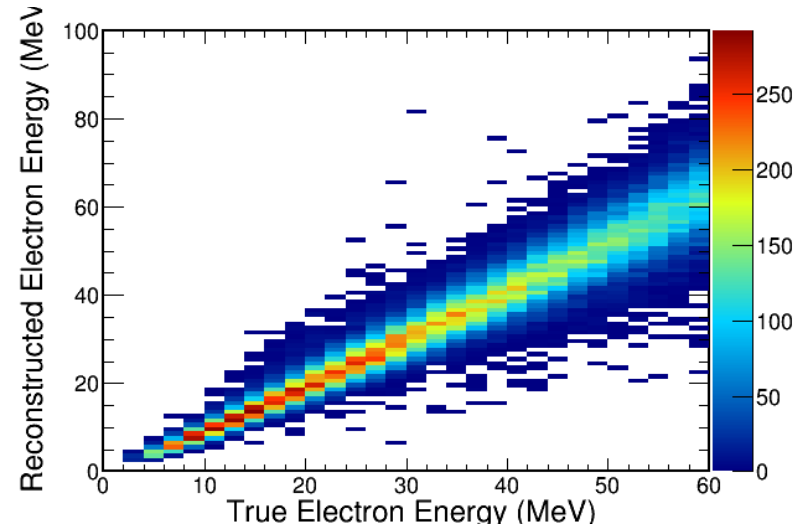
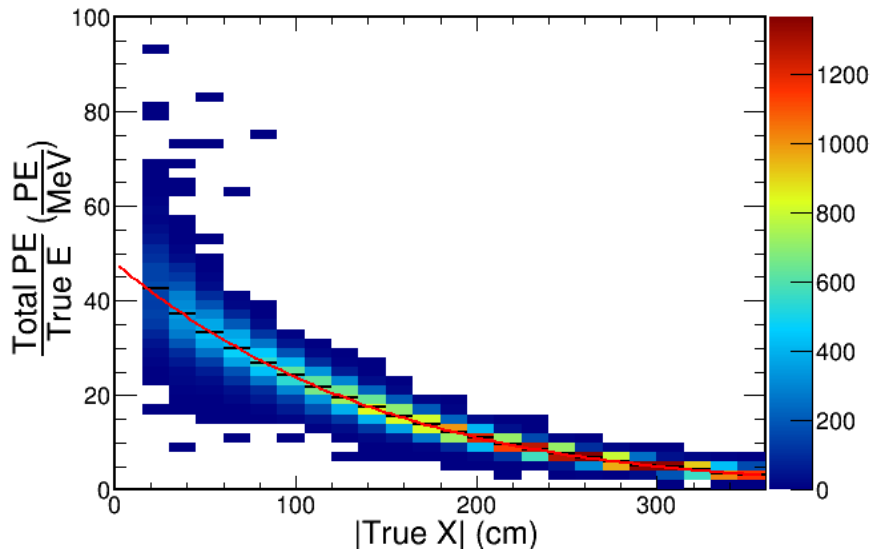


