M_{bc} and ΔE for Signal and Control channel

1.0 M events for both signal and control channel.

$$B^+ \rightarrow K^+ \tau^- \mu^+$$

$$\tau^- \rightarrow \pi^- \nu_\tau$$

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

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

For both Signal and Control channel.

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

01 Dec. 2023

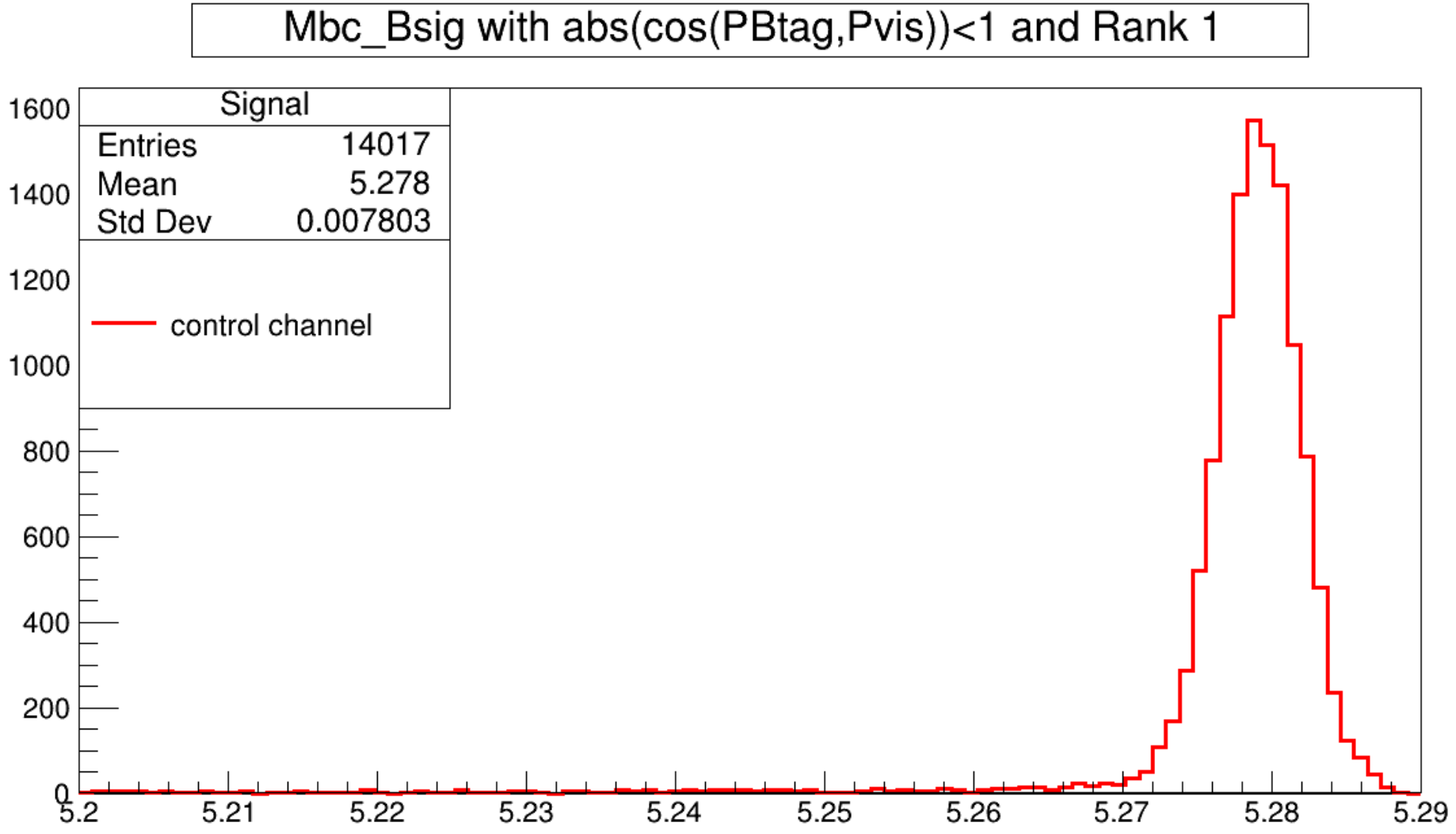
Cuts in the signal reconstruction program

