

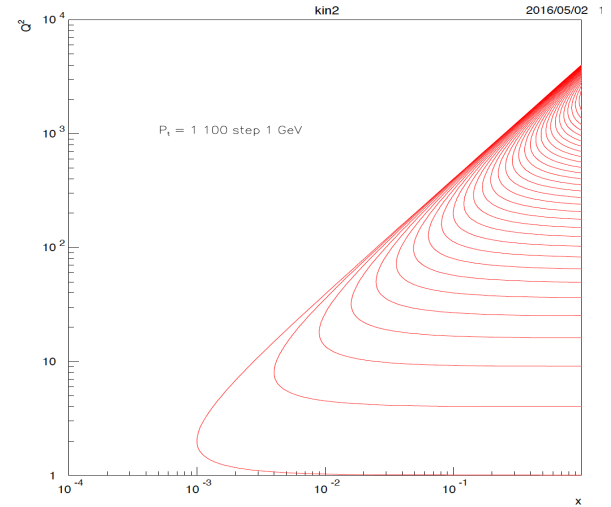
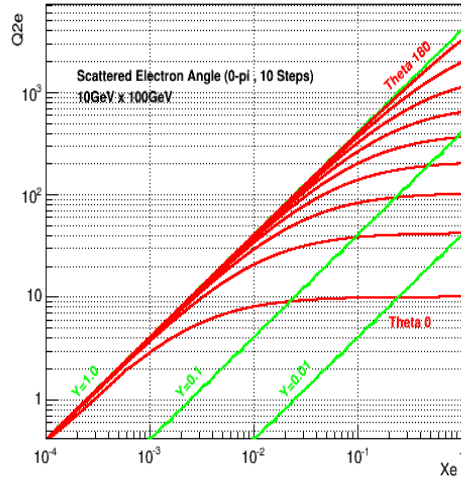
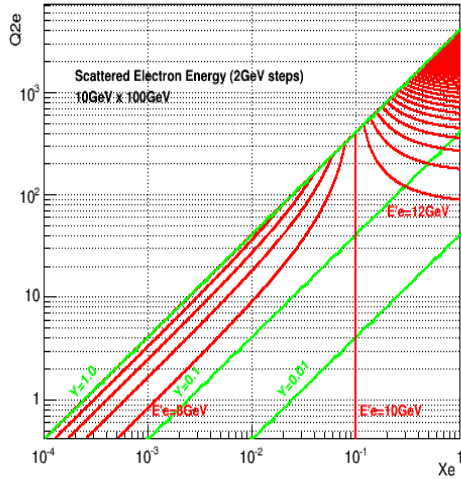


Probing nuclear gluons with heavy flavors at an Electron-Ion Collider

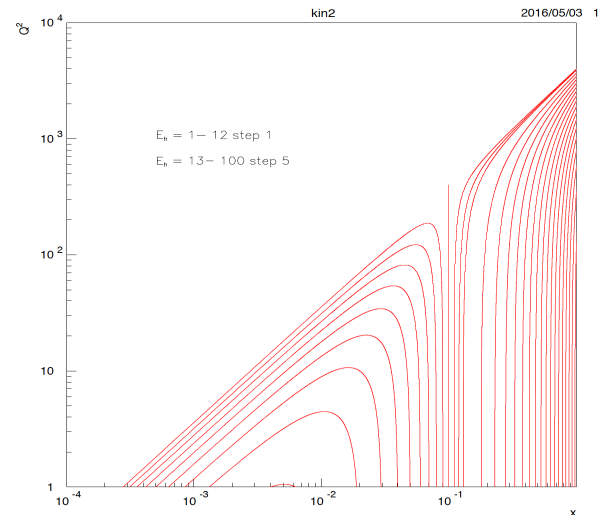
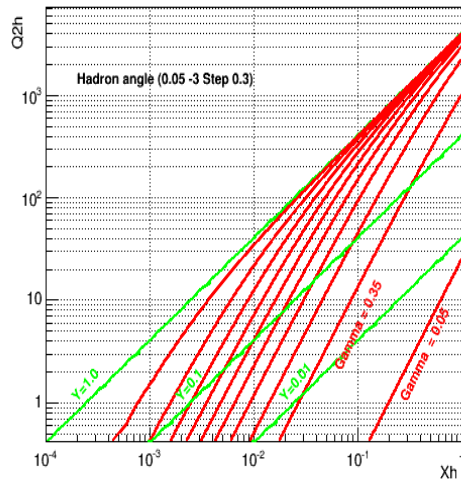
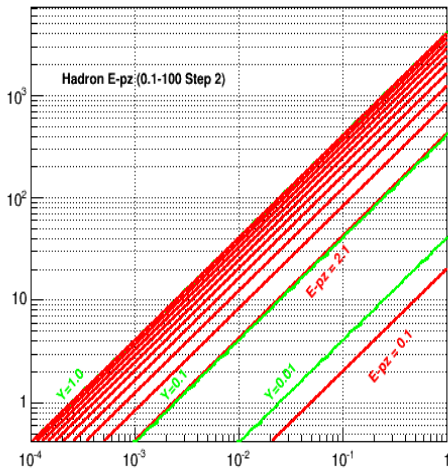
E. Chudakov, D. Higinbotham, Ch. Hyde, S. Furletov, Yu. Furletova, Dien Nguyen (grad. Stud.),
M. Stratmann, M. Strikman, C. Weisse

