Charm at EIC

Yulia Furletova

U.S. DEPARTMENT OF ENERGY
JSA
Jefferson Lab

Charm

- $c \to D^0$ (~55%) D0-> K- π+ (3.9%) , D0-> K-π+ π+ π- (8%)
- $c \to D^*$ (~20%) $D^{*+} \to D0\ \pi+_{slow}$ (67.7%)
- $c \to D^+$ (~20%) $D^+ \to$ K-π+ π+ (9.13%)
- $c \to D_s$ (~7 %) $D_s \to \varphi\ \pi+$ (1.8 %) -> (K+K-) π+
- $c \to \Lambda_c^+$ (~7%) ???

NUMBER OF D MESONS IN X -BINS

Cross section for signal and background (0<x<1)

Charm (BGF) : $Q^2 > 10\ GeV\ \sigma \sim\ 9.3\ nb$

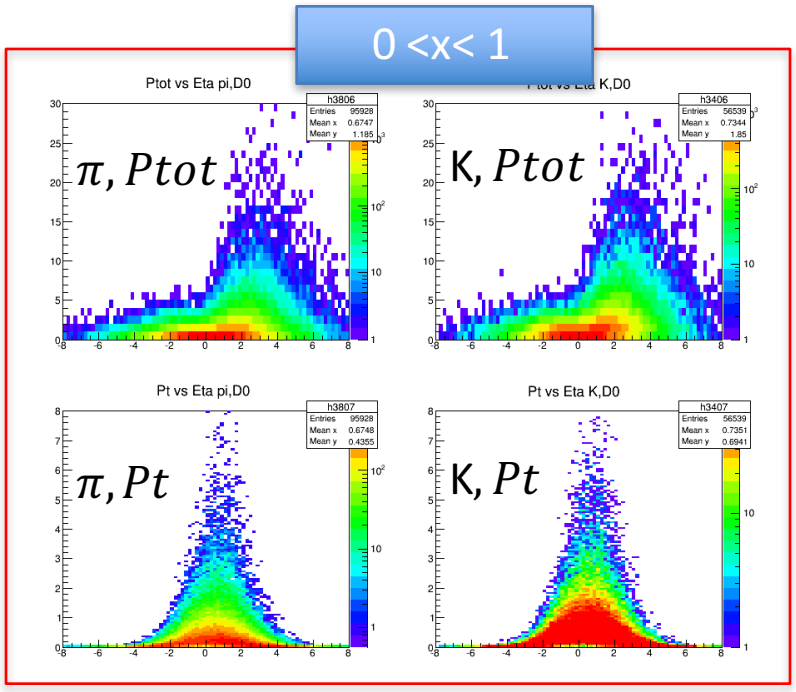
Minbias : $Q^2 > 10\ GeV\ \sigma \sim 41.5\ nb$ $\frac{S}{B} \sim ¼$

Number of charm mesons in Charm (BGF) sample vs x cut

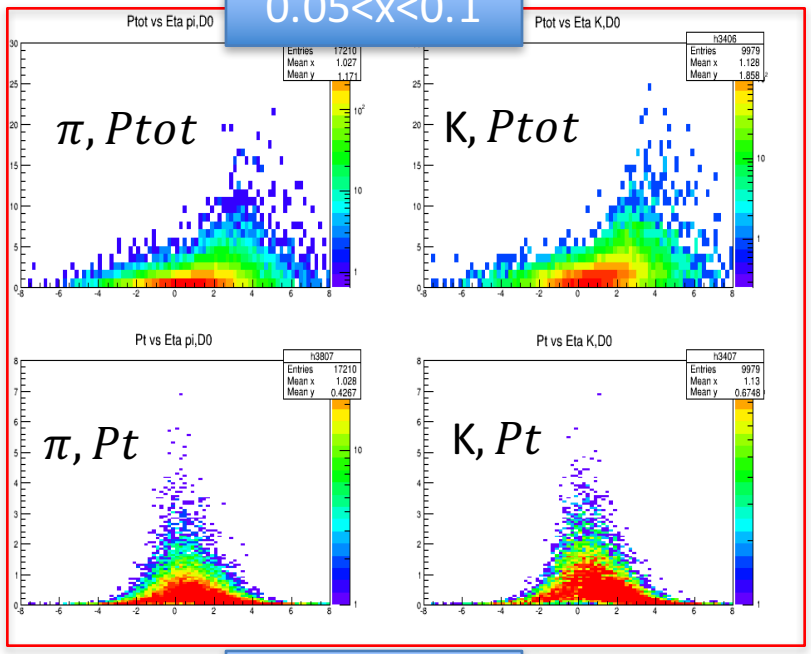
	All x	X>0.05	0.05<x<0.1	0.1<x<0.2
All events	100,000	46,018	17,773	14,870
D0	121,968	56,154	21,618	18,279
D*+-	59,632	27,448 (705)	10,574 (272)	8,862 (228)
D+-	38,969	18,046	6,920	5,792
Ds	22,892	10,530	4,196	3,352

