

0.1 K^\pm Track Selection

Charged kaons are identified using the AliFemtoESDTrackCutNSigmaFilter class. The specific cuts used in this analysis are as follows:

Track Selection:

- Kinematic range:
 - $0.14 < p_T < 1.5 \text{ GeV}/c$
 - $|\eta| < 0.8$
- FilterBit(7)
 - TPC tracks
- Track Quality
 - Minimum number of clusters in the TPC (fminTPCncls) = 80
 - Maximum allowed χ^2/N_{DOF} for ITS clusters = 3.0
 - Maximum allowed χ^2/N_{DOF} for TPC clusters = 4.0
- Primary Particle Selection:
 - Maximum XY impact parameter = 2.4 cm
 - Maximum Z impact parameter = 3.0 cm
- Remove particles with any kink labels (fRemoveKinks = true)
- Maximum allowed sigma to primary vertex (fMaxSigmaToVertex) = 3.0

K^\pm Identification:

- PID Probabilities:
 - K: > 0.2
 - π : < 0.1
 - μ : < 0.8
 - p: < 0.1
- Most probable particle type must be Kaon (fMostProbable=3)
- TPC and TOF N_σ cuts:
 - $p < 0.4 \text{ GeV}/c$: $N_{\sigma K, TPC} < 2$
 - $0.4 < p < 0.45 \text{ GeV}/c$: $N_{\sigma K, TPC} < 1$
 - $0.45 < p < 0.8 \text{ GeV}/c$: $N_{\sigma K, TPC} < 3$ & $N_{\sigma K, TOF} < 2$
 - $0.8 < p < 1.0 \text{ GeV}/c$: $N_{\sigma K, TPC} < 3$ & $N_{\sigma K, TOF} < 1.5$
 - $p > 1.0 \text{ GeV}/c$: $N_{\sigma K, TPC} < 3$ & $N_{\sigma K, TOF} < 1$
- Electron Rejection: Reject if $N_{\sigma e^-, TPC} < 3$
- Pion Rejection: Reject if:
 - $p < 0.65 \text{ GeV}/c$

- * if TOF and TPC available: $N_{\sigma\pi, \text{TPC}} < 3$ & $N_{\sigma\pi, \text{TOF}} < 3$
- * else
 - $p < 0.5$ GeV/c: $N_{\sigma\pi, \text{TPC}} < 3$
 - $0.5 < p < 0.65$ GeV/c: $N_{\sigma\pi, \text{TPC}} < 2$
- $0.65 < p < 1.5$ GeV/c: $N_{\sigma\pi, \text{TPC}} < 5$ & $N_{\sigma\pi, \text{TOF}} < 3$
- $p > 1.5$ GeV/c: $N_{\sigma\pi, \text{TPC}} < 5$ & $N_{\sigma\pi, \text{TOF}} < 2$

K^\pm selection		
$ \eta $		< 0.8
p_T		$0.14 < p_T < 1.5$ GeV/c
FilterBit		7
Min. number of clusters in the TPC		80
Max. allowed χ^2/N_{DOF} for ITS clusters		3.0
Max. allowed χ^2/N_{DOF} for TPC clusters		4.0
Maximum XY impact parameter		2.4 cm
Maximum Z impact parameter		3.0 cm
Remove particles with any kink labels		true
Maximum allowed sigma to primary vertex		3.0
PID Probabilities		
K		> 0.2
π		< 0.1
μ		< 0.8
p		< 0.1
Most probable particle type		Kaon (fMostProbable=3)
TPC and TOF $N\sigma$ Cuts		
$p < 0.4$ GeV/c		$N_{\sigma K, \text{TPC}} < 2$
$0.4 < p < 0.45$ GeV/c		$N_{\sigma K, \text{TPC}} < 1$
$0.45 < p < 0.80$ GeV/c		$N_{\sigma K, \text{TPC}} < 3$ & $N_{\sigma K, \text{TOF}} < 2$
$0.80 < p < 1.0$ GeV/c		$N_{\sigma K, \text{TPC}} < 3$ & $N_{\sigma K, \text{TOF}} < 1.5$
$p > 1.0$ GeV/c		$N_{\sigma K, \text{TPC}} < 3$ & $N_{\sigma K, \text{TOF}} < 1$
Electron Rejection		Reject if $N_{\sigma e^-, \text{TPC}} < 3$
Pion Rejection: Reject if:		
$p < 0.65$ GeV/c	if TOF and TPC available	$N_{\sigma\pi, \text{TPC}} < 3$ & $N_{\sigma\pi, \text{TOF}} < 3$
	else	$p < 0.5$ GeV/c $N_{\sigma\pi, \text{TPC}} < 3$
		$0.5 < p < 0.65$ GeV/c $N_{\sigma\pi, \text{TPC}} < 2$
$0.65 < p < 1.5$ GeV/c		$N_{\sigma\pi, \text{TPC}} < 5$ & $N_{\sigma\pi, \text{TOF}} < 3$
$p > 1.5$ GeV/c		$N_{\sigma\pi, \text{TPC}} < 5$ & $N_{\sigma\pi, \text{TOF}} < 2$

Table 1: K^\pm selection

The purity of the K^\pm collections was estimated using the HIJING MC data, for which the true identity of each reconstructed K^\pm particle is known. Therefore, the purity may be estimated as:

$$\text{Purity}(K^\pm) = \frac{N_{\text{true}}}{N_{\text{reconstructed}}} \quad (1)$$

$$\text{Purity}(K^+) \approx \text{Purity}(K^-) \approx 97\%$$