Estimating K short and Lambda Reconstruction Performances under Ideal PID or Tracking

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Ideal PID

Current method only utilizes tracks w/o PID.

Assuming ideal PID(each track has correct PID

Particle	K_s^0	Λ
ϵ_R	79.7%	65.1%
ϵ_T	39.8%	25.5%
P	89.7%	87.9%
$\epsilon_R \cdot P$	0.715	0.572
$\epsilon_T \cdot P$	0.357	0.224

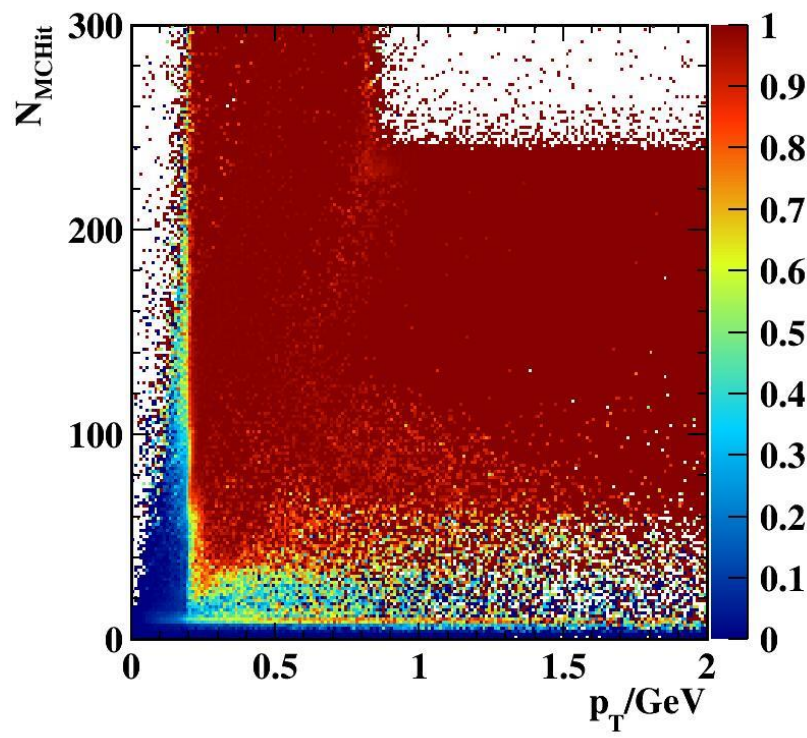| Particle	K_s^0	Λ
ϵ_R	82.8%	88.7%
ϵ_T	41.4%	34.8%
P	93.1%	91.2%
$\epsilon_R \cdot P$	0.771	0.832
$\epsilon_T \cdot P$	0.385	0.326

ε_R = reconstruction efficiency (correct reco/all Ks(Λ) with both tracks reconstructed)
ε_T = total efficiency (correct reco/all Ks(Λ))

