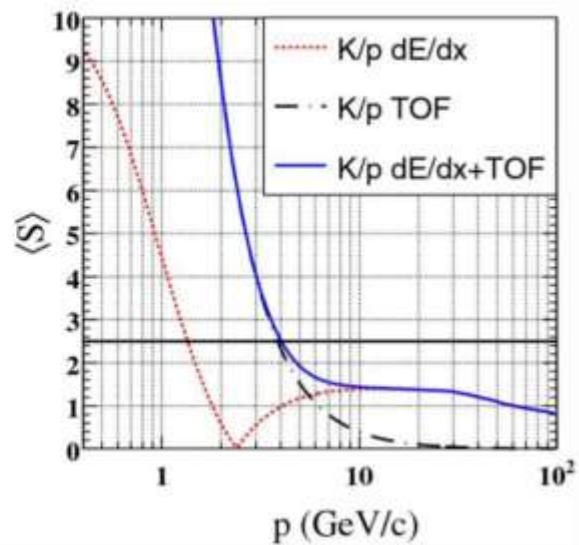
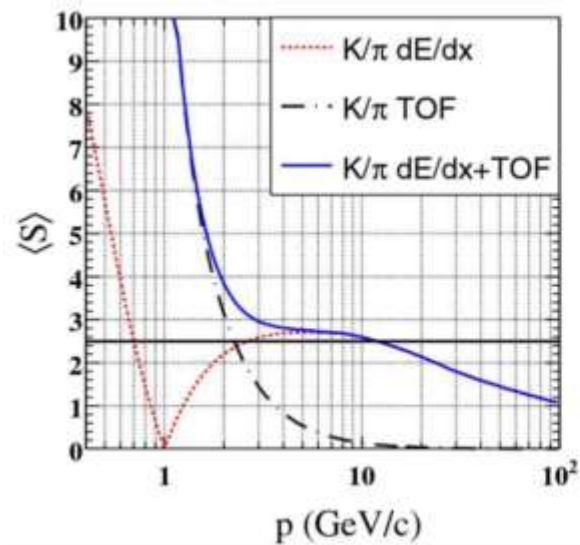


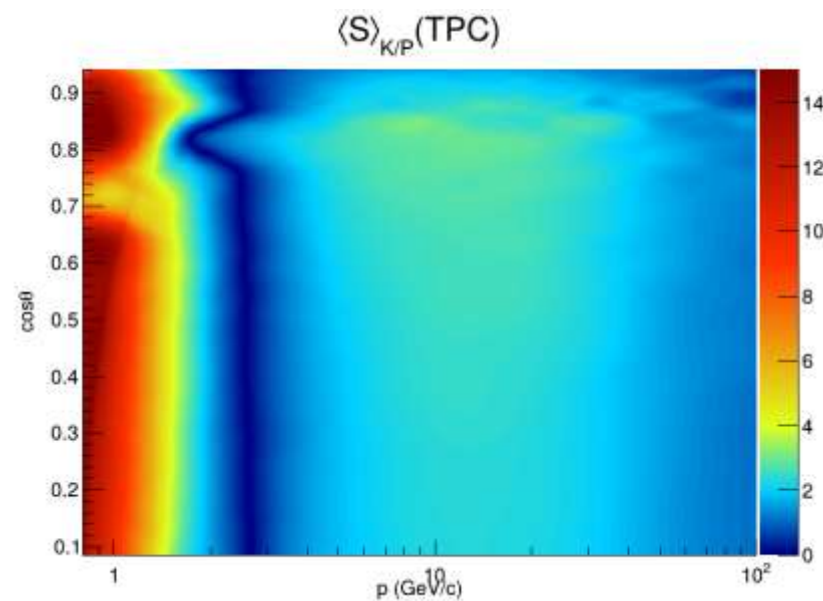
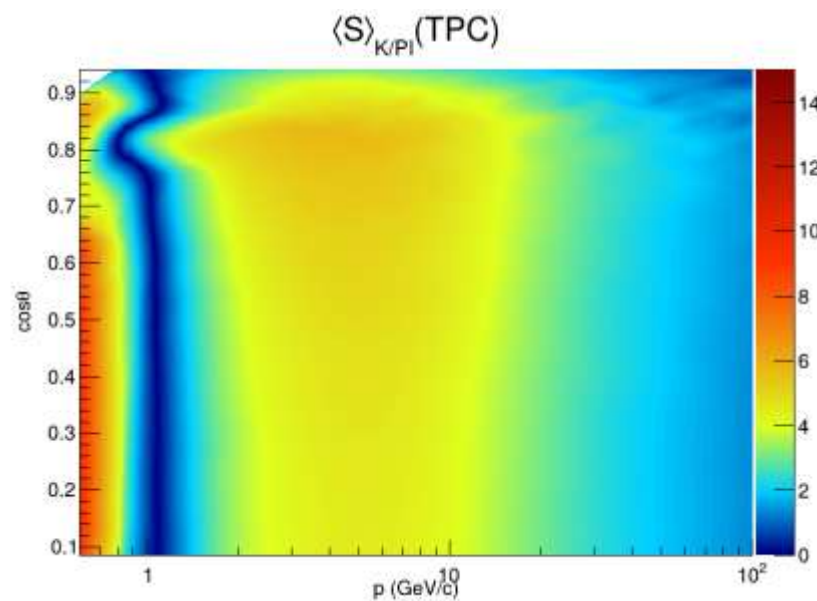
Separation power of TPC ITK OTK

