0.0.1 Λ *Reconstruction*

The following cuts, in addition to the misidentification and shared daughter cuts presented in Sec. **??**, were used to select good Λ(Λ̄) candidates:

Λ reconstruction	
$|\eta|$	< 0.8
p_T	> 0.4 GeV/c
$|m_\text{inv} - m_\text{PDG}|$	< 3.8 MeV
DCA to prim. vertex	< 0.5 cm
Cosine of pointing angle	> 0.9993
OnFlyStatus	false
Decay Length	< 60 cm
Shared Daughter Cut	true
Misidentification Cut	true
Daughter Cuts (π and p)	
$|\eta|$	< 0.8
Number of clusters in the TPC	> 80
Daughter status	kTPCrefit
DCA πp Daughters	< 0.4 cm
π-specific cuts	
p_T	> 0.16 GeV/c
DCA to prim vertex	> 0.3 cm
TPC and TOF Nσ Cuts	
$p < 0.5$ GeV/c		N$\sigma_\text{TPC} < 3$
$p > 0.5$ GeV/c	if TOF & TPC available	N$\sigma_\text{TPC} < 3$ & N$\sigma_\text{TOF} < 3$
	else	N$\sigma_\text{TOF} < 3$
p-specific cuts	
p_T	$> 0.5(p)$ [$0.3(\bar{p})$] GeV/c
DCA to prim vertex	> 0.1 cm
TPC and TOF Nσ Cuts	
$p < 0.8$ GeV/c		N$\sigma_\text{TPC} < 3$
$p > 0.8$ GeV/c	if TOF & TPC available	N$\sigma_\text{TPC} < 3$ & N$\sigma_\text{TOF} < 3$
	else	N$\sigma_\text{TOF} < 3$

Table 1: Λ reconstruction

Figure 1a shows the mass assuming K_S^0 hypothesis for the Λ collection, i.e. assume the daughters are $\pi^+\pi^-$ instead of $p^+\pi^-$. Figure 1b is a similar plot, but is for the Λ̄ collection, i.e. assume the daughters are $\pi^+\pi^-$ instead of $\pi^+\bar{p}^-$. The K_S^0 contamination is visible, although not profound, in both, in the slight peaks around $m_\text{inv} = 0.497$ GeV/c^2. If one simply cuts out the entire peak, good Λ particles will be lost. Ideally, the Λ selection and K_S^0 misidentification cuts are selected such that the peak is removed from this plot while leaving the underlying distribution continuous. To attempt to remove these K_S^0 contaminations without throwing away good Λ and Λ̄ particles, the misidentification cuts introduced in Sec. **??** were imposed.

(a) Mass assuming K_S^0-hypothesis for Λ collection,
i.e. assume the daughters are $\pi^+\pi^-$ instead of $p^+\pi^-$.

(b) Mass assuming K_S^0-hypothesis for $\bar{\Lambda}$ collection,
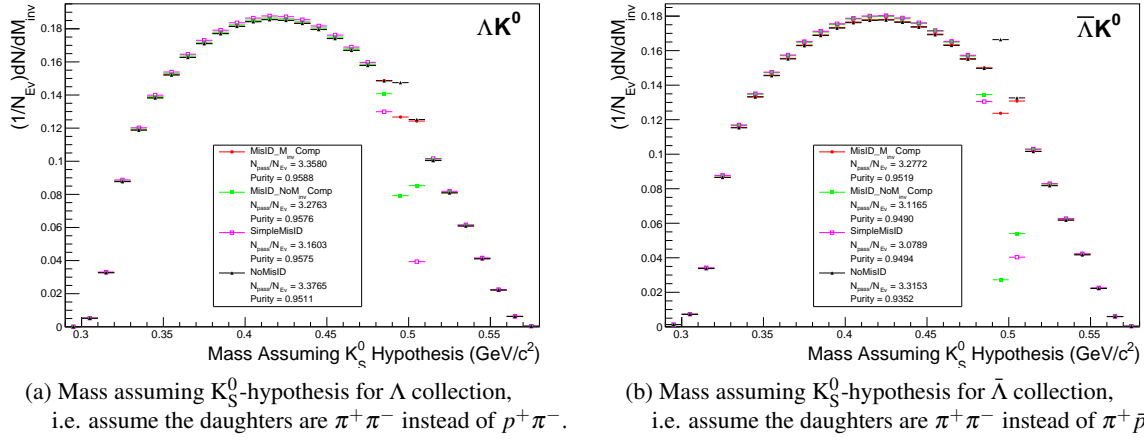i.e. assume the daughters are $\pi^+\pi^-$ instead of $\pi^+\bar{p}^-$.

Fig. 1: Mass assuming K_S^0-hypothesis for V0 candidates passing all Λ (1a) and $\bar{\Lambda}$ (1b) cuts. The "NoMisID" distribution (black triangles) uses the V0 finder without any attempt to remove misidentified K_S^0 The slight peak in the "NoMisID" distribution around $m_{inv} = 0.5$ GeV/c^2 contains misidentified K_S^0 particles in our $\Lambda(\bar{\Lambda})$ collection. "SimpleMisID" (pink squares) simply cuts out the entire peak, which throws away some good Λ and $\bar{\Lambda}$ particles. "MisID_NoM$_{inv}$Comp" (green squares) uses the misidentification cut outlined in the text, but does not utilize the final invariant mass comparison step. "MisID_M$_{inv}$Comp" (red circles) utilizes the full misidentification methods, and is currently used for this analysis. "N$_{pass}$/N$_{ev}$" is the total number of $\Lambda(\bar{\Lambda})$ particles found, normalized by the total number of events. The purity of the collection is also listed.