Belle Data/MC update

All experiments of Belle
1.0 M dedicated signal MC

15 Jan. 2024

Cuts in the reconstruction program

- MVA photon cuts

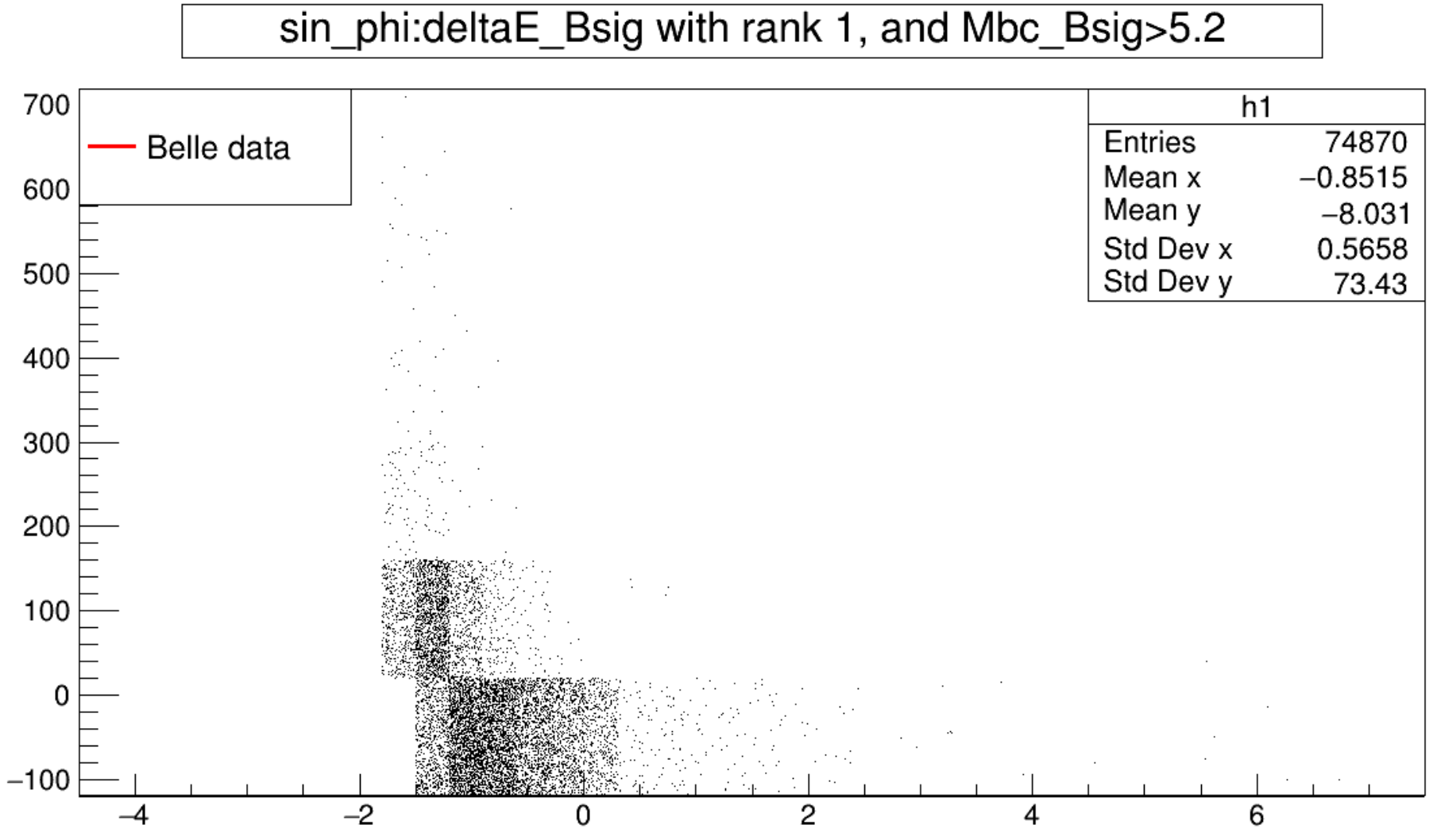
- $1.6 < m_{hadROE} < 2.4$ GeV

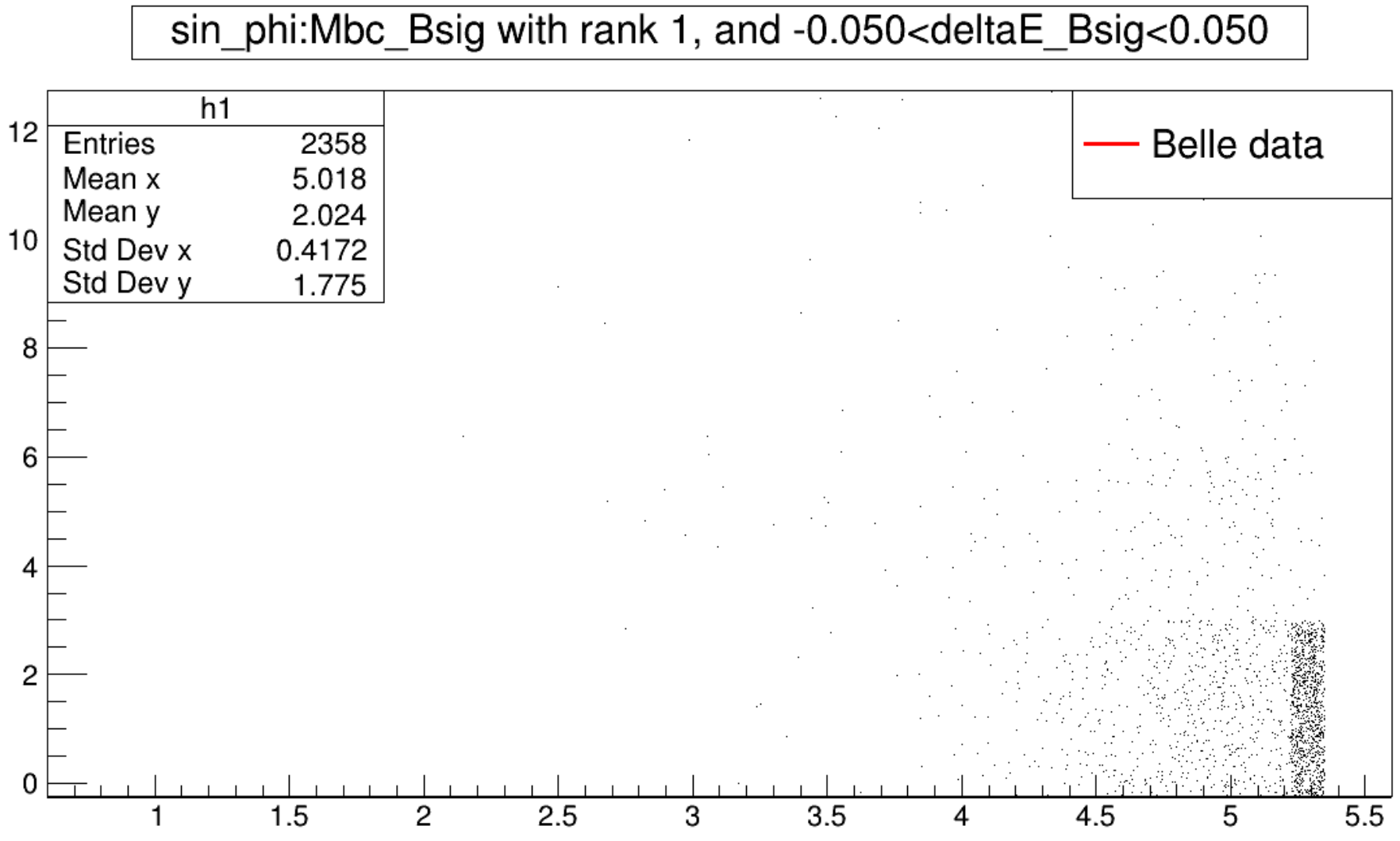
Signal side cuts (root level)