Houqian Ding, Dian Yu, Yunyun Fan

2025.8.1

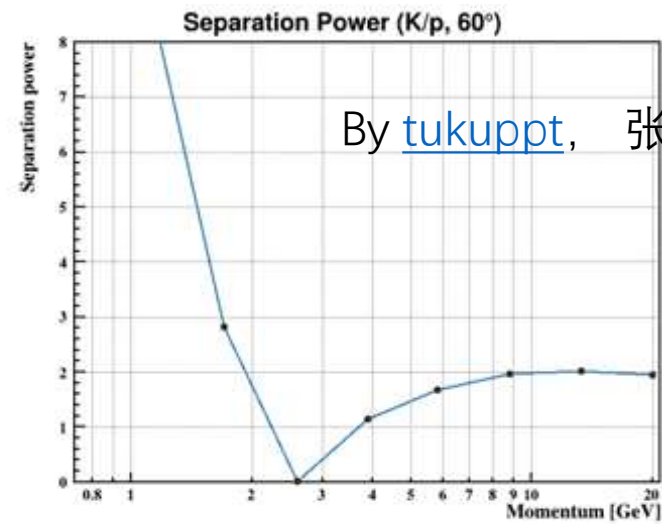
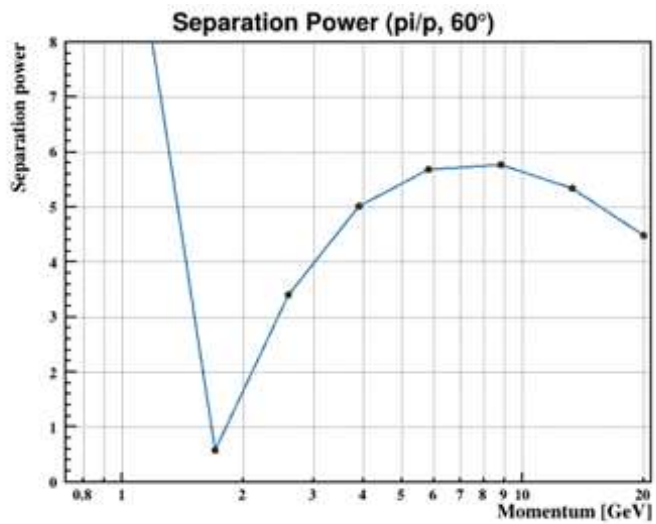
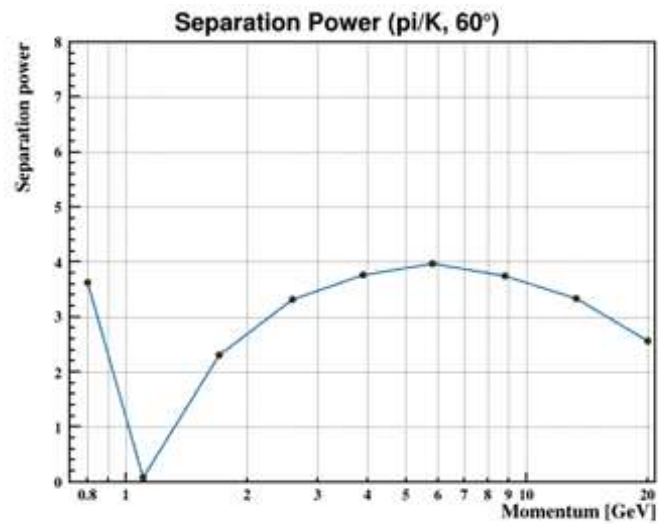


