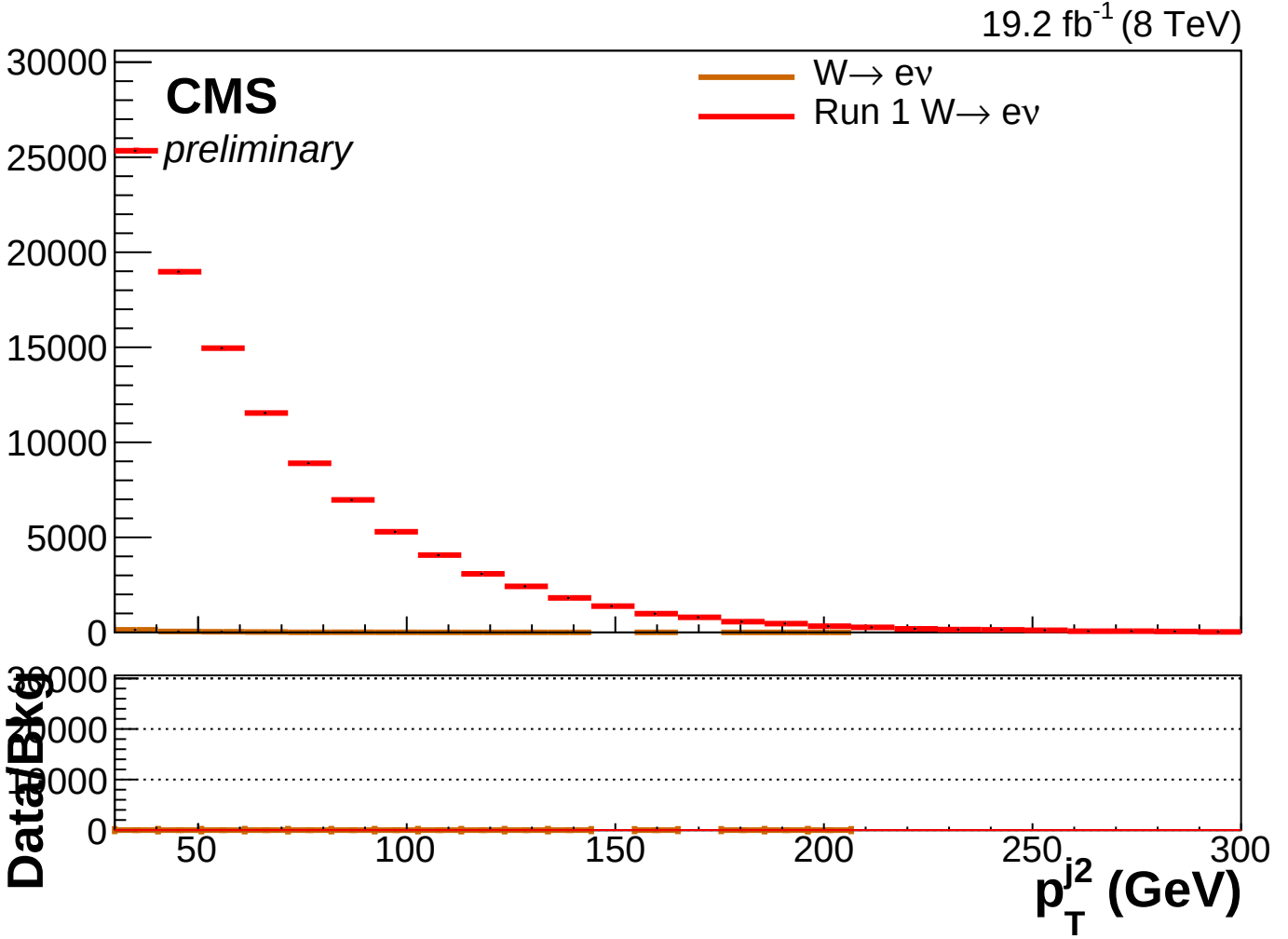
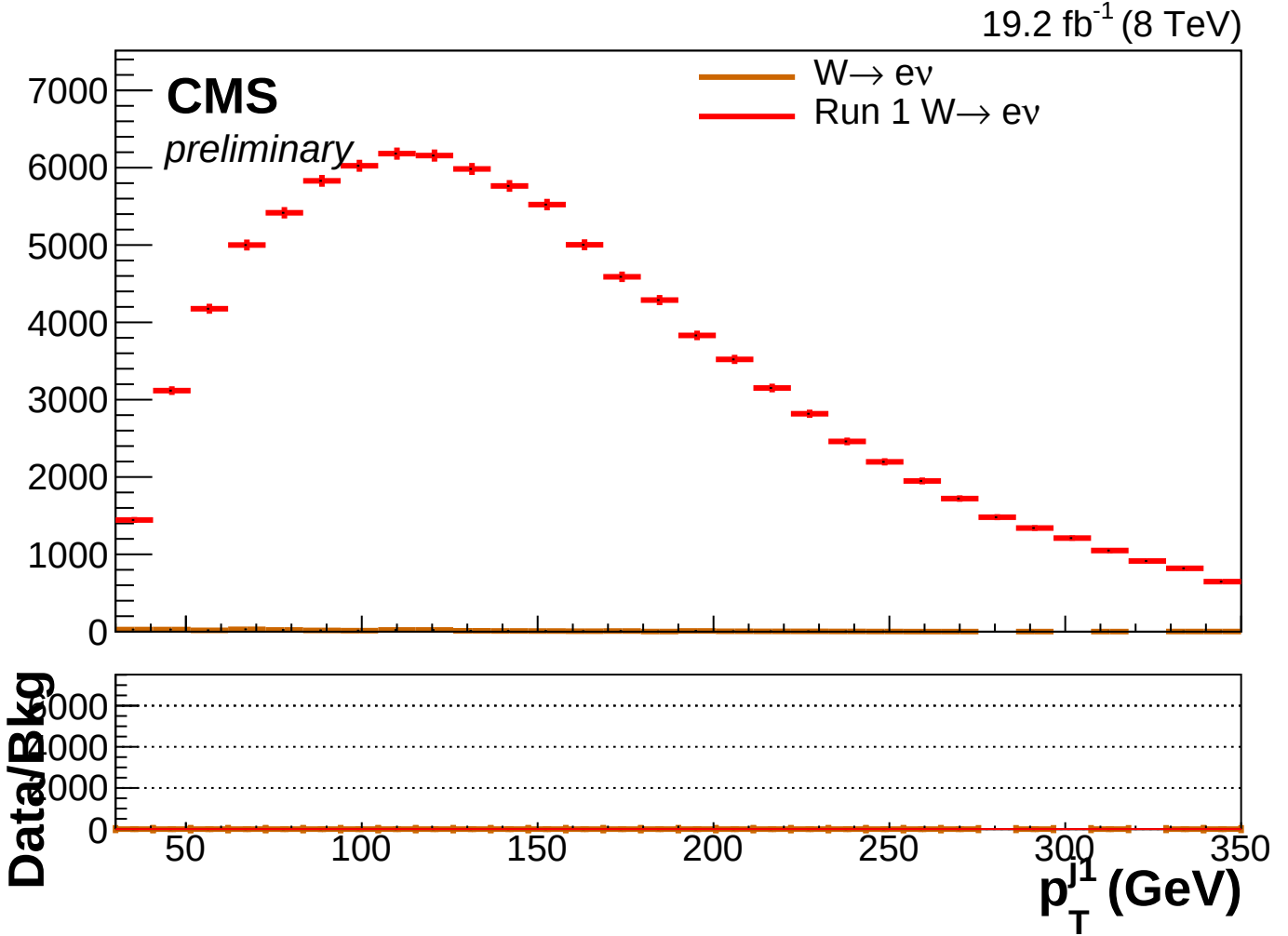