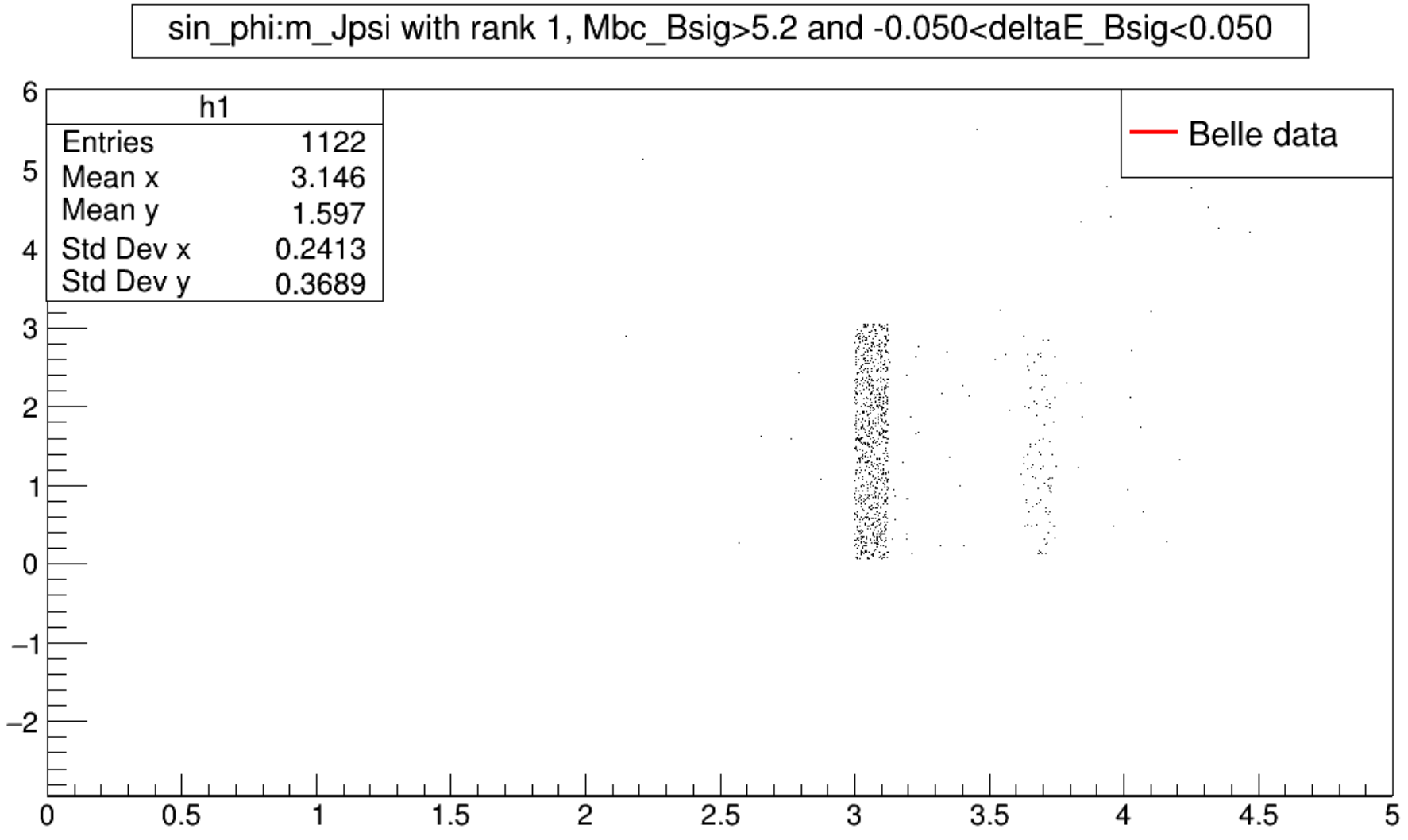
- All applied cuts are mentioned in the title of the plots.