Def:
$$S_{AB} = \frac{|\mu_A - \mu_B|}{(\sigma_A + \sigma_B)/2}$$



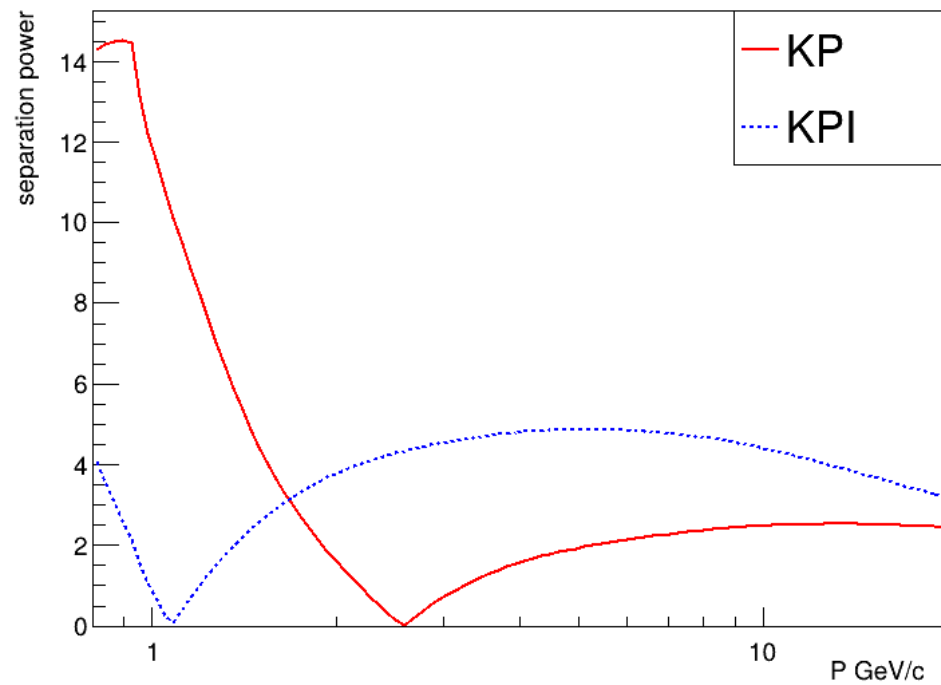
暖色: separation power >4

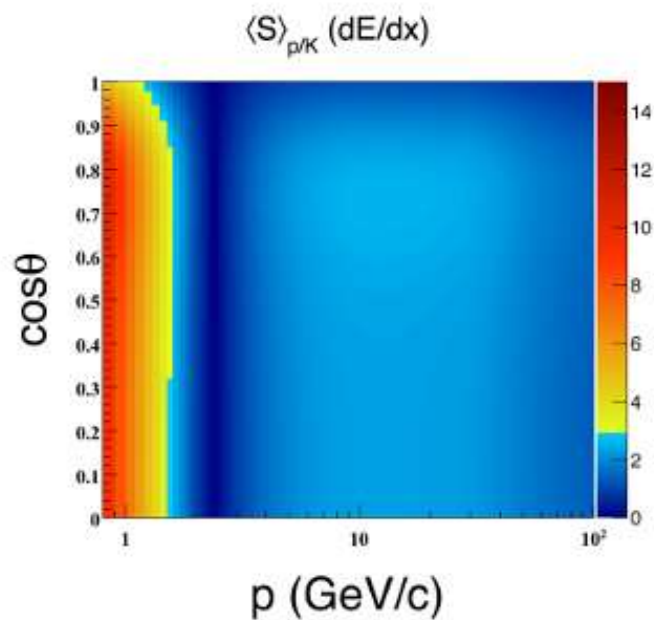
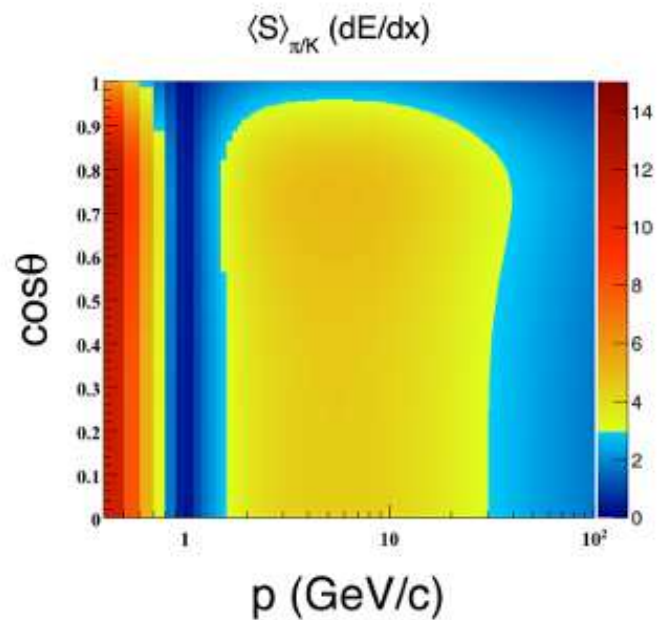
冷色: separation power <2



