Control channel signal and generic MC check results

1.0 M events for control channel Signal

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

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

$B^- \rightarrow$ generic

3 Streams of generic MC

11 Dec. 2023

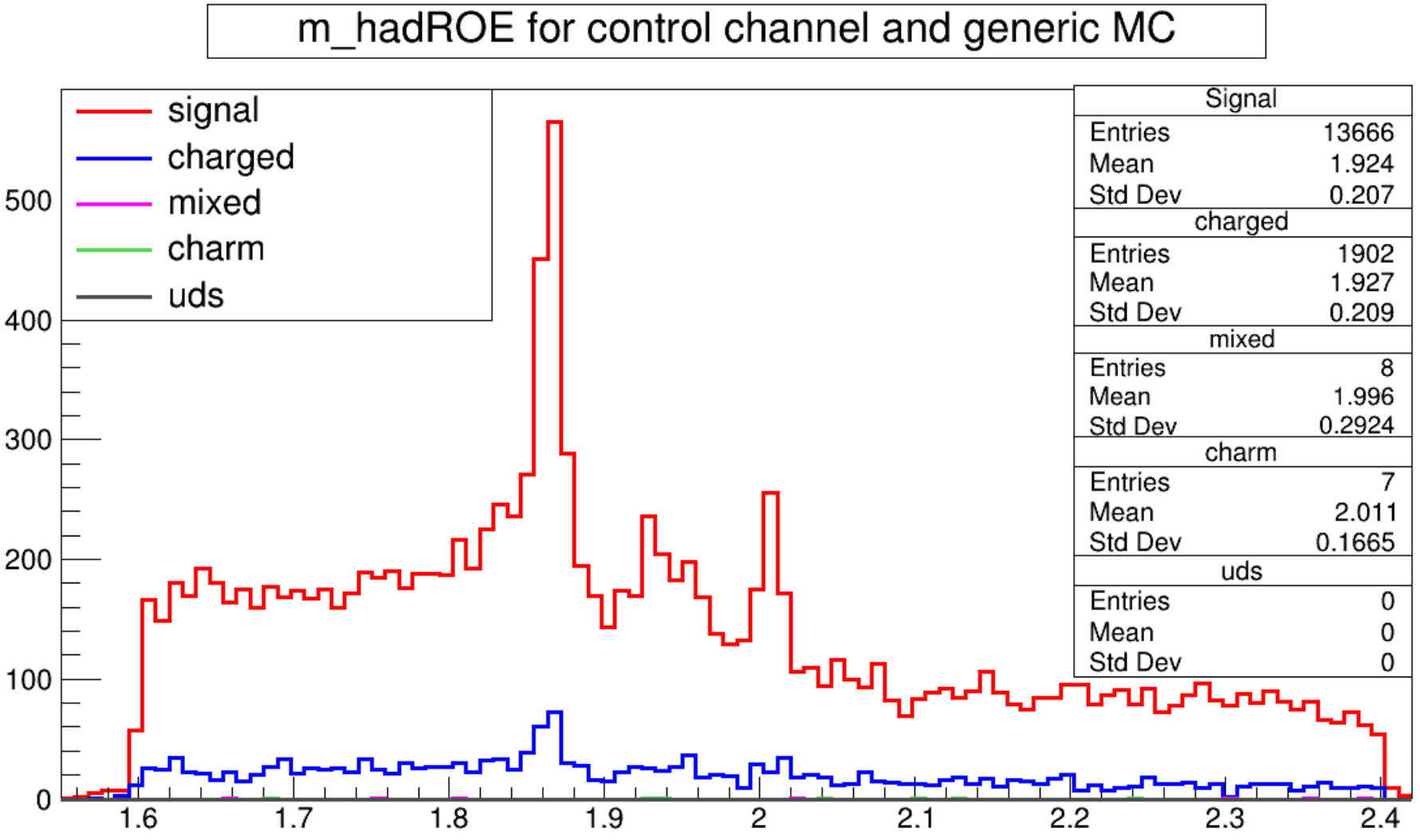
Cuts in the reconstruction program

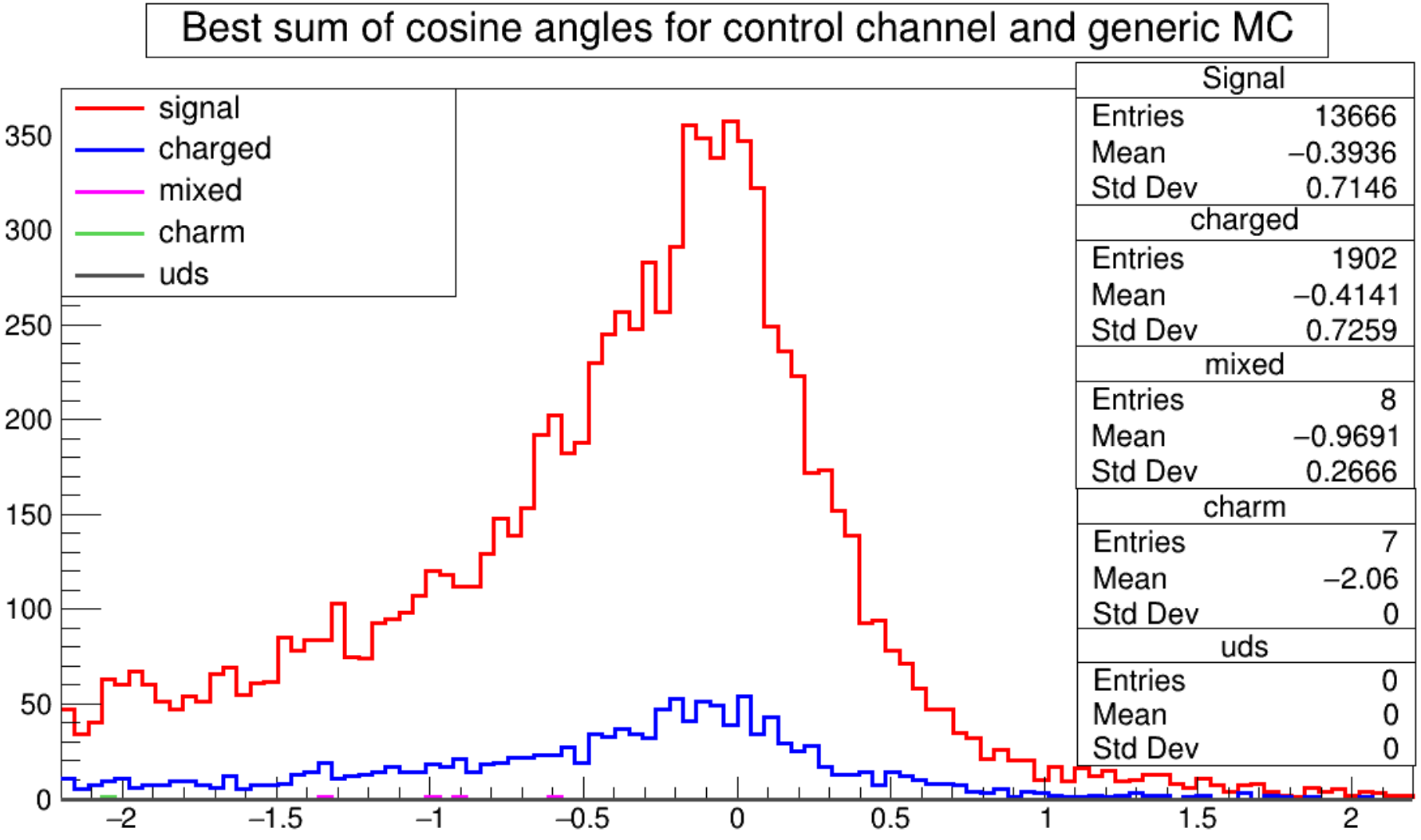
- MVA photon cuts

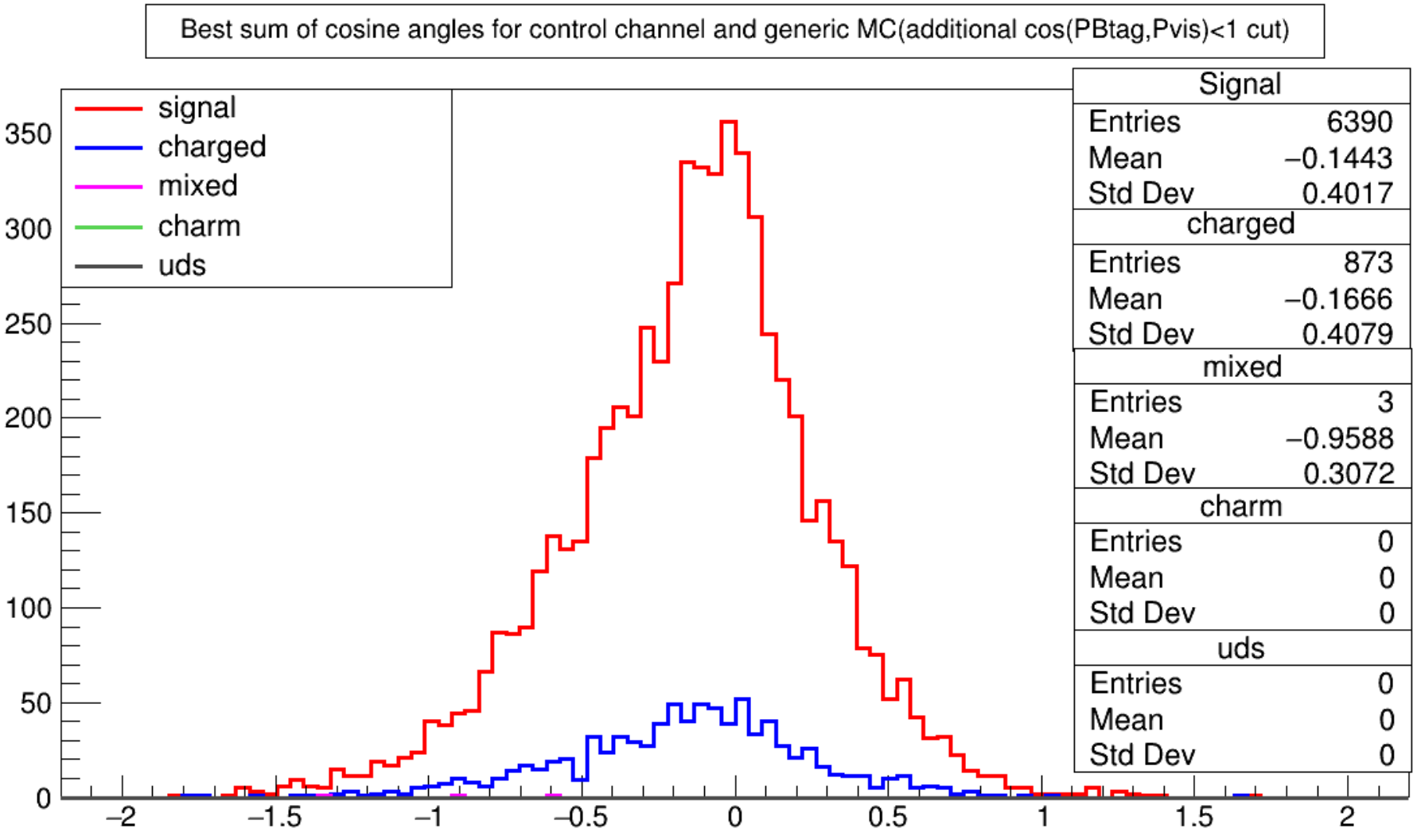
- $1.6 < m_{hadROE} < 2.4$ GeV

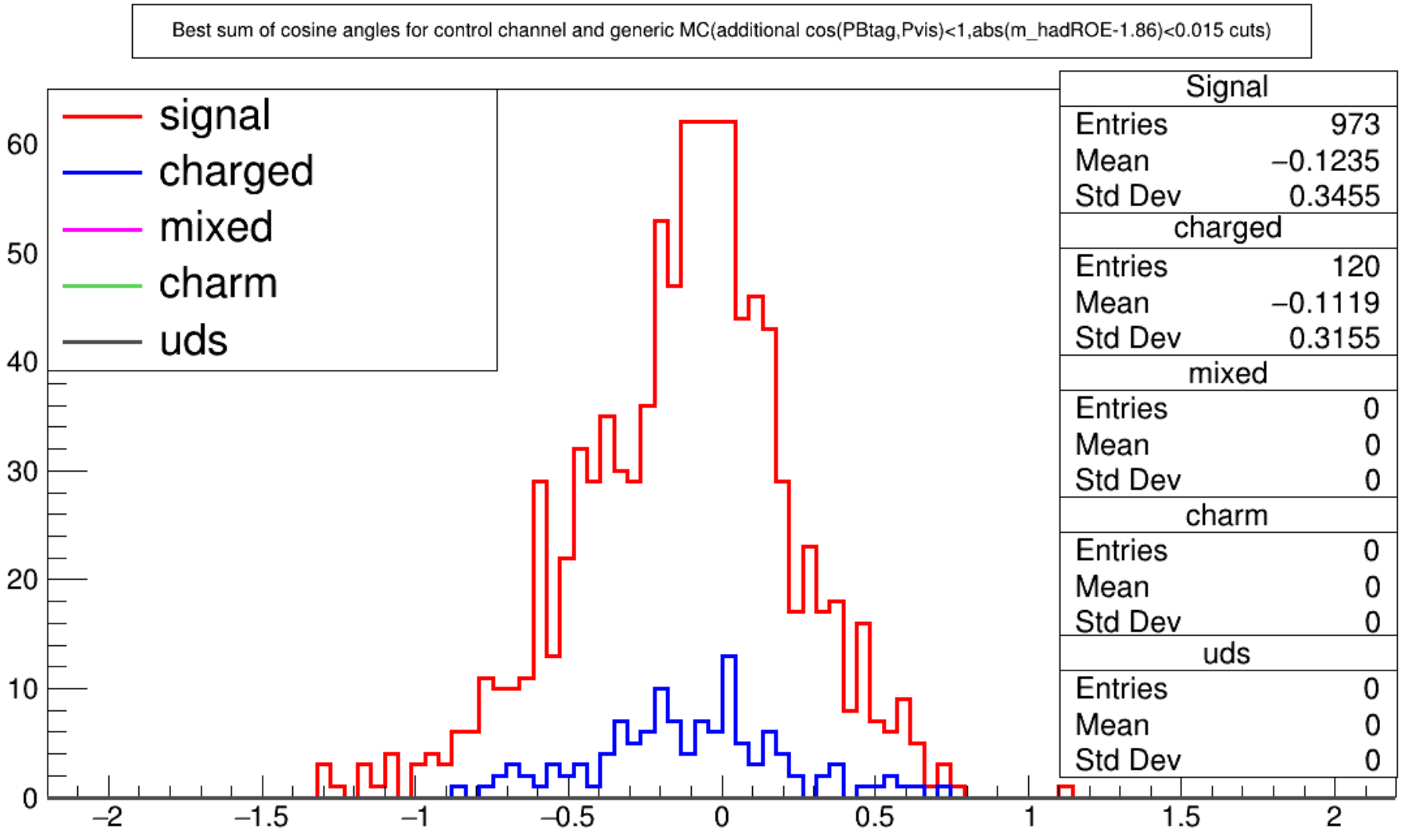
Signal side cuts (root level)

