

0.0.1 K_S^0 Reconstruction

The following cuts were used to select good K_S^0 candidates:

1. Pion Daughter Cuts

- (a) $|\eta| < 0.8$
- (b) SetTPCncIsDaughters(80)
- (c) SetStatusDaughters(AliESDtrack::kTPCrefic)
- (d) SetMaxDcaV0Daughters(0.3)
- (e) $p_T > 0.15$
- (f) DCA to prim vertex > 0.3

2. K_S^0 Cuts

- (a) $|\eta| < 0.8$
- (b) $p_T > 0.2$
- (c) $m_{PDG} - 13.677 \text{ MeV} < m_{inv} < m_{PDG} + 2.0323 \text{ MeV}$
- (d) Cosine of pointing angle > 0.9993
- (e) OnFlyStatus = false
- (f) Decay Length $< 30 \text{ cm}$

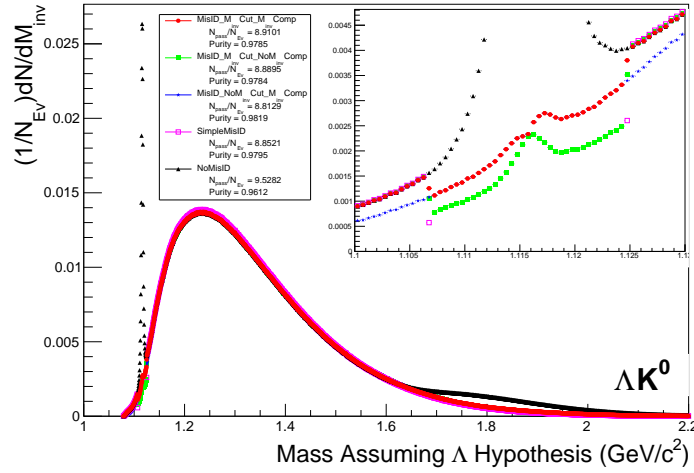


Fig. 1: Mass assuming Λ -hypothesis for V0 candidates passing all K_S^0 cuts, i.e. assume the daughters are $p^+\pi^-$ instead of $\pi^+\pi^-$. The peak around $m_{inv} = 1.115 \text{ GeV/c}^2$ likely contains misidentified Λ particles in our K_S^0 collection. If one simply cuts out the entire peak, some good K_S^0 particles will be lost. Ideally, the K_S^0 selection and $\Lambda(\bar{\Lambda})$ misidentification cuts can be selected such that the peak is removed from this plot while leaving the distribution continuous.

As can be seen in Figures 1 and 2, some misidentified Λ and $\bar{\Lambda}$ particles contaminate our K_S^0 sample. To attempt to remove these contaminations without throwing away good K_S^0 particles, the following misidentification cuts are imposed; a K_S^0 candidate is rejected if all of the following criteria are satisfied:

- $|m_{inv, \Lambda(\bar{\Lambda}) \text{ Hypothesis}} - m_{PDG, \Lambda(\bar{\Lambda})}| < 9.0 \text{ MeV/c}^2$
- Positive daughter passes $p^+(\pi^+)$ daughter cut implemented for $\Lambda(\bar{\Lambda})$ reconstruction
- Negative daughter passes $\pi^-(\bar{p}^-)$ daughter cut implemented by $\Lambda(\bar{\Lambda})$ reconstruction

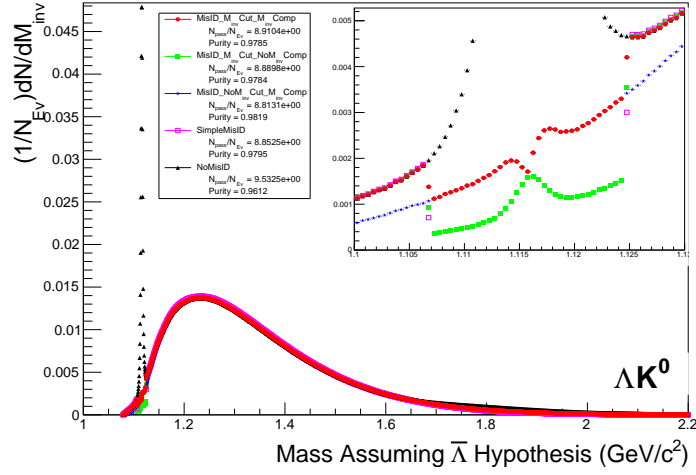


Fig. 2: Mass assuming $\bar{\Lambda}$ -hypothesis for V0 candidates passing all K_S^0 cuts, i.e. assume the daughters are $\pi^+\bar{p}^-$ instead of $\pi^+\pi^-$. Similar to Figure 1

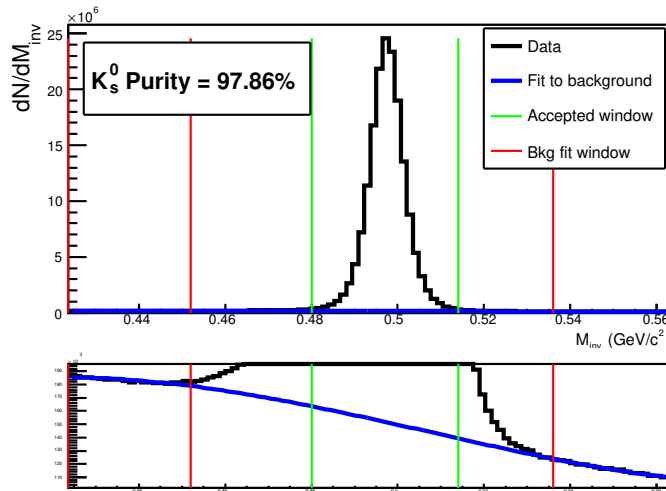


Fig. 3: K_S^0 Purity