By [tukuppt](#), 张锦闲

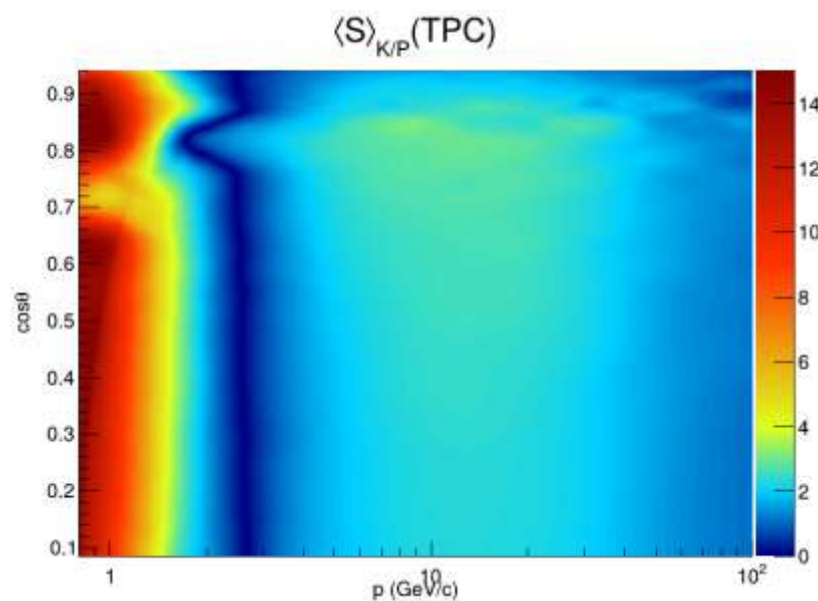
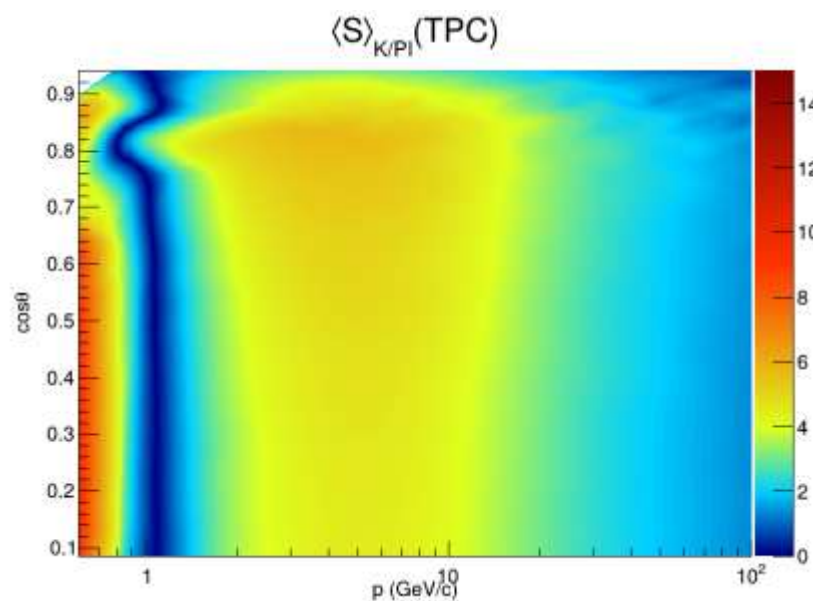
$\cos\theta = 0.5$