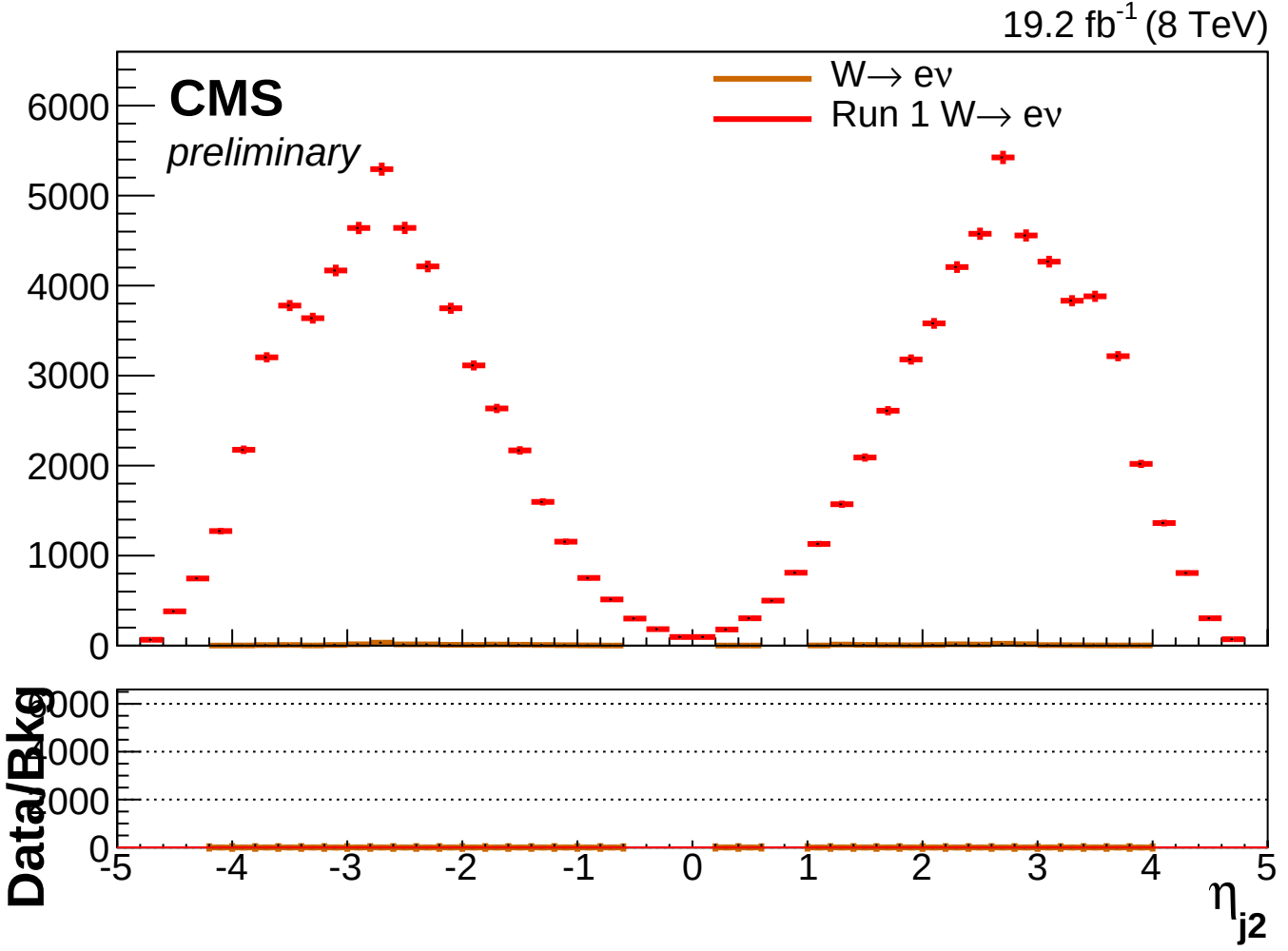
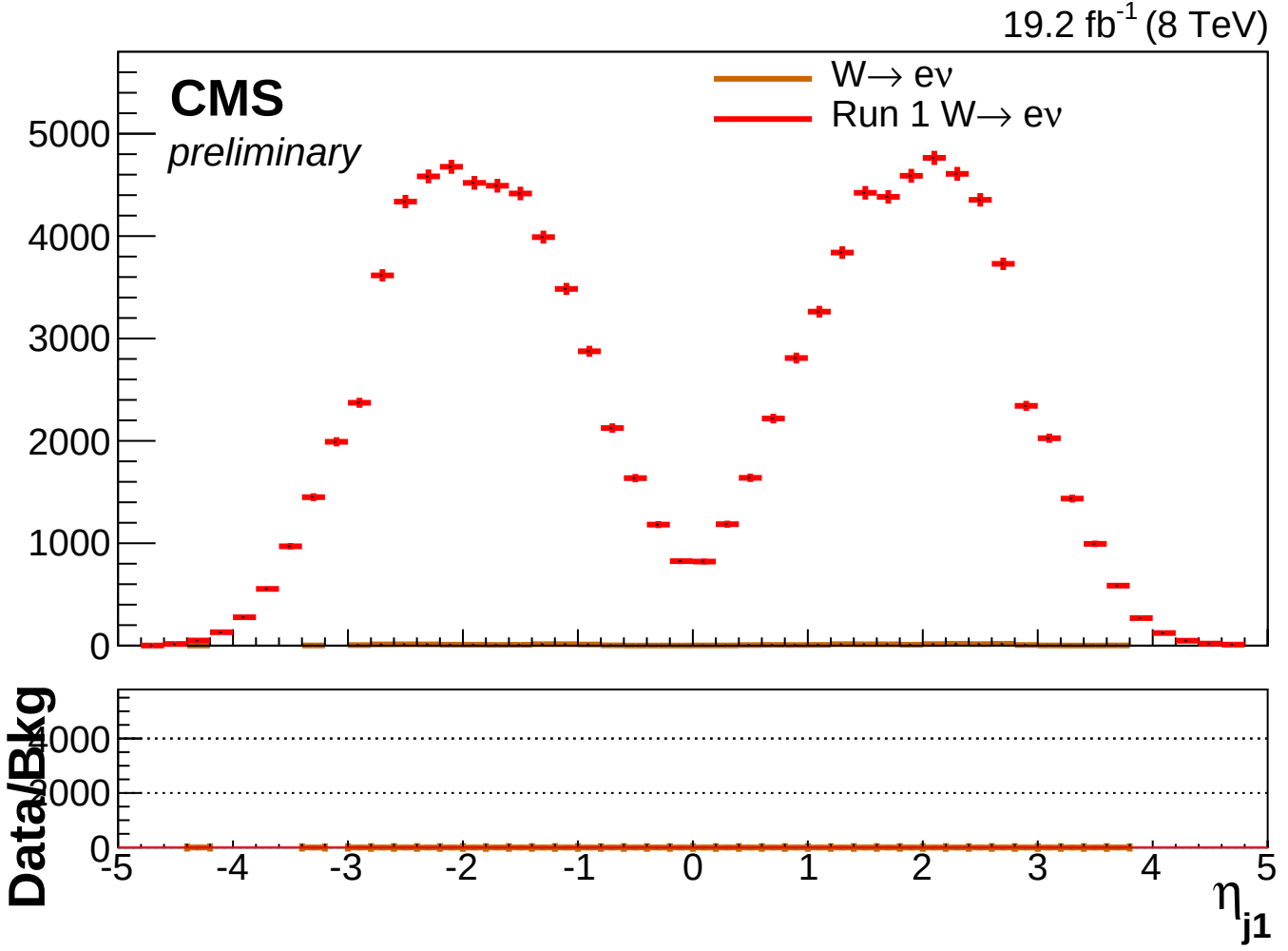
