

PID effect for $D^0 \rightarrow K^- \pi^+ \pi^0$

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$$D^0 \rightarrow K^- \pi^+ \pi^0$$

- 在 MC truth 的基础上，向样本中引入 PID 效率
- K^- 、 π^+ 的鉴别效率与它们各自的动量 $|\vec{p}|$ 、方向角 $|\cos \theta|$ 有关，
- 使用 $0 \sim 1$ 的均匀随机数，在样本中模拟粒子鉴别效率，去除“未鉴别”的事例

PID 效率

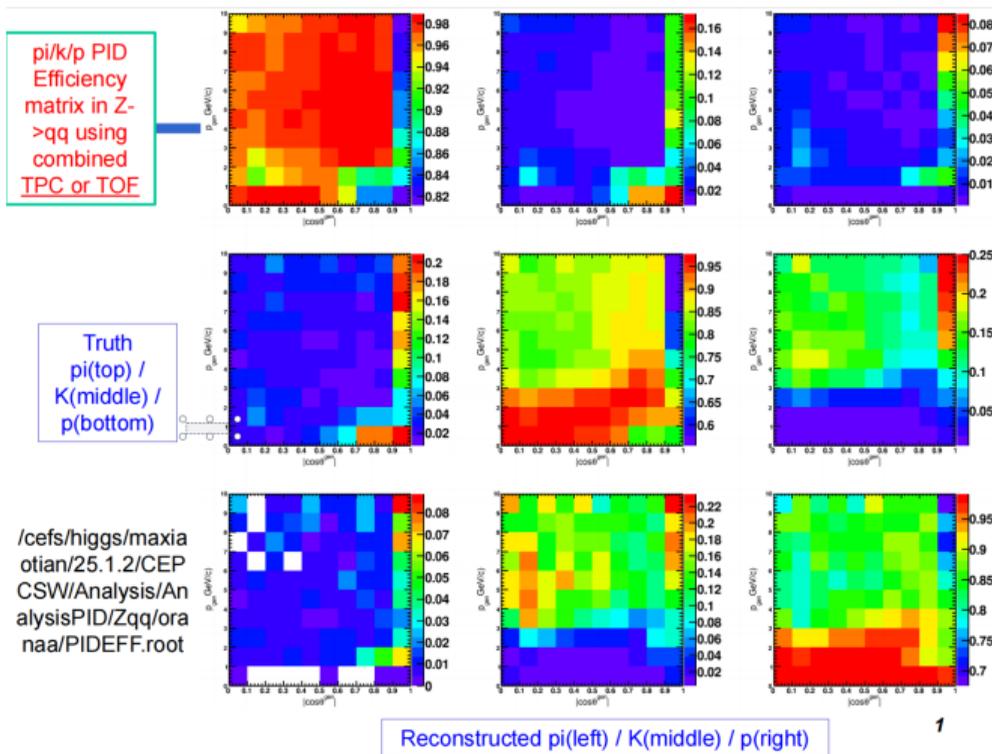


图: K^- 、 π^+ 的 PID 效率 (图源于 Xiaotian Ma)