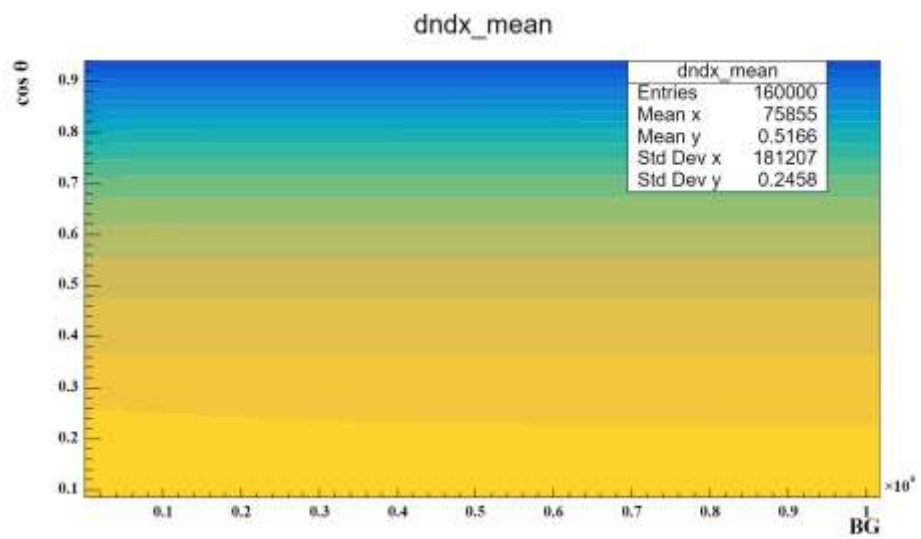
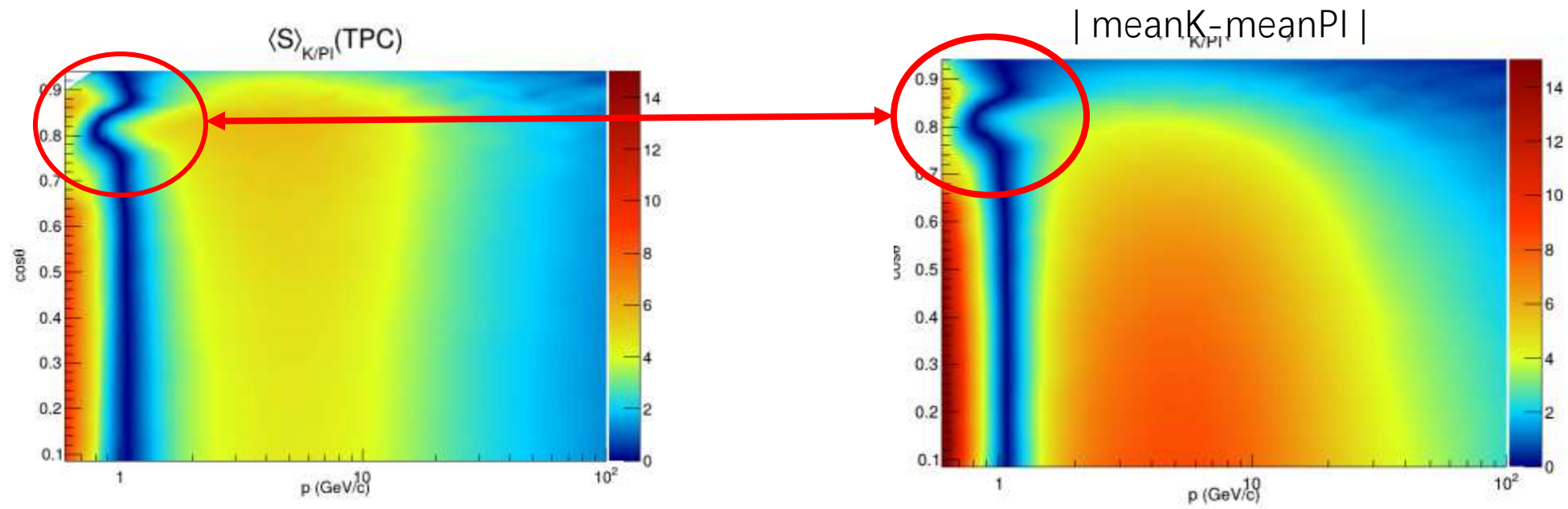


By Yongfeng Zhu
Def of separation power :

