THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

$$K^0_L + p \rightarrow \pi^{0/+} + \Sigma^{+/0}$$

MARSHALL B. C. SCOTT

HTTPS://WWW.LINKEDIN.COM/IN/MARSHALL-SCOTT-PH-D-17AB191B9

K LONG FACILITY

Jefferson Lab

RXNs : KL5 AND KL6

- Kl5
  - $K^0_L + p \rightarrow \pi^0 + \Sigma^+$
  - $\Sigma^+ \rightarrow p + \pi^0$
    - $\pi^0 \rightarrow 2\gamma$
  - Detect : γs and protons

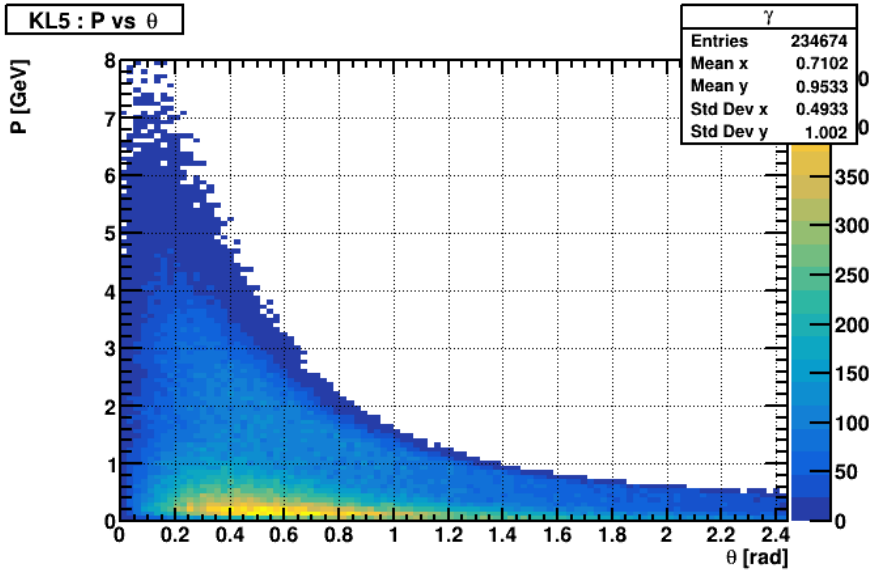
- Kl6
  - $K^0_L + p \rightarrow \pi^+ + \Sigma^0$
  - $\Sigma^0 \rightarrow \gamma + \Lambda^0$
    - $\Lambda^0 \rightarrow p + \pi^-$ (63.9%)
    - $\Lambda^0 \rightarrow n + \pi^0$ (35.8%)
      - $\pi^0 \rightarrow 2\gamma$
  - Detect : γs, π^+s, protons, and neutrons

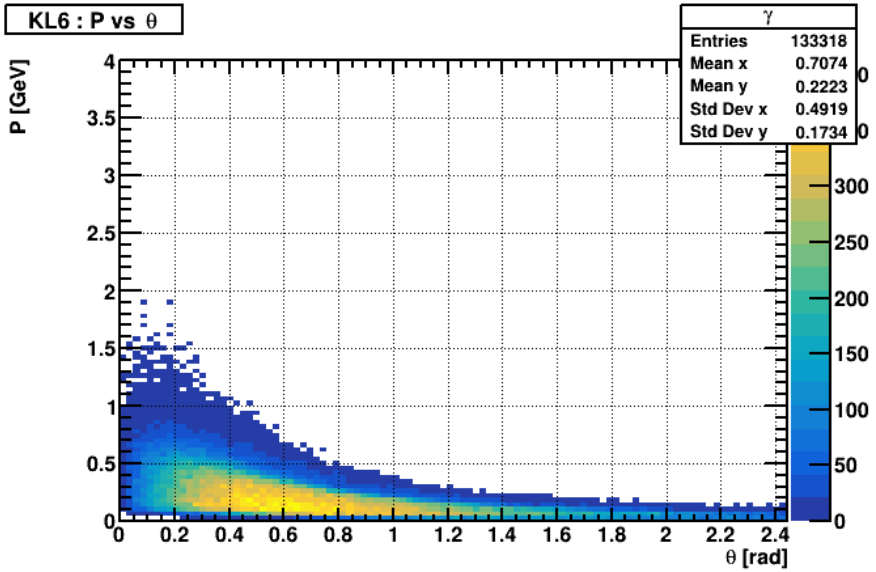
Generating Steps

- Generated histograms/root files (Monitoring Histograms, mcthrown_tree)
  - hd_root --nthreads=8 -PPLUGINS=PEVENTRFBUNCH:USE_TAG=KLong -PVERTEX:USEWEIGHTEDAVERAGE=1 -PPLUGINS=monitoring_hists foo_smeared.hddm
  - hd_root --nthreads=8 -PPLUGINS=PEVENTRFBUNCH:USE_TAG=KLong -PVERTEX:USEWEIGHTEDAVERAGE=1 -PPLUGINS=mcthrown_tree foo_smeared.hddm

