

Control channel signal and generic MC check results

1.0 M events for control channel Signal

$$B^+ \rightarrow J/\psi K^+$$

$$J/\psi \rightarrow \mu^+ \mu^-$$

$$B^- \rightarrow \text{generic}$$

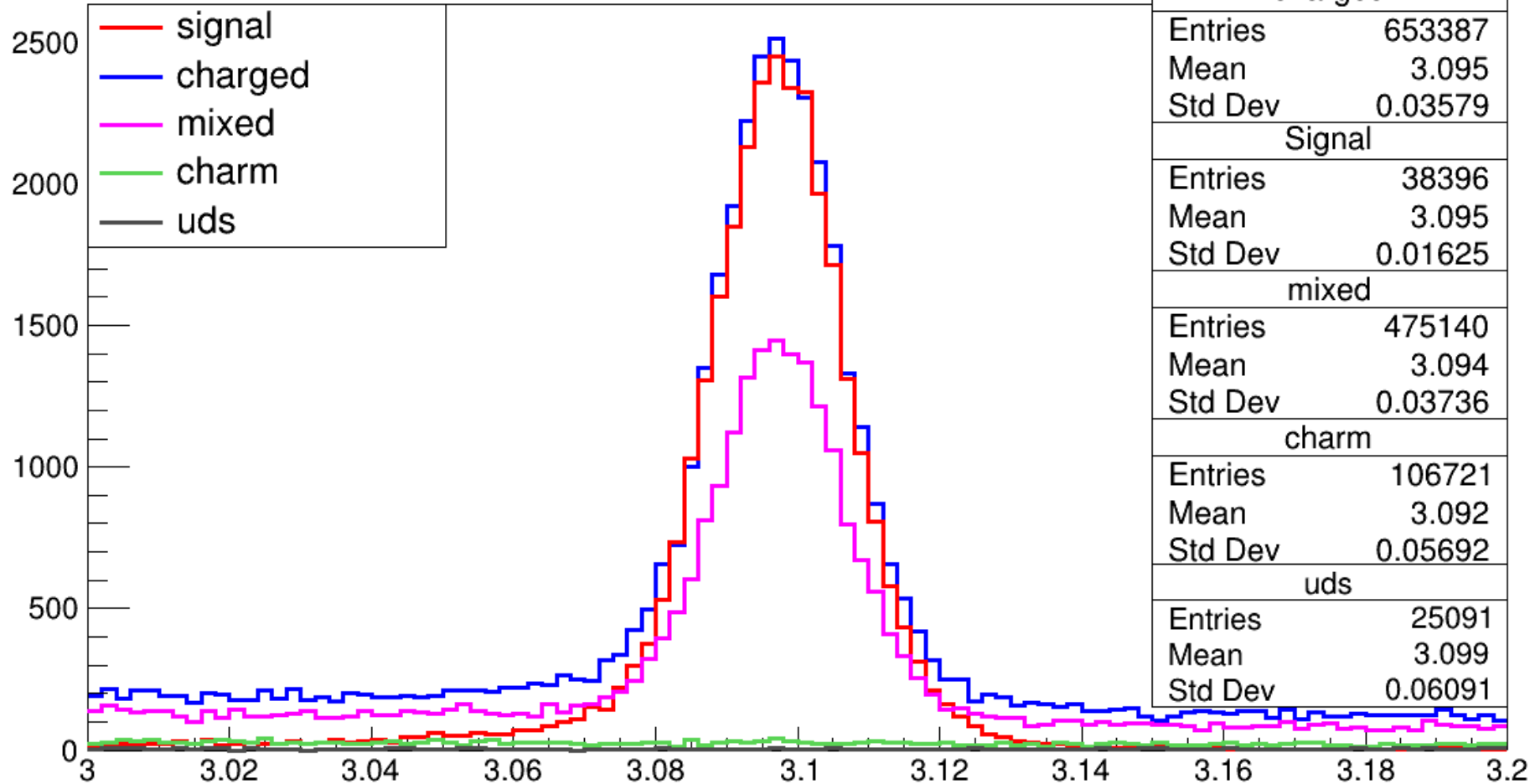
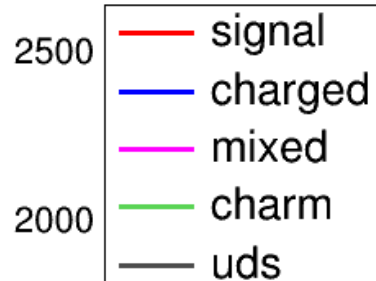
3 Streams of generic MC

06 Dec. 2023

Cuts in the reconstruction program

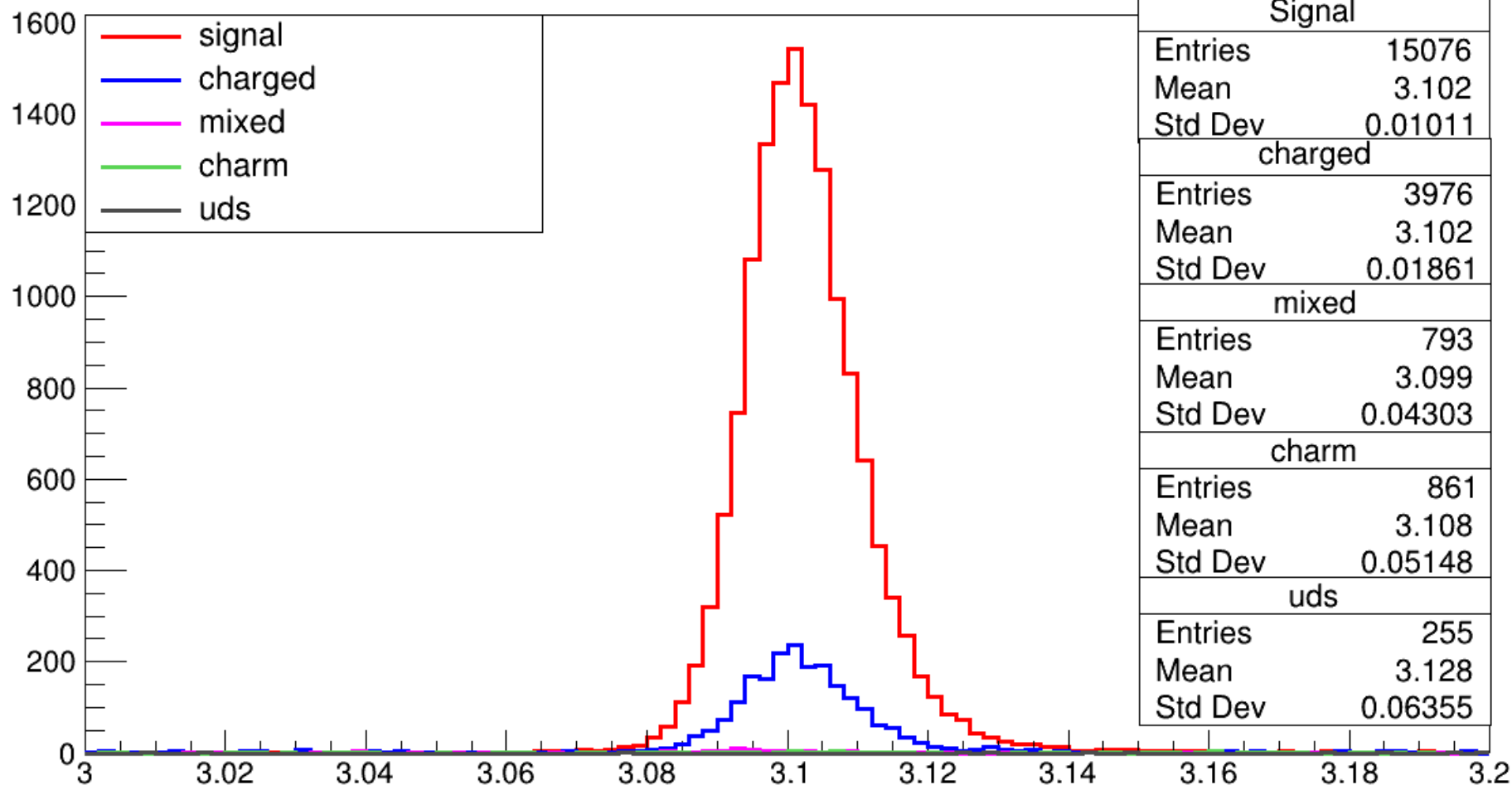
- MVA photon cuts
- $1.6 < m_{\text{hadROE}} < 2.4 \text{ GeV}$

m_Jpsi with only rank1 for control channel and generic MC

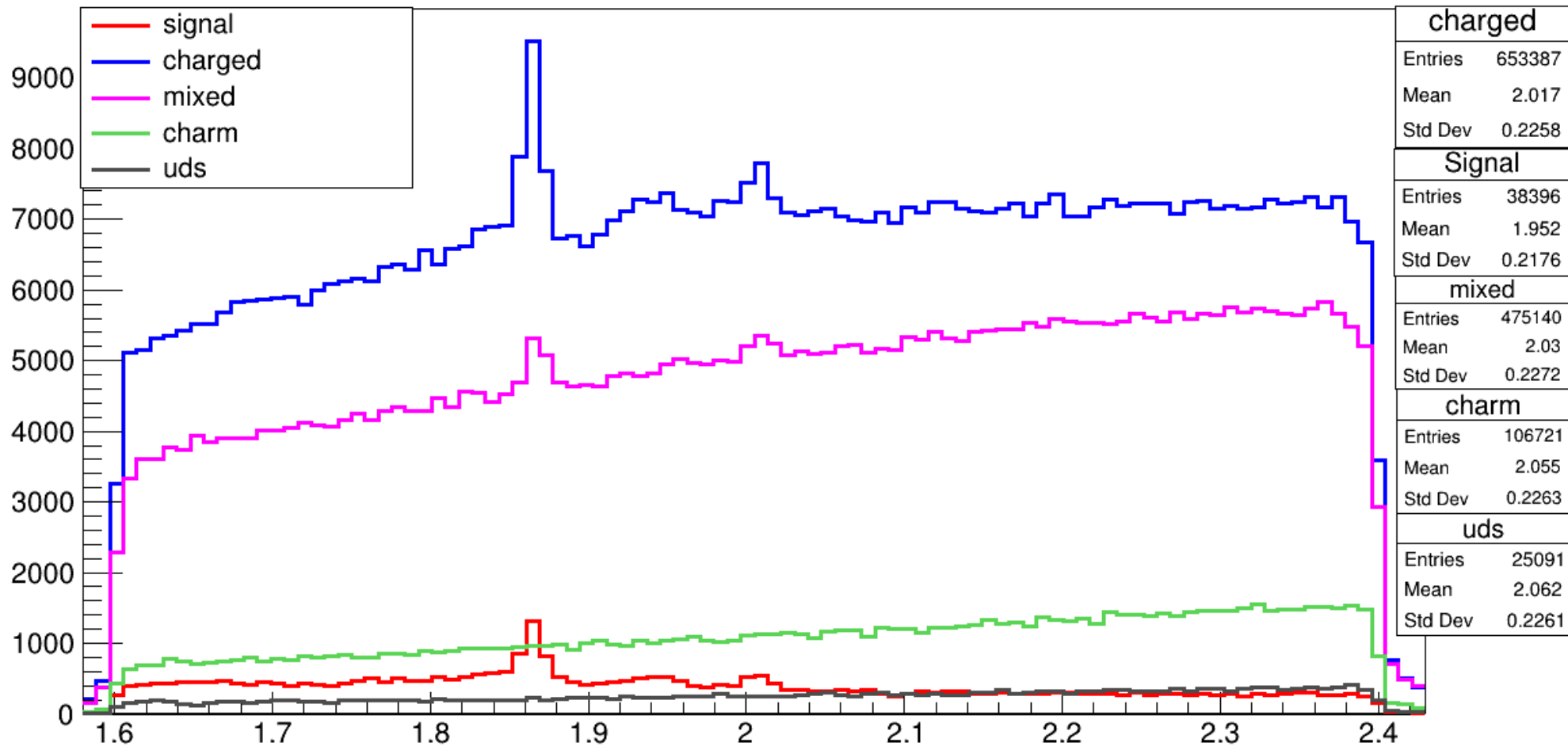


charged	
Entries	653387
Mean	3.095
Std Dev	0.03579
Signal	
Entries	38396
Mean	3.095
Std Dev	0.01625
mixed	
Entries	475140
Mean	3.094
Std Dev	0.03736
charm	
Entries	106721
Mean	3.092
Std Dev	0.05692
uds	
Entries	25091
Mean	3.099
Std Dev	0.06091