$$S_{AB} = \frac{|\mu_A - \mu_B|}{\sqrt{\sigma_A^2 + \sigma_B^2}}$$

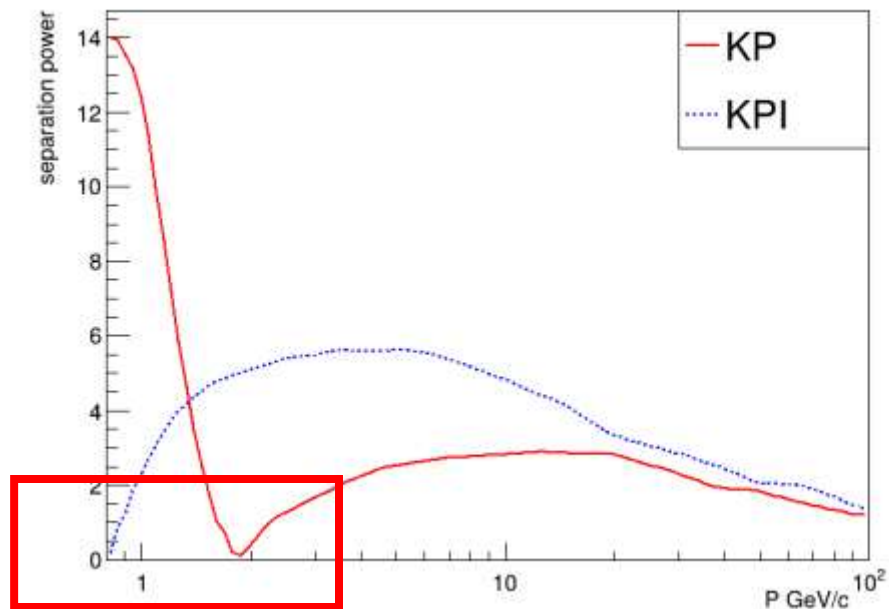


Separation power 前后定义不一致，上图的 $S=3$ 等价于下图 $S=4.2$ 左右。

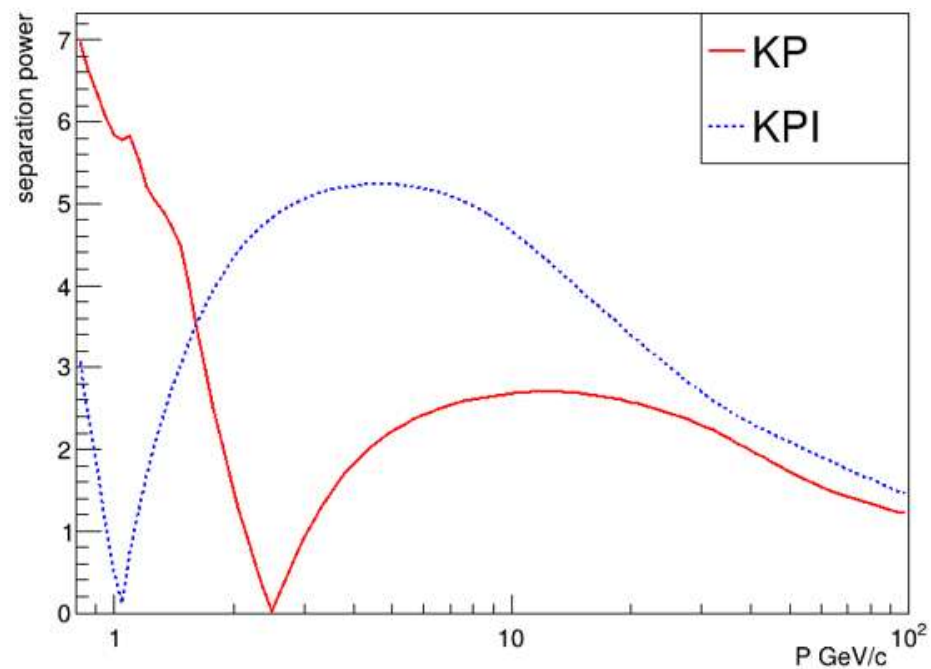


Cos $\theta=0.8$ 存在零点偏移

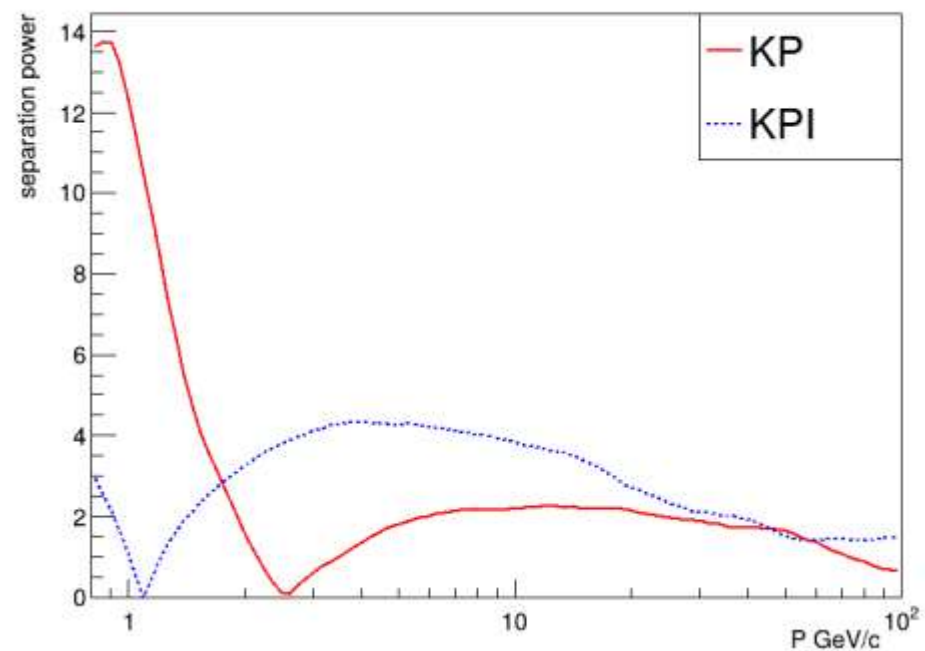
cos $\theta=0.8$