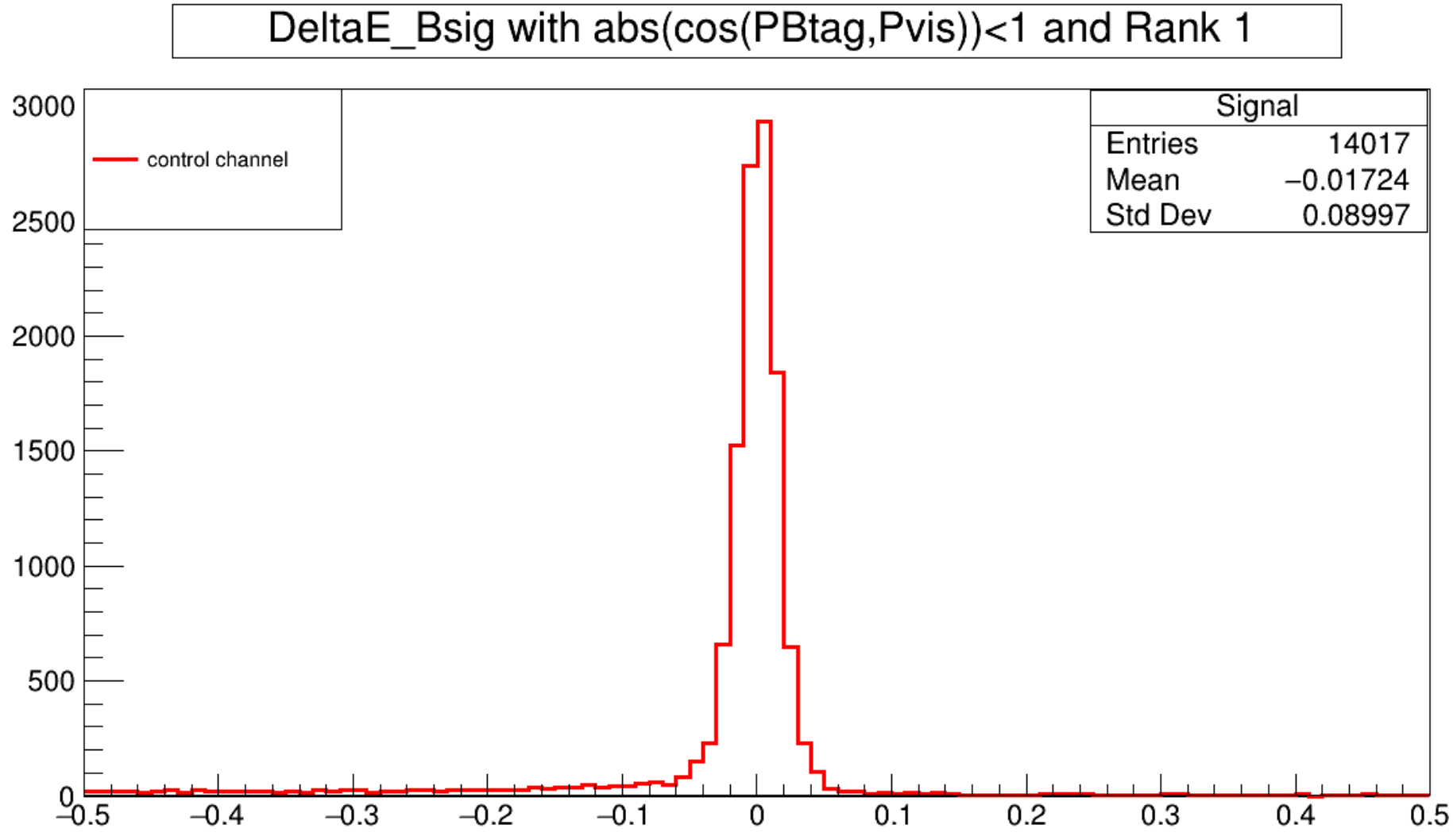
- $M_{kpi} > 0.7$ GeV
- $abs(m_{lpi}-3.1) > 0.015$ GeV
- $1.6 < m_{hadROE} < 2.4$ GeV
- $abs(cos(P_{Btag},P_{tag,vis})) < 2$
- $abs(sin(Phi)) < 1.5$