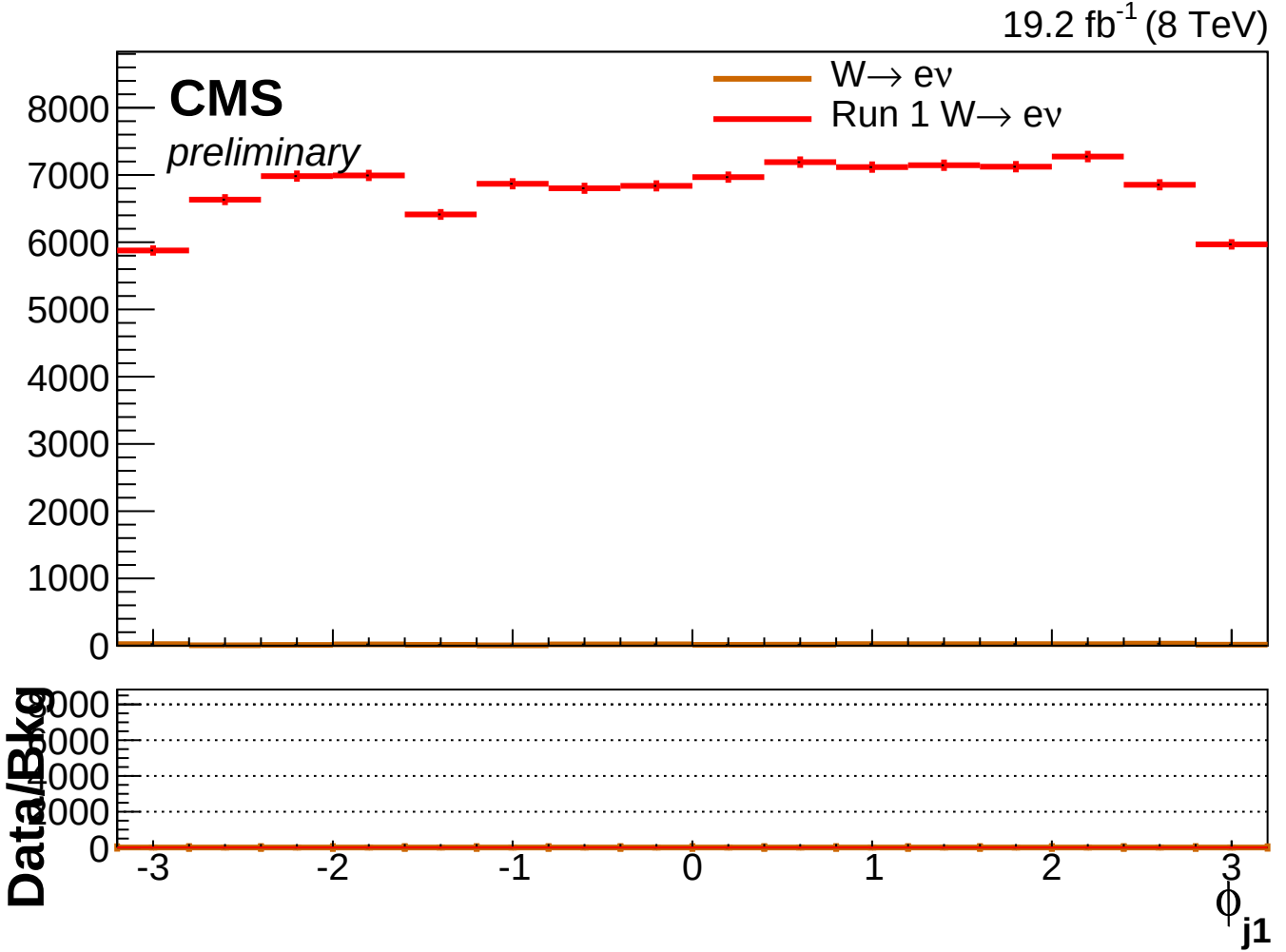
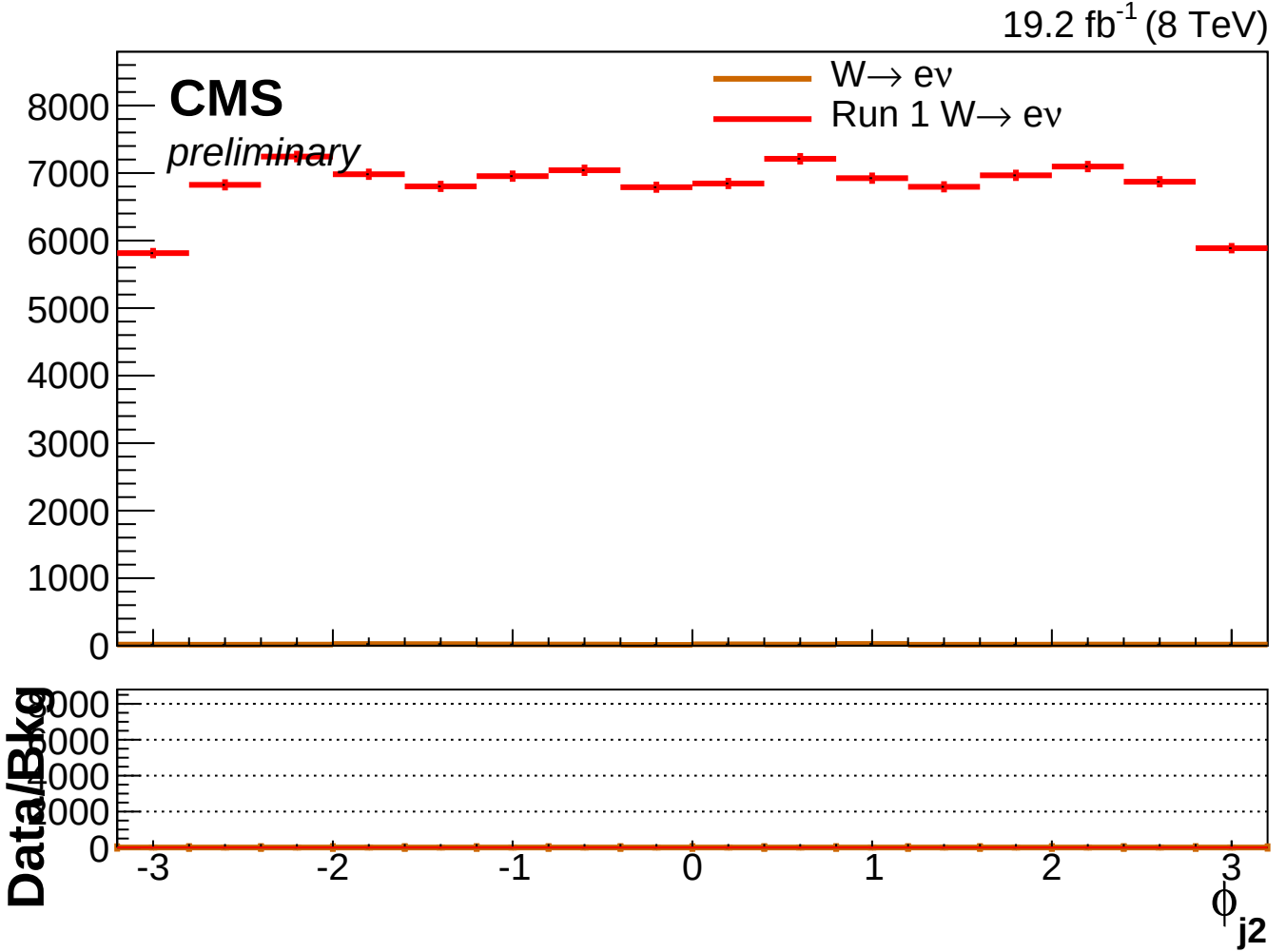