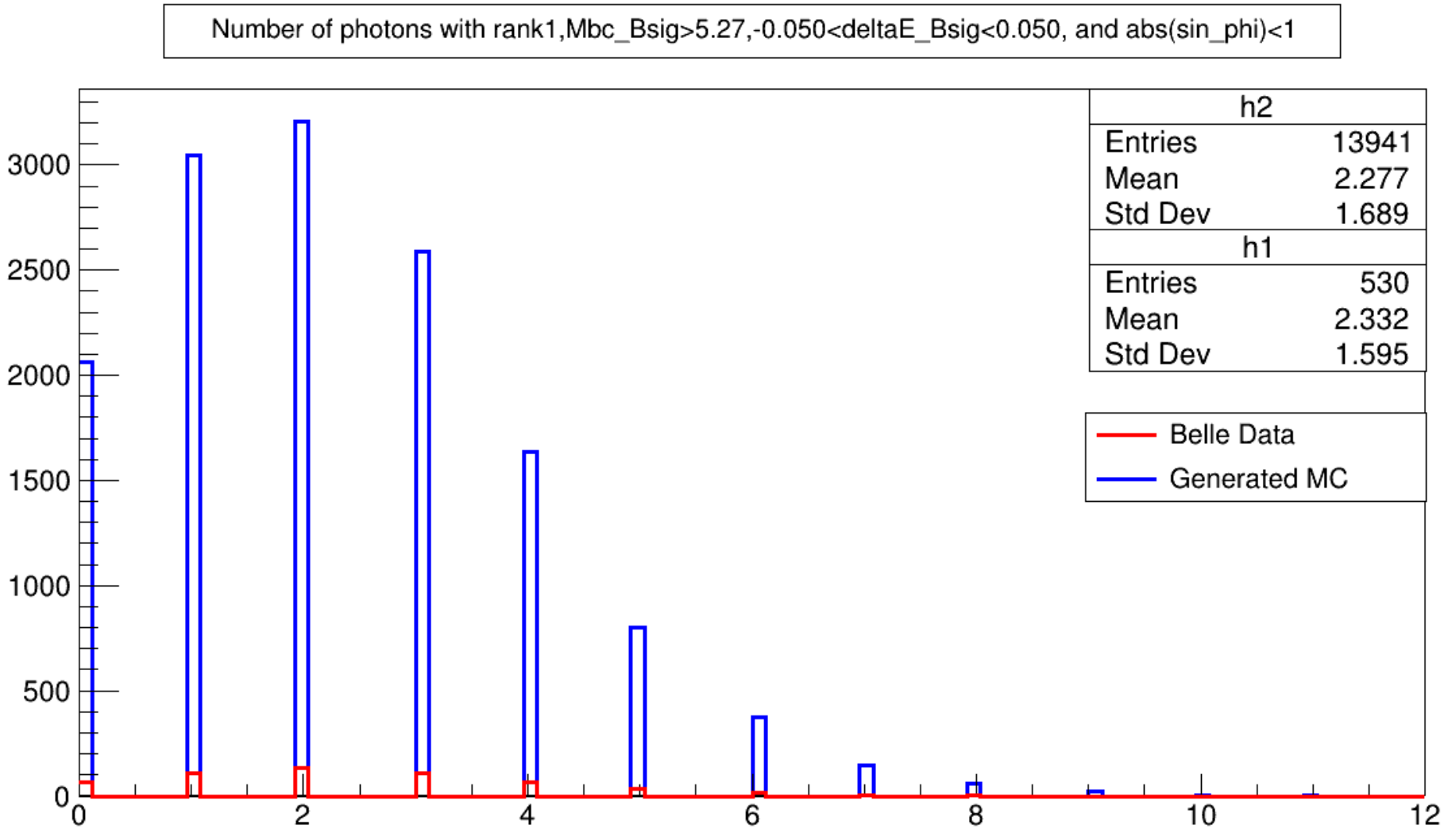
Last meeting comments

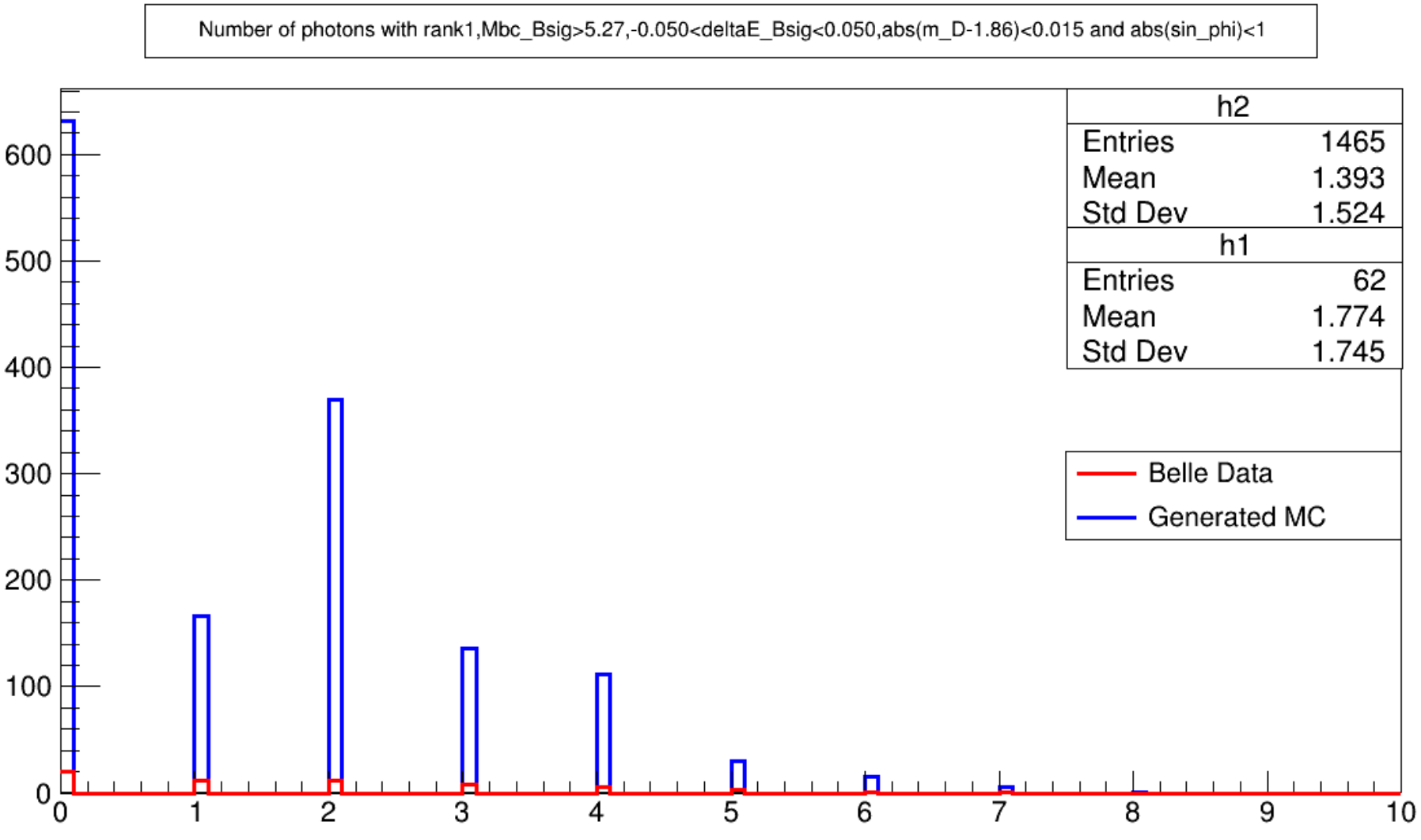
- Sinφ Vs M_{bc} ,Sinφ Vs ΔE_B_{sig} ,Sinφ Vs m(J/Psi) plots.
- Direct cosine angle from B_{sig} momentum to B_{tag} momentum and the sum of best cosine angles for both Belle Data and MC.
- Number of photons for both Belle Data and MC.
- Cuts change on m_hadROE on reconstruction level. (Not done yet)