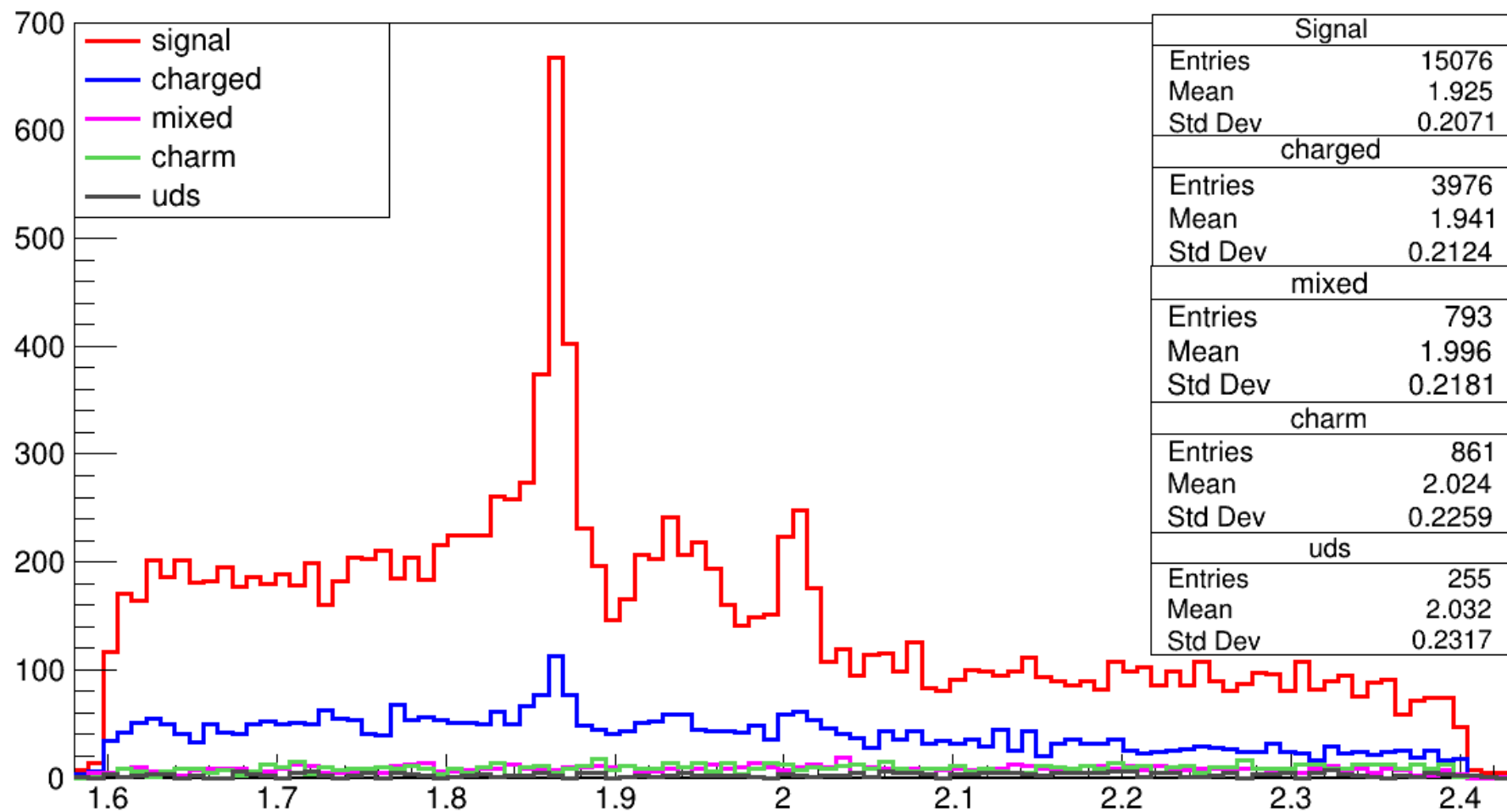
m_Jpsi with $|\sin\phi| < 1$, rank1 for control channel and generic MC



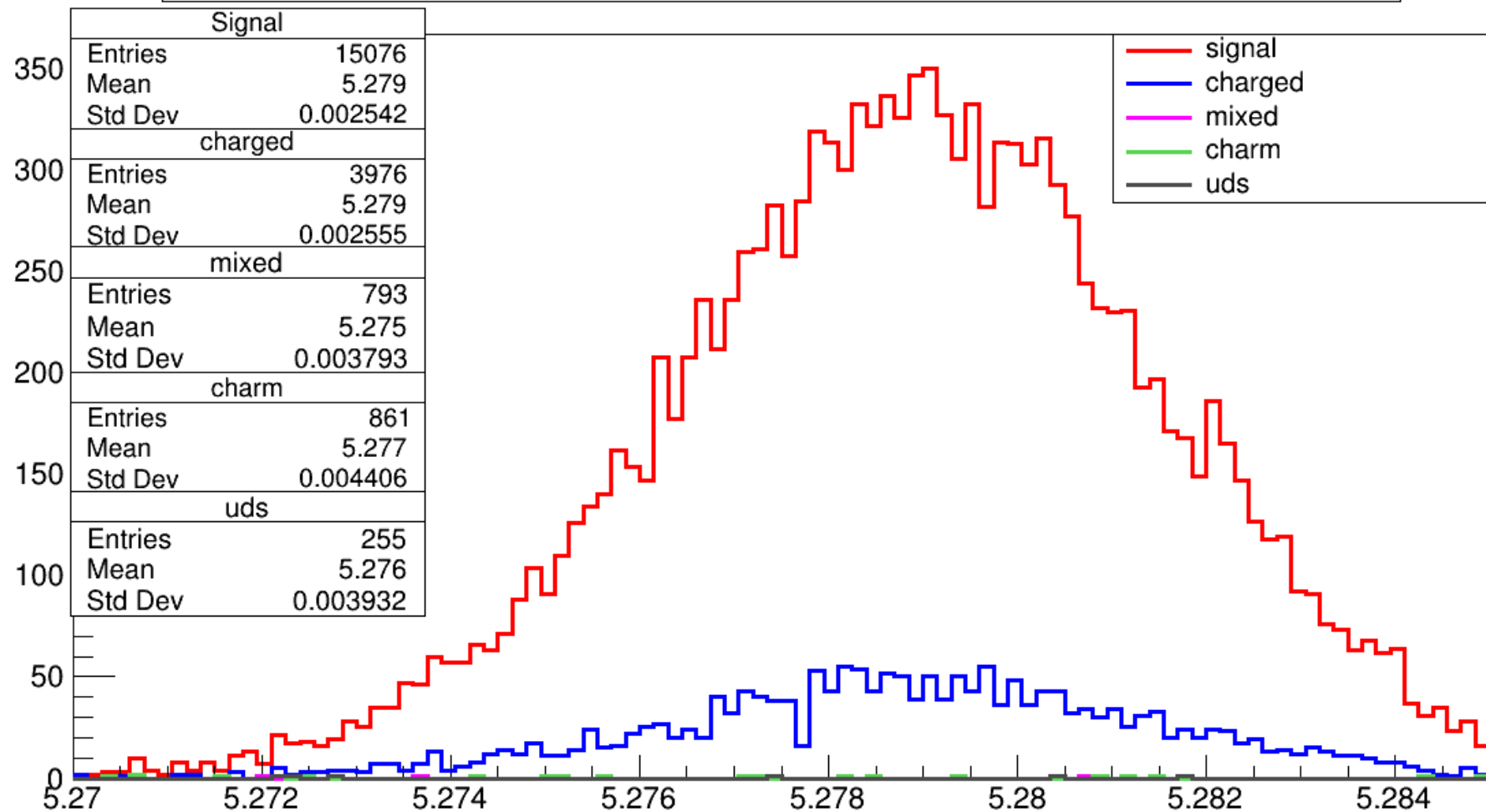
m_hadROE with only rank1 for control channel and generic MC



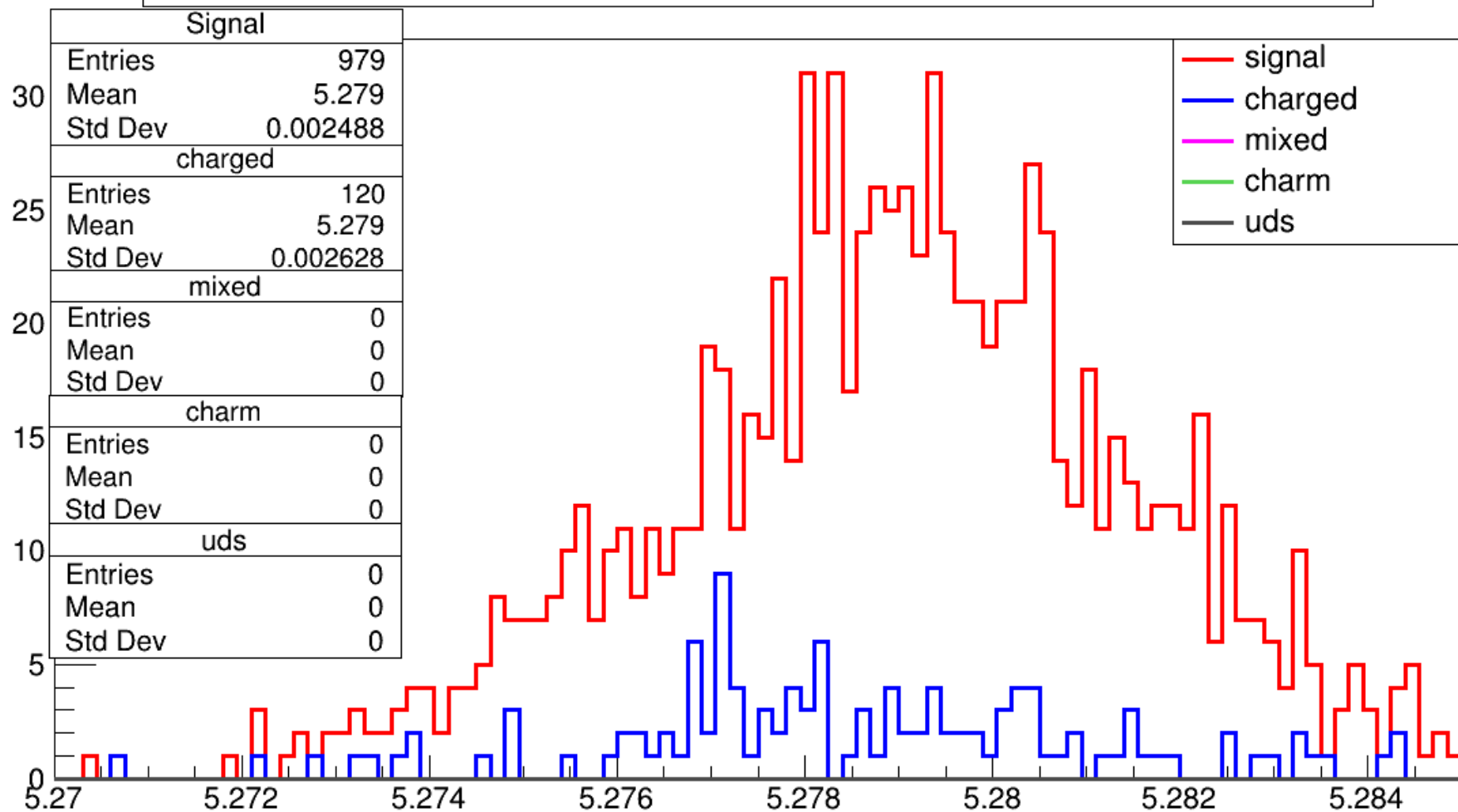
m_hadROE with $|\sin\phi| < 1$, rank1 for control channel and generic MC