MAY
THE 4TH
BE WITH
YOU

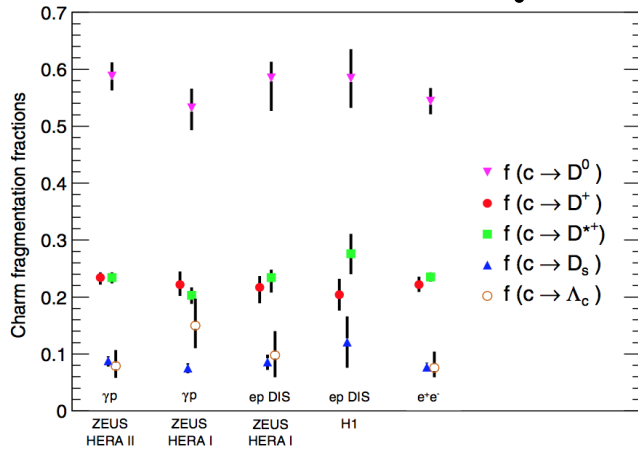
EIC Kinematics



yp0



Open Charm



Abramowicz, H., et al. (ZEUS Collaboration), 2013b, J. High Energy Phys. 09, 058.

- Fragmentation:
- $c \rightarrow D^0$ (~55%)
 - $c \rightarrow D^+$ (~20%)
 - $c \rightarrow D^{*+}$ (~20%)
 - $c \rightarrow D_s$ (~7%)
 - $c \rightarrow \Lambda_c^+$ (~7%)

$c \rightarrow D^0$ (55%)
 Mass: 1864.8 MeV
 $\tau \sim 123 \mu\text{s}$
 $D^0 \rightarrow K^- \pi^+$ (3.9%)
 $D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$ (8%)
 $D^0 \rightarrow K^+ K^-$ ($4 \cdot 10^{-3}$)
 $D^0 \rightarrow \pi^+ \pi^-$ ($1.4 \cdot 10^{-3}$)

$c \rightarrow D^+$ (20%)
 mass: 1869.5 MeV
 $\tau \sim 315 \mu\text{s}$
 $D^+ \rightarrow K^- \pi^+ \pi^+$ (9.13%)

$D^+ \rightarrow K^- 3\pi^+ \pi^-$ ($5.6 \cdot 10^{-3}$ %)
 $D^+ \rightarrow 2\pi^+ \pi^-$ ($3.18 \cdot 10^{-3}$ %)
 $D^+ \rightarrow 3\pi^+ 2\pi^-$ ($1.61 \cdot 10^{-3}$ %)