## Introduction:

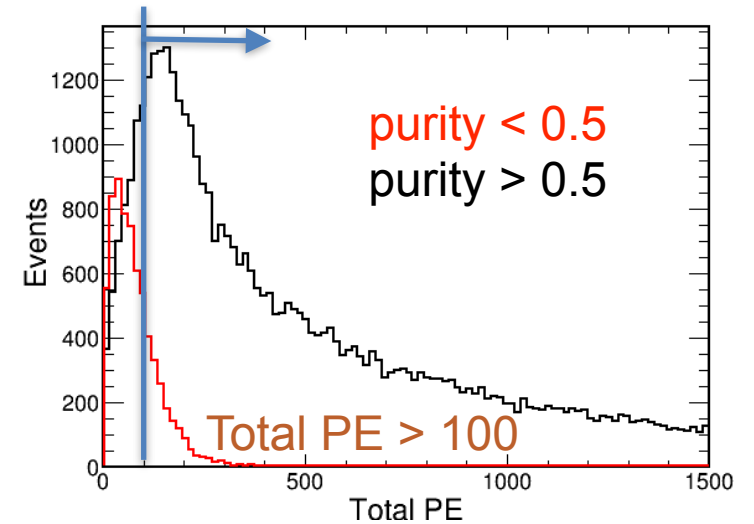
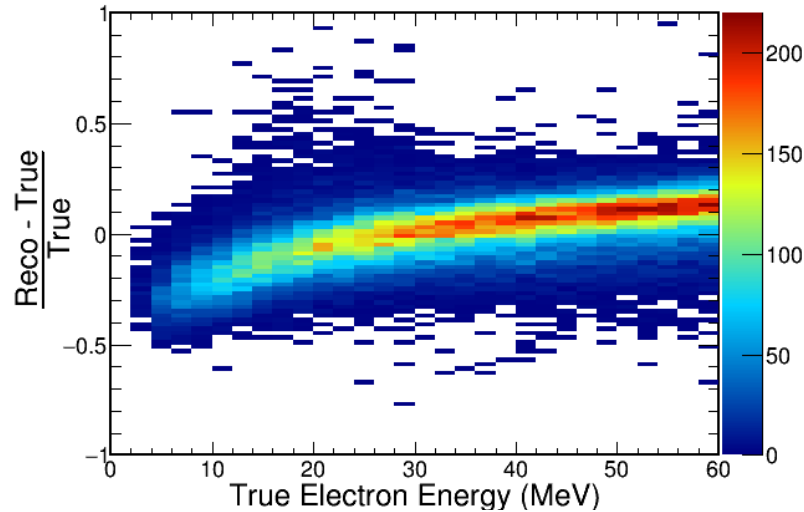
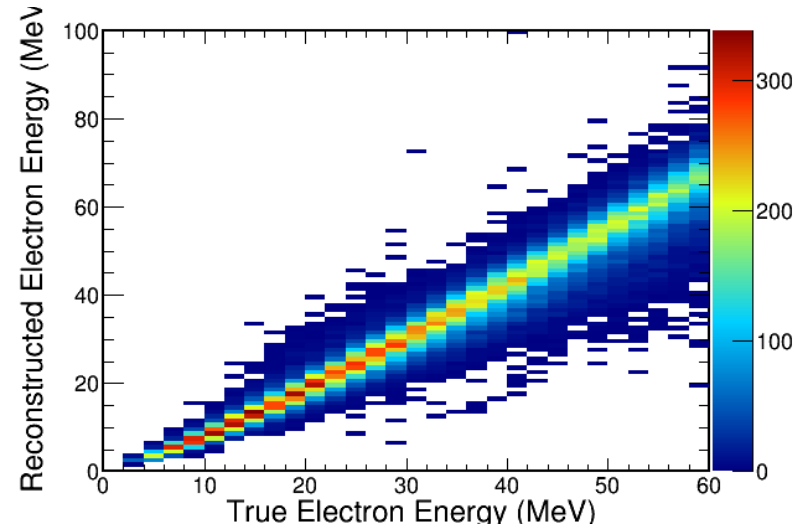
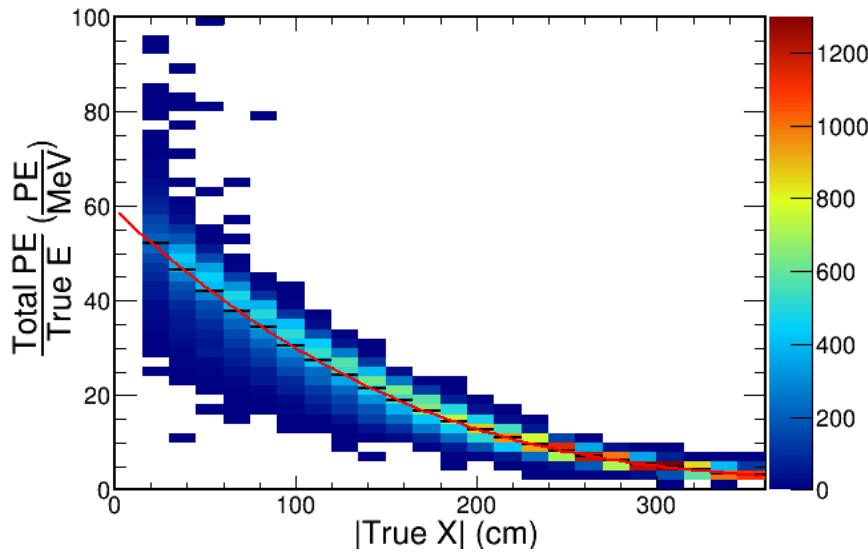
- This study compares with different threshold, and looking for resolution of electron energy.
- For this study I have generated photons from the single electron.
- Limit study to central set of APAs to avoid effects of walls ( $300 < z \text{ (cm)} < 1000$ ,  $-300 < y \text{ (cm)} < 300$ ,  $x \text{ (cm)} > 20$ ).