- abs(m_Jpsi-3.1) < 0.02 GeV
- Mbc_Bsig > 5.2 GeV
- -0.15 < deltaE_Bsig < 0.40 GeV
- Yincl_rank_all = 1
- abs(sin_phi) < 1


m_hadROE for control channel and generic MC
signal
charged
mixed
charm
uds
Signal
Entries 13666
Mean 1.924
Std Dev 0.207
charged
Entries 1902
Mean 1.927
Std Dev 0.209
mixed
Entries 8
Mean 1.996
Std Dev 0.2924
charm
Entries 7
Mean 2.011
Std Dev 0.1665
uds
Entries 0
Mean 0
Std Dev 0
0
100
200
300
400
500
1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4


Best sum of cosine angles for control channel and generic MC
signal
charged
mixed
charm
uds
Signal
Entries 13666
Mean −0.3936
Std Dev 0.7146
charged
Entries 1902
Mean −0.4141
Std Dev 0.7259
mixed
Entries 8
Mean −0.9691
Std Dev 0.2666
charm
Entries 7
Mean −2.06
Std Dev 0
uds
Entries 0
Mean 0
Std Dev 0
350
300
250
200
150
100
50
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2


Best sum of cosine angles for control channel and generic MC(additional cos(PBtag,Pvis)<1 cut)
signal
charged
mixed
charm
uds
Signal
Entries 6390
Mean −0.1443
Std Dev 0.4017
charged
Entries 873
Mean −0.1666
Std Dev 0.4079
mixed
Entries 3
Mean −0.9588
Std Dev 0.3072
charm
Entries 0
Mean 0
Std Dev 0
uds
Entries 0
Mean 0
Std Dev 0
350
300
250
200
150
100
50
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2


Best sum of cosine angles for control channel and generic MC(additional cos(PBtag,Pvis)<1,abs(m_hadROE-1.86)<0.015 cuts)
signal
charged
mixed
charm
uds
Signal
Entries 973
Mean −0.1235
Std Dev 0.3455
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
60
50
40
30
20
10
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2