PID 效率

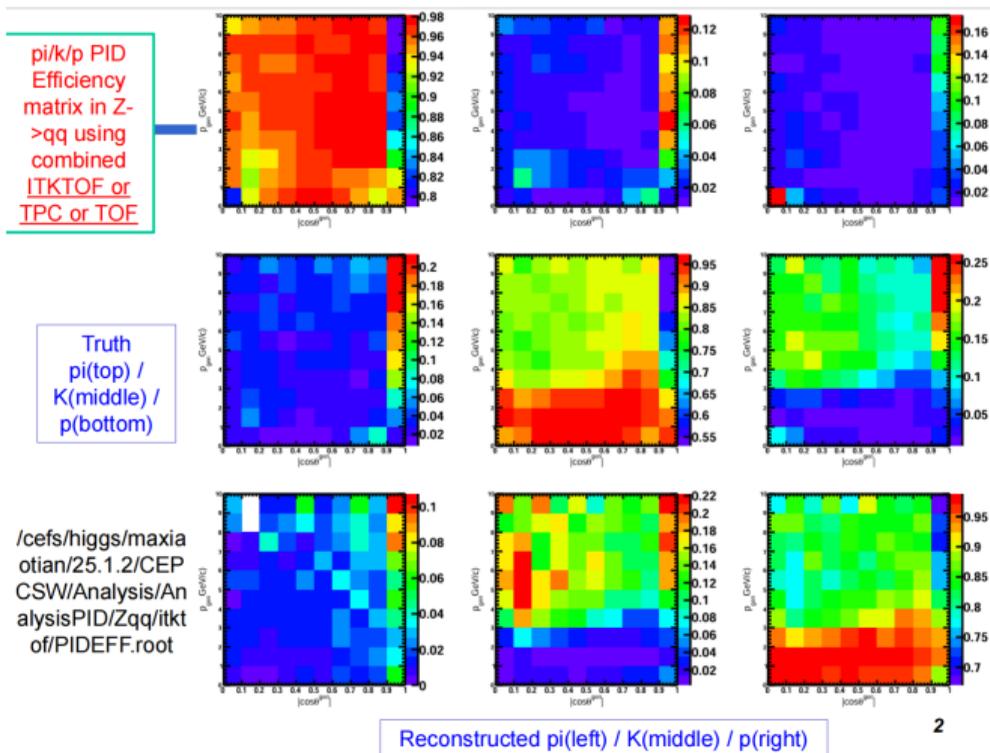


图: K^- 、 π^+ 的 PID 效率 (考虑 ITKTOF 后。图源于 Xiaotian Ma)

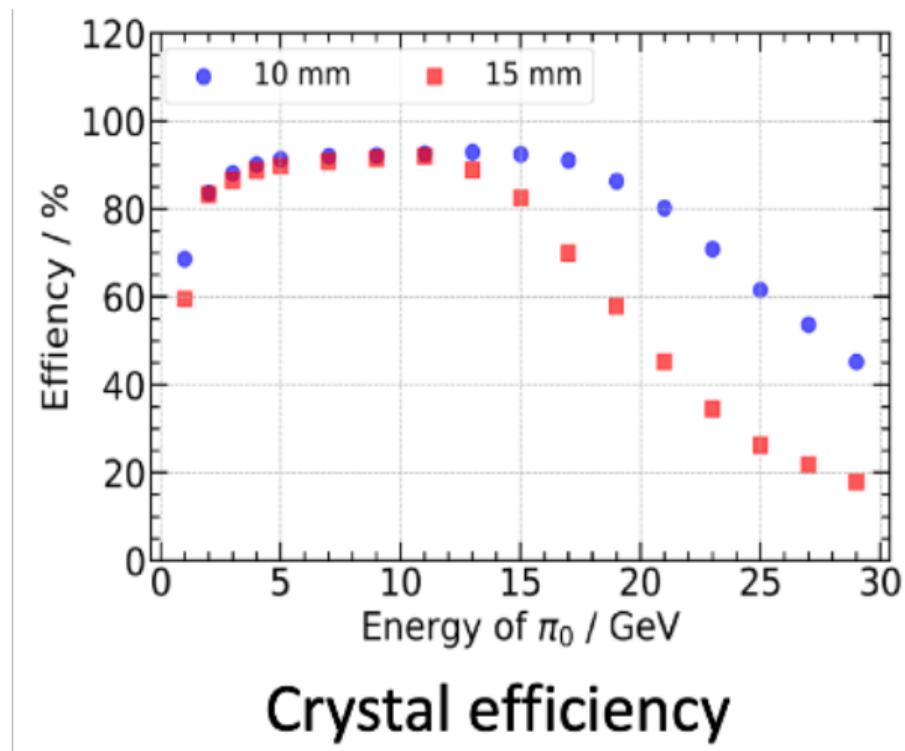
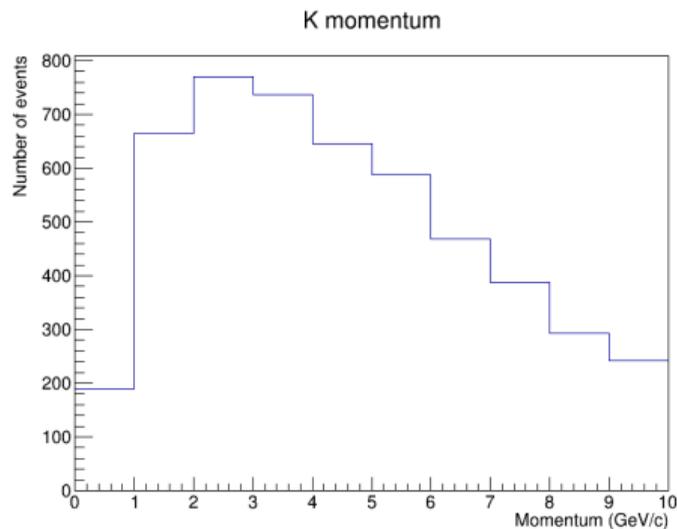