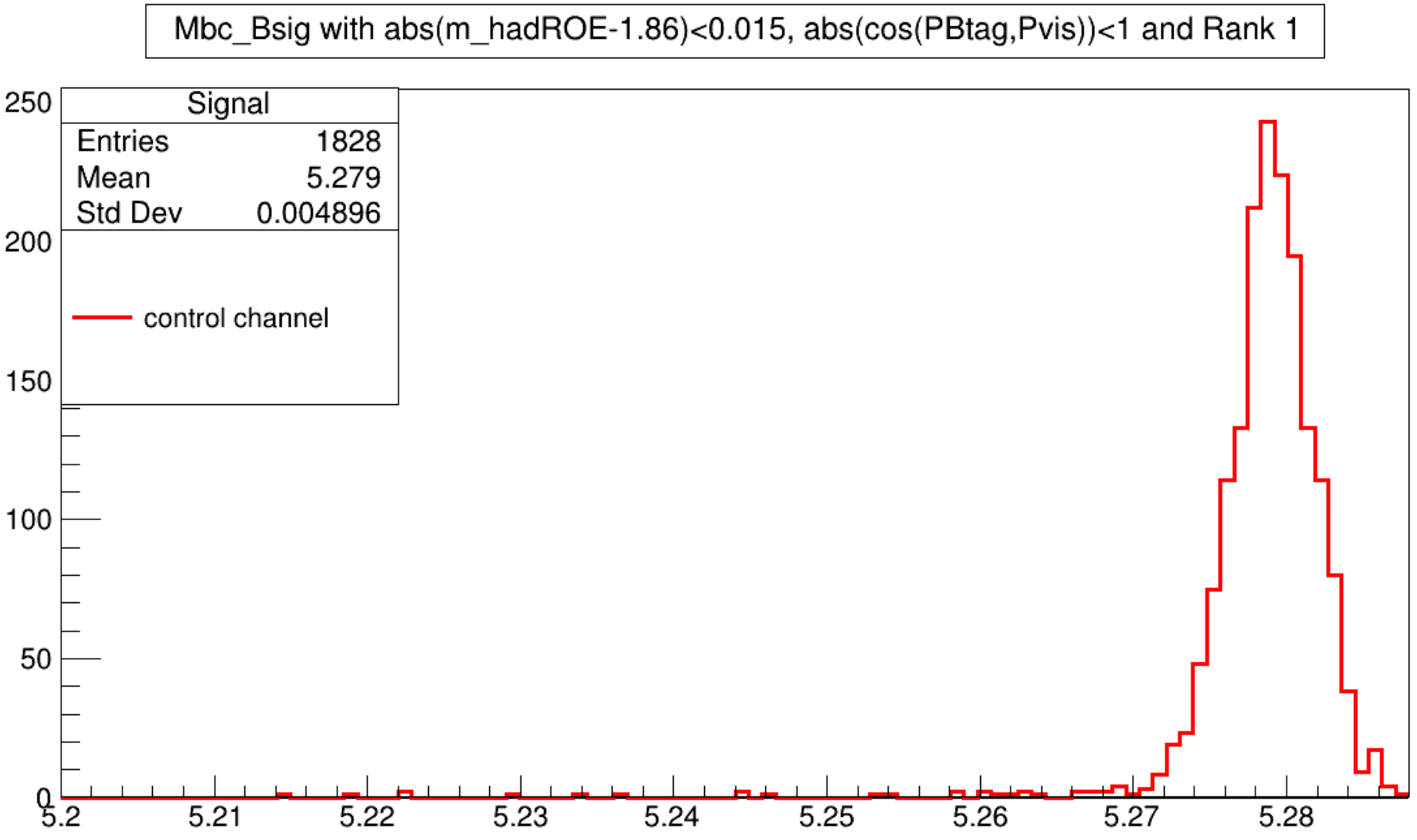
Cuts in the control channel reconstruction program