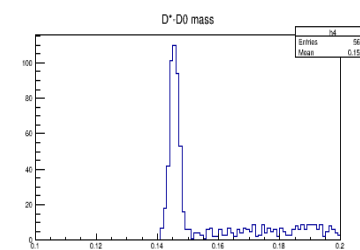
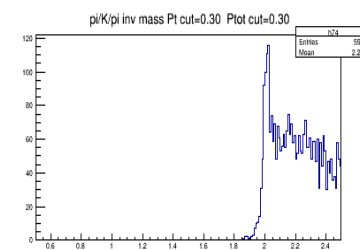
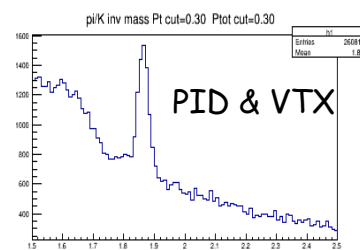
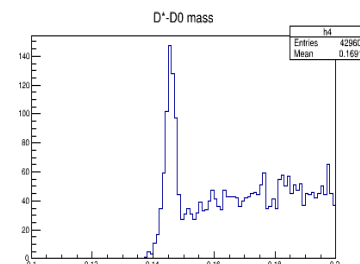
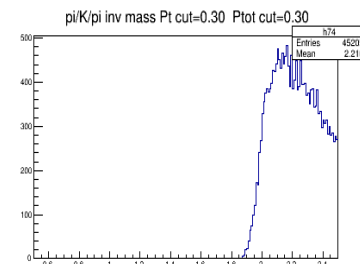
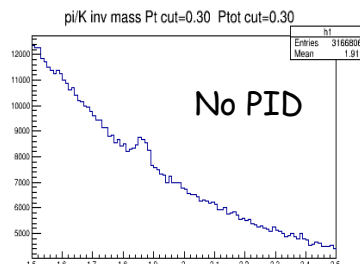
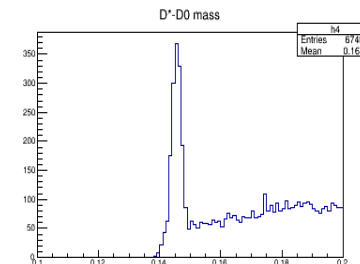
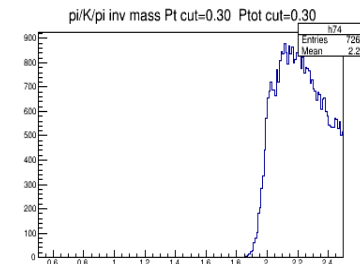
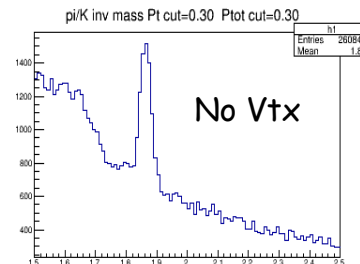
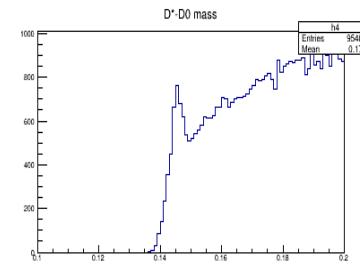
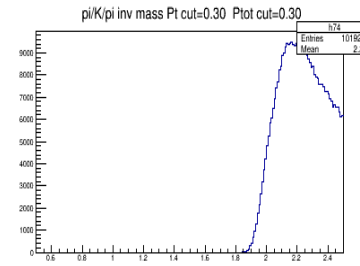
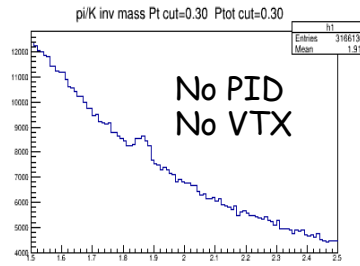
$c \rightarrow D^{*+}$ (20%)
 Mass: 2010 MeV
 $D^{*+} \rightarrow D^0 \pi^+_{\text{slow}}$ (67.7%)
 $D^0 \rightarrow K^- \pi^+$ (3.9%)
 $D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$ (8%)

$c \rightarrow D^+ s$ (7%)
 Mass: 1967 MeV
 $\tau \sim 147 \mu\text{s}$
 $D^+ s \rightarrow \phi \pi^+$ (1.8 %)
 $\phi \rightarrow K^+ K^-$
 mass: 1019.5 MeV