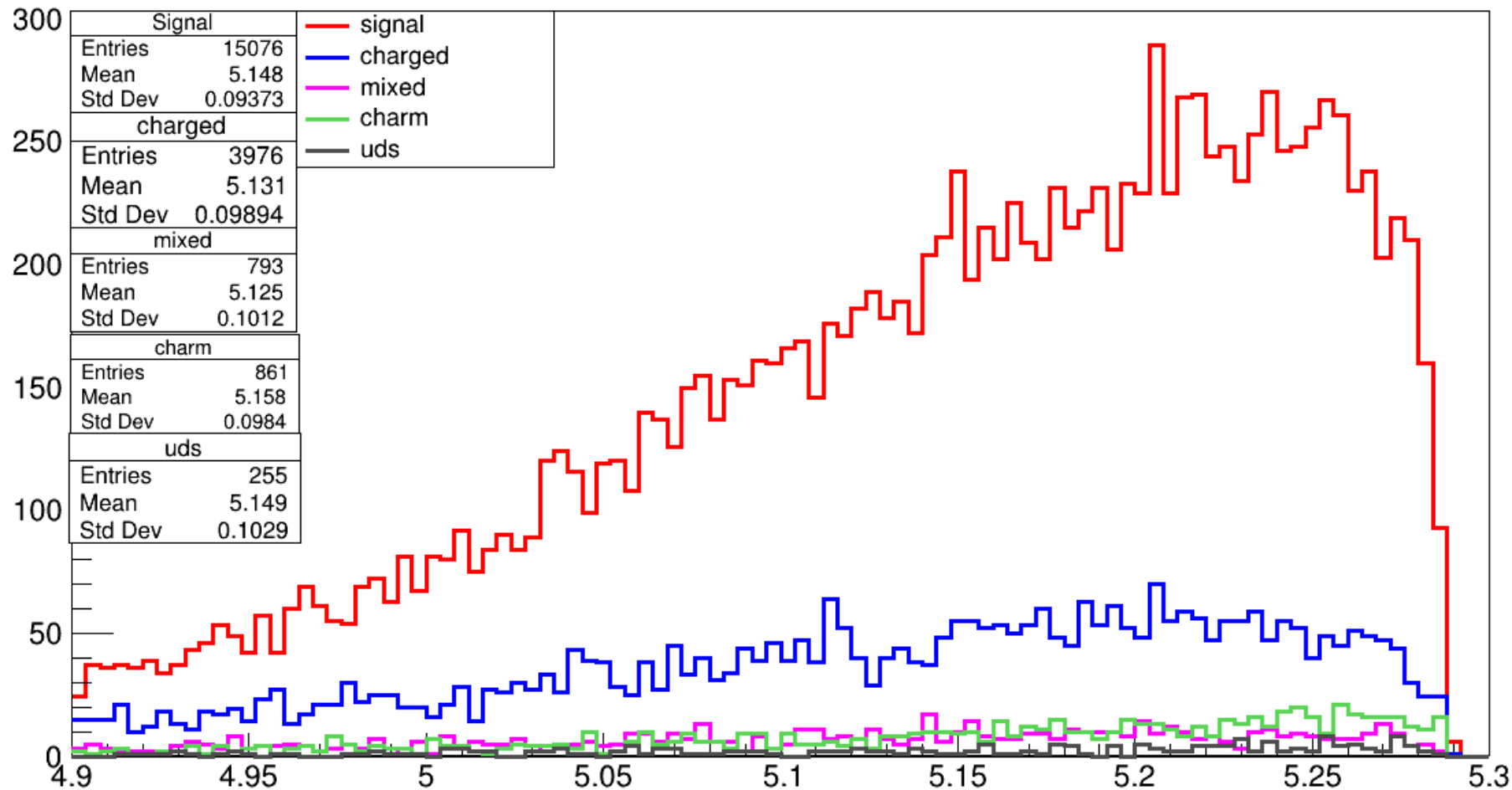
Mbc_Bsig with rank1 and abs(sin_phi)<1 for control channel and generic MC



Mbc_Bsig with rank1,abs(m_hadROE-1.86)<0.015,abs(cos(PBtag,Pvis))<1,abs(m_Jpsi-3.1)<0.02 and abs(sin_phi)<1 for control channel and generic MC

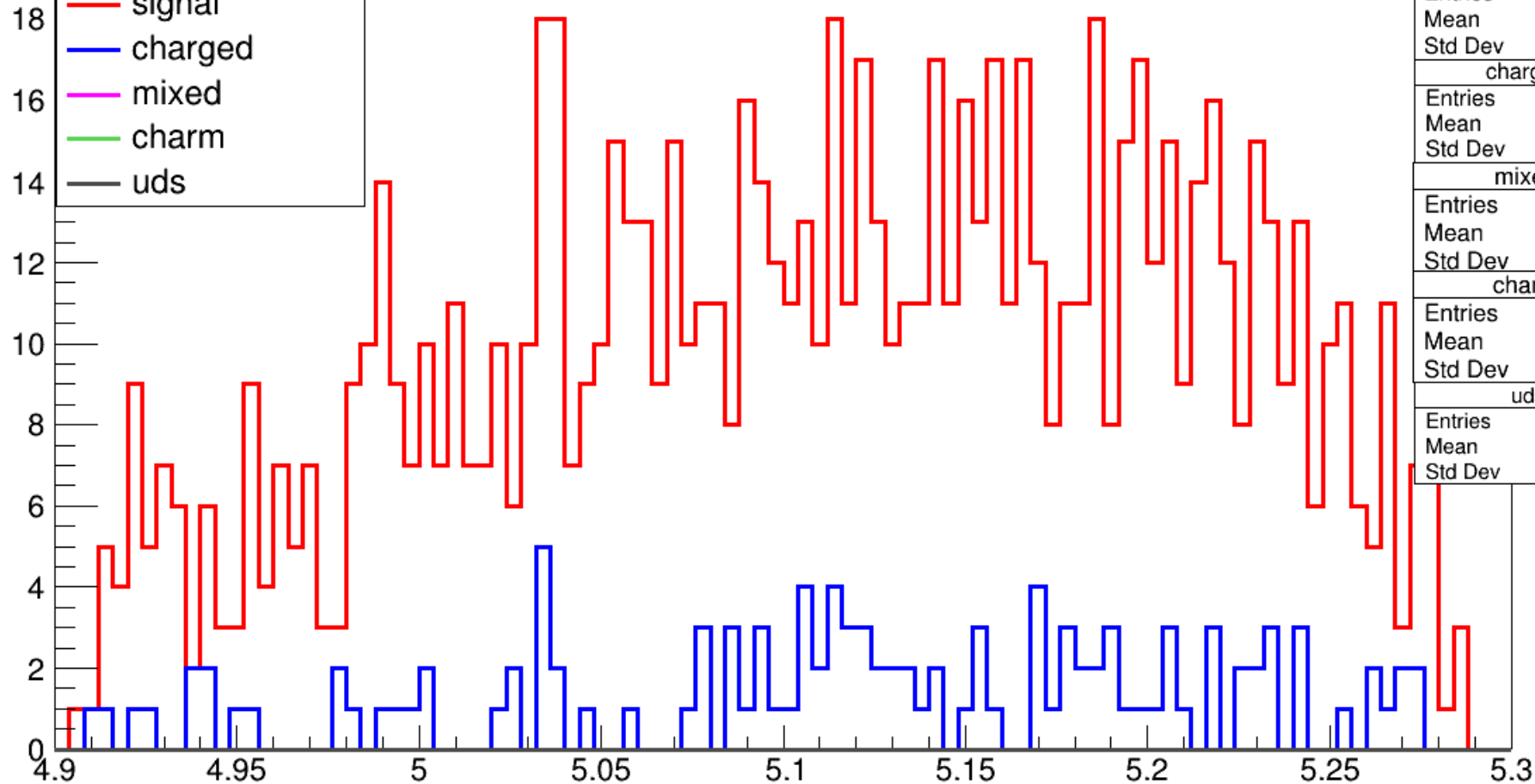


Mbc_Btag with rank1 and abs(sin_phi)<1 for control channel and generic MC



Mbc_Btag with rank1,abs(m_hadROE-1.86)<0.015,abs(cos(PBtag,Pvis))<1,abs(m_Jpsi-3.1)<0.02 and abs(sin_phi)<1 for control channel and generic MC