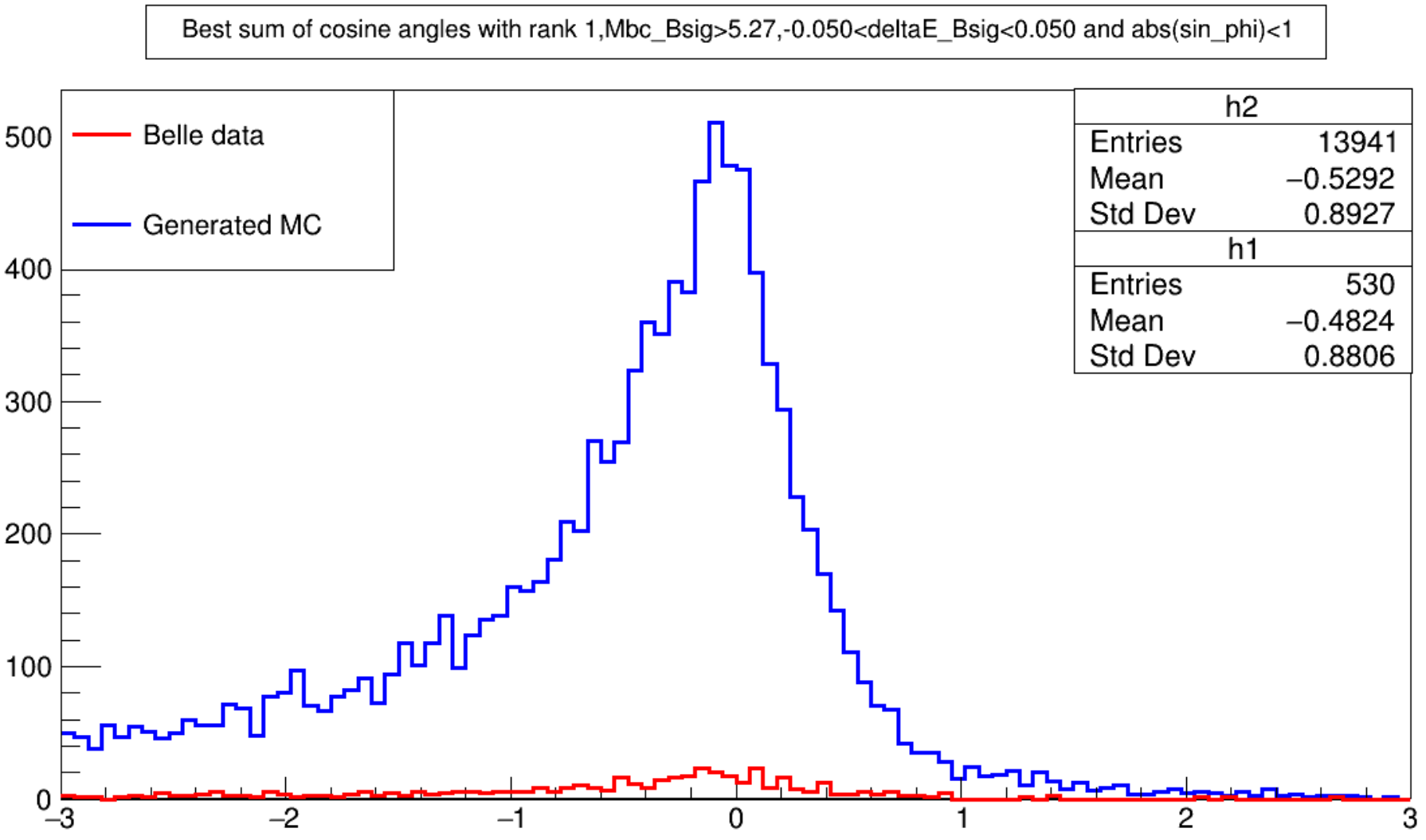

sin_phi:deltaE_Bsig with rank 1, and Mbc_Bsig>5.2
Belle data
h1
Entries 74870
Mean x −0.8515
Mean y −8.031
Std Dev x 0.5658
Std Dev y 73.43
700
600
500
400
300
200
100
0
−100
−4
−2
0
2
4
6

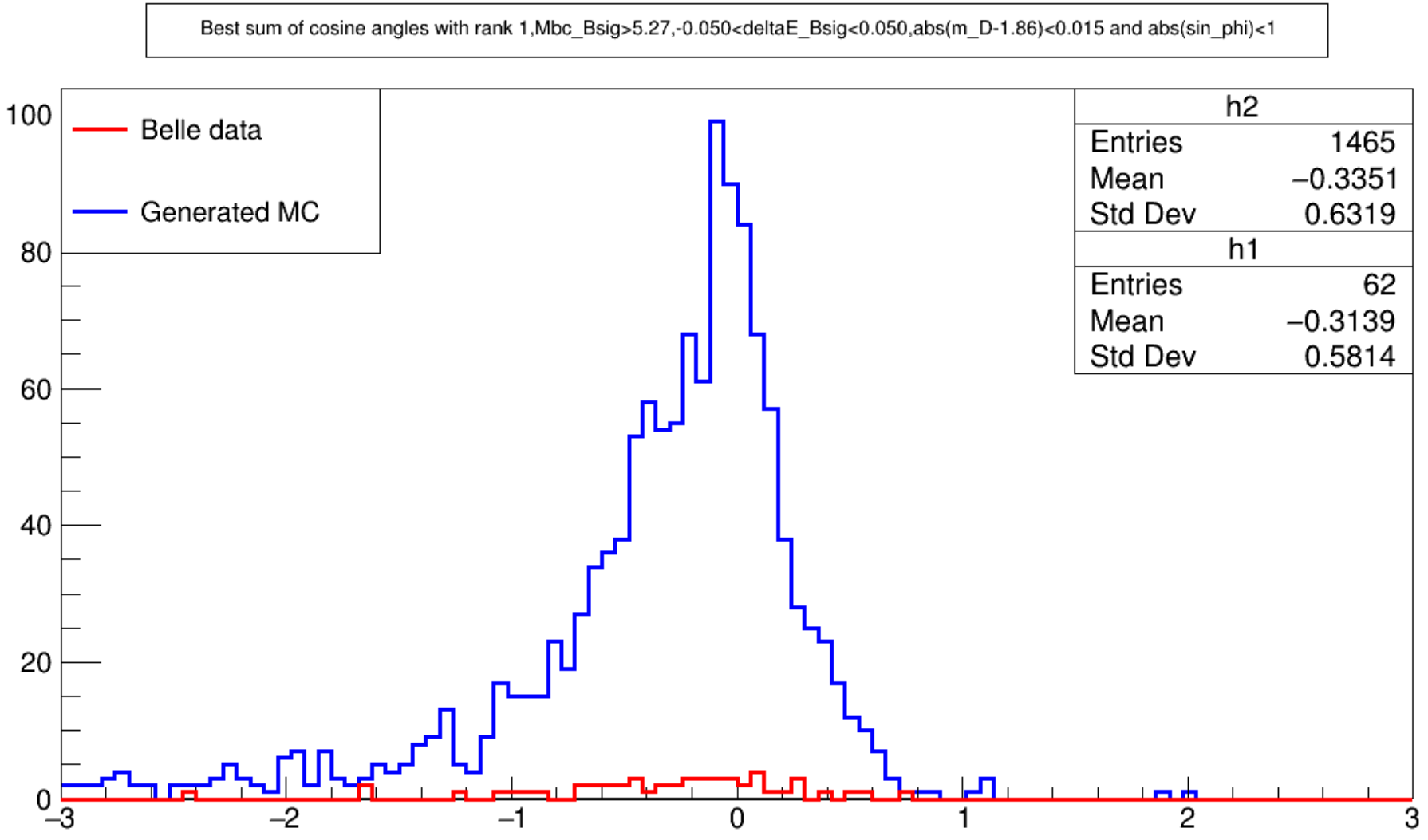

sin_phi:Mbc_Bsig with rank 1, and -0.050<deltaE_Bsig<0.050
h1
Entries 2358
Mean x 5.018
Mean y 2.024
Std Dev x 0.4172
Std Dev y 1.775
Belle data
12
10
8
6
4
2
0
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