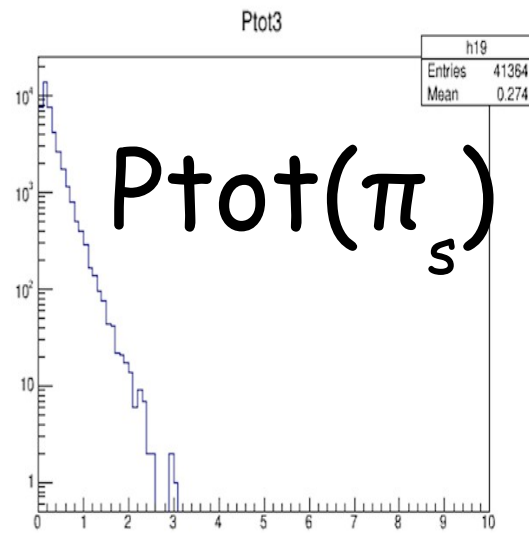
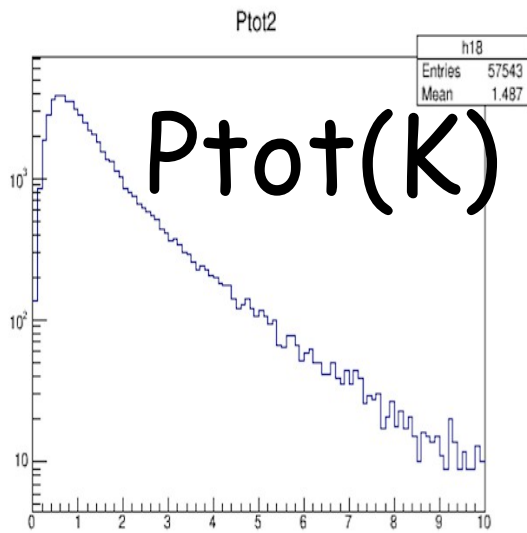
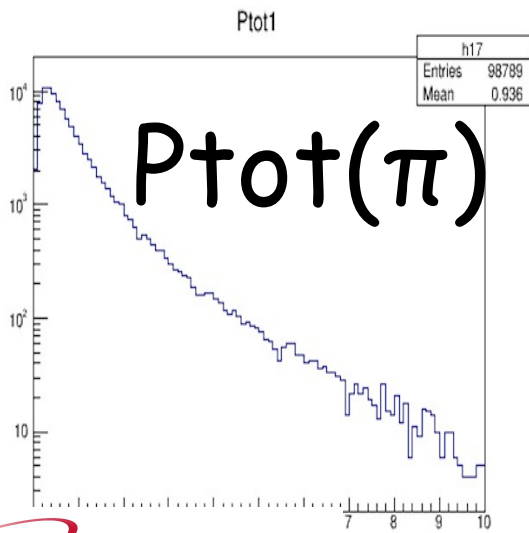
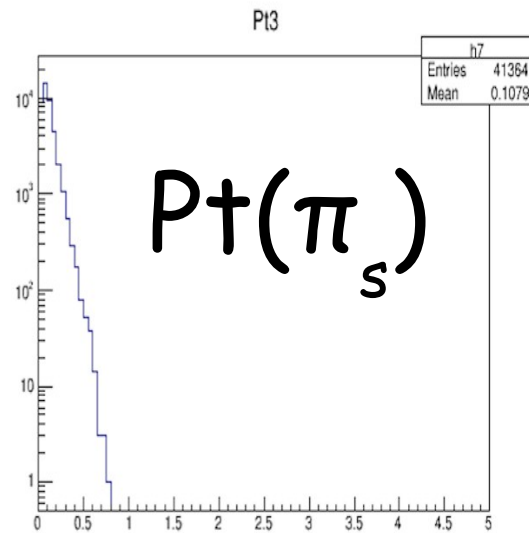
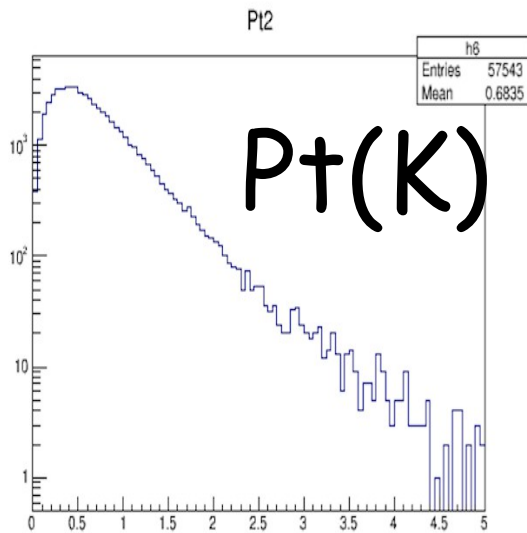
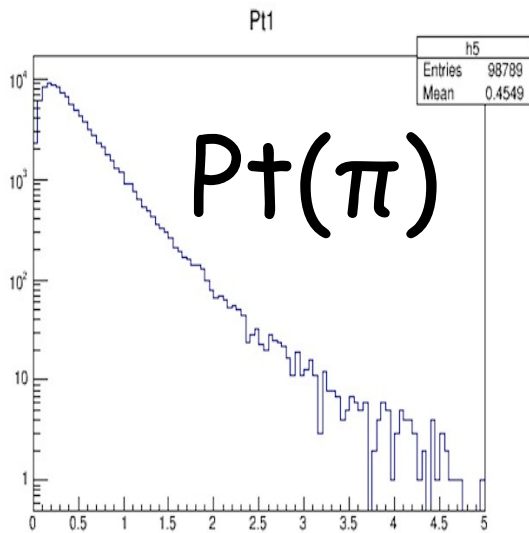
$c \rightarrow \Lambda_c^+$ (7%)
 Mass: 2285 MeV
 $\tau \sim 60 \mu\text{s}$
 $\Lambda_c^+ \rightarrow p K$ (???? %)
 $\phi \rightarrow K^+ K^-$