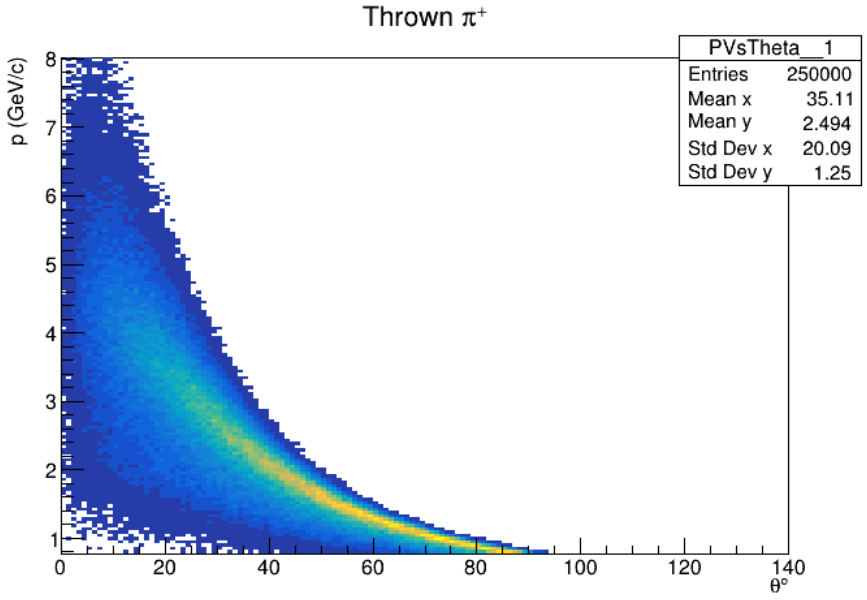
Thrown Gamma (MCThrown Histograms): P vs Theta for KL5 and KL6

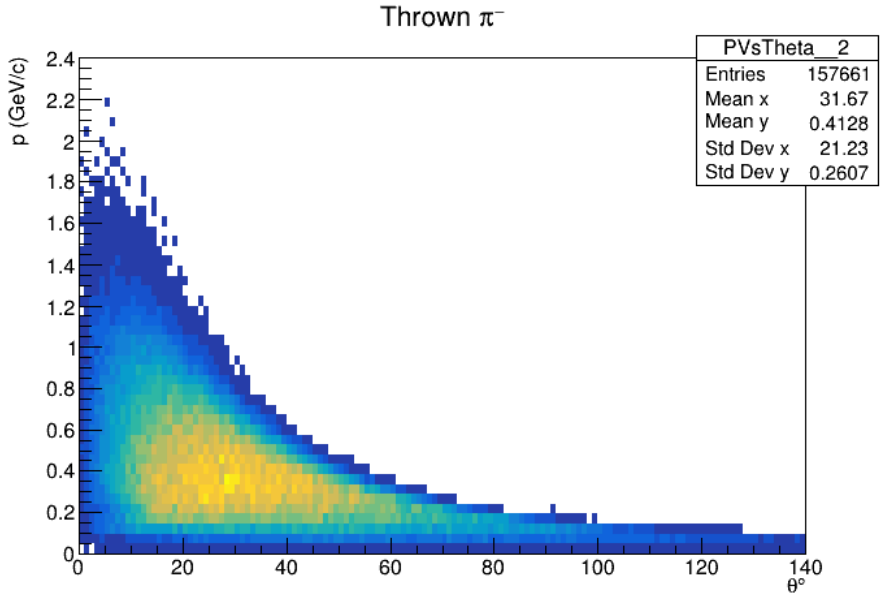
Left(Right) : KL5(KL6)





Thrown Pi+ & Pi- (MCThrown Histograms): P vs Theta for KL6





Back up slides

RXNs : KL5 AND KL6

- Kl5
  - $K^0_L + p \rightarrow \pi^0 + \Sigma^+$
  - $\Sigma^+ \rightarrow p + \pi^0$
    - $\pi^0 \rightarrow 2\gamma$
  - Detect : γs and protons
    - Σ^+ : $c\tau \approx 2.4$ cm
    - π^0 : $c\tau \approx 0.26$ nm

- Kl6
  - $K^0_L + p \rightarrow \pi^+ + \Sigma^0$
  - $\Sigma^0 \rightarrow \gamma + \Lambda^0$
    - $\Lambda^0 \rightarrow p + \pi^-$ (63.9%)
    - $\Lambda^0 \rightarrow n + \pi^0$ (35.8%)
      - $\pi^0 \rightarrow 2\gamma$
  - Detect : γs, π^+s, protons, and neutrons
    - Σ^0 : $c\tau \approx 22$ pm
    - Λ^0 : $c\tau \approx 7.8$ cm

Thrown Gamma (Monitoring Histograms): P vs Theta for KL5 and KL6

Left(Right) : KL5(KL6)