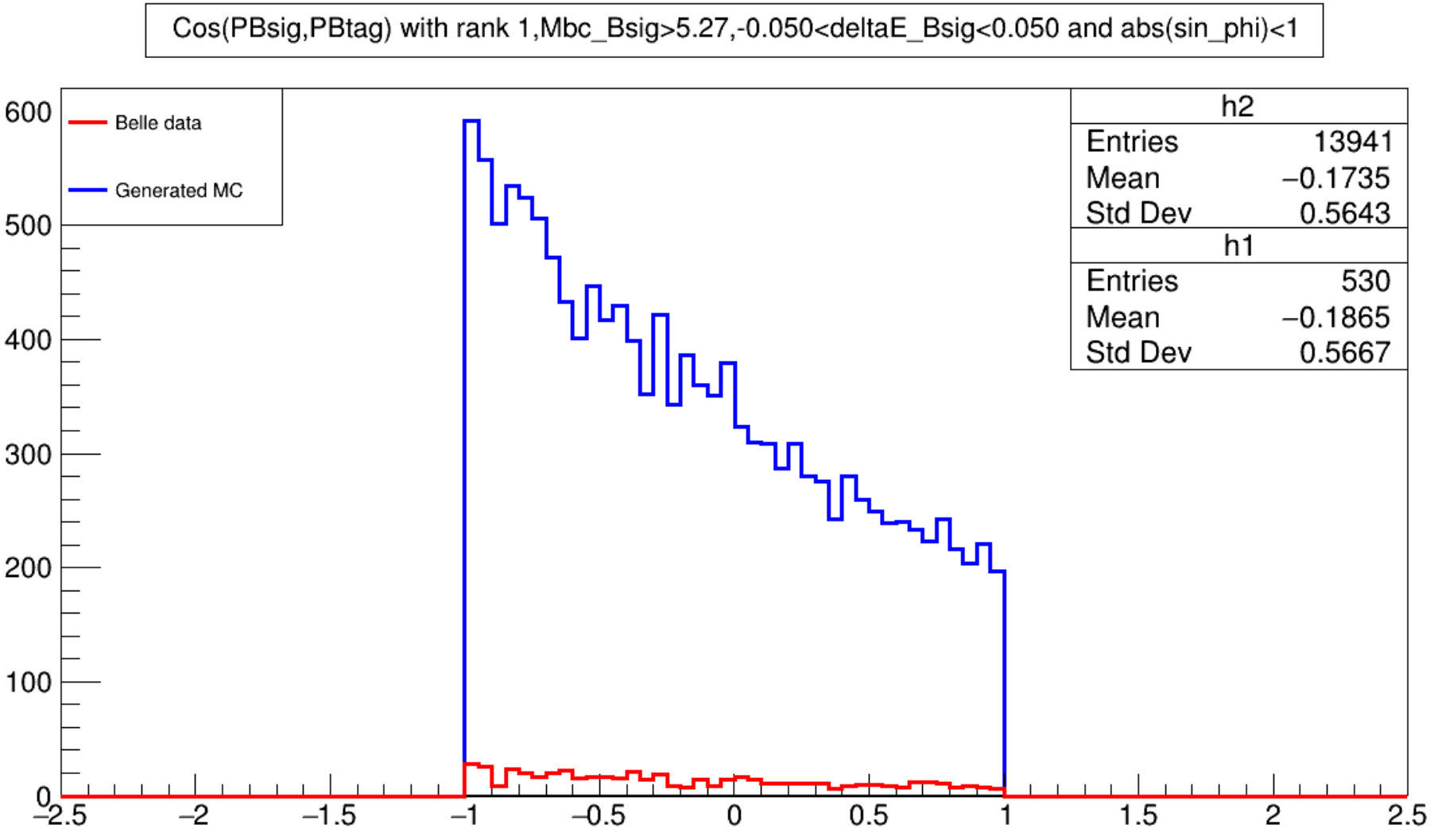

sin_phi:m_Jpsi with rank 1, Mbc_Bsig>5.2 and -0.050<deltaE_Bsig<0.050
h1
Entries 1122
Mean x 3.146
Mean y 1.597
Std Dev x 0.2413
Std Dev y 0.3689
Belle data
6
5
4
3
2
1
0
−1
−2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