cos $\theta=0.7$

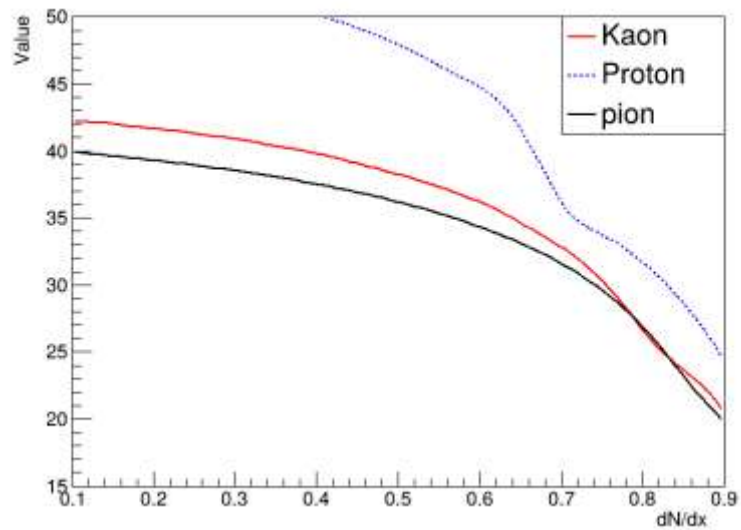


cos $\theta=0.9$

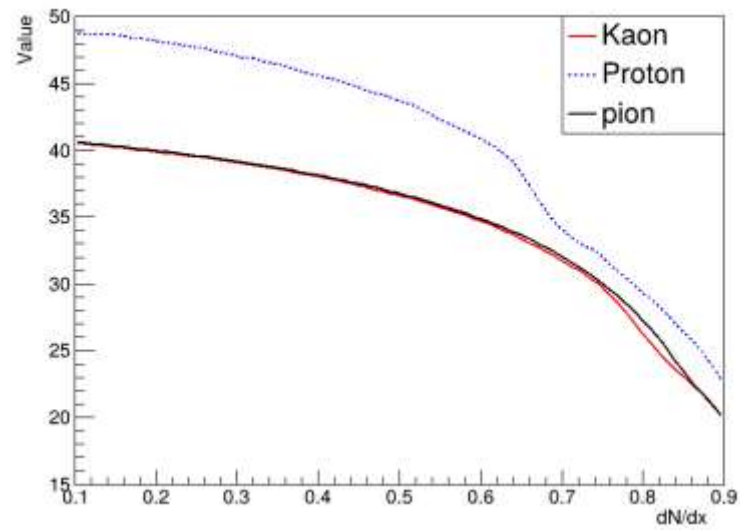


Dndx value VS $\cos \theta$

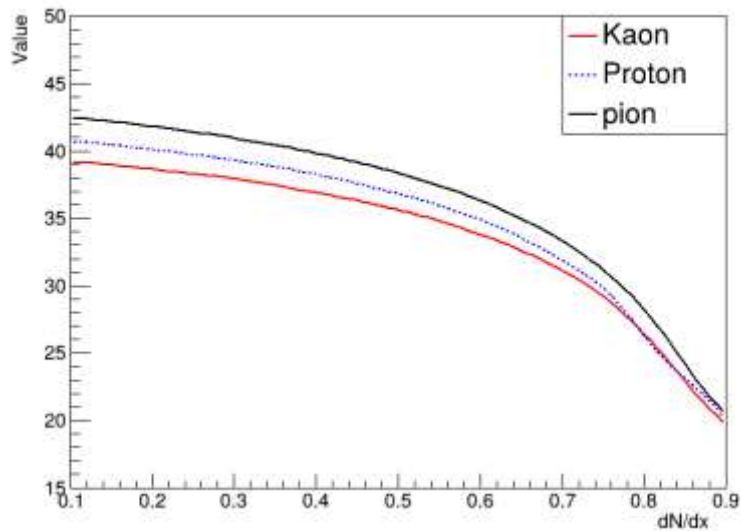
$p=0.85 \text{ GeV/c}$



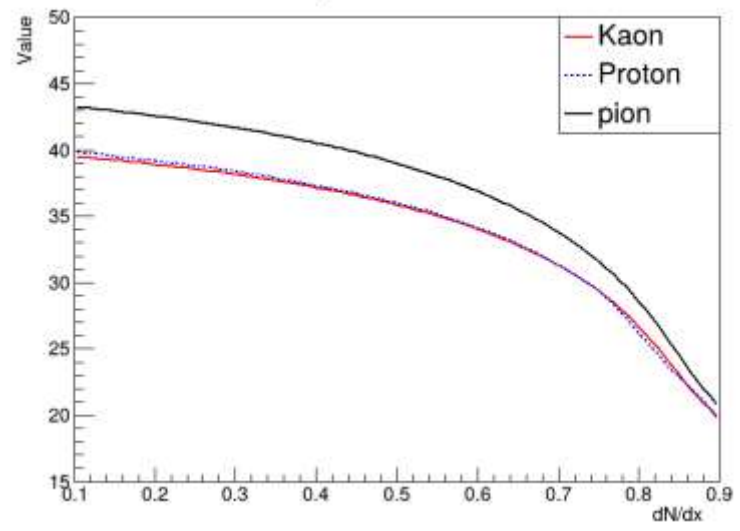
$p=1.1 \text{ GeV/c}$