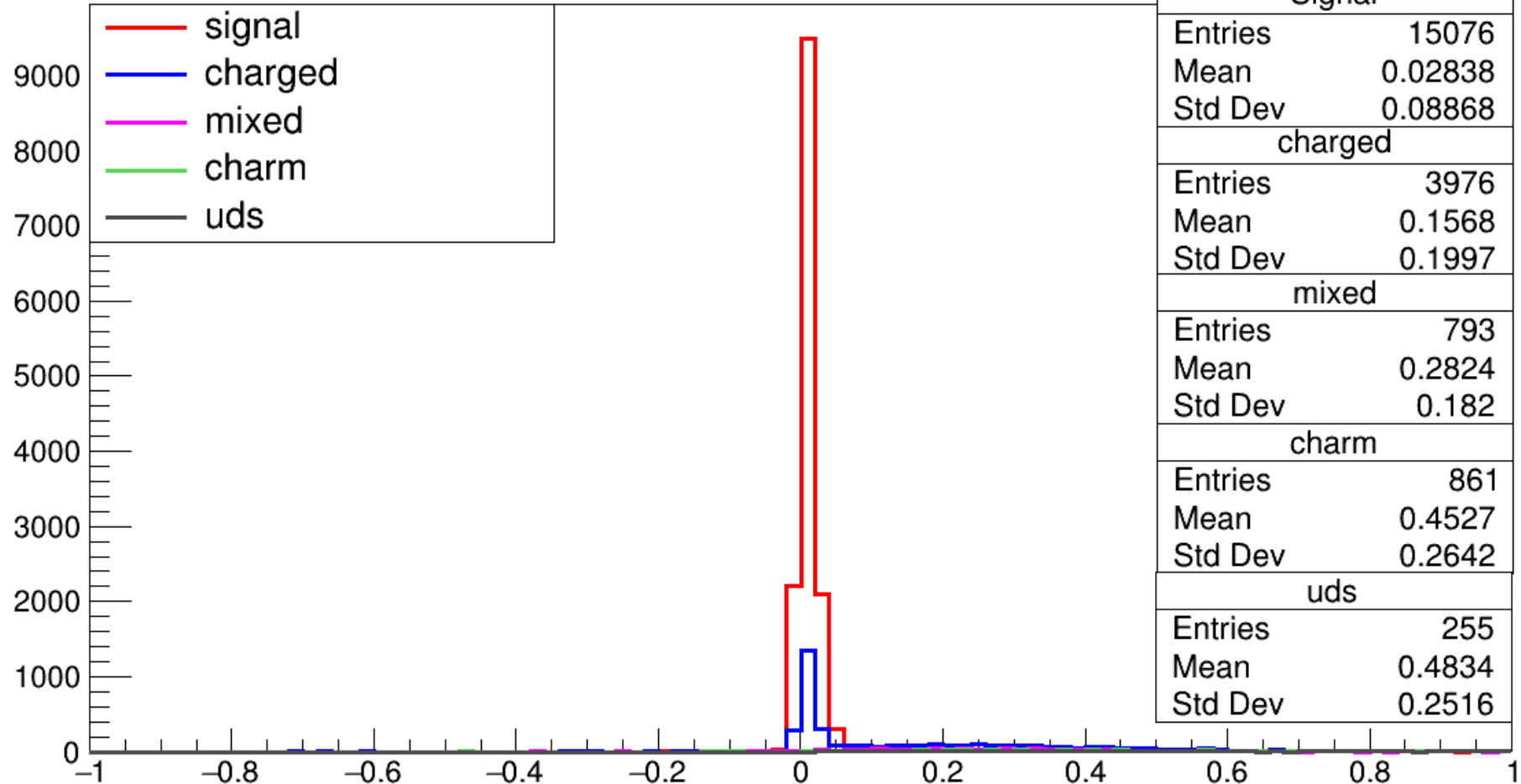
— signal
— charged
— mixed
— charm
— uds



Signal	
Entries	979
Mean	5.113
Std Dev	0.09475
charged	
Entries	120
Mean	5.119
Std Dev	0.09409
mixed	
Entries	0
Mean	0
Std Dev	0
charm	
Entries	0
Mean	0
Std Dev	0
uds	
Entries	0
Mean	0
Std Dev	0