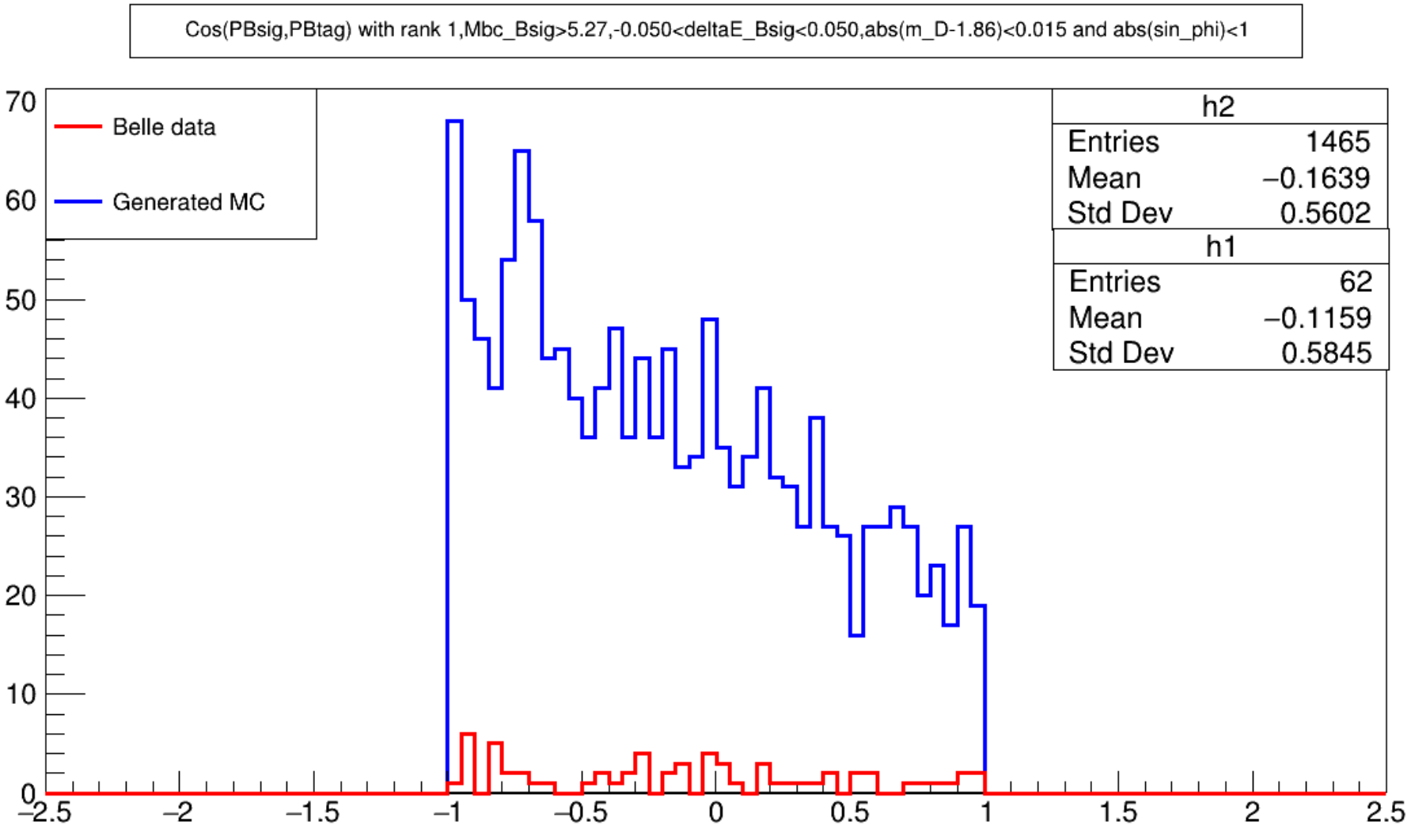

Number of photons with rank1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050, and abs(sin_phi)<1
h2
Entries 13941
Mean 2.277
Std Dev 1.689
h1
Entries 530
Mean 2.332
Std Dev 1.595
Belle Data
Generated MC
3000
2500
2000
1500
1000
500
0
0
2
4
6
8
10
12

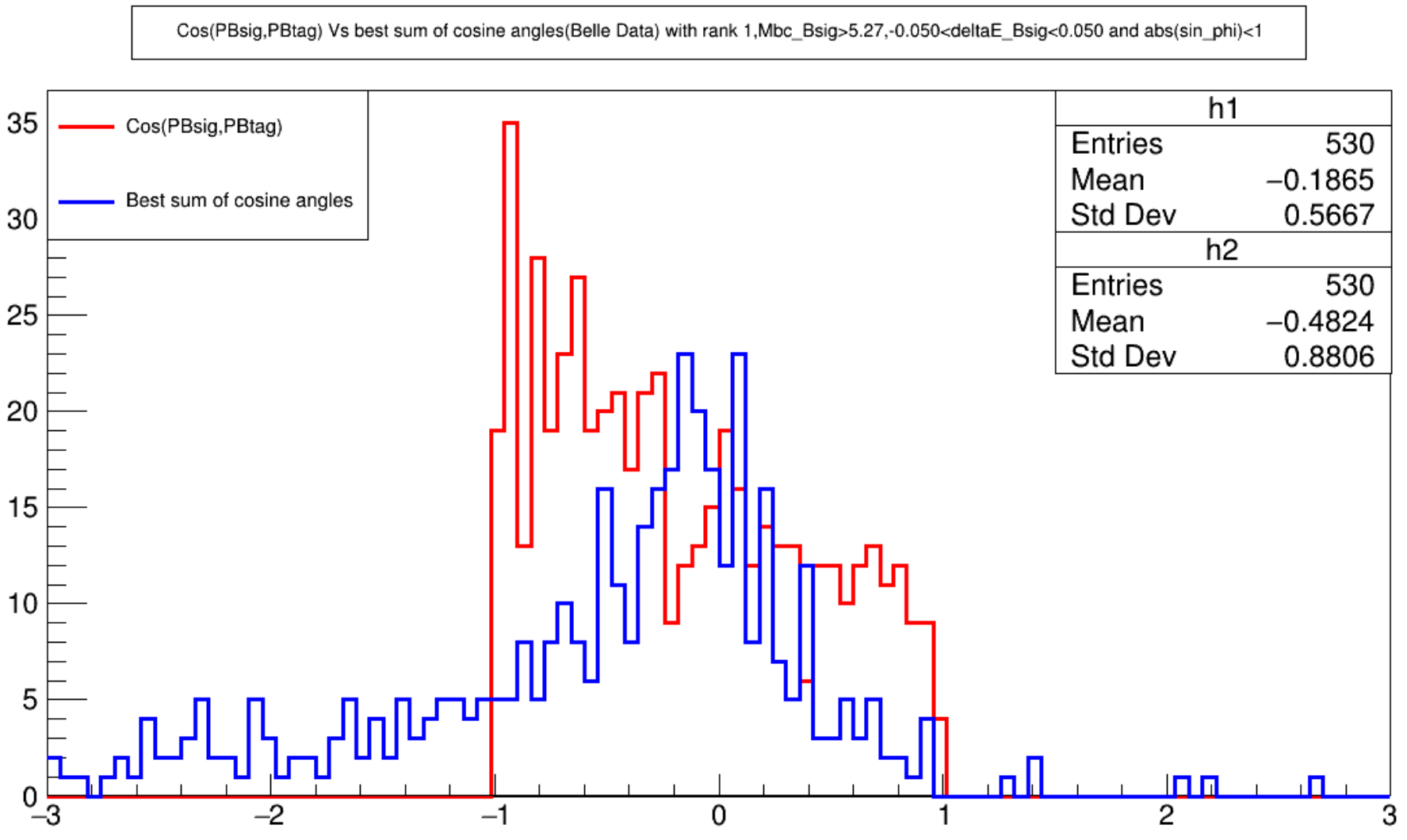

Number of photons with rank1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050,abs(m_D-1.86)<0.015 and abs(sin_phi)<1
h2
Entries 1465
Mean 1.393
Std Dev 1.524
h1
Entries 62
Mean 1.774
Std Dev 1.745
Belle Data
Generated MC
0
100
200
300
400
500
600
0
1
2
3
4
5
6
7
8
9
10