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
30000
25000
20000
15000
10000
5000
0
Data/BKG
50
100
150
200
250
300
pj2T (GeV)

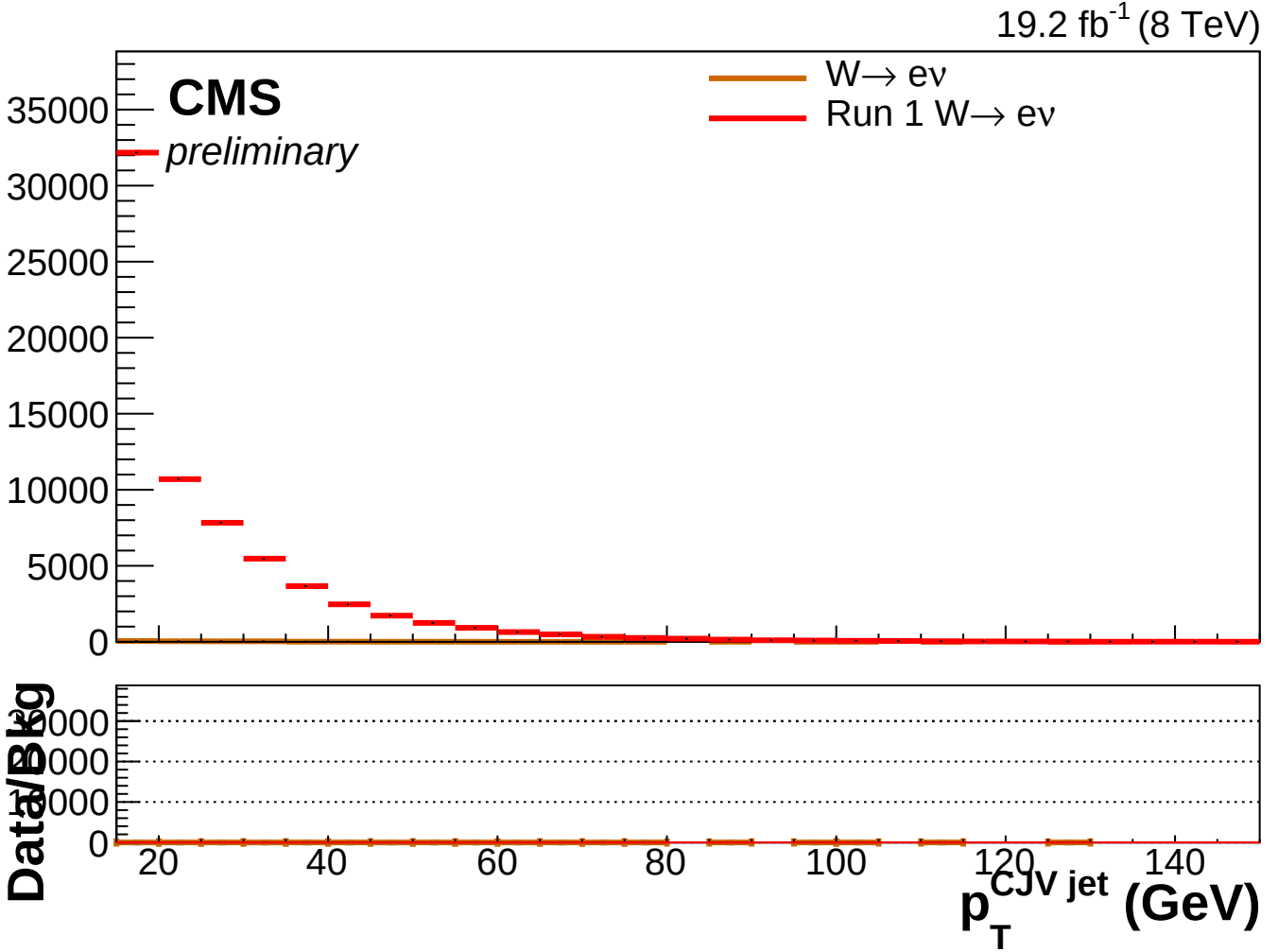

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1000
0
50
100
150
200
250
300
350
pJ1T (GeV)

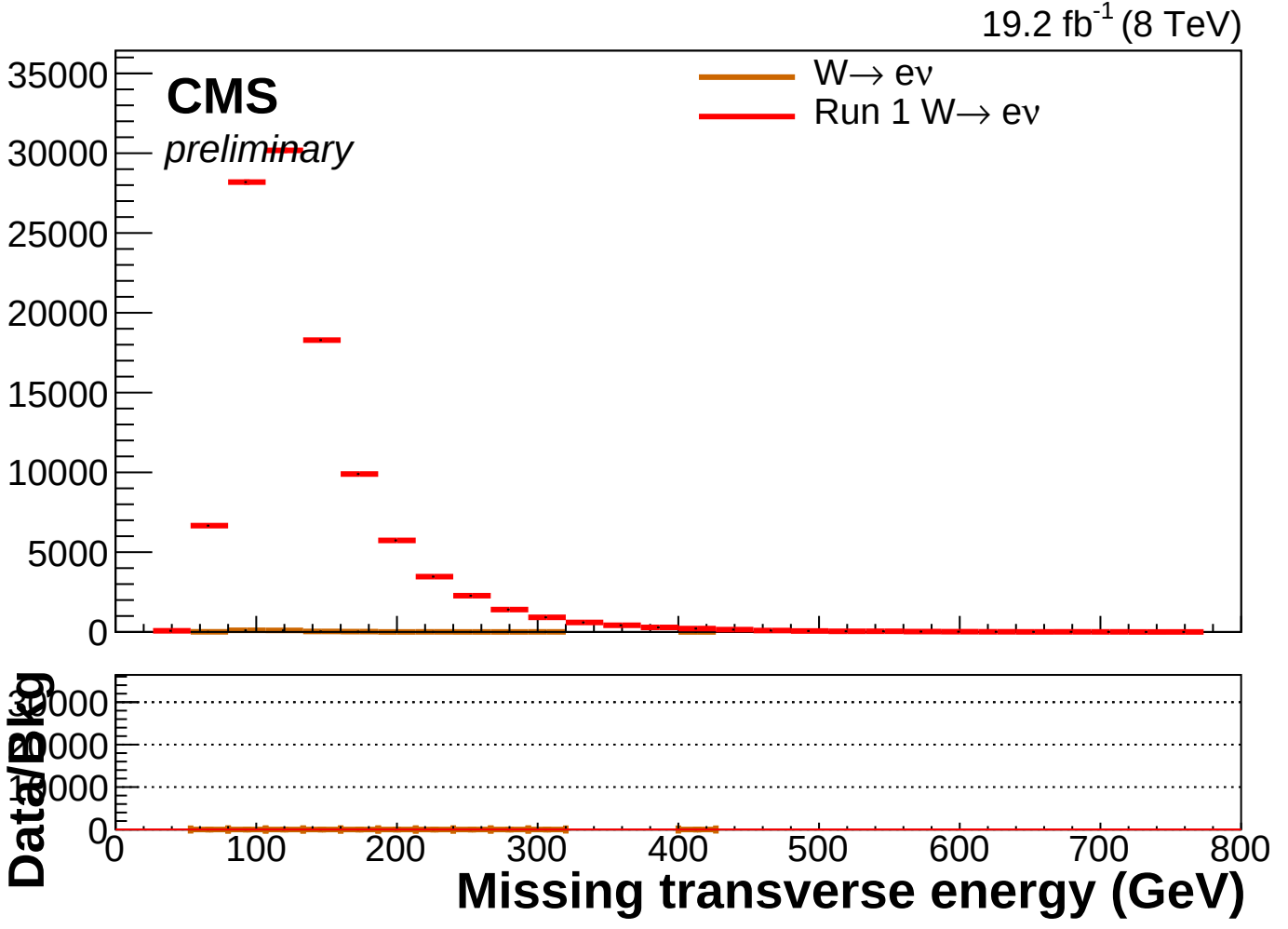

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
6000
5000
4000
3000
2000
1000
0
Data/Bkg
-5
-4
-3
-2
-1
0
1
2
3
4
5
ηj2