deltaE_Bsig with rank1 and abs(sin_phi)<1 for control channel and generic MC

— signal
— charged
— mixed
— charm
— uds



Signal

Entries	15076
Mean	0.02838
Std Dev	0.08868

charged

Entries	3976
Mean	0.1568
Std Dev	0.1997

mixed

Entries	793
Mean	0.2824
Std Dev	0.182

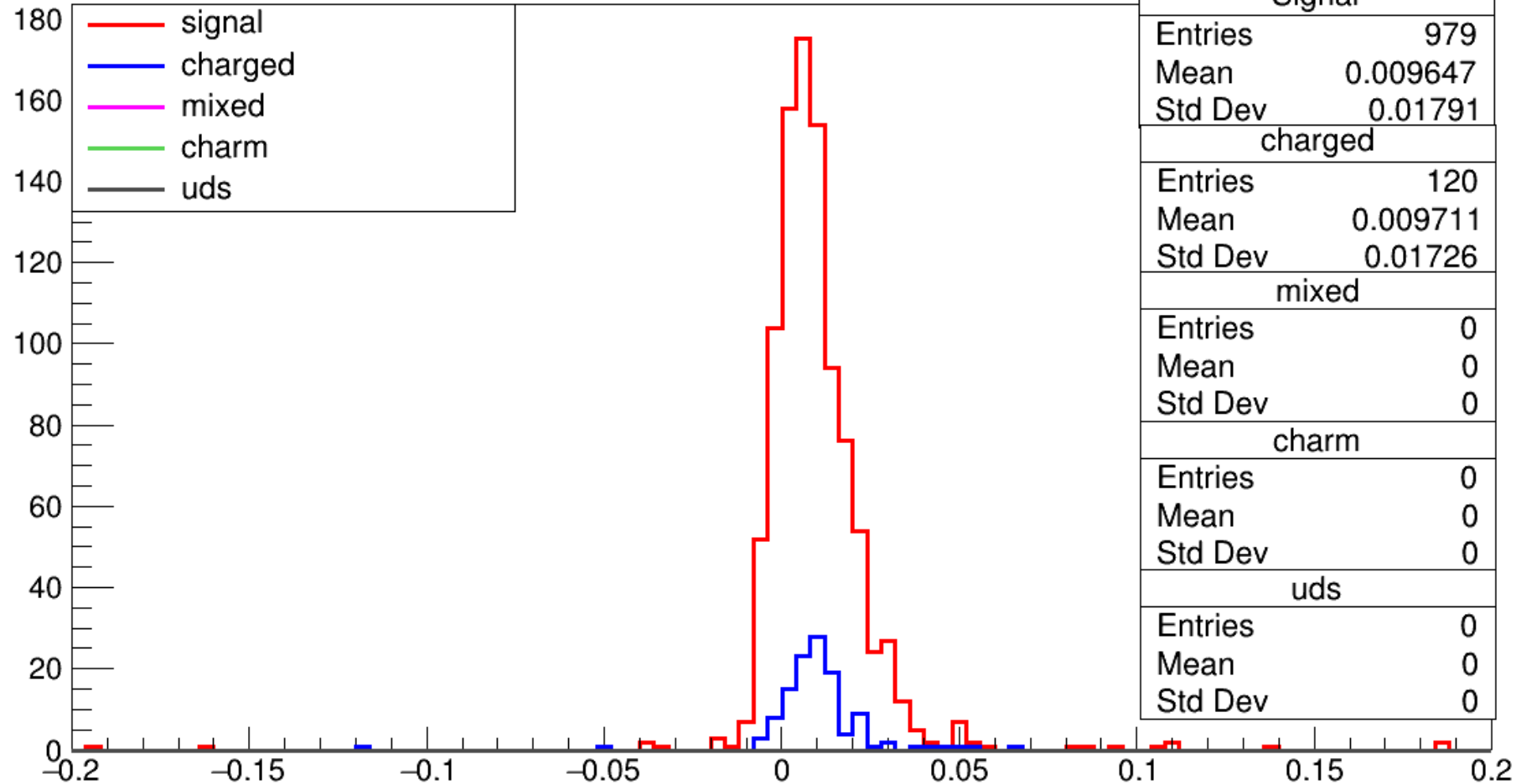
charm

Entries	861
Mean	0.4527
Std Dev	0.2642

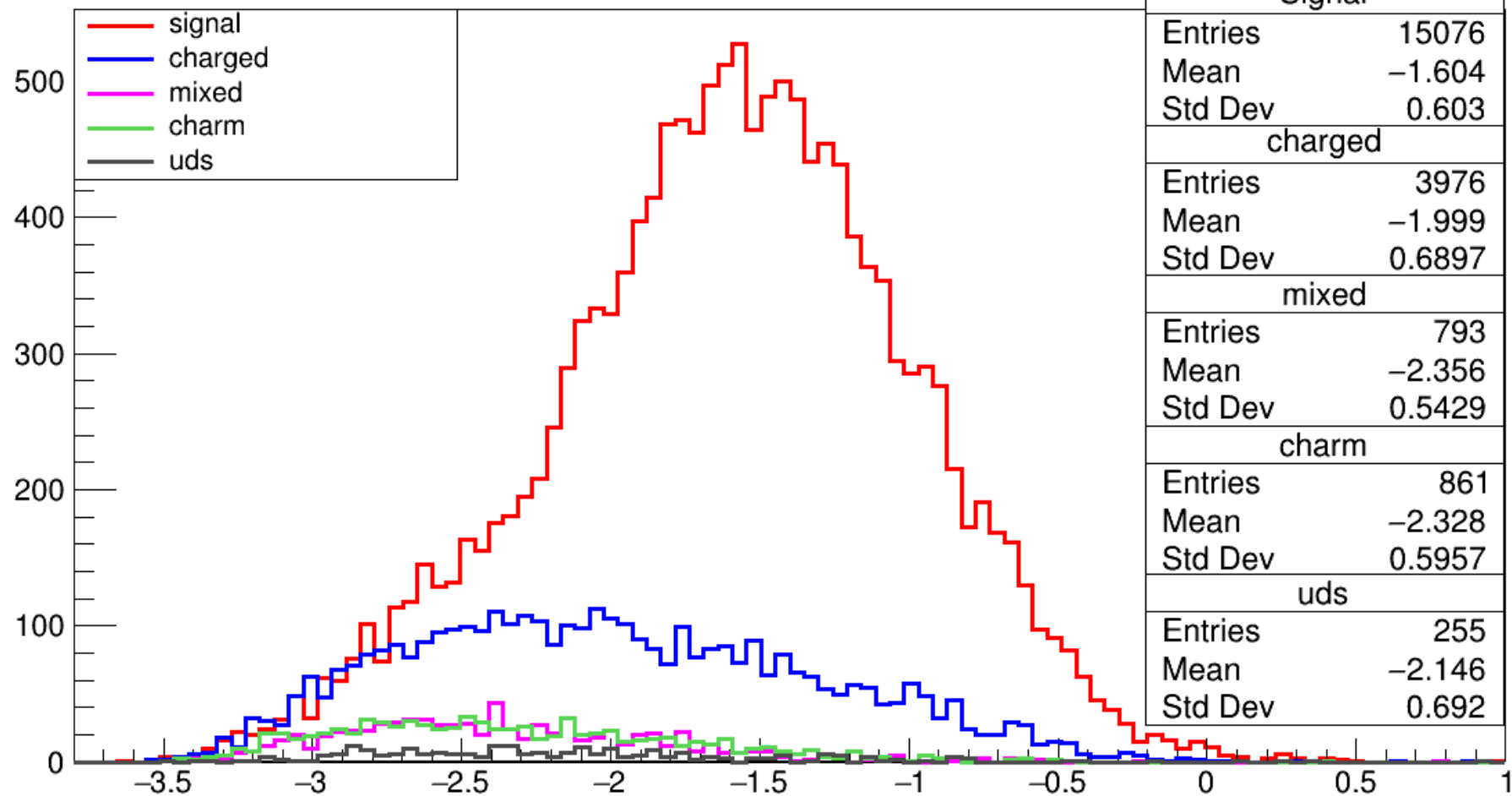
uds

Entries	255
Mean	0.4834
Std Dev	0.2516

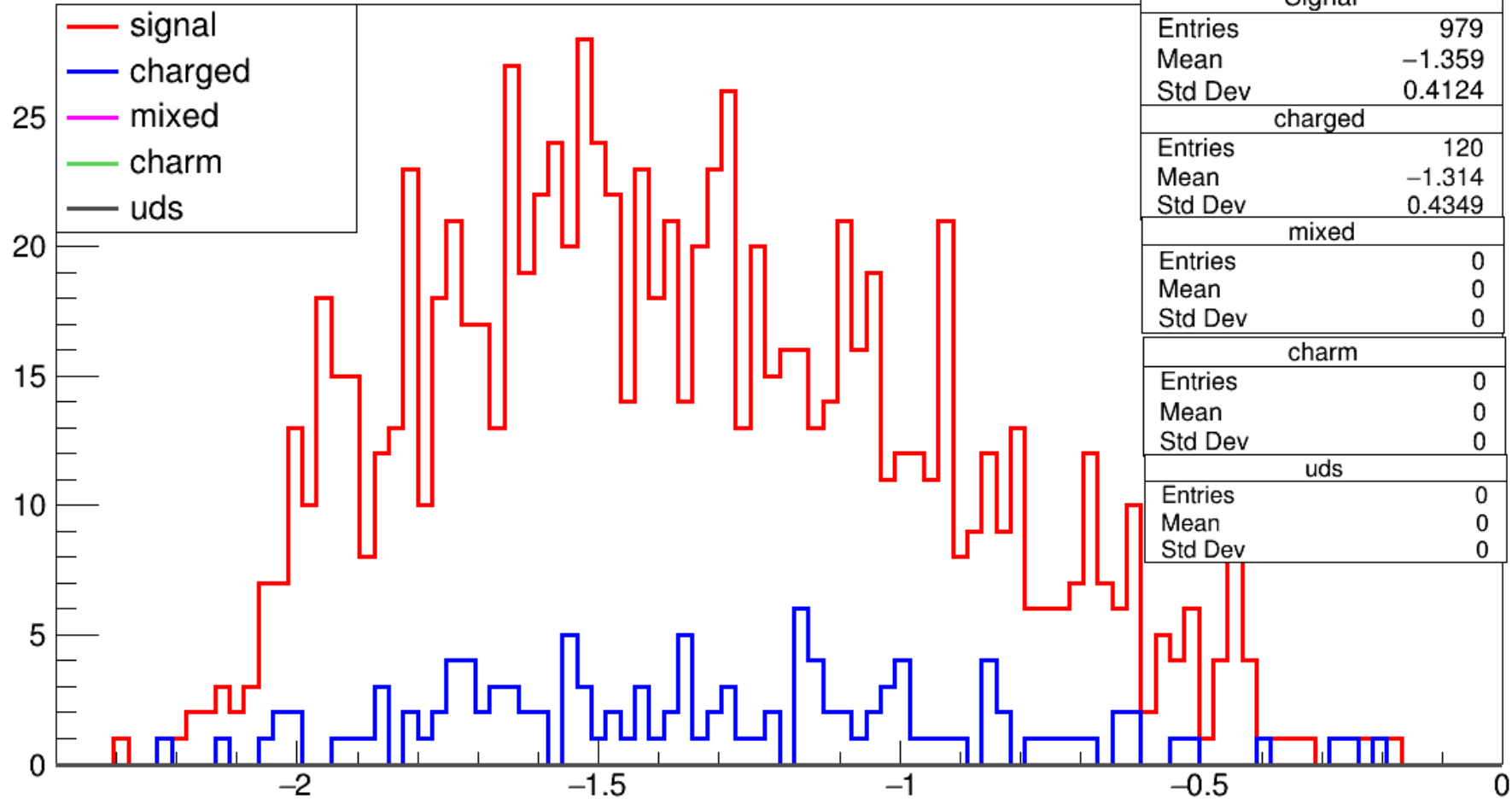
deltaE_Bsig with rank1,abs(m_hadROE-1.86)<0.015,abs(cos(PBtag,Pvis))<1,abs(m_Jpsi-3.1)<0.02 and abs(sin_phi)<1 for control channel and generic MC



deltaE_Btag with rank1 and abs(sin_phi)<1 for control channel and generic MC

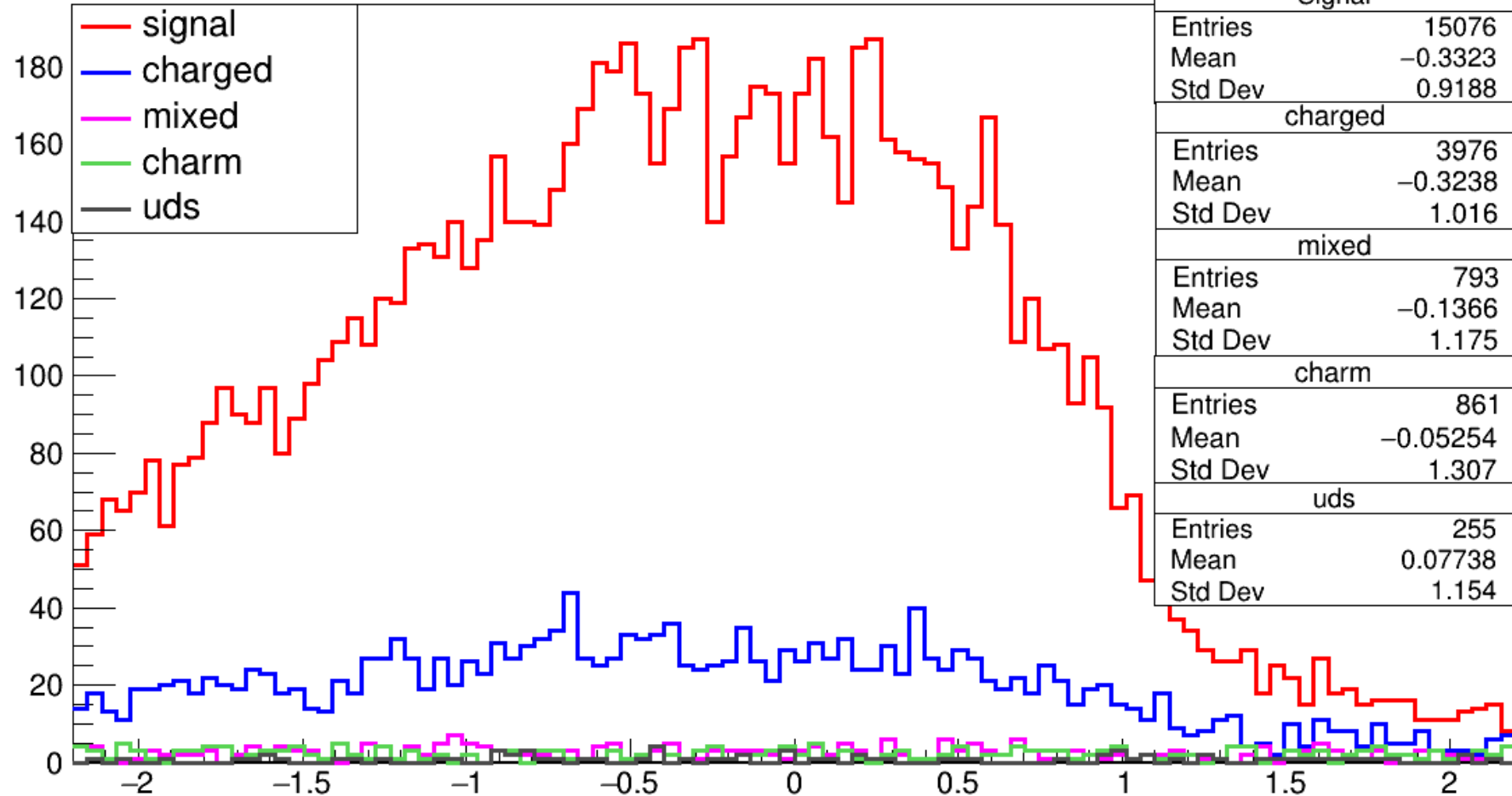


deltaE_Btag with rank1,abs(m_hadROE-1.86)<0.015,abs(cos(PBtag,Pvis))<1,abs(m_Jpsi-3.1)<0.02 and abs(sin_phi)<1 for control channel and generic MC