图: π^0 的效率

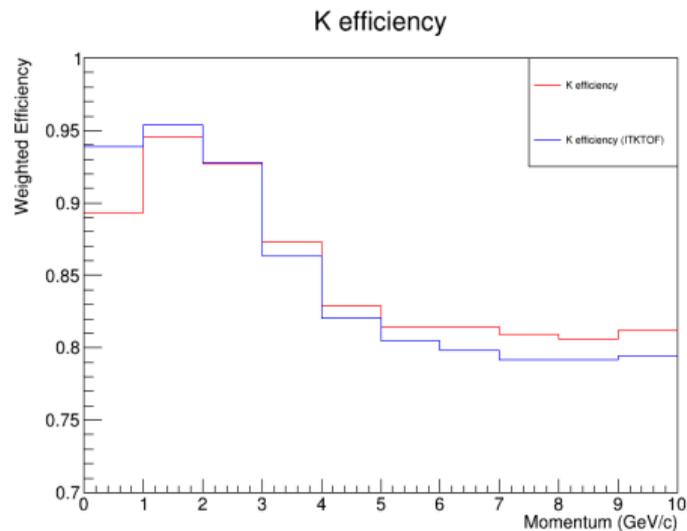
Particle	Removed ratio (%)	
	—	ITKTOF
K^-	27.4	27.2
π^+	13.1	13.0
π^0		18.0
K^-, π^+, π^0	48.1	48.3

表: 各粒子的 PID (或重建) 效率对样本的影响

K^- , π^+ 的动量分布

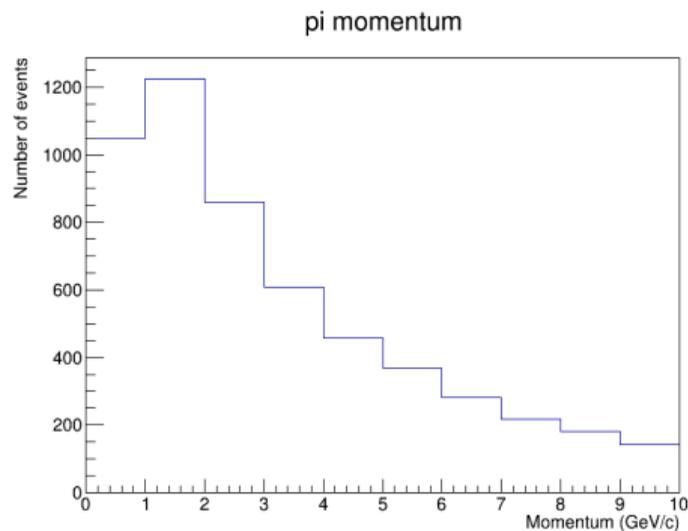


(a) K^- 动量分布 (85% entries)

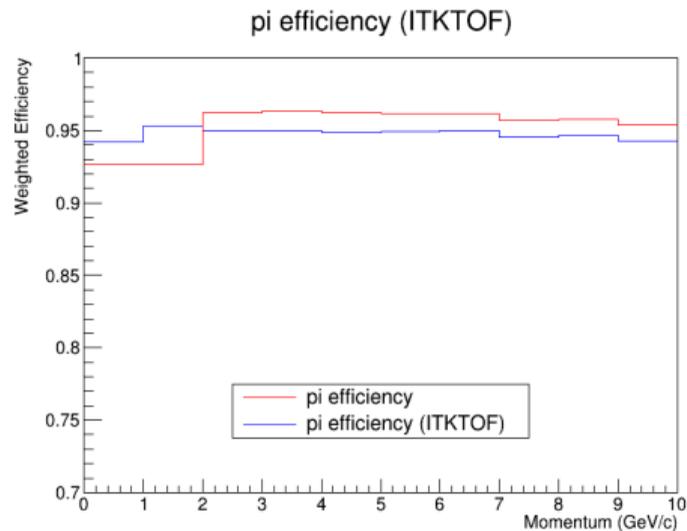


(b) K^- 的 PID 效率随其动量的分布

K^- , π^+ 的动量分布

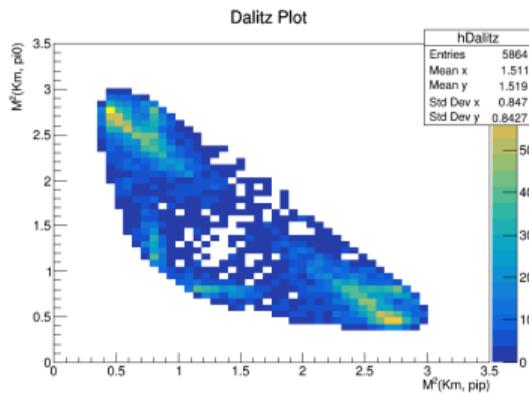


(c) π^+ 动量分布 (92% entries)