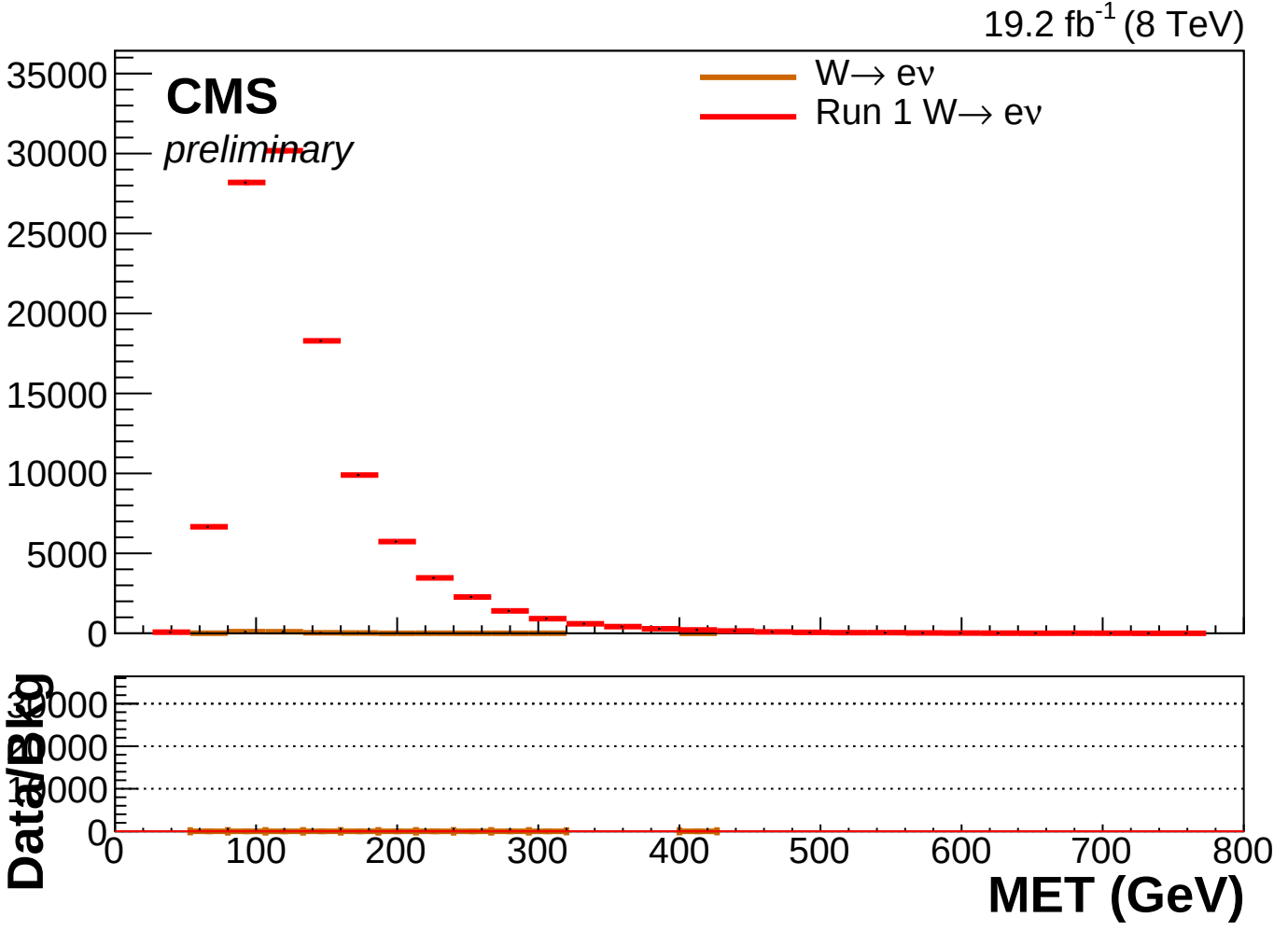

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1000
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
ηj1

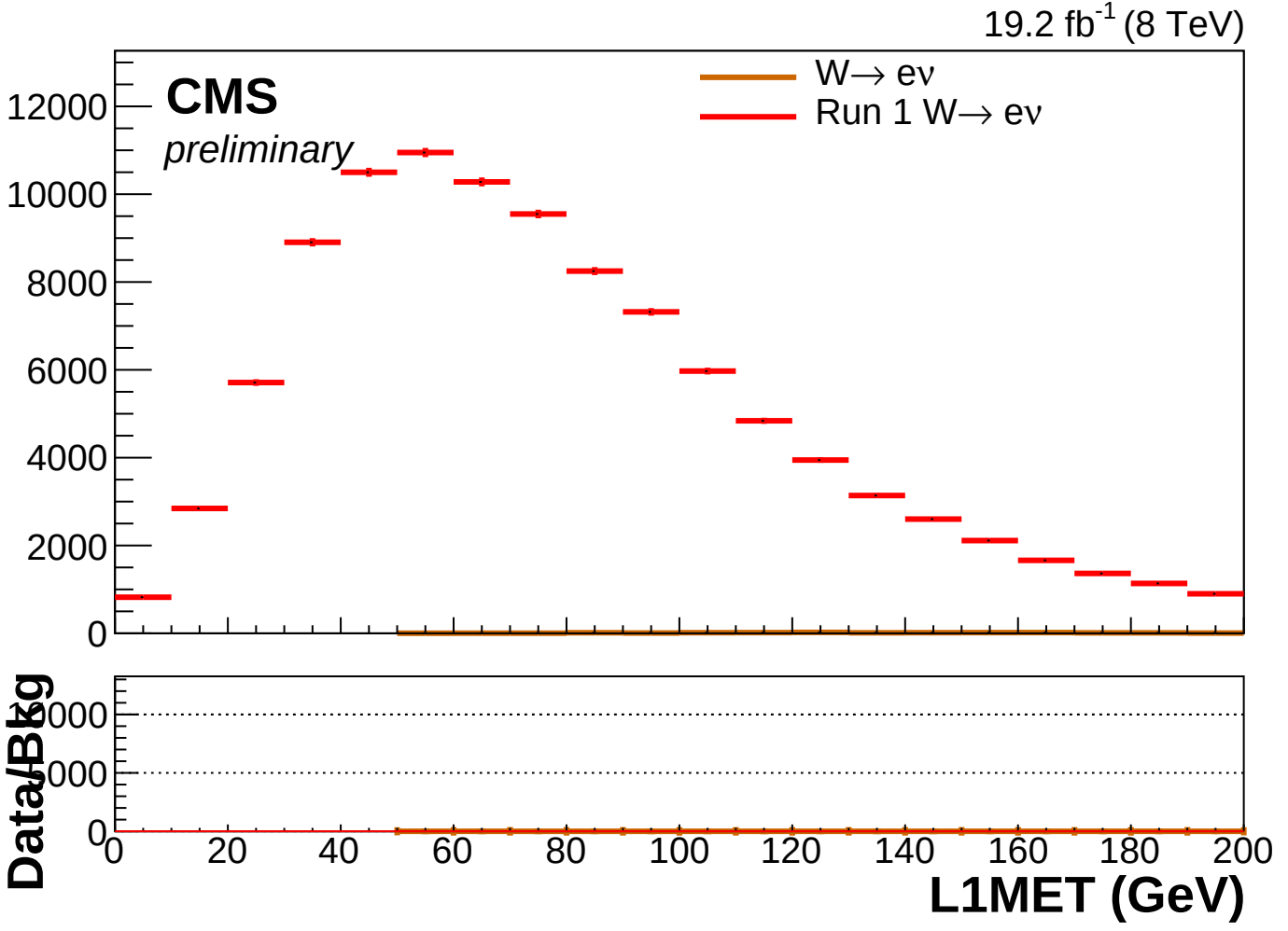

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
8000
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
-3
-2
-1
0
1
2
3
φj1