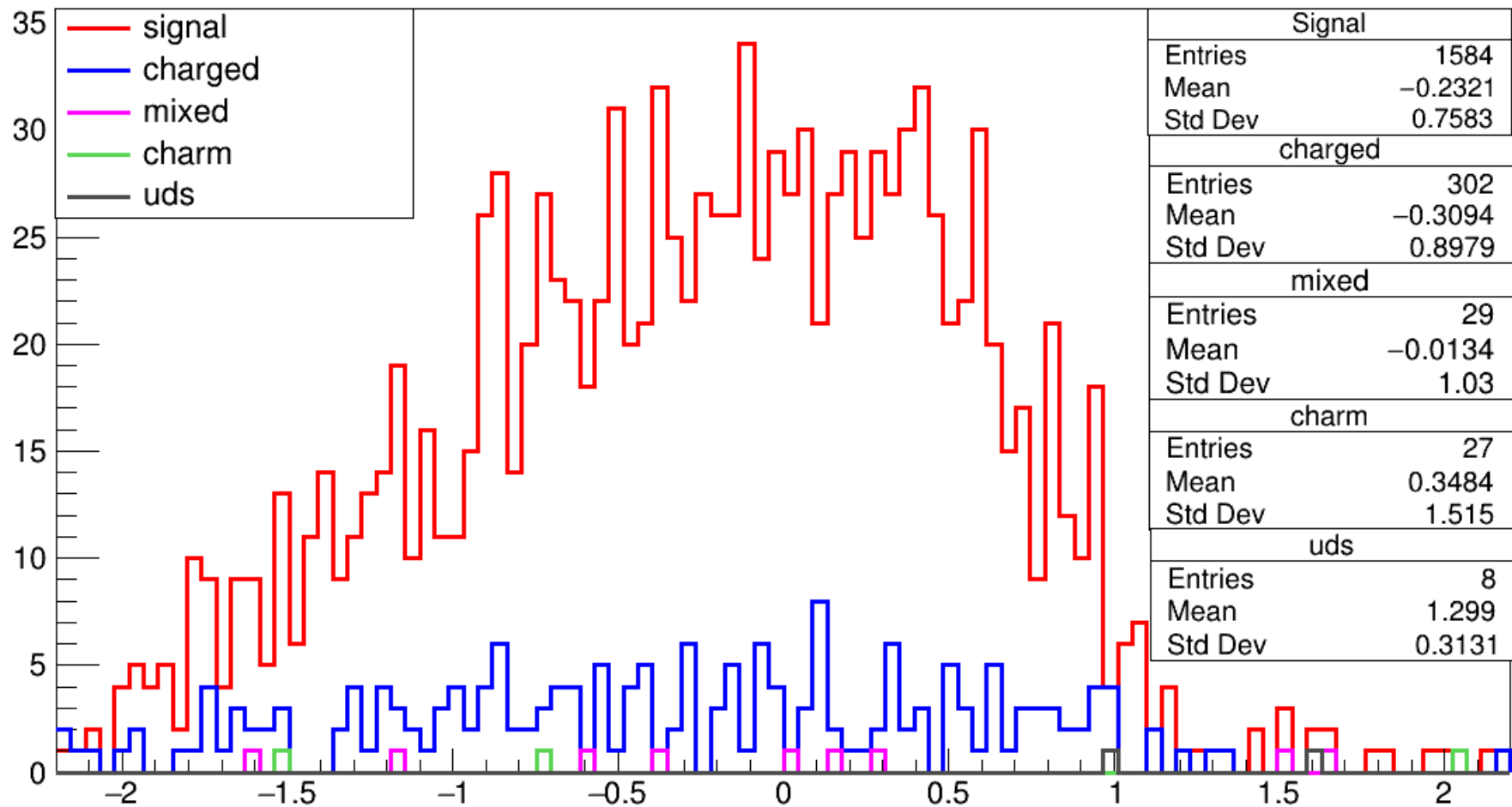


cos(PBtag,Pvis) with rank1 and abs(sin_phi)<1 for control channel and generic MC

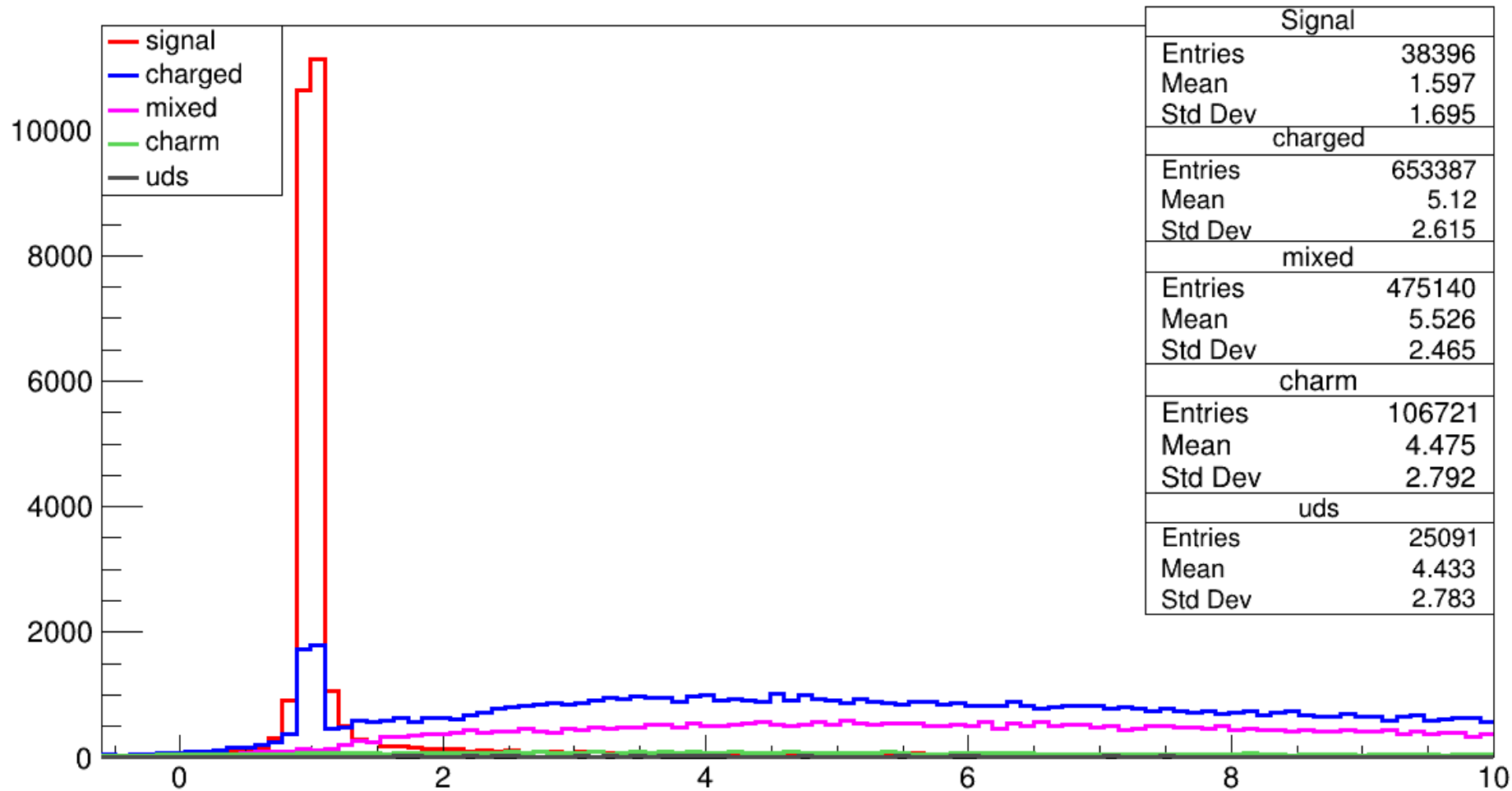
— signal
— charged
— mixed
— charm
— uds



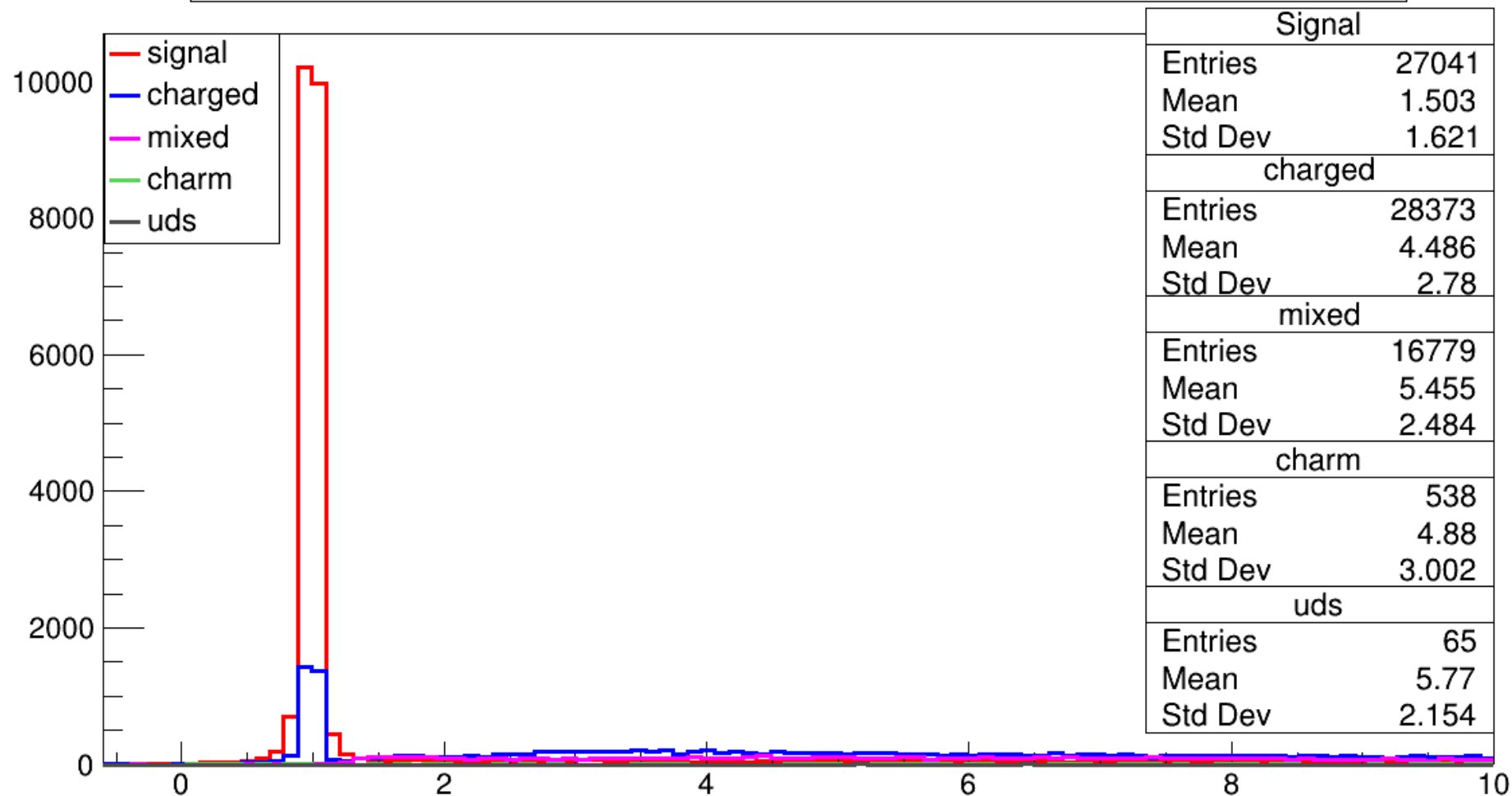
cos(PBtag,Pvis) with rank1, abs(sin_phi)<1 and abs(m_hadROE-1.86)<0.015 for control channel and generic MC



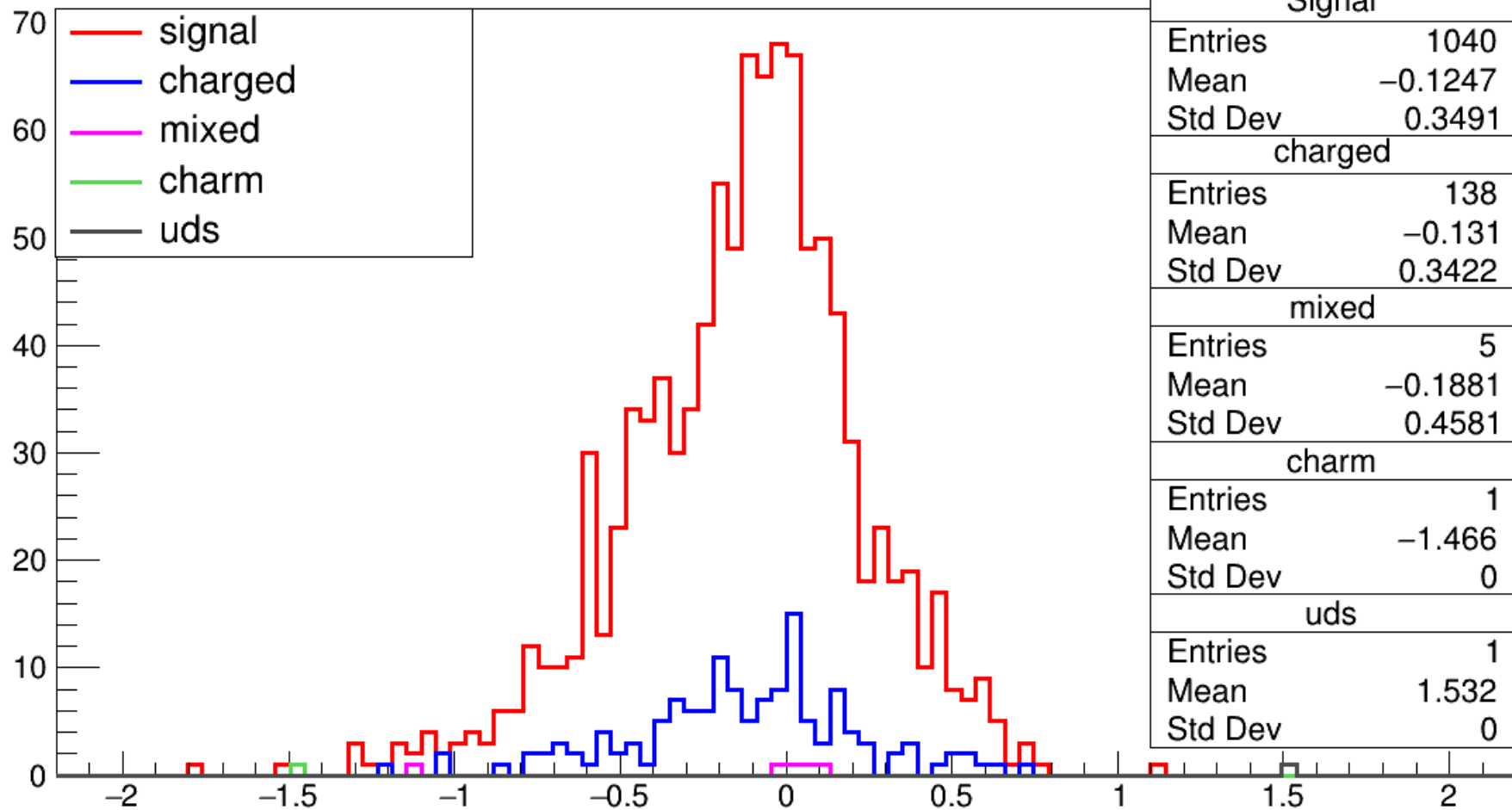
Sin_phi with only rank1 for control channel and generic MC



