1 $K^{\pm}$ Track Selection

Charged kaons are identified using the AliFemtoESDTrackCutNSigmaFilter class. The single-particle selection criteria used to select charged kaon candidates are summarized in Tables 1 and 2. $K^{\pm}$ track detection utilized both TPC and TOF detectors, and tracks within the range $0.14 < p_{\mathrm{T}} < 1.5$ GeV/c were accepted. As we are interested in primary particles originating from the primary vertex, to reduce the number of secondaries (for instance, charged particles produced in the detector material, particles from weak decays, etc.) in our sample, we established a maximum cut on the distance-of-closest-approach (DCA) of the track the the primary vertex. This restriction is realized by imposing a DCA cut in both the transverse and beam directions.

PID was performed using both the TPC and TOF detectors via the Nσ method. Additionally, we include methods to reduce the contamination in our $K^{\pm}$ samples from electrons and pions. The specifics for these cuts are contained in Table 1.

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:

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

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

$K^{\pm}$ **selection**	
Kinematic range	
$\lvert\eta\rvert$	< 0.8
p_{T}	$0.14 < p_{\mathrm{T}} < 1.5$ GeV/c
Track quality and selection	
FilterBit	7
Number of clusters in the TPC	> 80
χ^2/N_{DOF} for (ITS, TPC) clusters	$<$ (3.0, 4.0)
DCA to primary vertex (XY, Z)	$<$ (2.4, 3.0) cm
Remove particles with any kink labels	true
Nσ to primary vertex	< 3.0
$K^{\pm}$ identification	
PID Probabilities	
K	> 0.2
(π, μ, p)	$<$ (0.1, 0.8, 0.1)
Most probable particle type (fMostProbable =)	Kaon (3)
TPC and TOF Nσ Cuts	
$p < 0.4$ GeV/c	$\mathrm{N}_{\sigma\mathrm{K,TPC}} < 2$
$0.4 < p < 0.45$ GeV/c	$\mathrm{N}_{\sigma\mathrm{K,TPC}} < 1$
$0.45 < p < 0.80$ GeV/c	$\mathrm{N}_{\sigma\mathrm{K,TPC}} < 3$ $\mathrm{N}_{\sigma\mathrm{K,TOF}} < 2$
$0.80 < p < 1.0$ GeV/c	$\mathrm{N}_{\sigma\mathrm{K,TPC}} < 3$ $\mathrm{N}_{\sigma\mathrm{K,TOF}} < 1.5$
$p > 1.0$ GeV/c	$\mathrm{N}_{\sigma\mathrm{K,TPC}} < 3$ $\mathrm{N}_{\sigma\mathrm{K,TOF}} < 1$

Table 1: $K^{\pm}$ selection

$K^{\pm}$ selection - Misidentification Cuts

Electron Rejection: Reject if			$N_{\sigma e^-,\mathrm{TPC}} < 3$
Pion Rejection: Reject if:			
$p < 0.65$ GeV/c	TOF and TPC available		$N_{\sigma\pi,\mathrm{TPC}} < 3$ $N_{\sigma\pi,\mathrm{TOF}} < 3$
	Only TPC available	$p < 0.5$ GeV/c	$N_{\sigma\pi,\mathrm{TPC}} < 3$
		$0.5 < p < 0.65$ GeV/c	$N_{\sigma\pi,\mathrm{TPC}} < 2$
$0.65 < p < 1.5$ GeV/c			$N_{\sigma\pi,\mathrm{TPC}} < 5$ $N_{\sigma\pi,\mathrm{TOF}} < 3$
$p > 1.5$ GeV/c			$N_{\sigma\pi,\mathrm{TPC}} < 5$ $N_{\sigma\pi,\mathrm{TOF}} < 2$

Table 2: $K^{\pm}$ selection - misidentification cuts