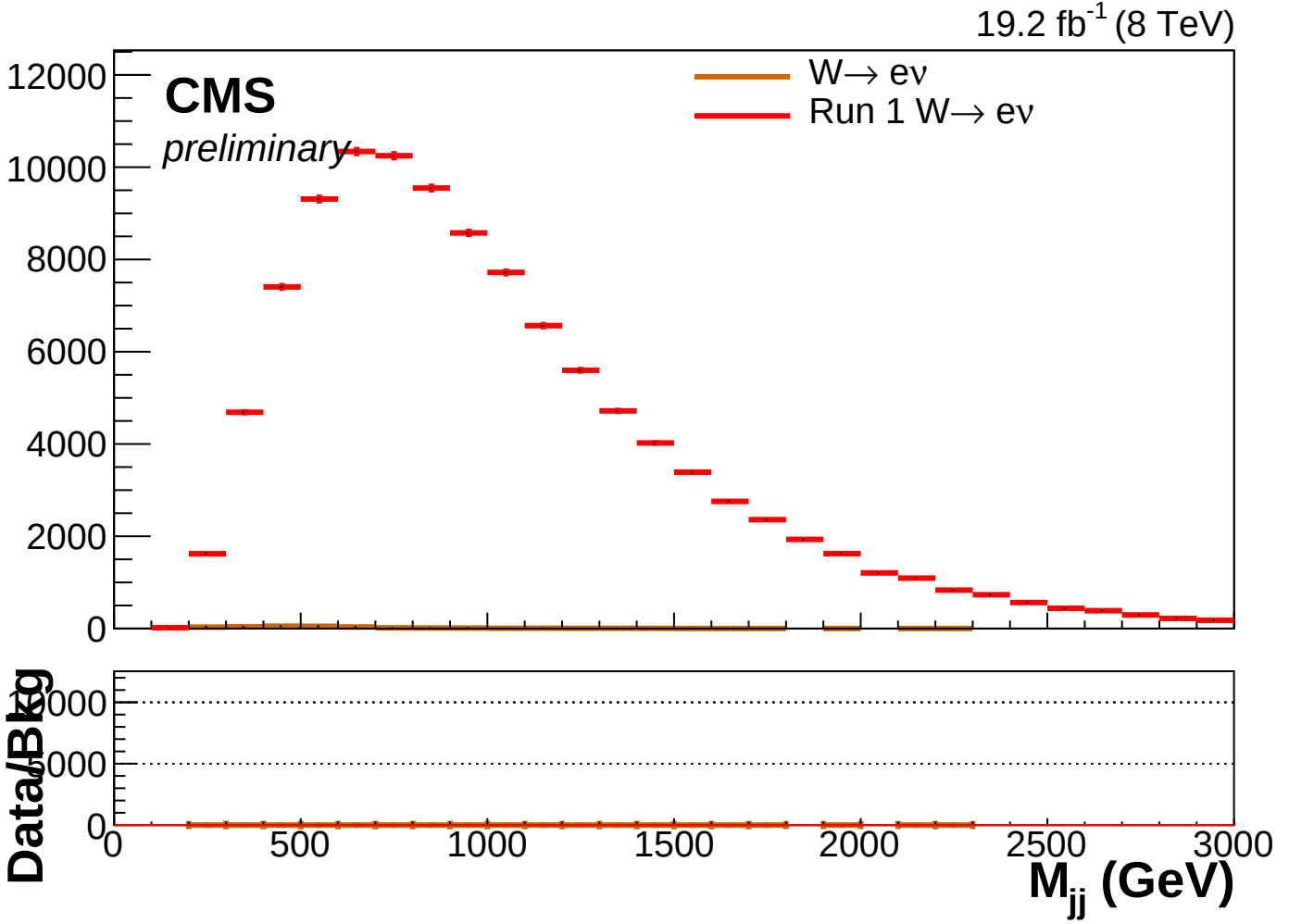

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
8000
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
-3
-2
-1
0
1
2
3
φj2

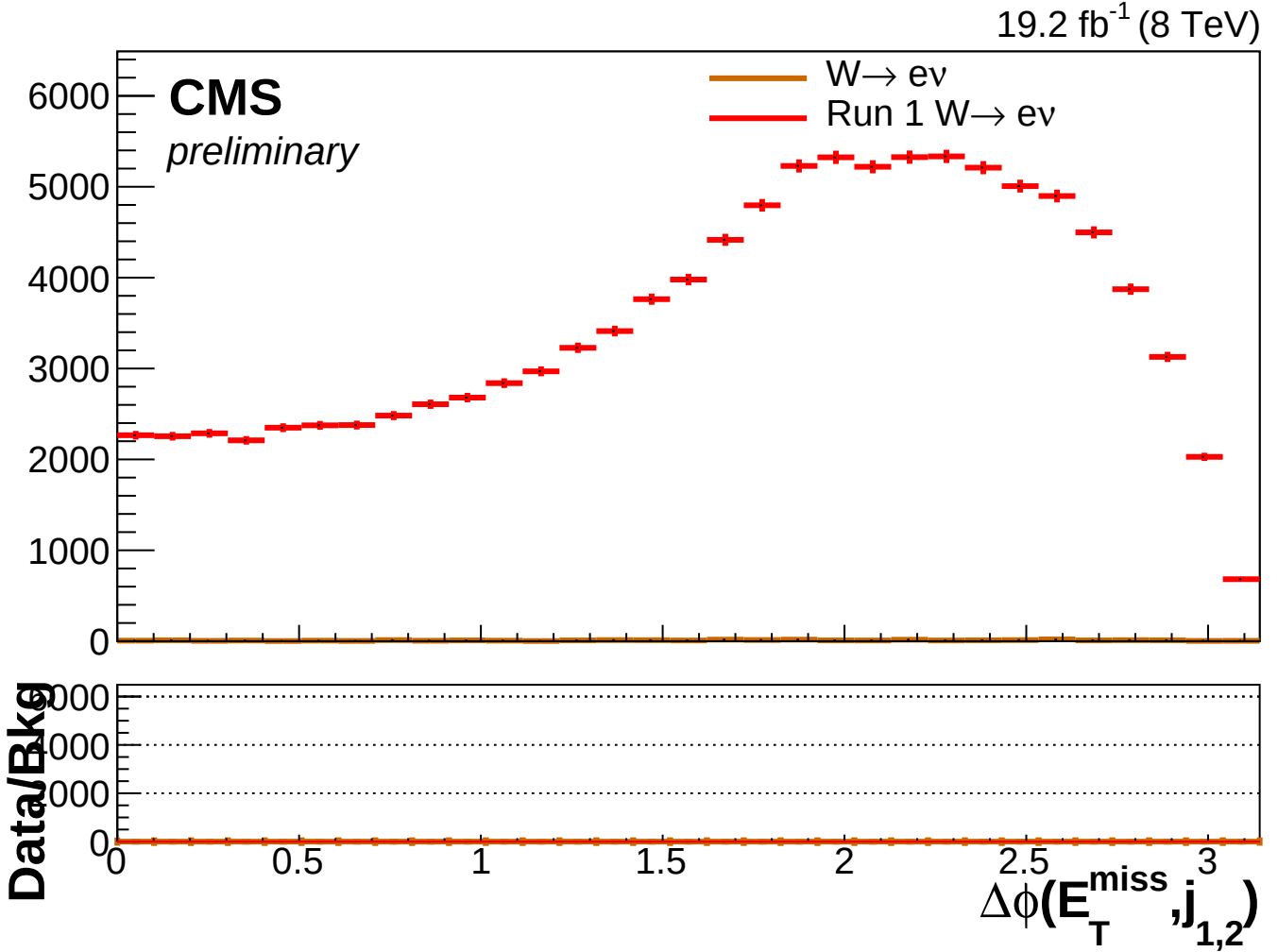

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
35000
30000
25000
20000
15000
10000
5000
0
Data/Bkg
20
40
60
80
100
120
140
pTCJV jet (GeV)