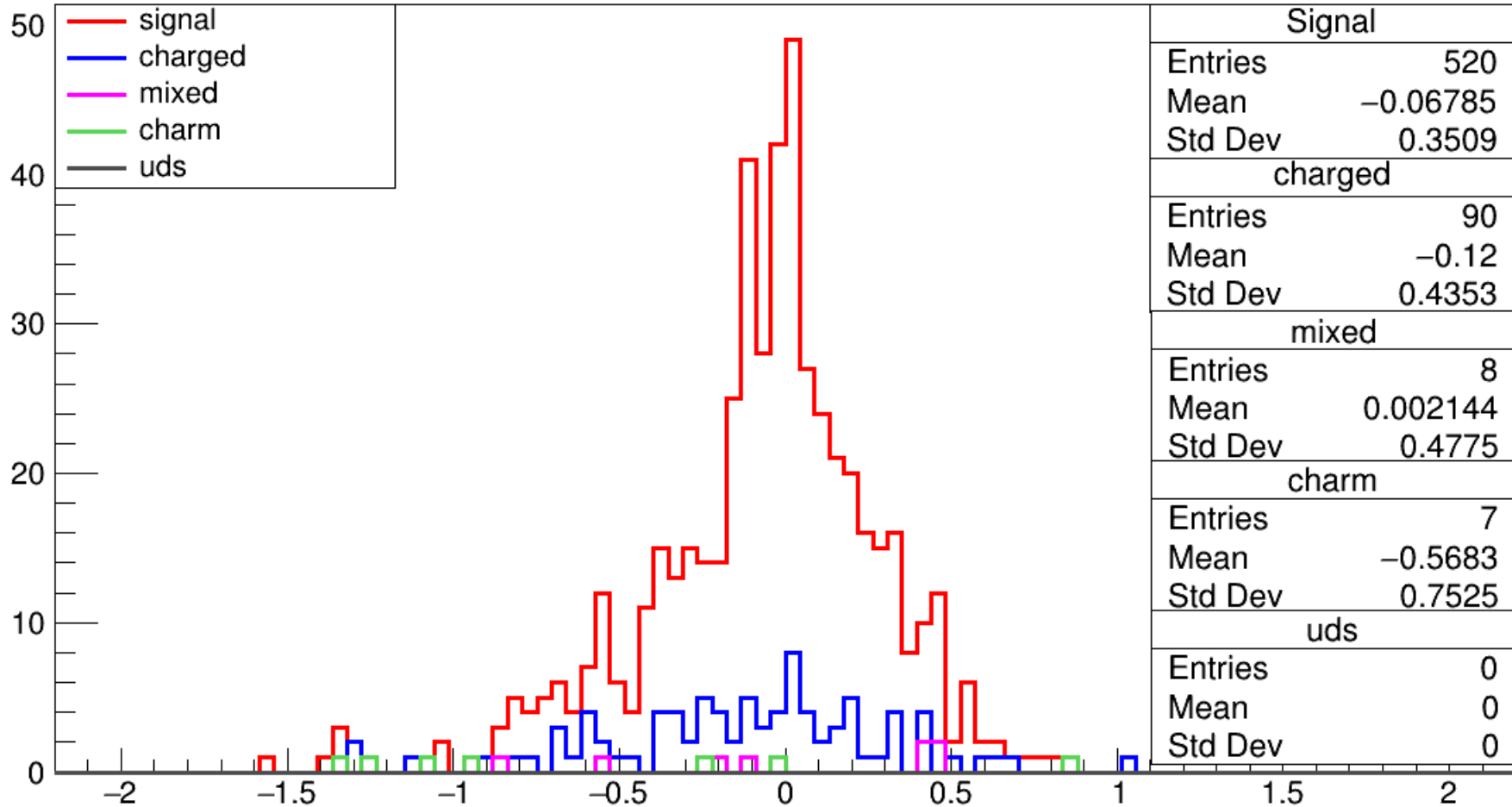
Sin_phi with rank1 and abs(m_Jpsi-3.1)<0.02 for control channel and generic MC



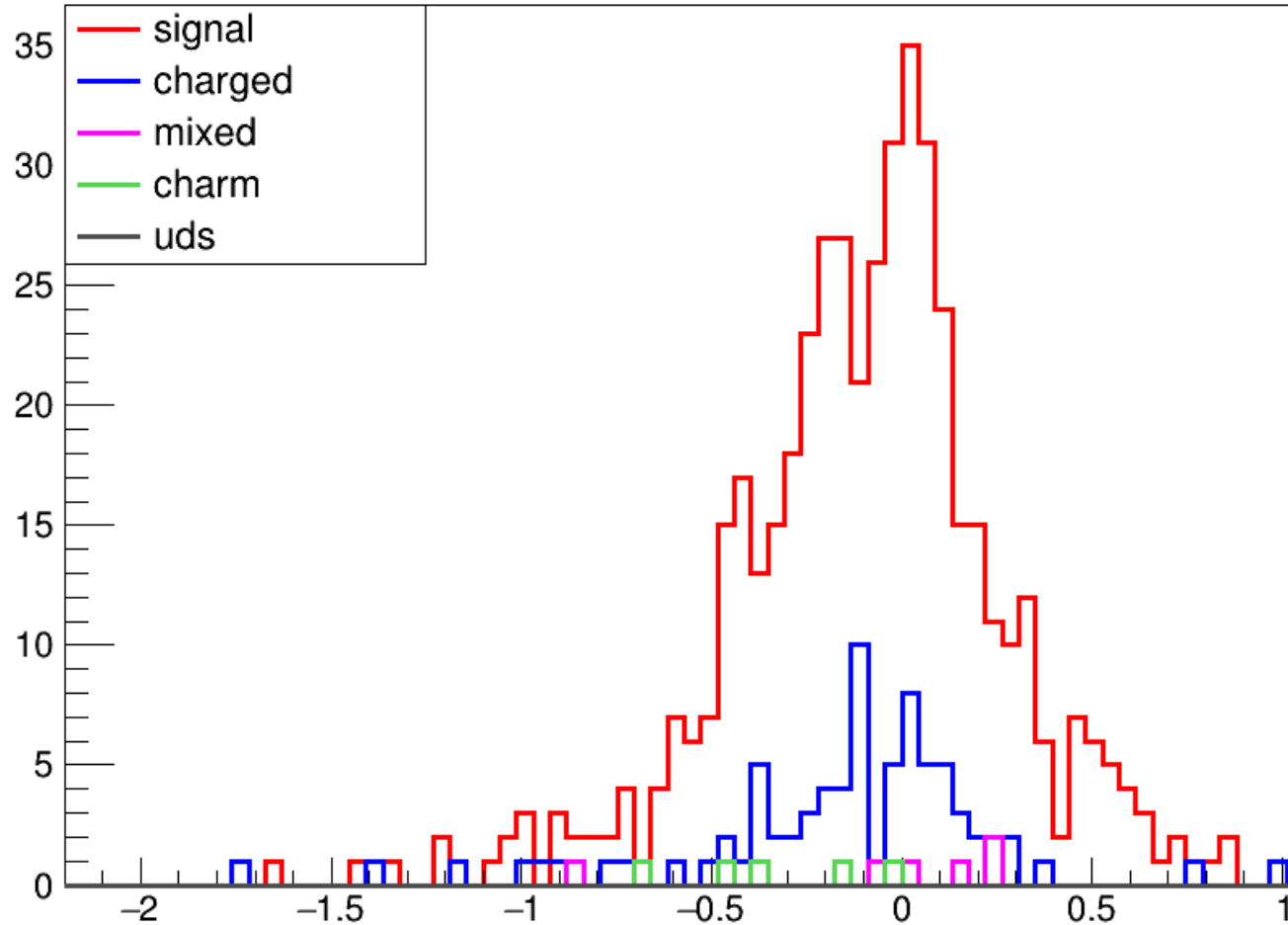
Best sum of cosine angles with $\text{rank1}, \text{abs}(\cos(\text{PBtag}, \text{Pvis})) < 1, \text{abs}(m_{\text{hadROE}} - 1.86) < 0.015$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel and generic MC



Best sum of cosine angles with $\text{rank1}, \text{abs}(\cos(\text{PBtag}, \text{Pvis})) < 1, \text{abs}(m_{\text{hadROE}} - 2.006) < 0.02$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel and generic MC

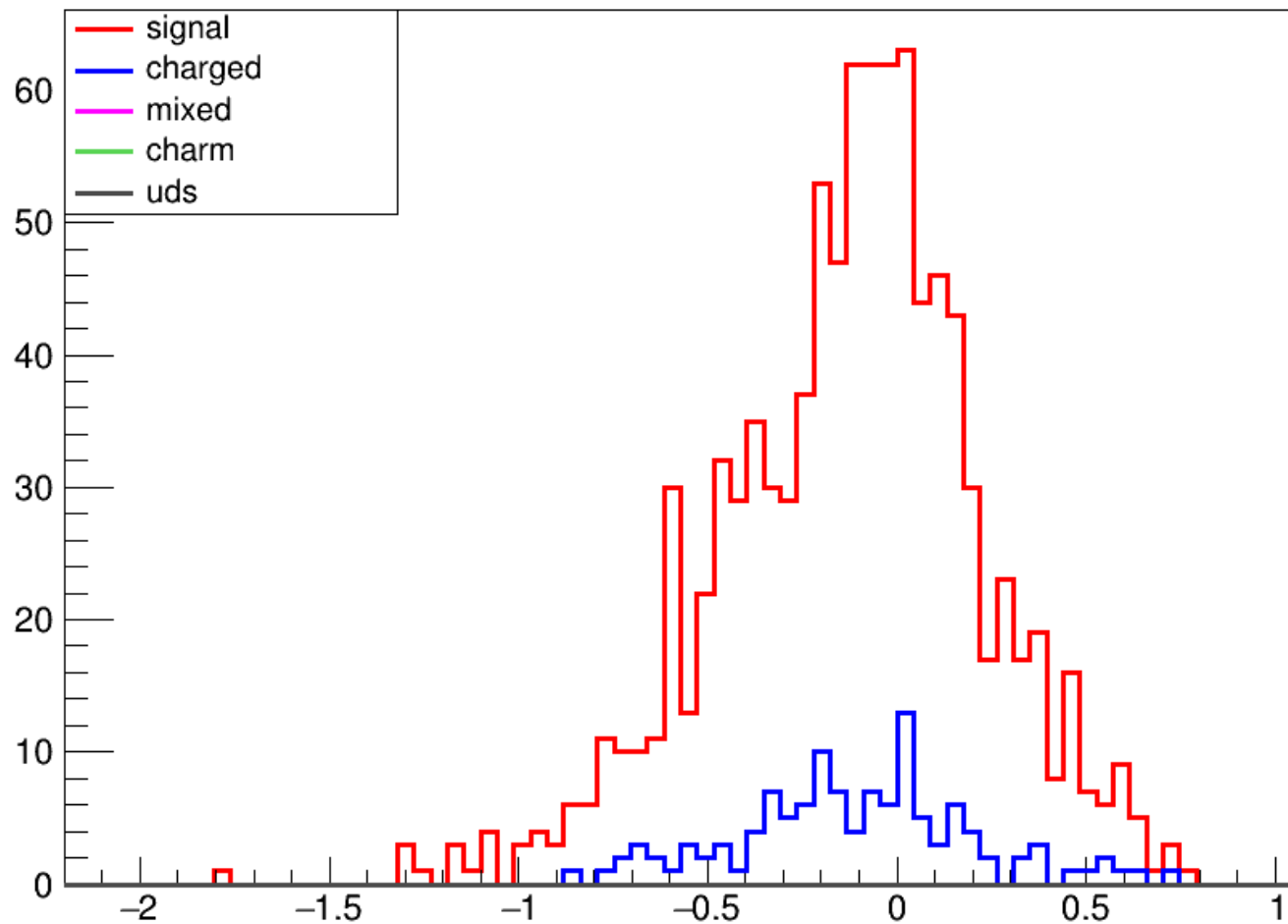


Best sum of cosine angles with rank1, $|\cos(\text{PBtag}, \text{Pvis})| < 1$, $|\text{m_hadROE} - 1.96| < 0.02$ and $|\sin(\phi)| < 1$ for control channel and generic MC