D0 -> π ,K

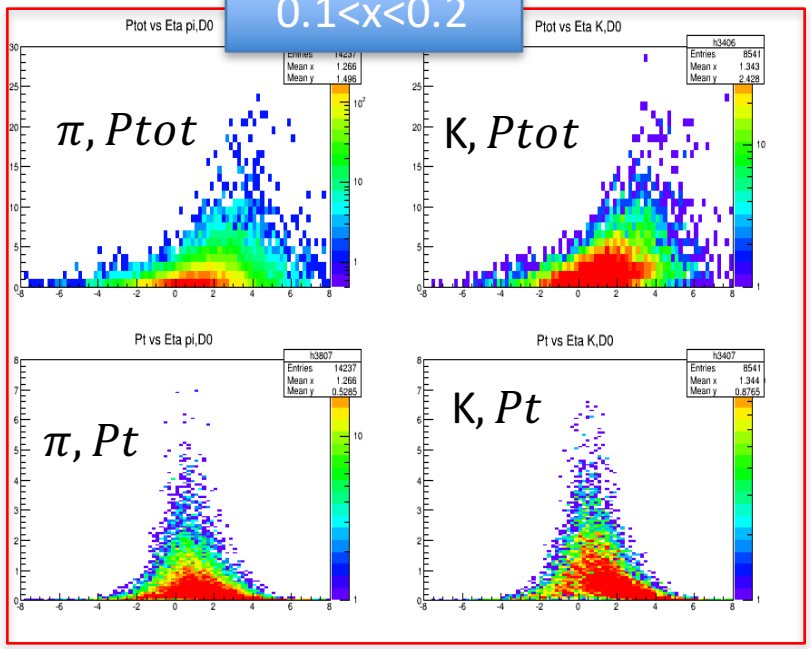
0 <x< 1



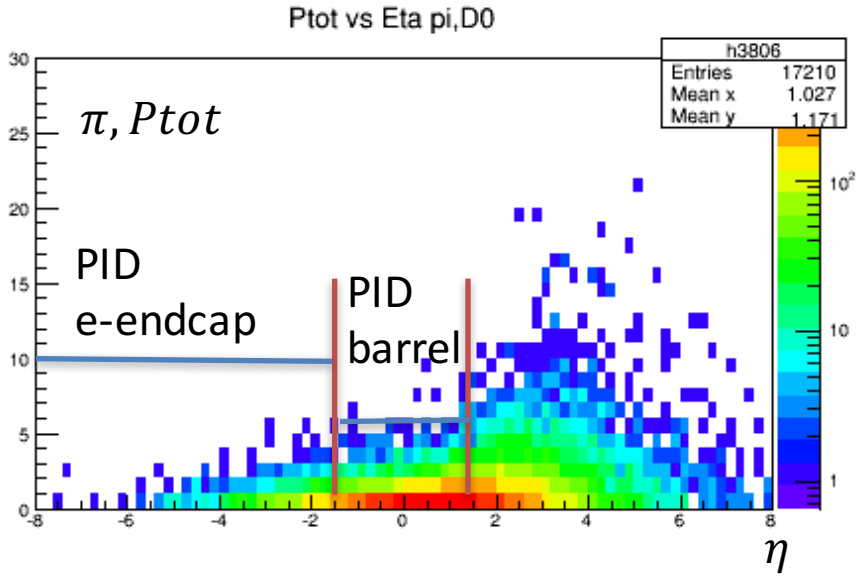
0.05<x<0.1

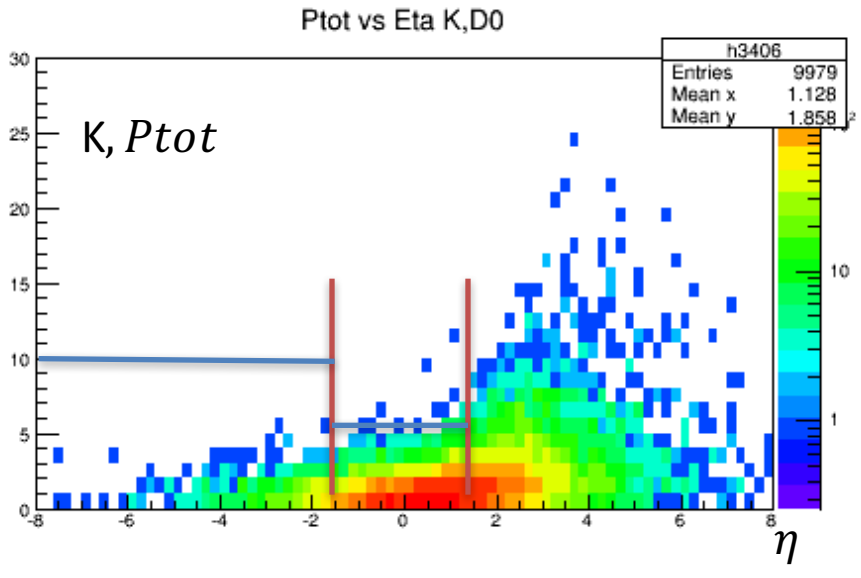