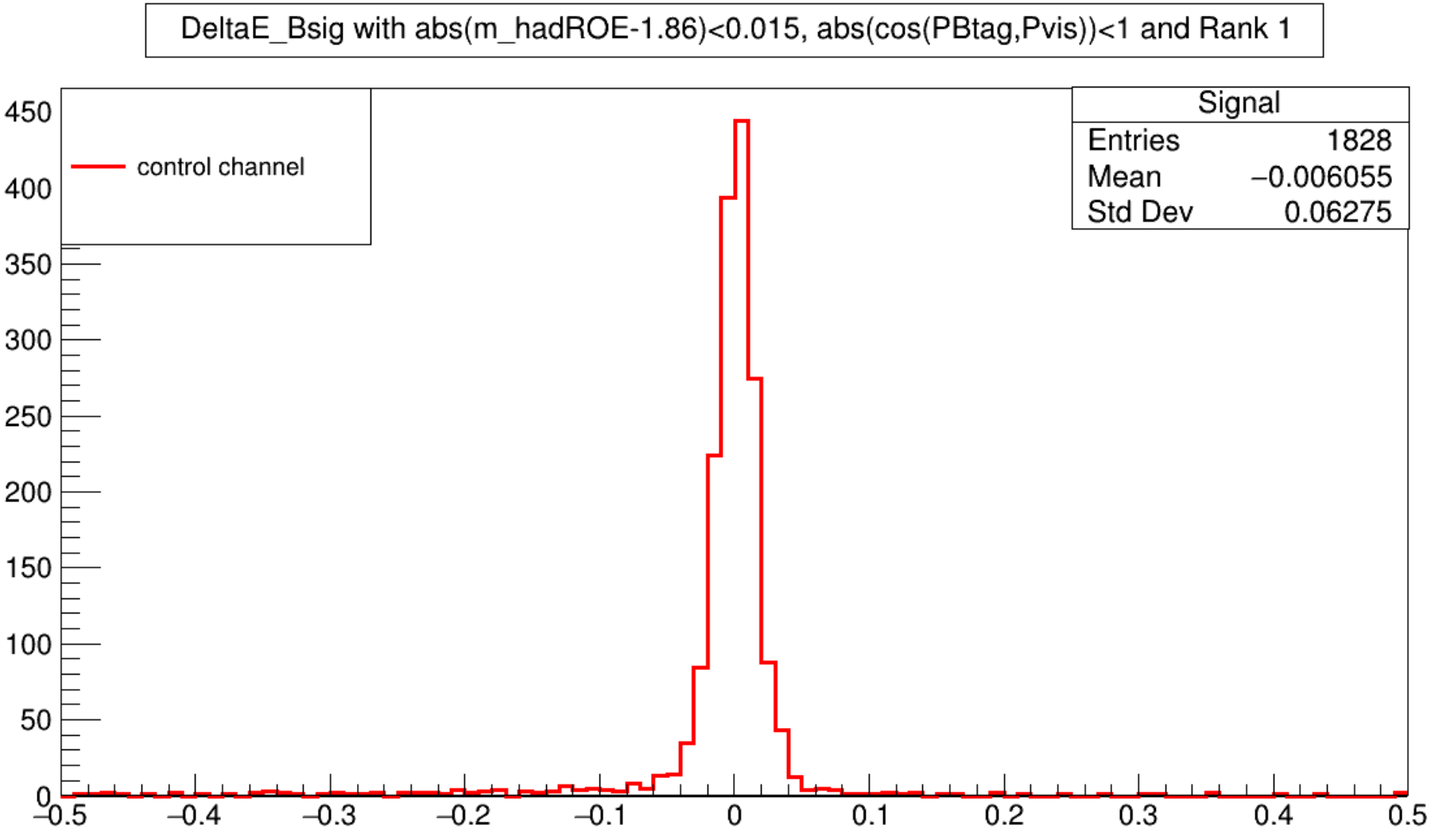
- MVA photon cuts

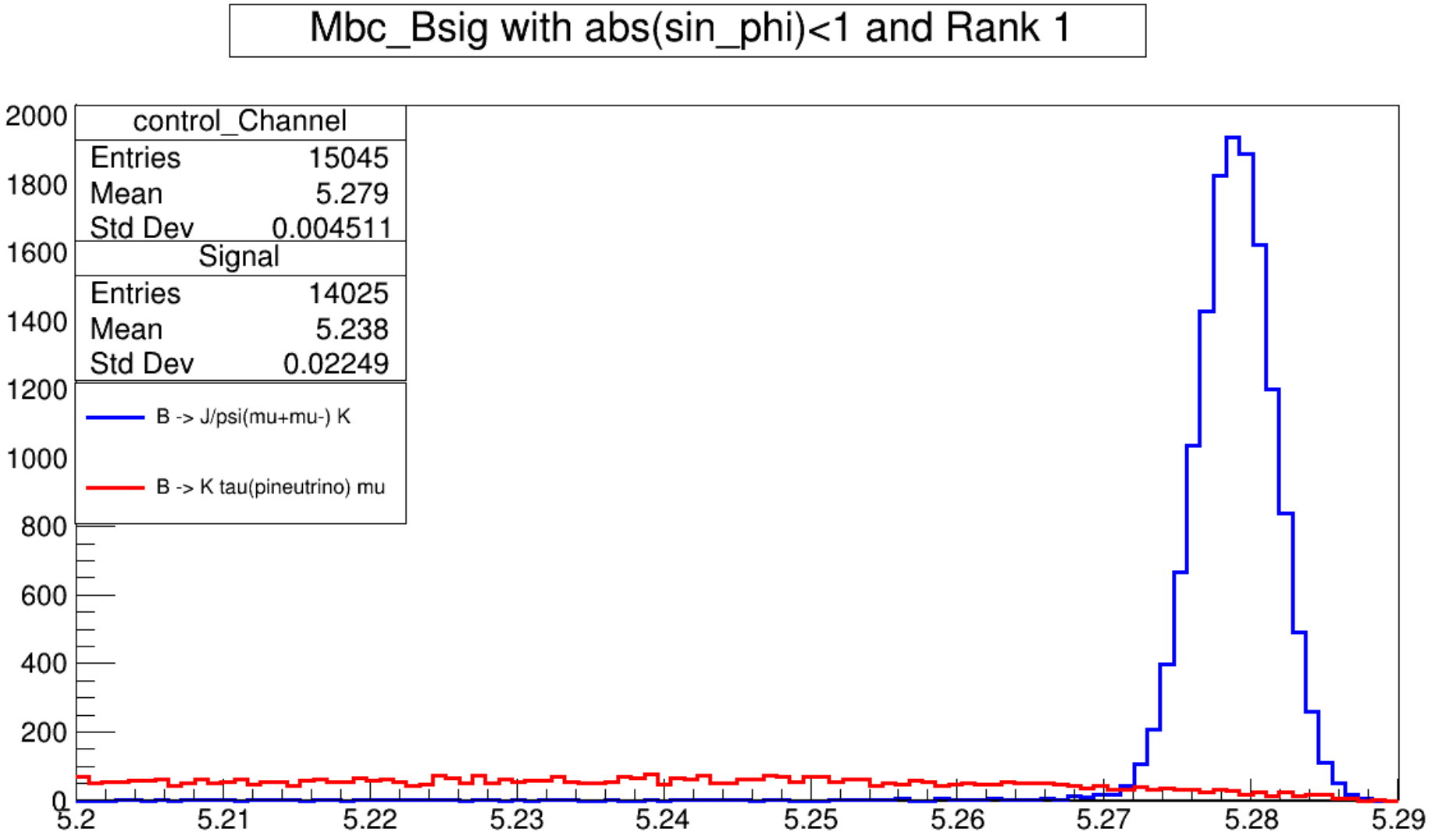
- $1.6 < m_{hadROE} < 2.4$ GeV

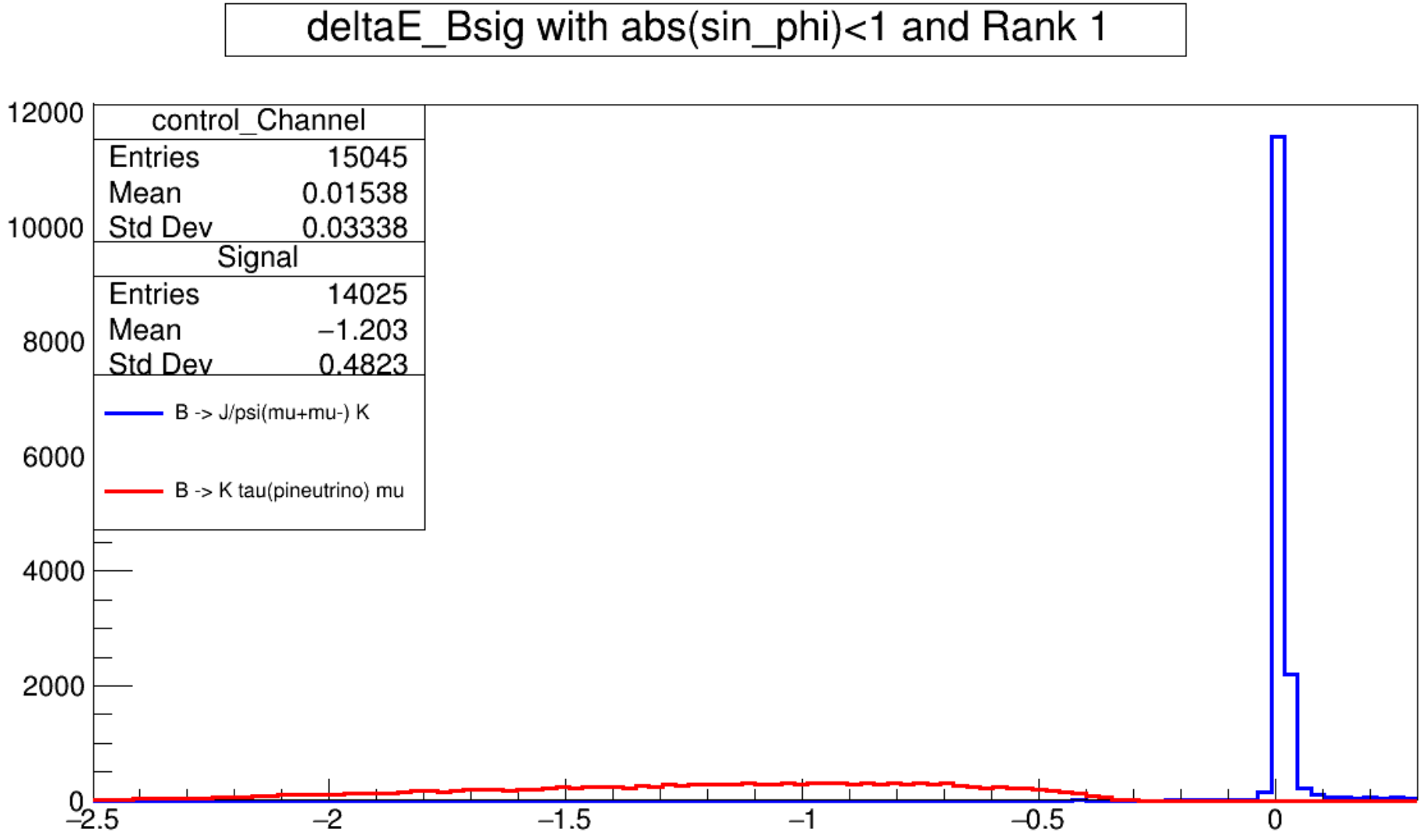

Mbc_Bsig with abs(cos(PBtag,Pvis))<1 and Rank 1
Signal
Entries 14017
Mean 5.278
Std Dev 0.007803
control channel
1600
1400
1200
1000
800
600
400
200
0
5.2
5.21
5.22
5.23
5.24
5.25
5.26
5.27
5.28
5.29


DeltaE_Bsig with abs(cos(PBtag,Pvis))<1 and Rank 1
control channel
Signal
Entries 14017
Mean −0.01724
Std Dev 0.08997
3000
2500
2000
1500
1000
