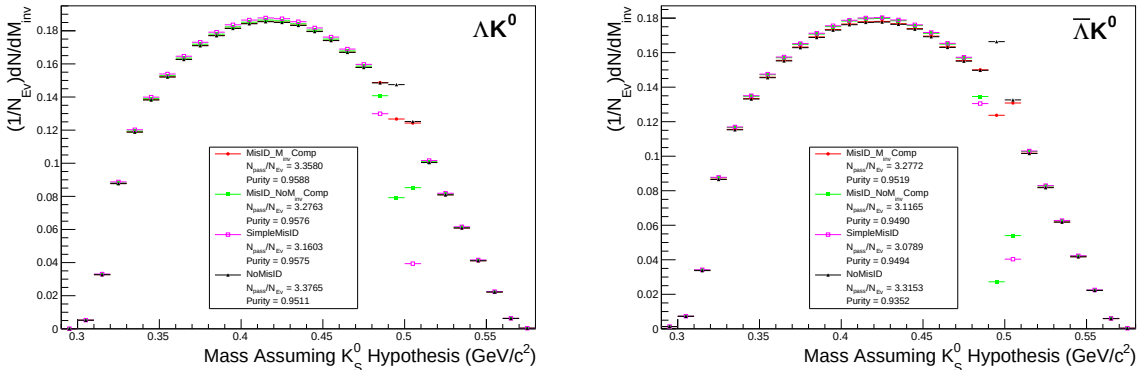
0.0.1 Λ *Reconstruction*

The following cuts, in addition to the misidentification and shared daughter cuts presented in Sec. **??**, were used to select good $\Lambda(\bar{\Lambda})$ candidates:

Λ selection		
$\lvert\eta\rvert$		< 0.8
p_{T}		> 0.4 GeV/c
$\lvert m_{\mathrm{inv}} - m_{\mathrm{PDG}}\rvert$		< 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)		
$\lvert\eta\rvert$		< 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$\sigma_{\mathrm{TPC}} < 3$
$p > 0.5$ GeV/c	if TOF & TPC available	N$\sigma_{\mathrm{TPC}} < 3$ & N$\sigma_{\mathrm{TOF}} < 3$
	else	N$\sigma_{\mathrm{TOF}} < 3$
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$\sigma_{\mathrm{TPC}} < 3$
$p > 0.8$ GeV/c	if TOF & TPC available	N$\sigma_{\mathrm{TPC}} < 3$ & N$\sigma_{\mathrm{TOF}} < 3$
	else	N$\sigma_{\mathrm{TOF}} < 3$

Table 1: Λ selection

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



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

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

Fig. 1: Mass assuming K^0_S-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^0_S The slight peak in the "NoMisID" distribution around $m_{\rm inv} = 0.5$ GeV/c^2 contains misidentified K^0_S 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$_{\rm inv}$Comp" (green squares) uses the misidentification cut outlined in the text, but does not utilize the final invariant mass comparison step. "MisID_M$_{\rm inv}$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.