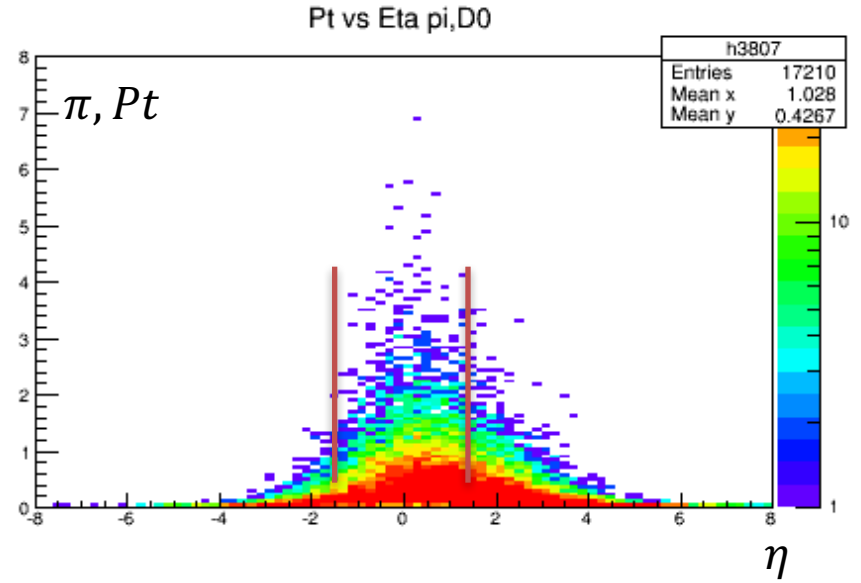
0.1<x<0.2

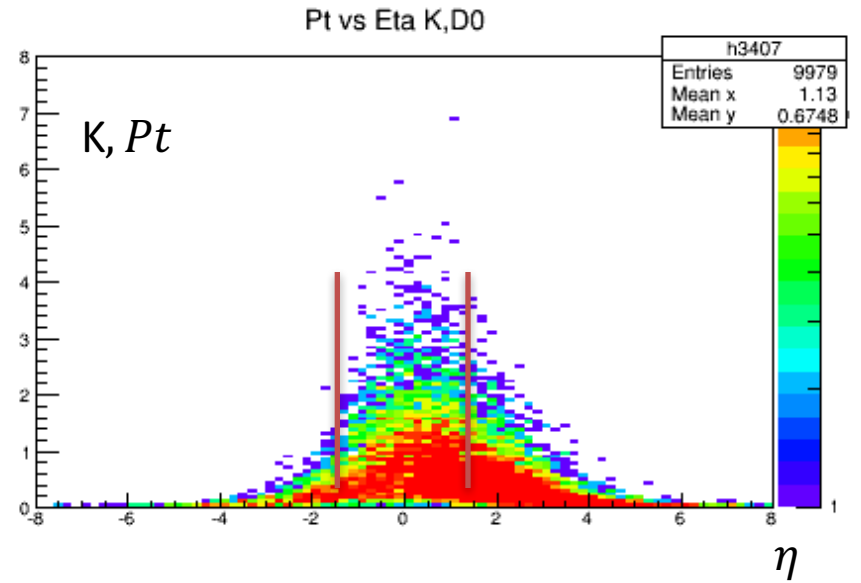


D0 -> π,K 0.05<x<0.1