500
0
−0.5
−0.4
−0.3
−0.2
−0.1
0
0.1
0.2
0.3
0.4
0.5


Mbc_Bsig with abs(m_hadROE-1.86)<0.015, abs(cos(PBtag,Pvis))<1 and Rank 1
Signal
Entries 1828
Mean 5.279
Std Dev 0.004896
control channel
250
200
150
100
50
0
5.2
5.21
5.22
5.23
5.24
5.25
5.26
5.27
5.28


DeltaE_Bsig with abs(m_hadROE-1.86)<0.015, abs(cos(PBtag,Pvis))<1 and Rank 1
control channel
Signal
Entries 1828
Mean −0.006055
Std Dev 0.06275
450
400
350
300
250
200
150
100
50
0
−0.5
−0.4
−0.3
−0.2
−0.1
0
0.1
0.2
0.3
0.4
0.5


Mbc_Bsig with abs(sin_phi)<1 and Rank 1
control_Channel
Entries 15045
Mean 5.279
Std Dev 0.004511
Signal
Entries 14025
Mean 5.238
Std Dev 0.02249
B -> J/psi(mu+mu-) K
B -> K tau(pineutrino) mu
2000
1800
1600
1400
1200
1000
800
600
400
200
0
5.2
5.21
5.22
5.23
5.24
5.25
5.26
5.27
5.28
5.29


deltaE_Bsig with abs(sin_phi)<1 and Rank 1
control_Channel
Entries 15045
Mean 0.01538
Std Dev 0.03338
Signal
Entries 14025
Mean −1.203
Std Dev 0.4823
B -> J/psi(mu+mu-) K
B -> K tau(pineutrino) mu
12000
10000
8000
6000
4000
2000
0
−2.5
−2
−1.5
−1
−0.5
0