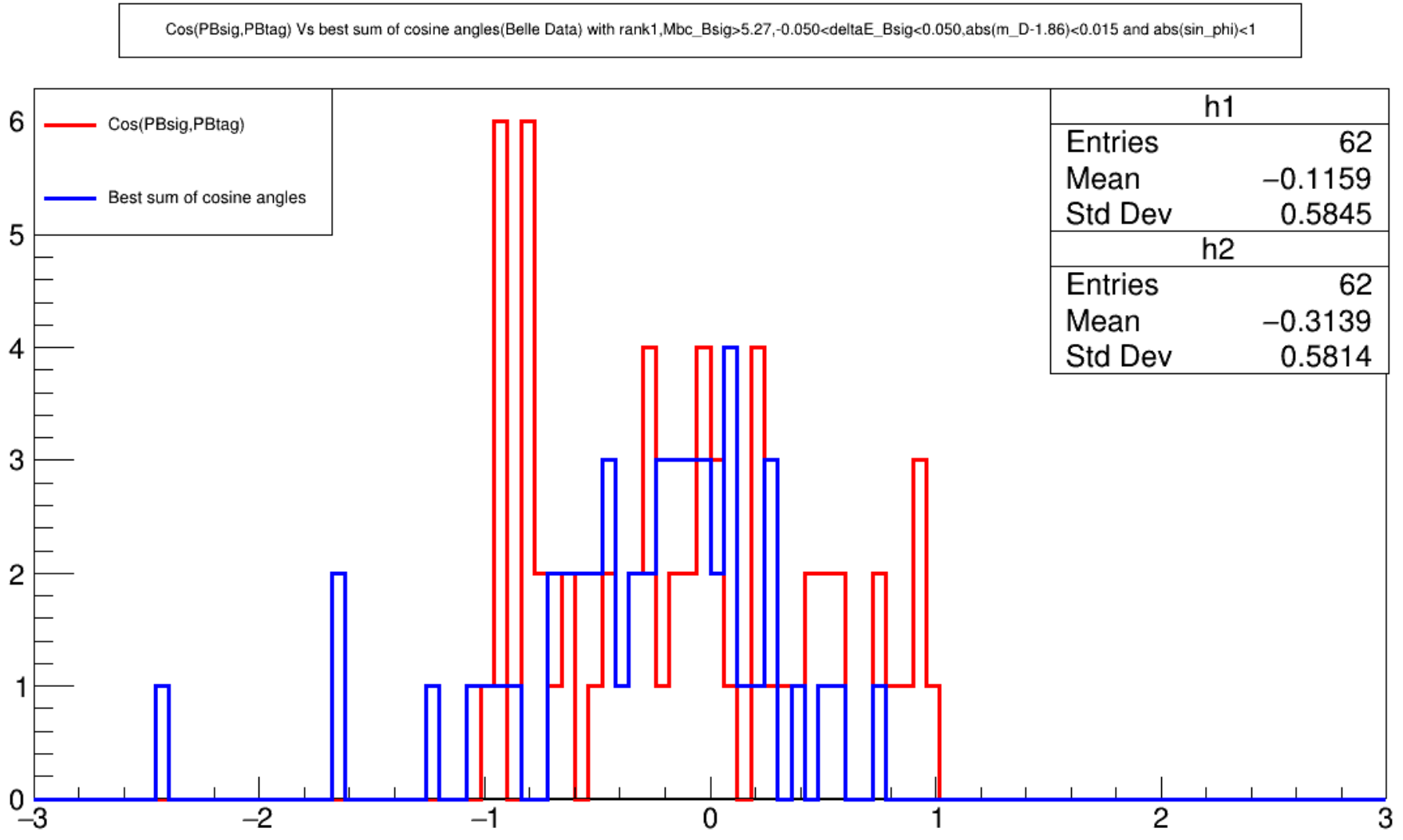

Best sum of cosine angles with rank 1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050 and abs(sin_phi)<1
Belle data
Generated MC
h2
Entries 13941
Mean −0.5292
Std Dev 0.8927
h1
Entries 530
Mean −0.4824
Std Dev 0.8806
500
400
300
200
100
0
−3
−2
−1
0
1
2
3

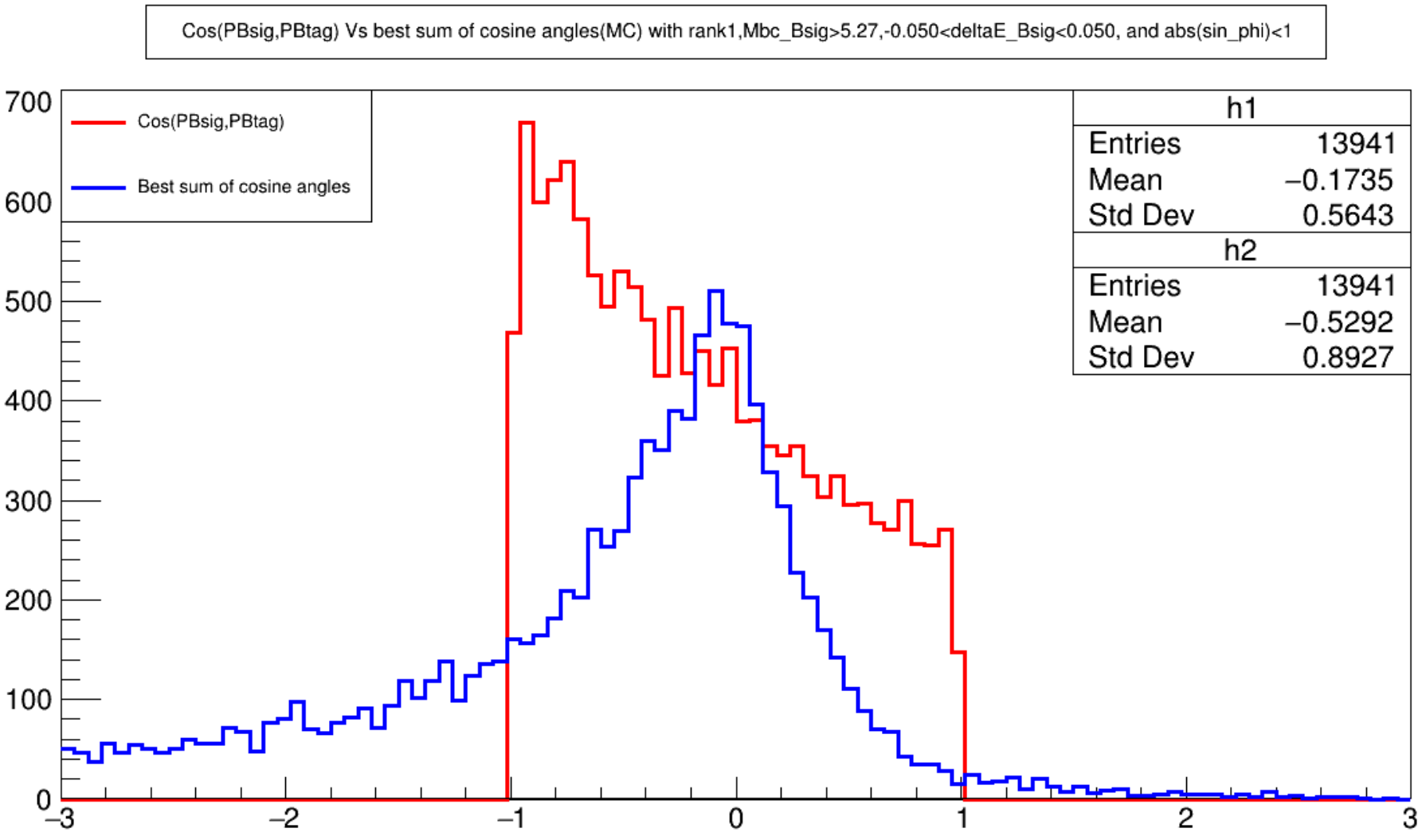

Best sum of cosine angles with rank 1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050,abs(m_D-1.86)<0.015 and abs(sin_phi)<1
Belle data
Generated MC
h2
Entries 1465
Mean −0.3351
Std Dev 0.6319
h1
Entries 62
Mean −0.3139
Std Dev 0.5814
100
80
60
40
20
0
−3
−2
−1
0
1
2
3