Open Charm: $D^* - \pi K \pi$ (mass cut)

$c \rightarrow D^{*+}$ (20%)
 Mass: 2010 MeV
 $D^* c\tau \sim 0$, $D^0 c\tau \sim 123 \mu\text{m}$
 $D^{*+} \rightarrow D^0 \pi^+$ (67.7%)
 slow
 $D^0 \rightarrow K^- \pi^+$ (3.9%)
 $D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$ (8%)



Open Charm: $D^* - \pi K \pi_s$



Open Charm: $D^+ - \pi K \pi$

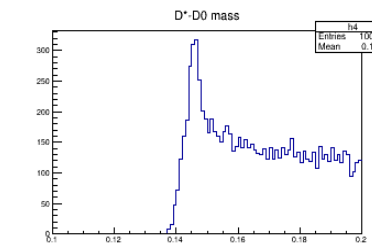
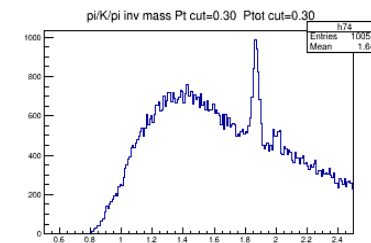
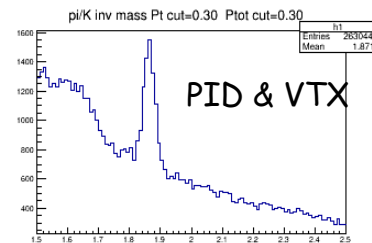
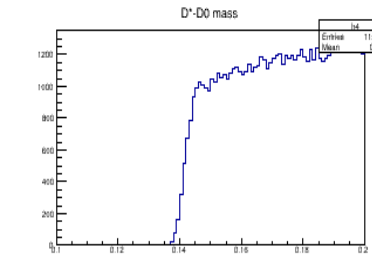
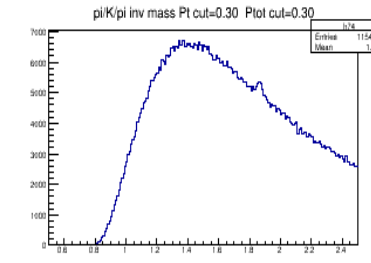
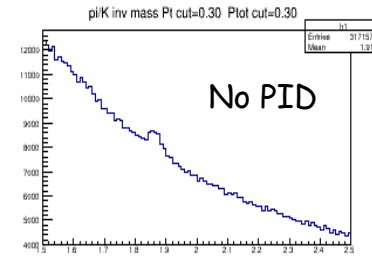
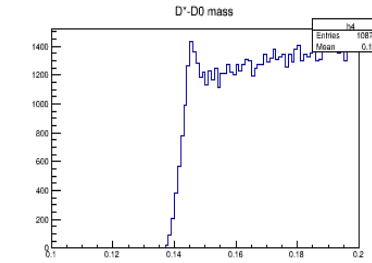
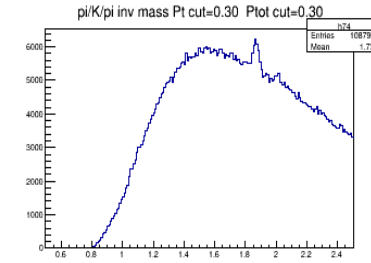
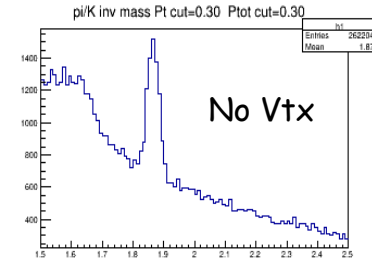
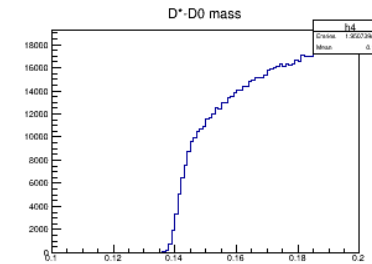
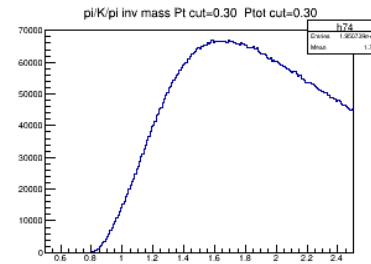
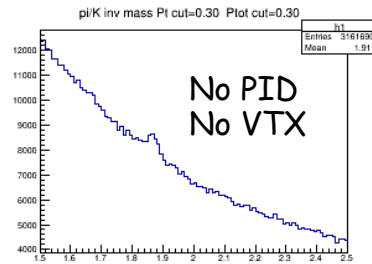
$c \rightarrow D^+$ (20%)
 mass: 1869.5 MeV
 $C\tau$: 315 μm