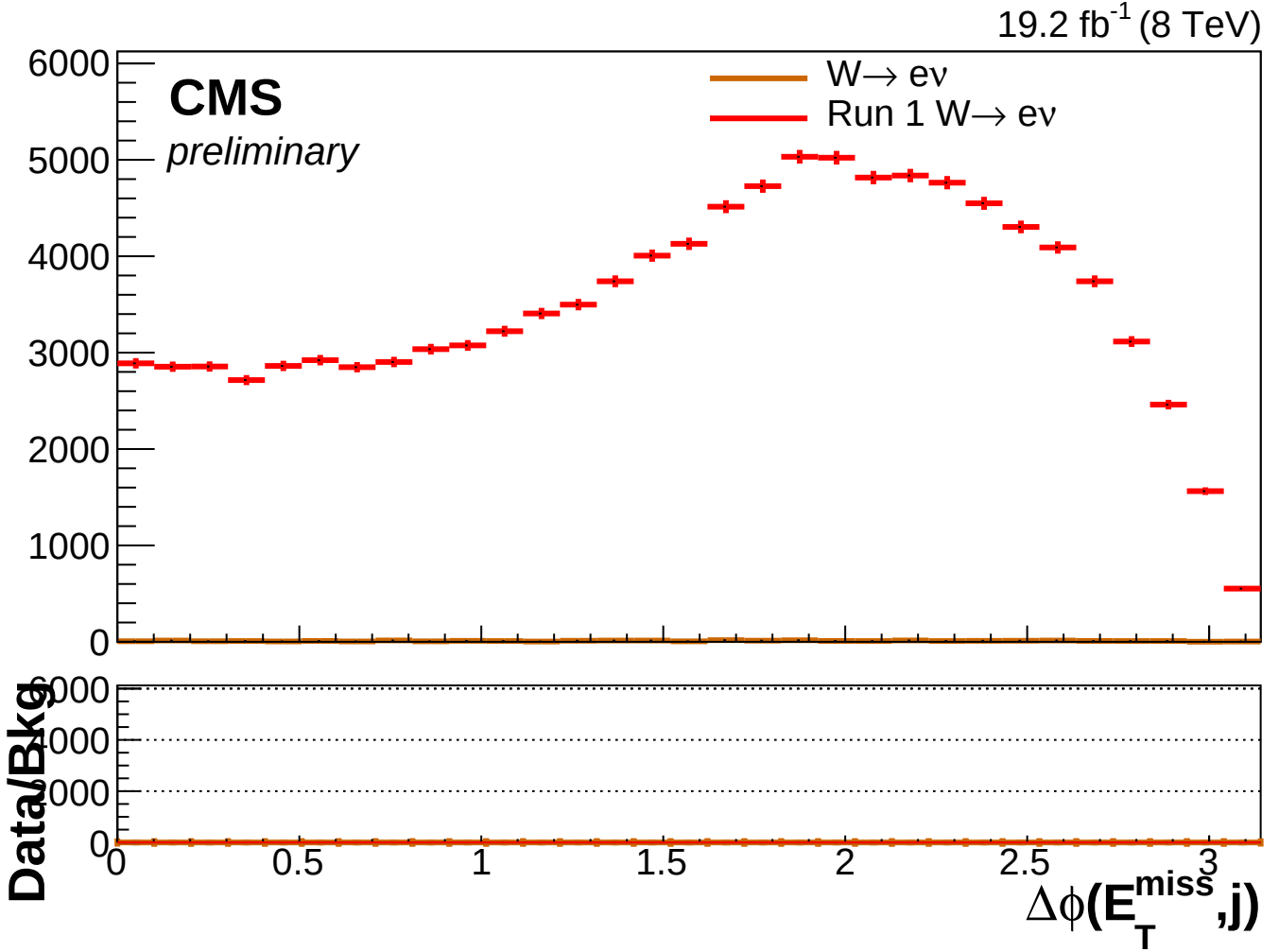

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
35000
30000
25000
20000
15000
10000
5000
0
Data/Bkg
0
100
200
300
400
500
600
700
800
Missing transverse energy (GeV)

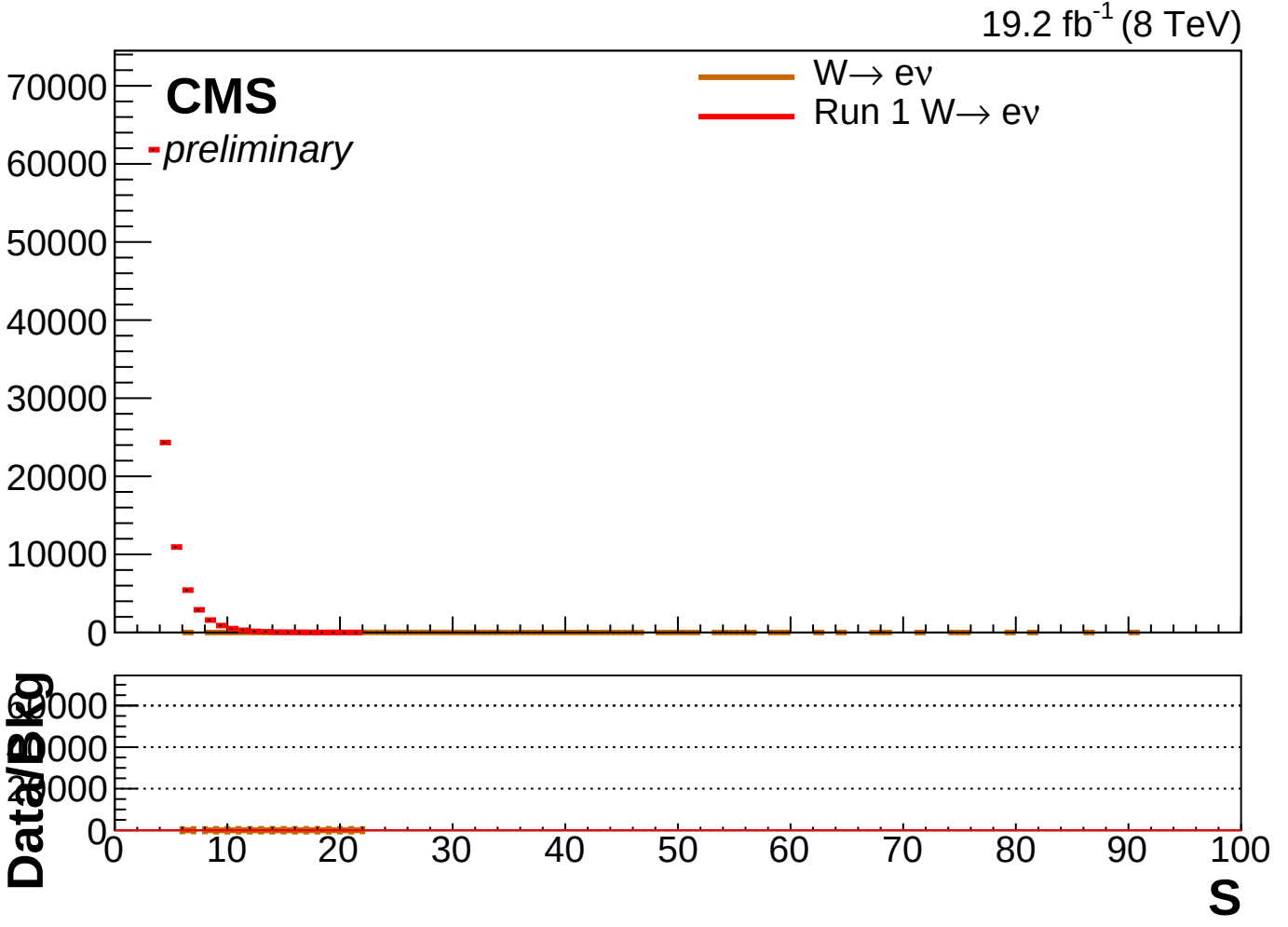

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
35000
30000
25000
20000
15000
10000
5000
0
Data/Bkg
2
1
0
0
100
200
300
400
500
600
700
800
MET (GeV)