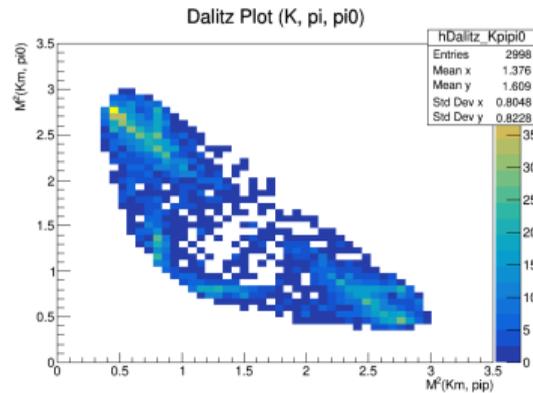


(d) π^+ 的 PID 效率随其动量的分布

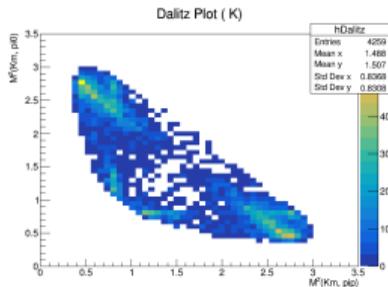
Dalitz Plot



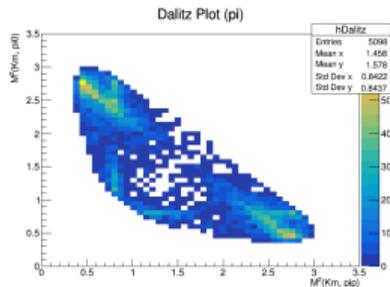
(e) MC truth



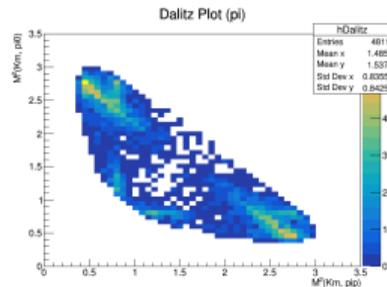
(f) K^- , π^+ , π^0



(g) K^-

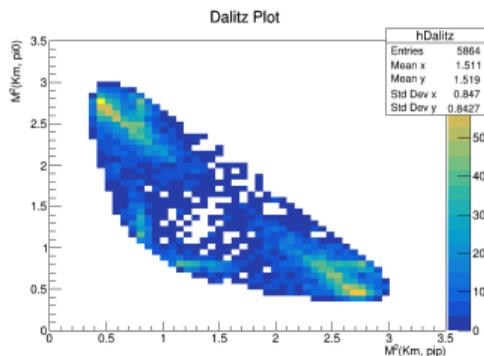


(h) π^+

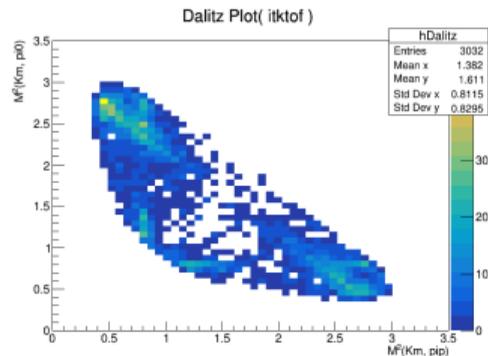


(i) π^0

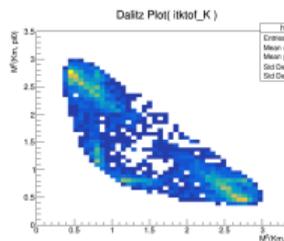
Dalitz Plot



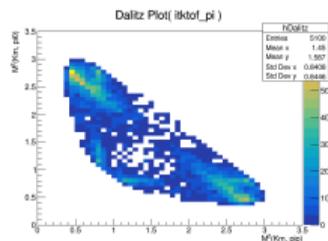
(j) MC truth



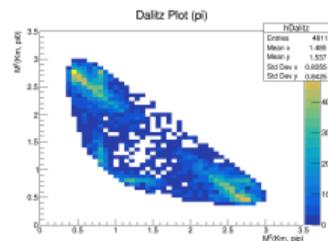
(k) K^-, π^+, π^0



(l) K^-



(m) π^+



(n) π^0

图: 考虑 ITKTOF

Thank You