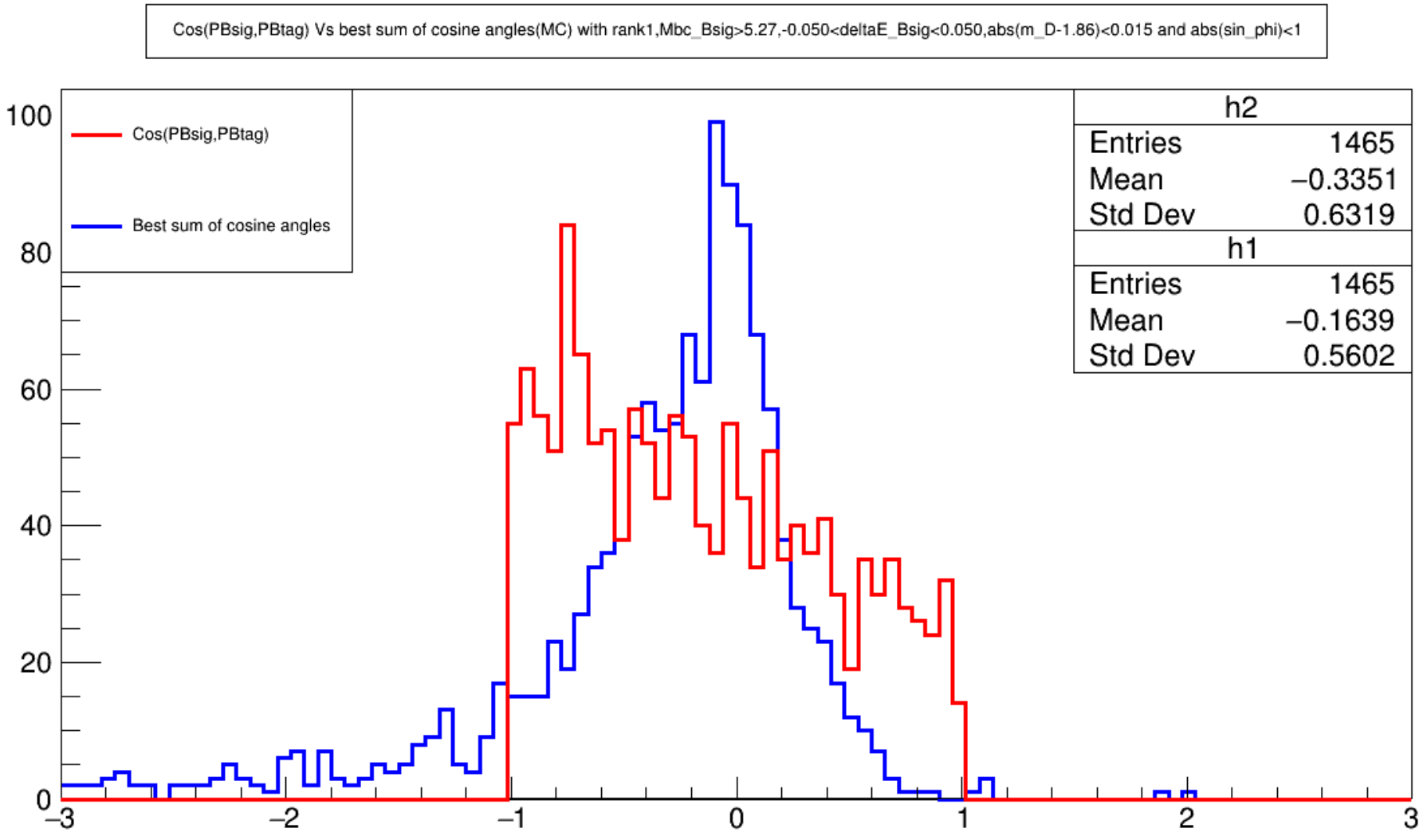

Cos(PBsig,PBtag) with rank 1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050 and abs(sin_phi)<1
Belle data
Generated MC
h2
Entries 13941
Mean −0.1735
Std Dev 0.5643
h1
Entries 530
Mean −0.1865
Std Dev 0.5667
600
500
400
300
200
100
0
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
2.5


Cos(PBsig,PBtag) with rank 1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050,abs(m_D-1.86)<0.015 and abs(sin_phi)<1
Belle data
Generated MC
h2
Entries 1465
Mean −0.1639
Std Dev 0.5602
h1
Entries 62
Mean −0.1159
Std Dev 0.5845
70
60
50
40
30
20
10
0
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
2.5


Cos(PBsig,PBtag) Vs best sum of cosine angles(Belle Data) with rank 1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050 and abs(sin_phi)<1
Cos(PBsig,PBtag)
Best sum of cosine angles
h1
Entries 530
Mean −0.1865
Std Dev 0.5667
h2
Entries 530
Mean −0.4824
Std Dev 0.8806
35
30
25
20
15
10
5
0
−3
−2
−1
0
1
2
3


Cos(PBsig,PBtag) Vs best sum of cosine angles(Belle Data) with rank1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050,abs(m_D-1.86)<0.015 and abs(sin_phi)<1
Cos(PBsig,PBtag)
Best sum of cosine angles
h1
Entries 62
Mean −0.1159
Std Dev 0.5845
h2
Entries 62
Mean −0.3139
Std Dev 0.5814
0
1
2
3
4
5
6
−3
−2
−1
0
1
2
3


Cos(PBsig,PBtag) Vs best sum of cosine angles(MC) with rank1,Mbc_Bsig>5.27,-0.050<deltaE_Bsig<0.050, and abs(sin_phi)<1
Cos(PBsig,PBtag)
Best sum of cosine angles
h1
Entries 13941
Mean −0.1735
Std Dev 0.5643
h2
Entries 13941
Mean −0.5292
Std Dev 0.8927
700
600
500
400
300
200
100
0
−3
−2
−1
0
1
2
3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Cos(PBsig,PBtag)
Best sum of cosine angles
h2
Entries 1465
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h1
Entries 1465
Mean −0.1639
Std Dev 0.5602
100
80
60
40
20
0
−3
−2
−1
0
1
2
3