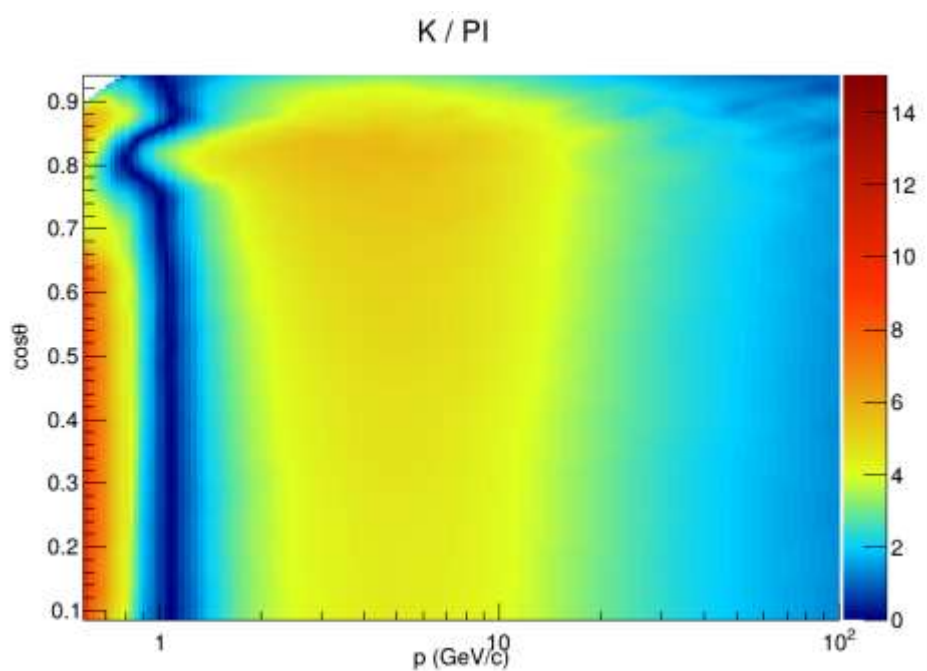
$p=2 \text{ GeV/c}$



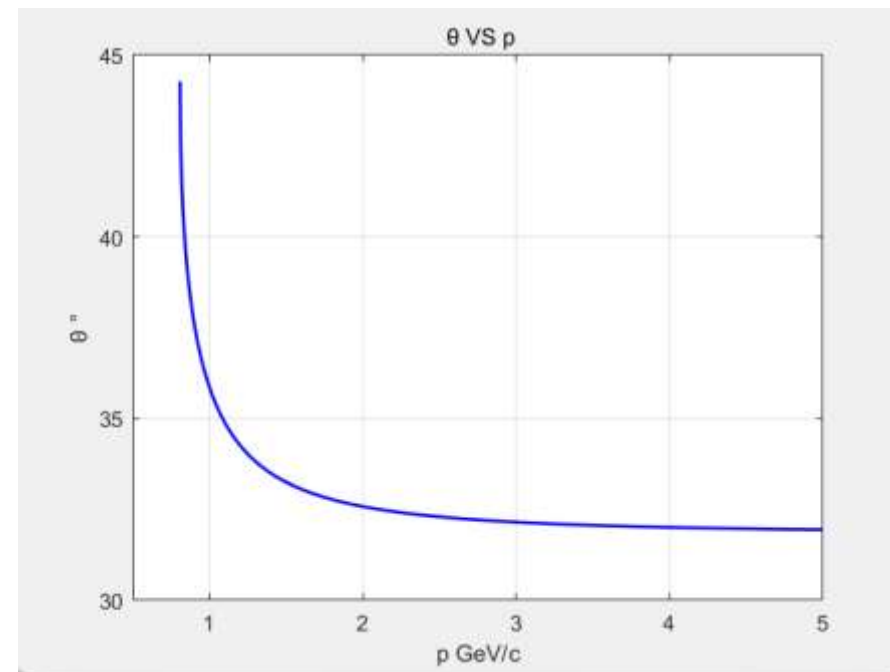
$p=2.5 \text{ GeV/c}$



与jinxian 讨论的：
算法上差异 插值函数
Endcap和 Barrel交点处角度分布在 32.5°
偏移集中发生在 32.5° 的角度，可能是存在统计量问题



无插值函数结果，依旧存在偏移。



粒子击中endcap和 Barrel交点处的角度随径向动量分布图

对 K/PI 的偏移处并未在交点处