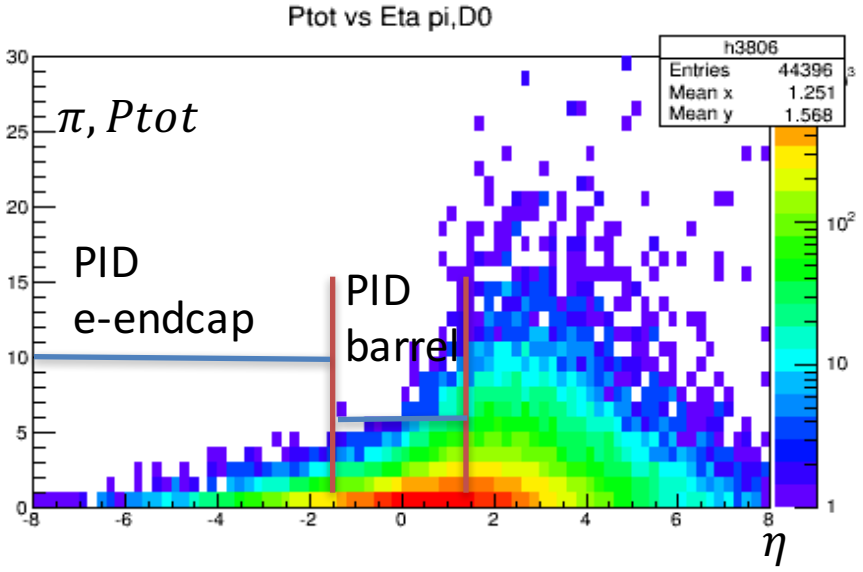


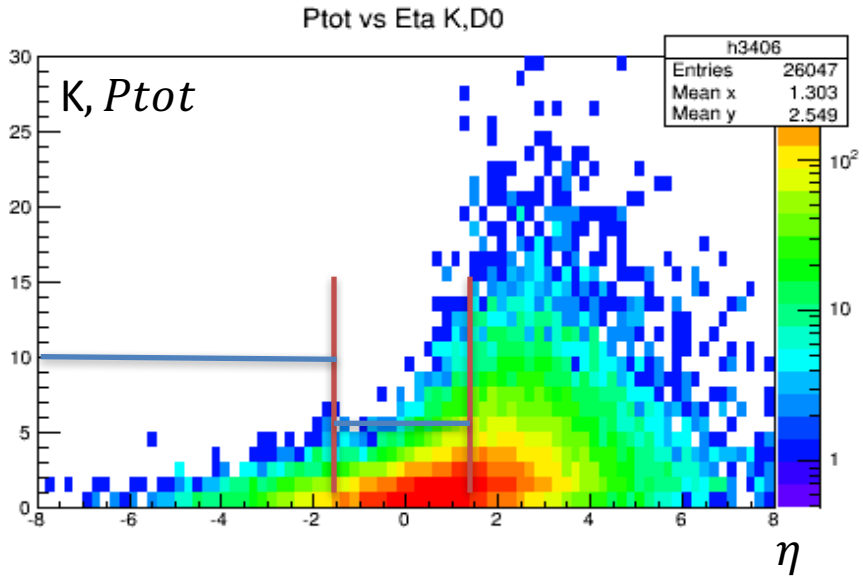


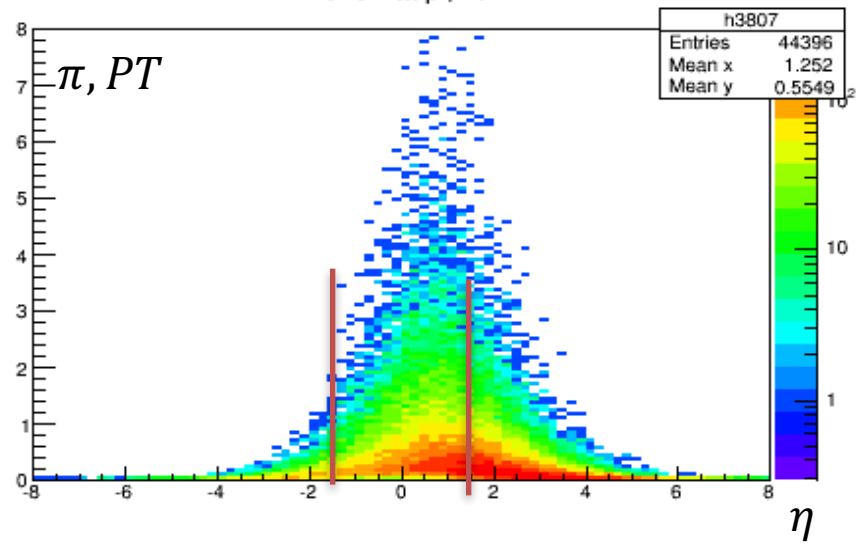


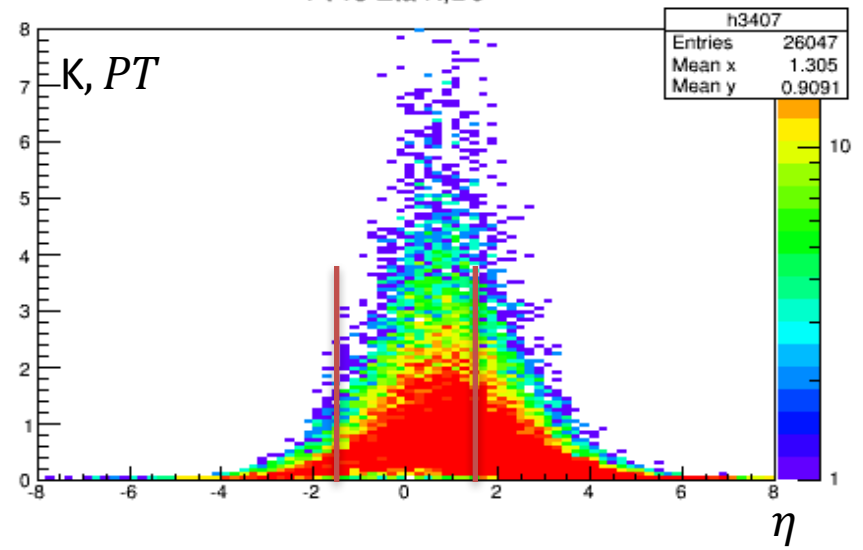


D0 -> π,K 0.05 <x<1


Ptot vs Eta pi,D0
h3806
Entries 44396
Mean x 1.251
Mean y 1.568
$\pi, Ptot$
PID
e-endcap
PID
barrel
η