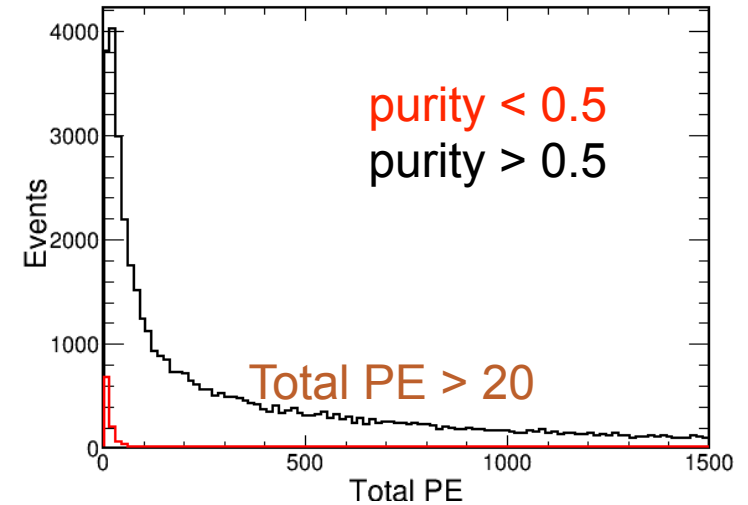
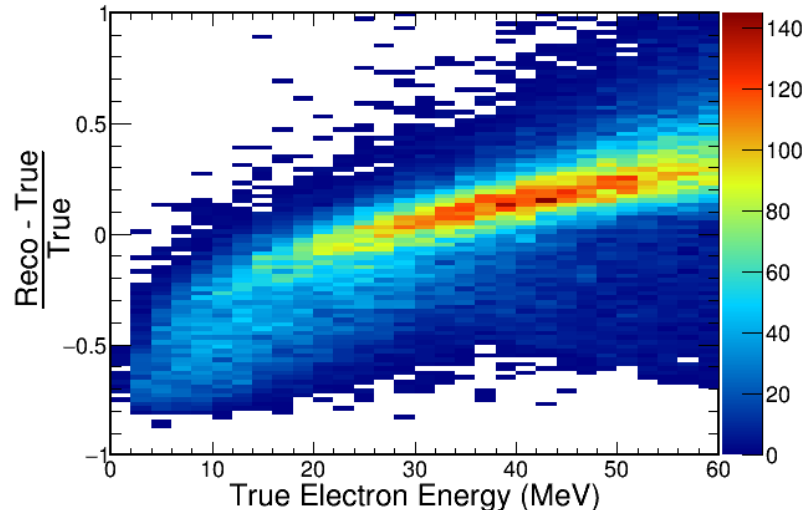
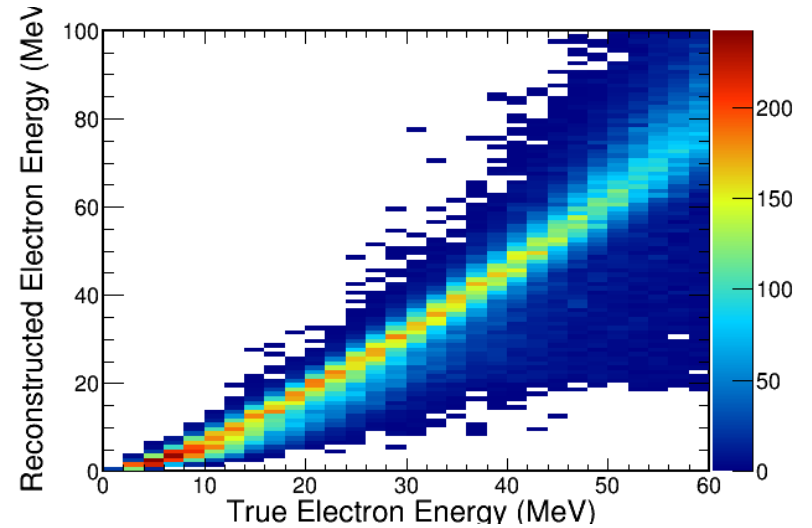
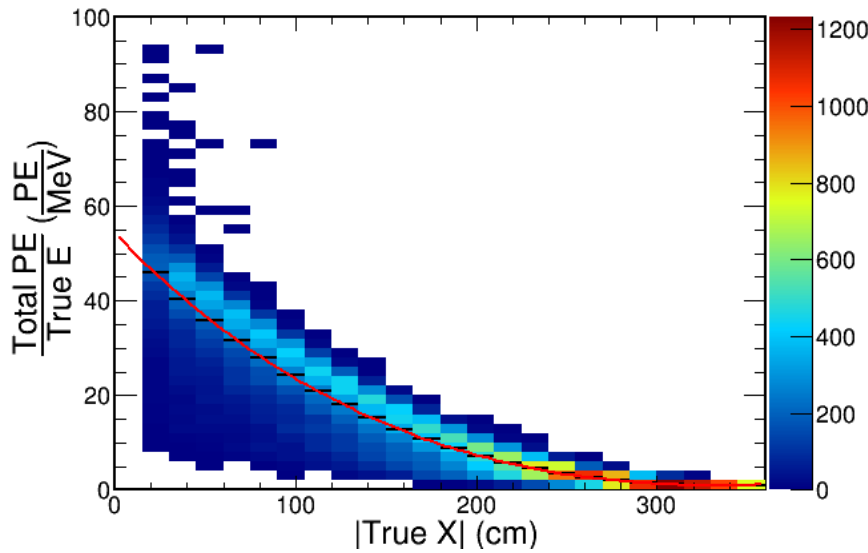
# Threshold 1 PE:



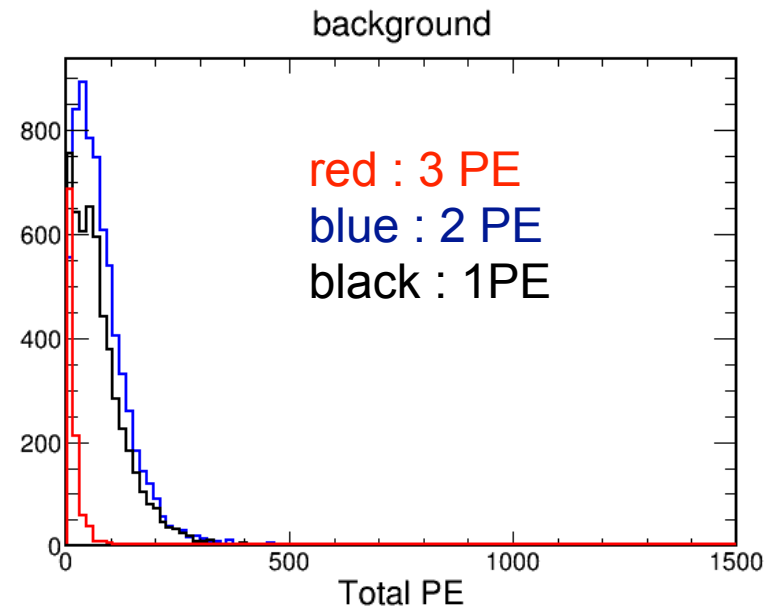
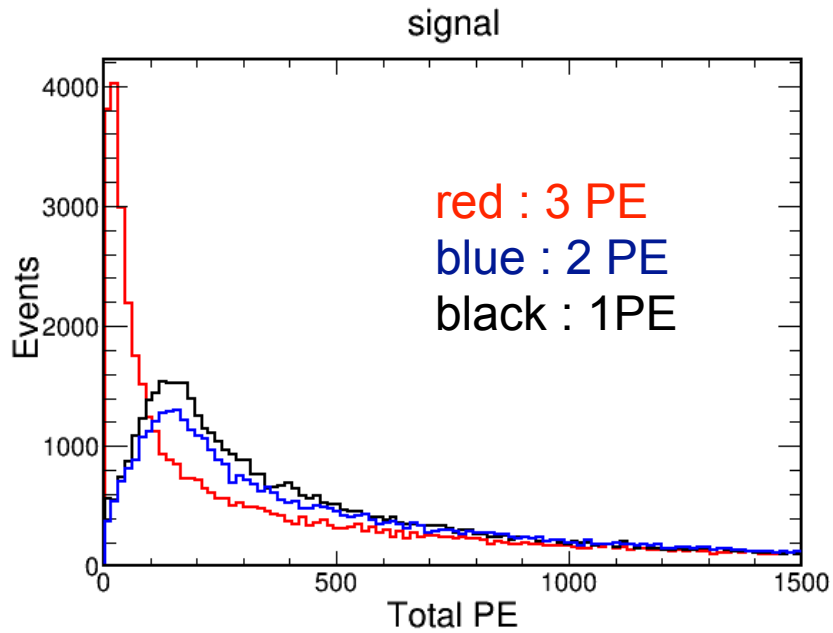
# Threshold 2 PE:



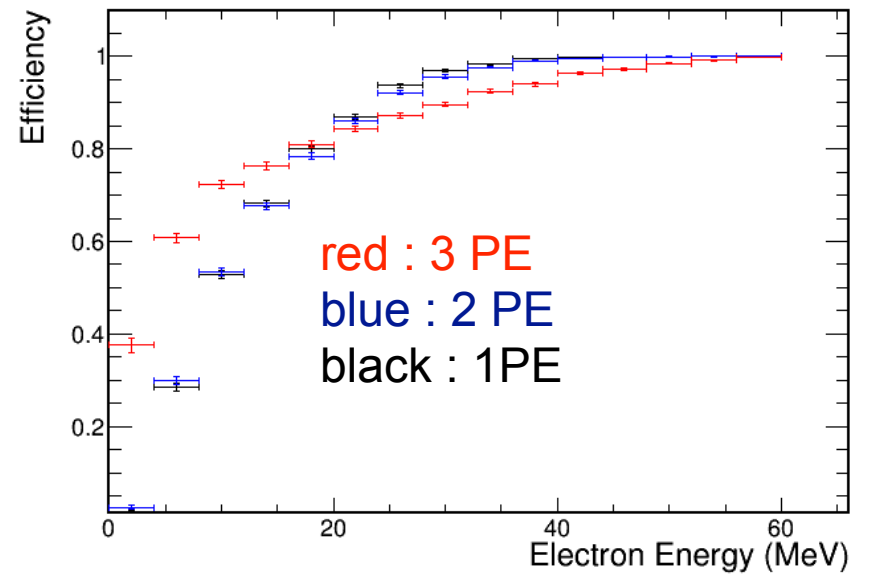
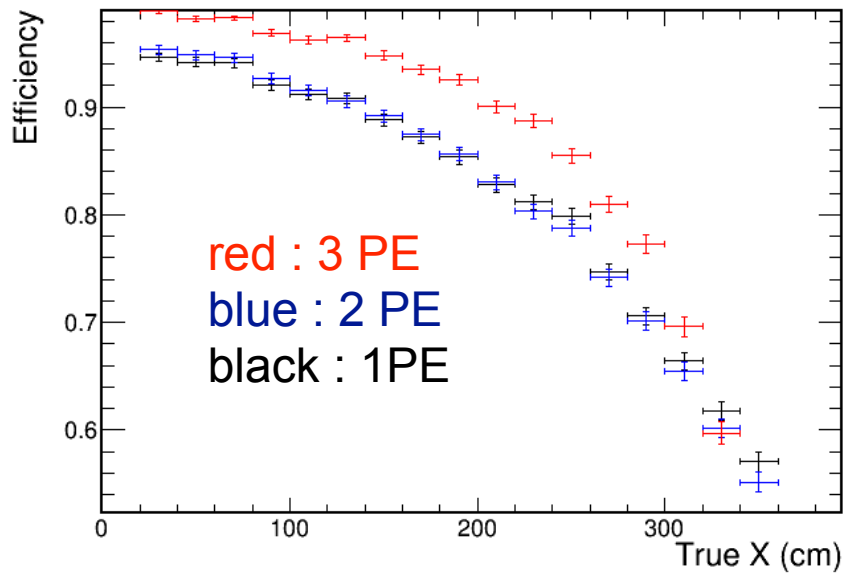
# Threshold 3 PE:



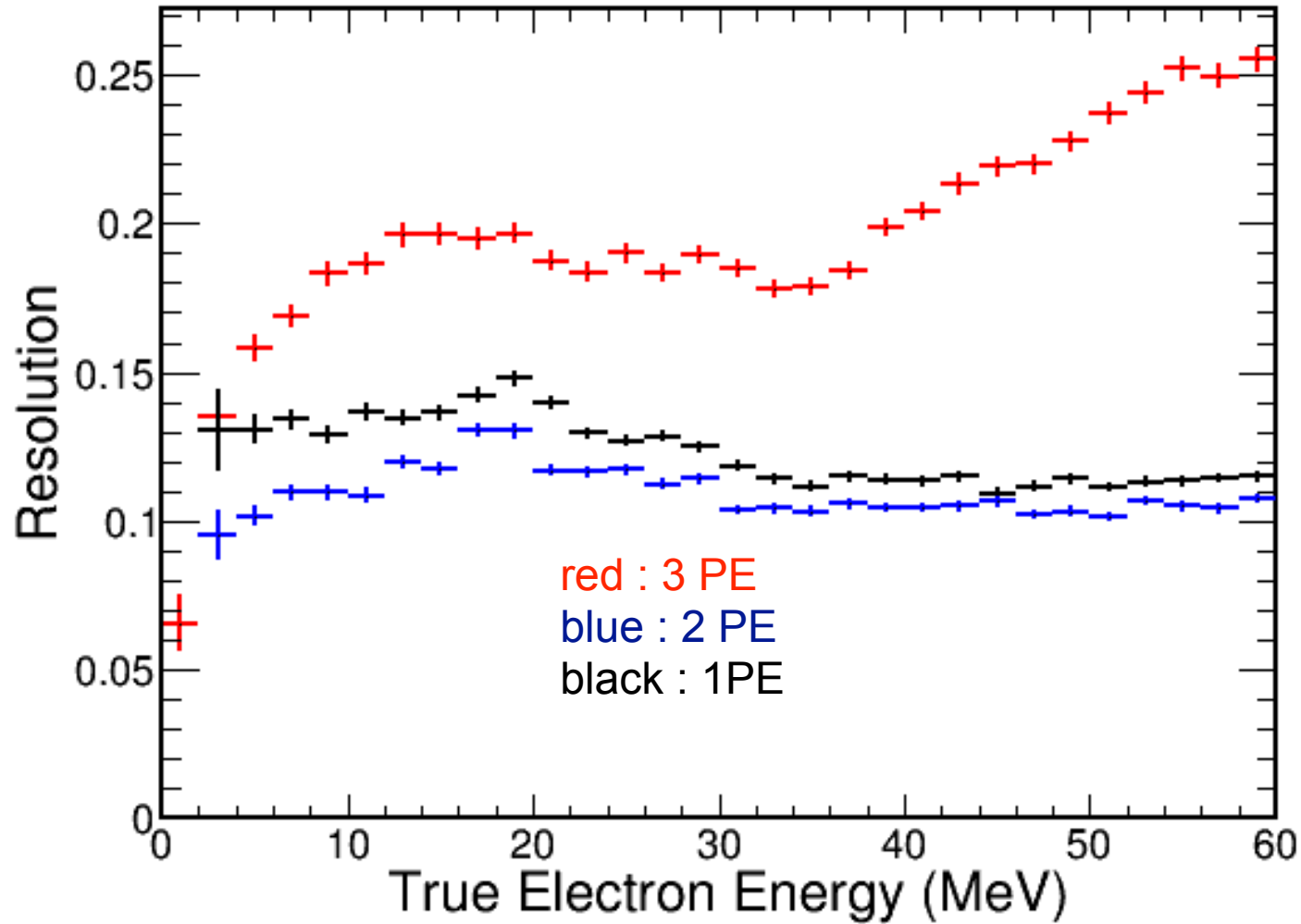
# Total PE Distributions:



# Efficiency:



## Resolution:





## Summary:

- The electron energy resolution is better in 2 PE threshold than the 1 PE and is worst for 3 PE.
- Efficiency is going better for 3 PE as a function of True X, when we decide a cut  $\text{totalPE} > 20$ .
- However efficiency is better in lower electron energy and in the higher electron energy efficiency gets lower for 3 PE.
- I am now investigating where we can make a cut so that we can improve efficiency and resolution.

Thank you for your attention!

Suggestion or Comments!