$D^+ \rightarrow K^- \pi^+ \pi^+$ (9.13%)

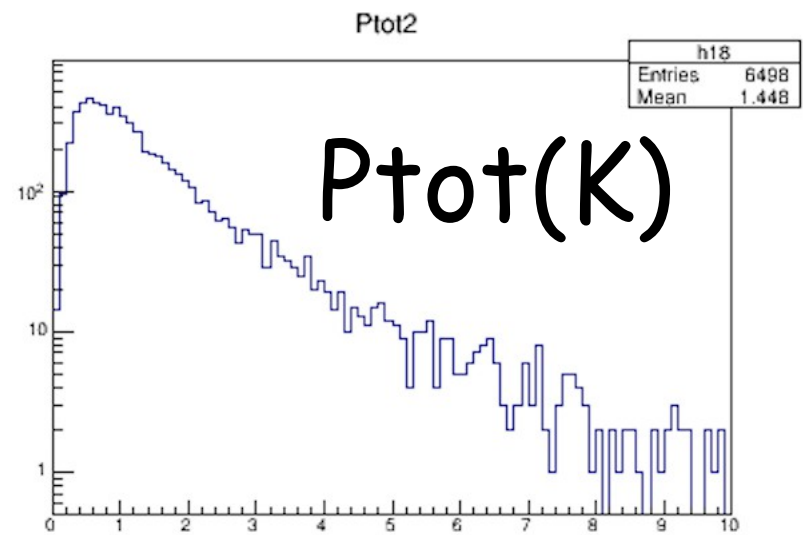
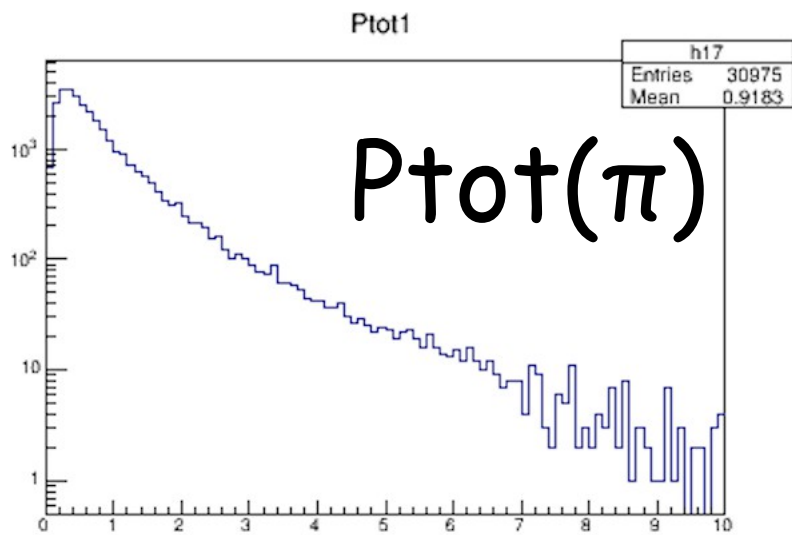
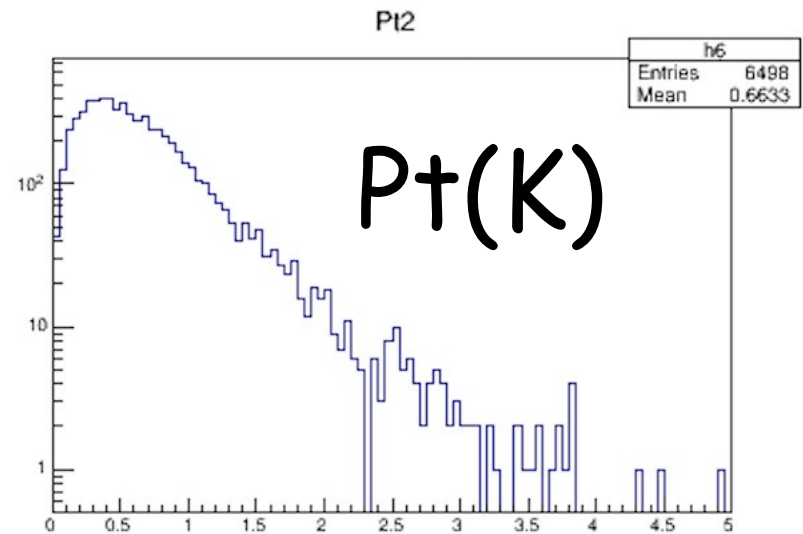
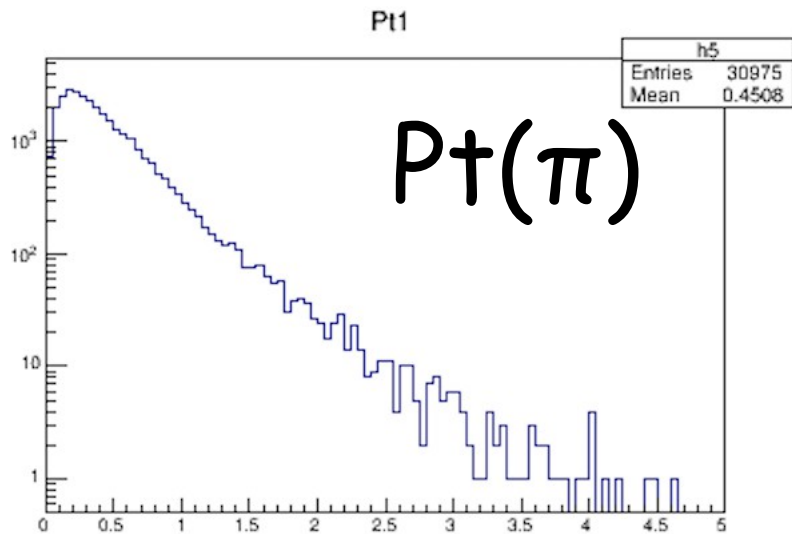
$D^+ \rightarrow K^- 3\pi^+ \pi^-$ ($5.6 \cdot 10^{-3}$ %)

$D^+ \rightarrow 2\pi^+ \pi^-$ ($3.18 \cdot 10^{-3}$ %)

$D^+ \rightarrow 3\pi^+ 2\pi^-$ ($1.61 \cdot 10^{-3}$ %)

