### 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:
  - $0.14 < p_T < 1.5$
  - $|\eta| < 0.8$
- FilterBit8
  - TPC tracks
- Track Quality
  - Minimum number of clusters in the TPC (fminTPCncls) = 80
  - Maximum allowed $\chi^2/N_{DOF}$ for ITS clusters = 3.0
  - Maximum allowed $\chi^2/N_{DOF}$ for TPC clusters = 4.0
- Primary Particle Selection:
  - Maximum XY impact parameter = 2.4
  - Maximum Z impact parameter = 3.0
- Remove particles with any kink labels (fRemoveKinks = true)
- Maximum allowed sigma to primary vertex (fMaxSigmaToVertex) = 3.0

$K^{\pm}$ Identification:

- PID Probabilities:
  - K: $> 0.2$
  - $\pi$: $< 0.1$
  - $\mu$: $< 0.8$
  - p: $< 0.1$
- Most probable particle type must be Kaon (fMostProbable=3)
- TPC and TOF $N_\sigma$ cuts:
  - $p < 0.4$ GeV/c: $N_{\sigma K,TPC} < 2$
  - $0.4 < p < 0.45$ GeV/c: $N_{\sigma K,TPC} < 1$
  - $0.45 < p < 0.8$ GeV/c: $N_{\sigma K,TPC} < 3$ & $N_{\sigma K,TOF} < 2$
  - $0.8 < p < 1.0$ GeV/c: $N_{\sigma K,TPC} < 3$ & $N_{\sigma K,TOF} < 1.5$
  - $p > 1.0$ 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:
  - $p < 0.65$

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

The purity of the $K^{\pm}$ collections was estimated using the 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($K^{-}$) $\approx 97\%$