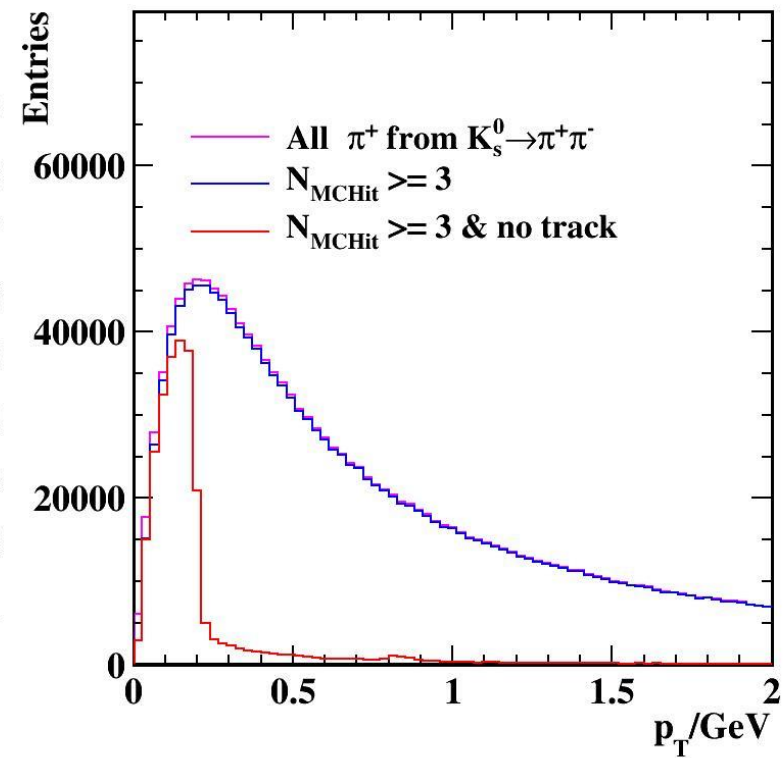# Track reconstruction efficiency(Using pi+ from Ks->pi+pi- to analyze)
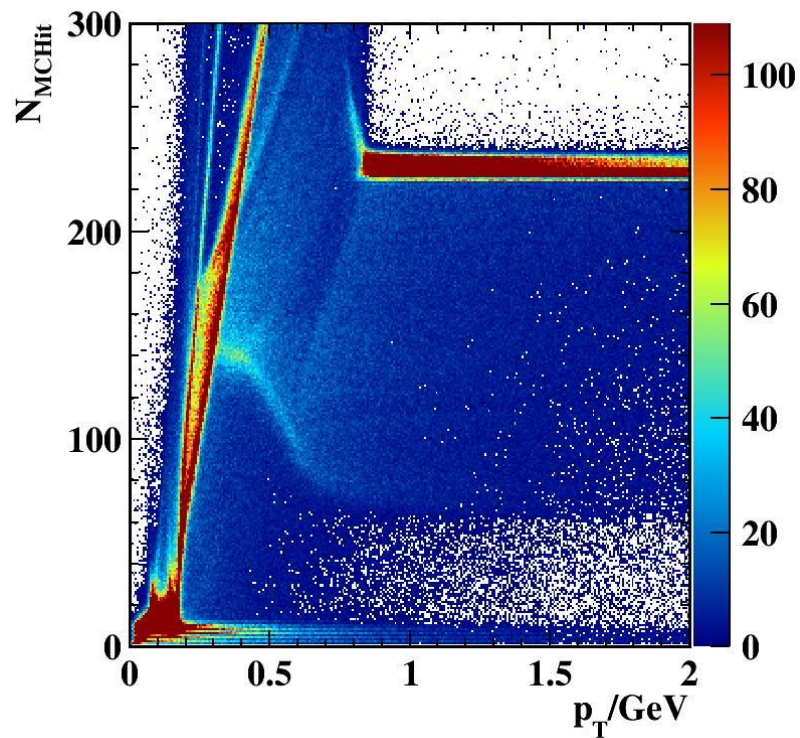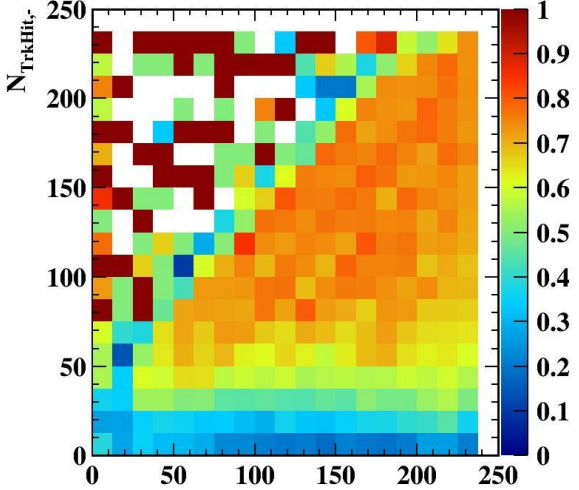