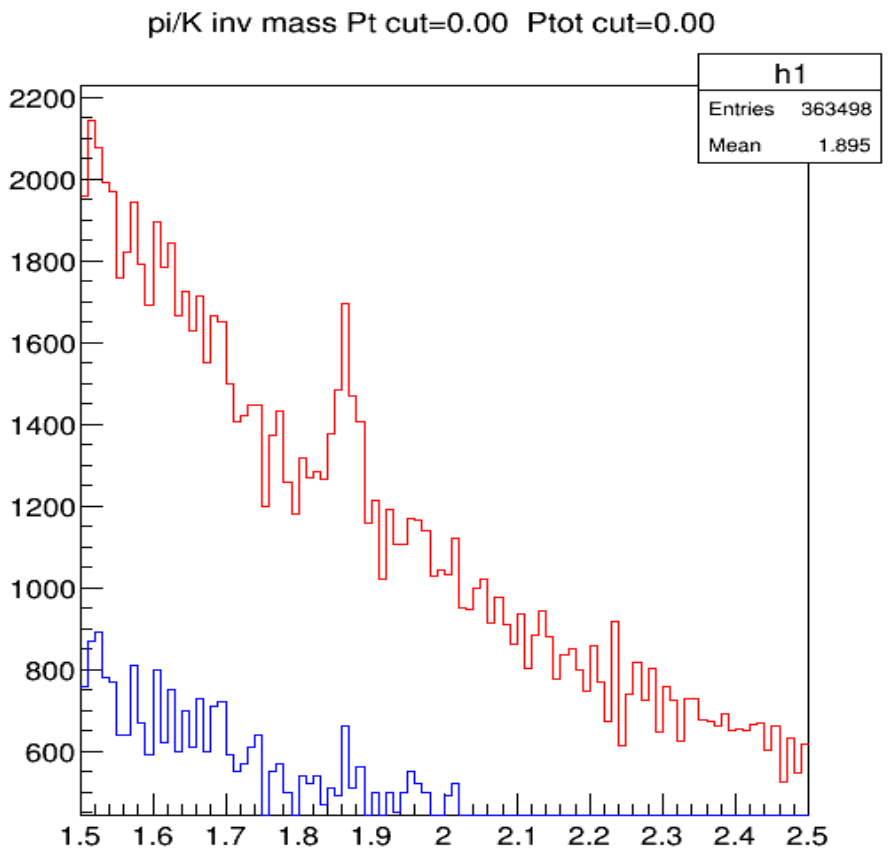

Ptot vs Eta K,D0
h3406
Entries 26047
Mean x 1.303
Mean y 2.549
K, $Ptot$
η

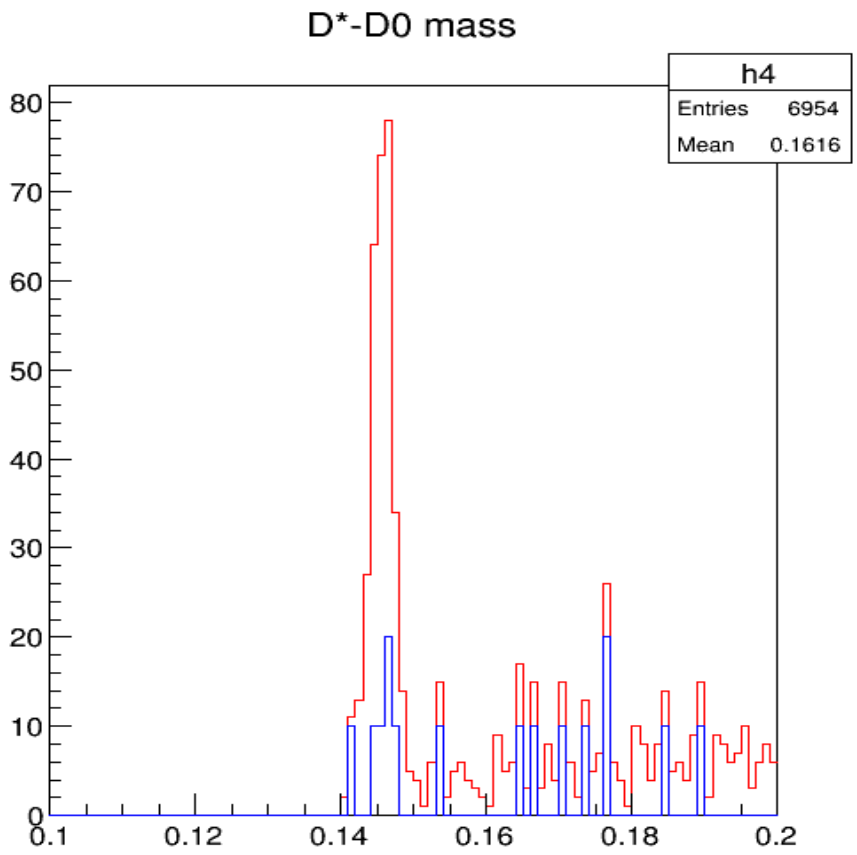

Pt vs Eta pi,D0
h3807
Entries 44396
Mean x 1.252
Mean y 0.5549
π, PT
η


Pt vs Eta K,D0
h3407
Entries 26047
Mean x 1.305
Mean y 0.9091
K, PT
η

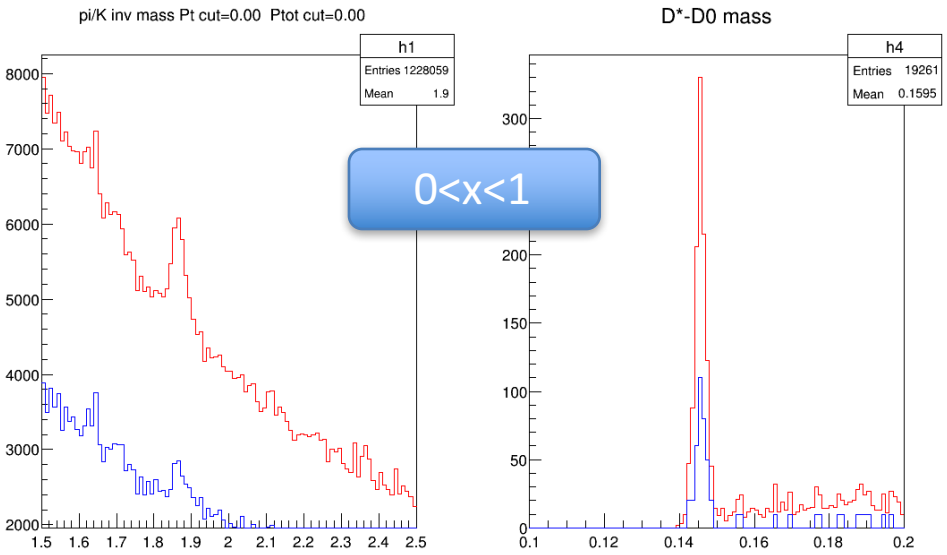