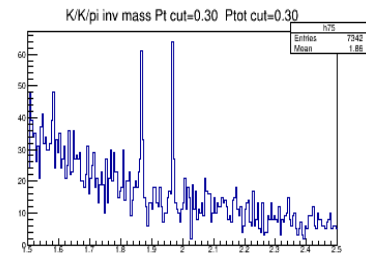
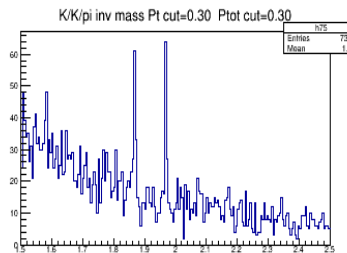
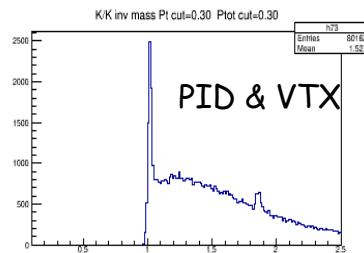
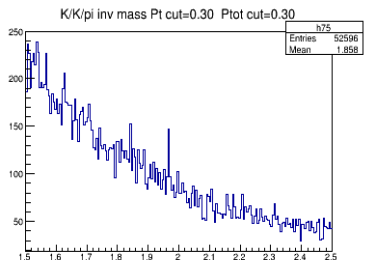
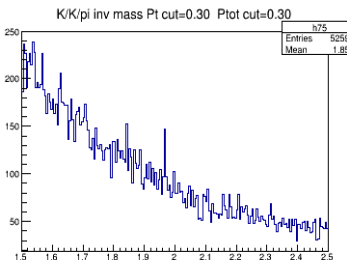
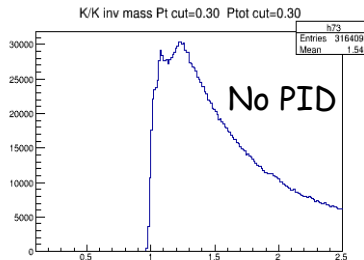
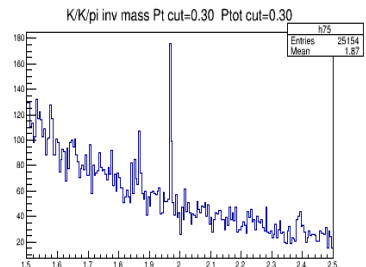
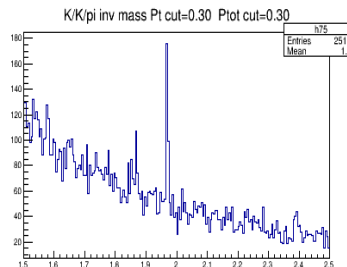
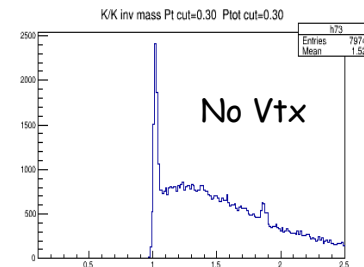
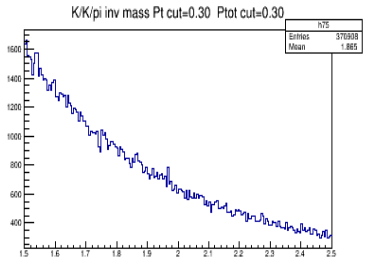
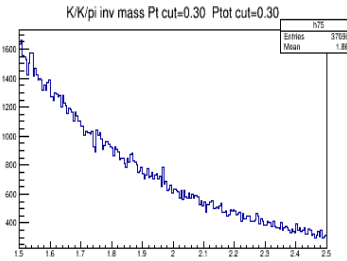
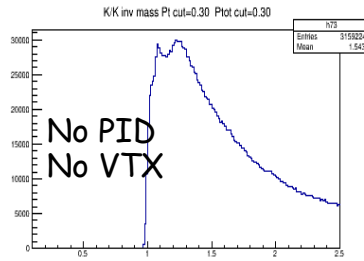


Open Charm: $D^+ - \pi K \pi$



Open Charm: $Ds^+ - KK\pi$

$c \rightarrow D+s$ (7%)
 Mass: 1967 MeV
 σ_T : 147 μm
 $D+s \rightarrow \phi \pi^+$ (1.8 %)
 $\phi \rightarrow K+K^-$
 mass: 1019.5 MeV



- Backup
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