N_{MCHit} vs p_T

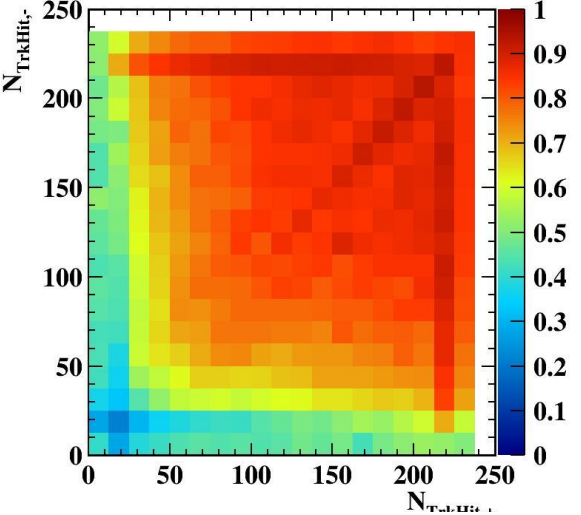Eff distribution over N_{MCHit} vs p_T

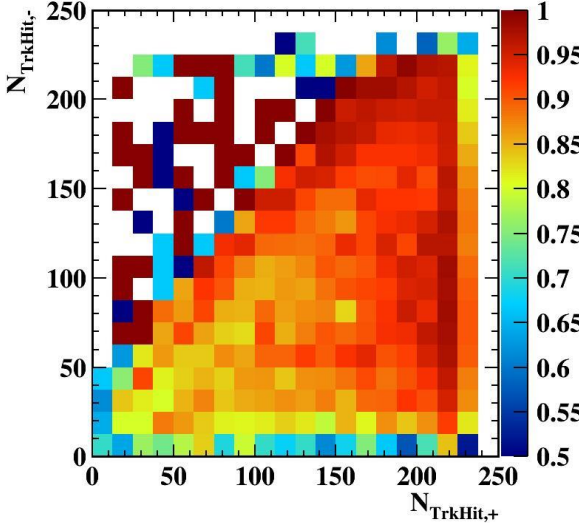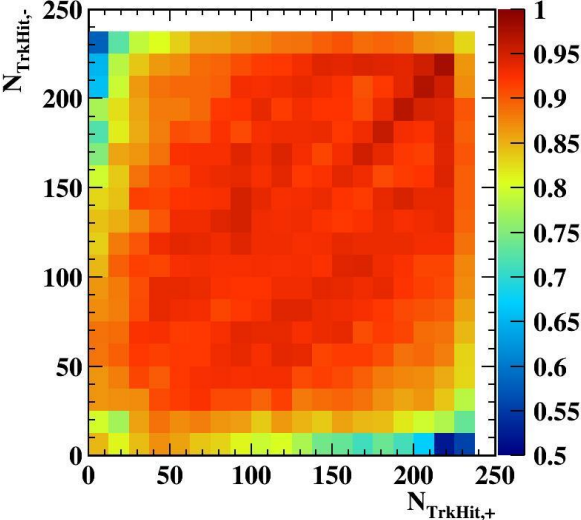p_T distributions

K short/Λ reconstruction efficiency/purity vs N_TrkHit

K short/Λ reconstruction efficiency/purity vs N_{TrkHit}

efficiency

purity

K short

Λ

Estimation of K short/Λ Performance Under Ideal Tracking

Table 5: Estimation of K_s^0 and Λ reconstruction performance assuming ideal ϵ_{Trk} for $p_T > 0.2\text{GeV}$, $p_T > 0.1\text{GeV}$ or all particles.

Particle	K_s^0			Λ		
p_T threshold/GeV	0.2	0.1	—	0.2	0.1	—
ϵ_T	41%	46%	48%	32%	37%	39%
P	89%	89%	88%	87%	87%	86%
$\epsilon_T \cdot P$	0.37	0.41	0.42	0.28	0.32	0.34