Mass spectrum Q2>10, 0.05<x<0.2

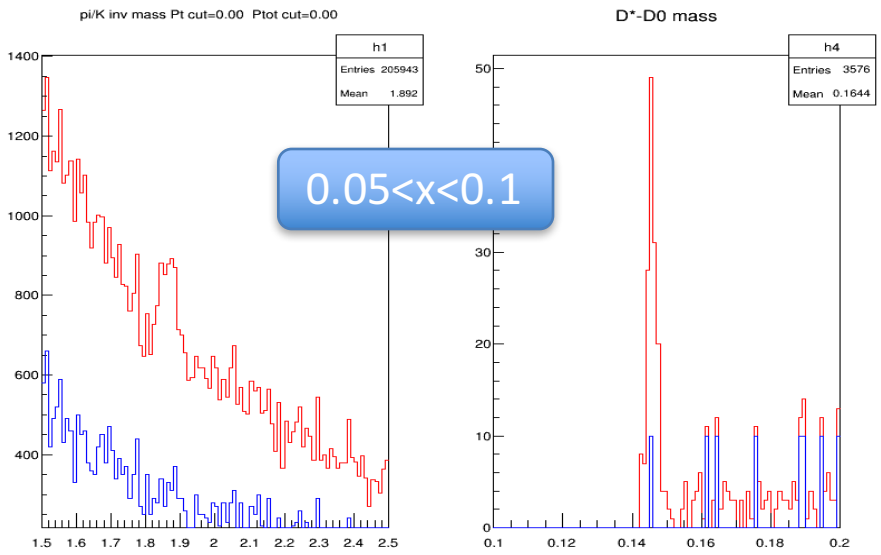
(charm)+ (minbias) red
(minbias) blue

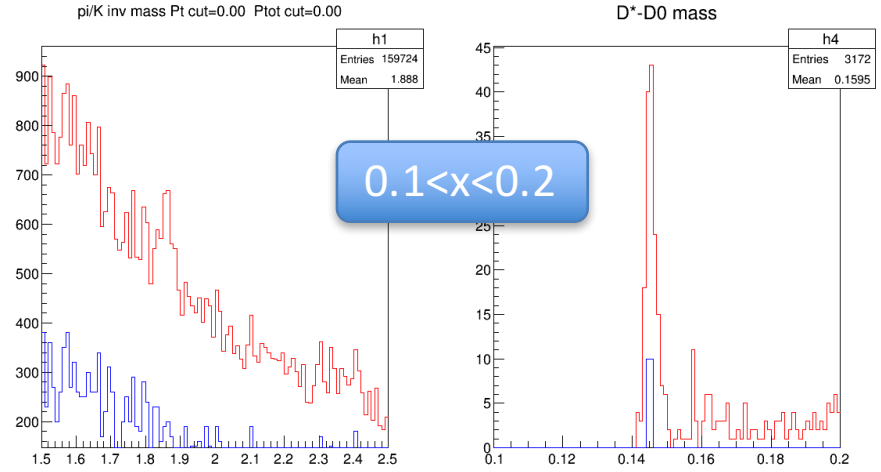




MASS SPECTRUM







TO DO

- Compare charm cross section and Dstar with sergey
- Curve momentum vs zone in barrel
- Acceptance via histogramm

BACKUP