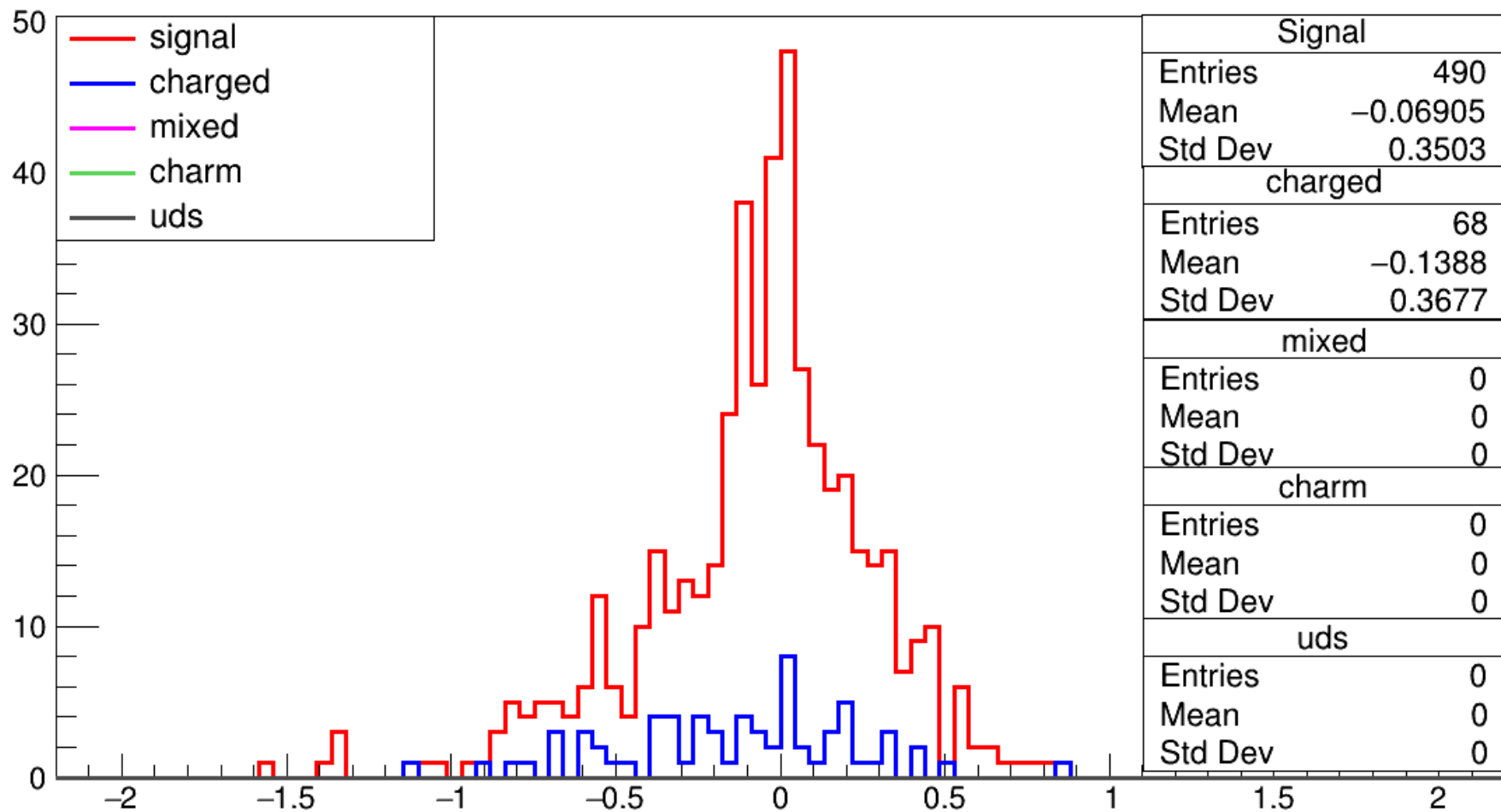
Signal	
Entries	475
Mean	-0.09865
Std Dev	0.3559
charged	
Entries	80
Mean	-0.1641
Std Dev	0.4085
mixed	
Entries	6
Mean	-0.04333
Std Dev	0.3769
charm	
Entries	5
Mean	-0.3365
Std Dev	0.2355
uds	
Entries	0
Mean	0
Std Dev	0

Best sum of cosine angles with $\text{rank1}, \text{abs}(\cos(\text{Pbtag}, \text{Pvis})) < 1, \text{abs}(m_{\text{hadROE}} - 1.86) < 0.015, \text{abs}(m_{\text{Jpsi}} - 3.1) < 0.02$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel and generic MC

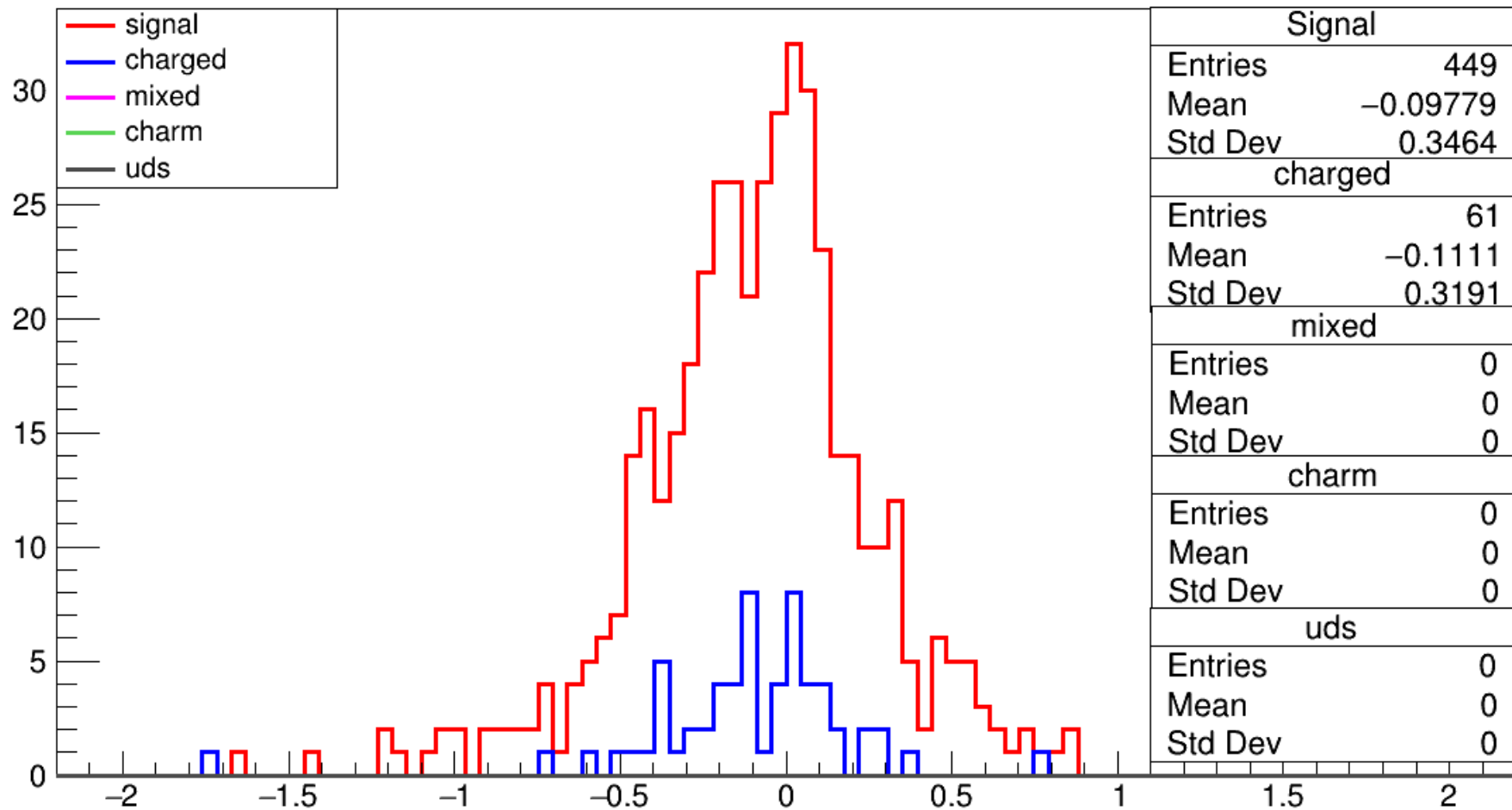


Signal	
Entries	979
Mean	-0.1248
Std Dev	0.3493
charged	
Entries	120
Mean	-0.1119
Std Dev	0.3155
mixed	
Entries	0
Mean	0
Std Dev	0
charm	
Entries	0
Mean	0
Std Dev	0
uds	
Entries	0
Mean	0
Std Dev	0

Best sum of cosine angles with $\text{rank1}, \text{abs}(\cos(\text{Pbtag}, \text{Pvis})) < 1, \text{abs}(m_{\text{hadROE}} - 2.006) < 0.02, \text{abs}(m_{\text{Jpsi}} - 3.1) < 0.02$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel and generic MC



Best sum of cosine angles with rank1, $\text{abs}(\cos(\text{PBtag}, \text{Pvis})) < 1$, $\text{abs}(m_{\text{hadROE}} - 1.96) < 0.02$, $\text{abs}(m_{\text{Jpsi}} - 3.1) < 0.02$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel and generic MC



Rank1, $\text{abs}(\cos(\text{PBtag}, \text{Pvis})) < 1$, $\text{abs}(m_{\text{hadROE}} - 1.86) < 0.015$, $\text{abs}(m_{\text{Jpsi}} - 3.1) < 0.02$ and $\text{abs}(\sin_{\text{phi}}) < 1$ for control channel