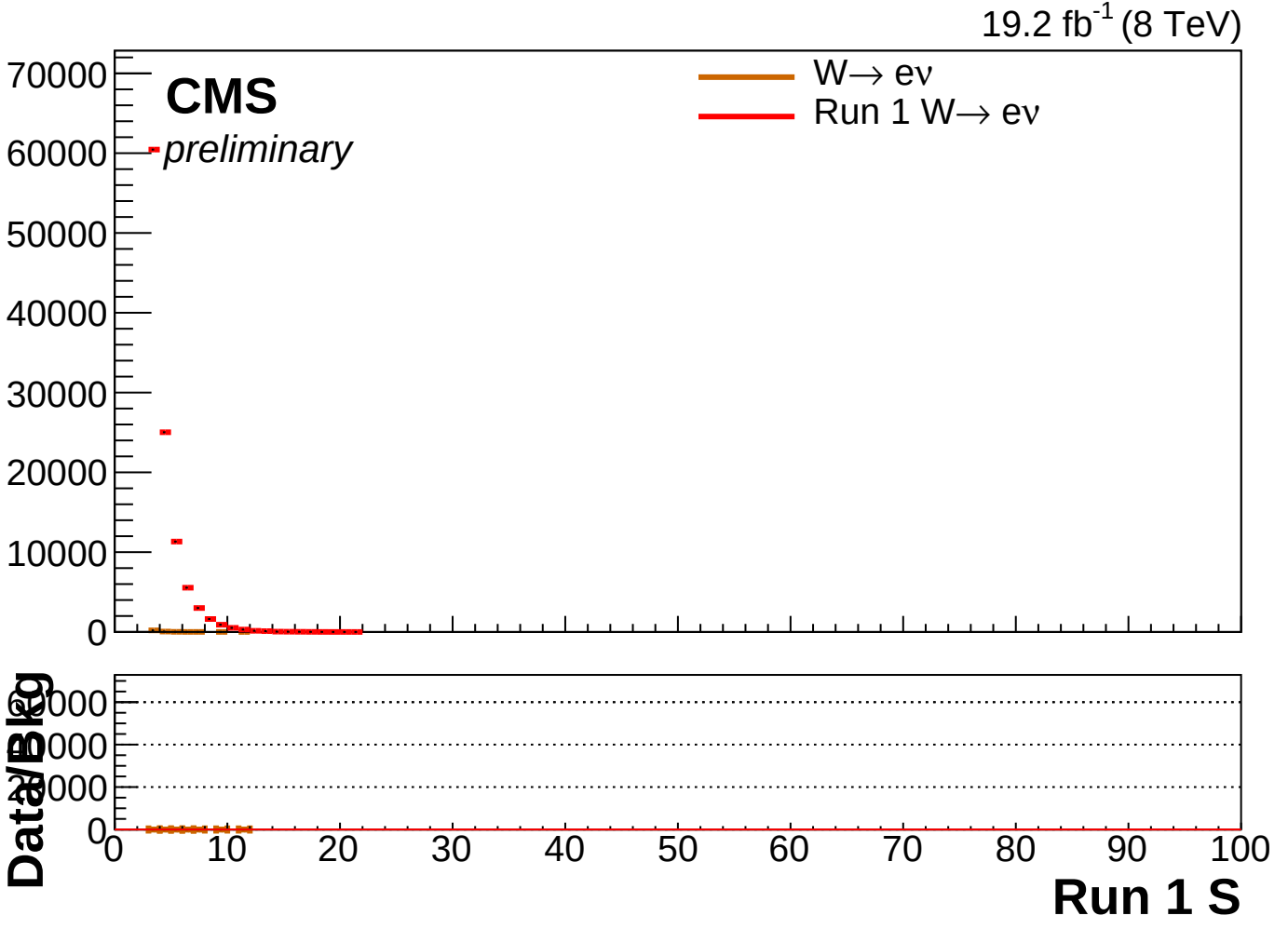

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2
1
0
0
20
40
60
80
100
120
140
160
180
200
L1MET (GeV)

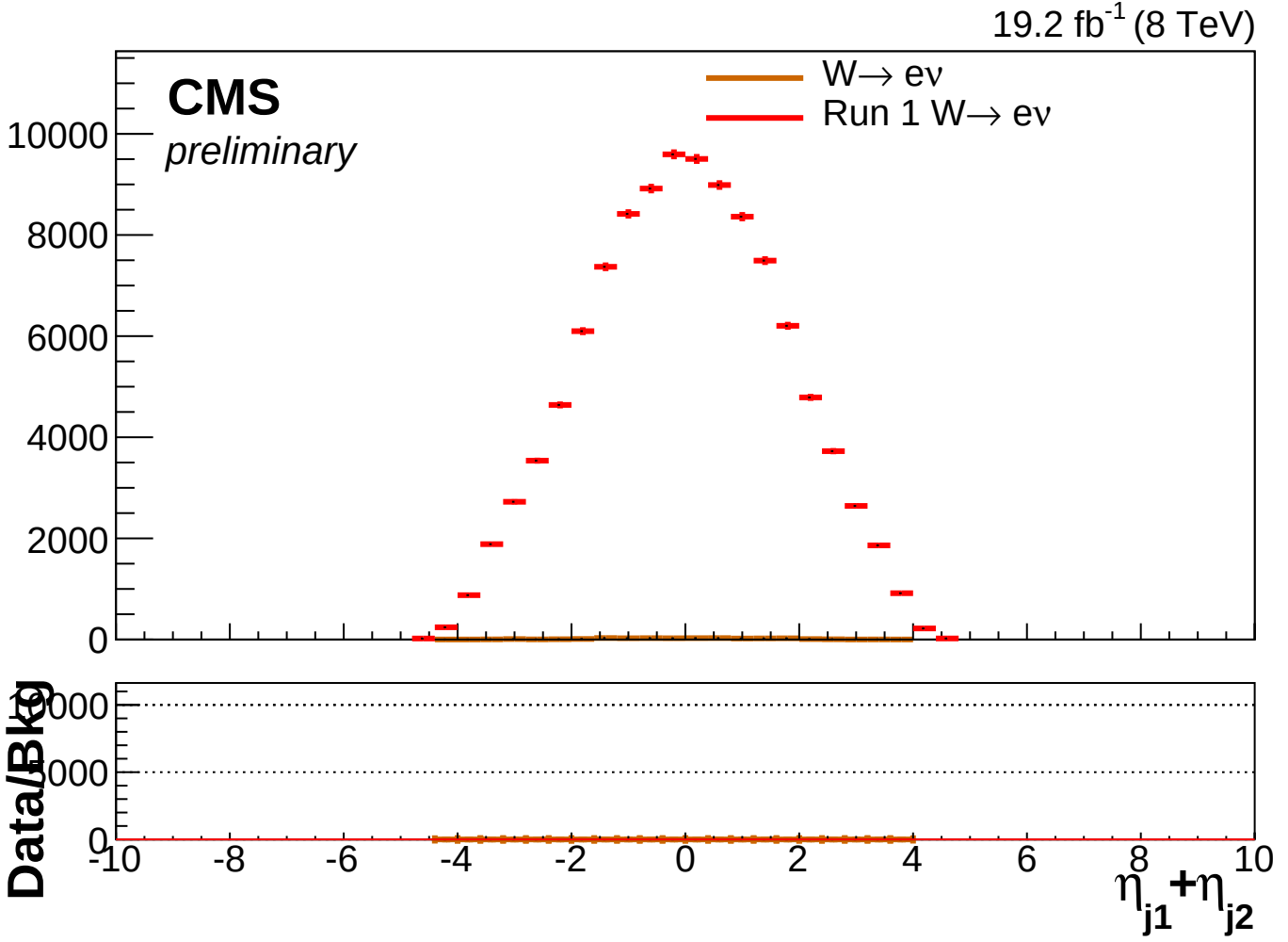

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2000
0
0
500
1000
1500
2000
2500
3000
Mjj (GeV)

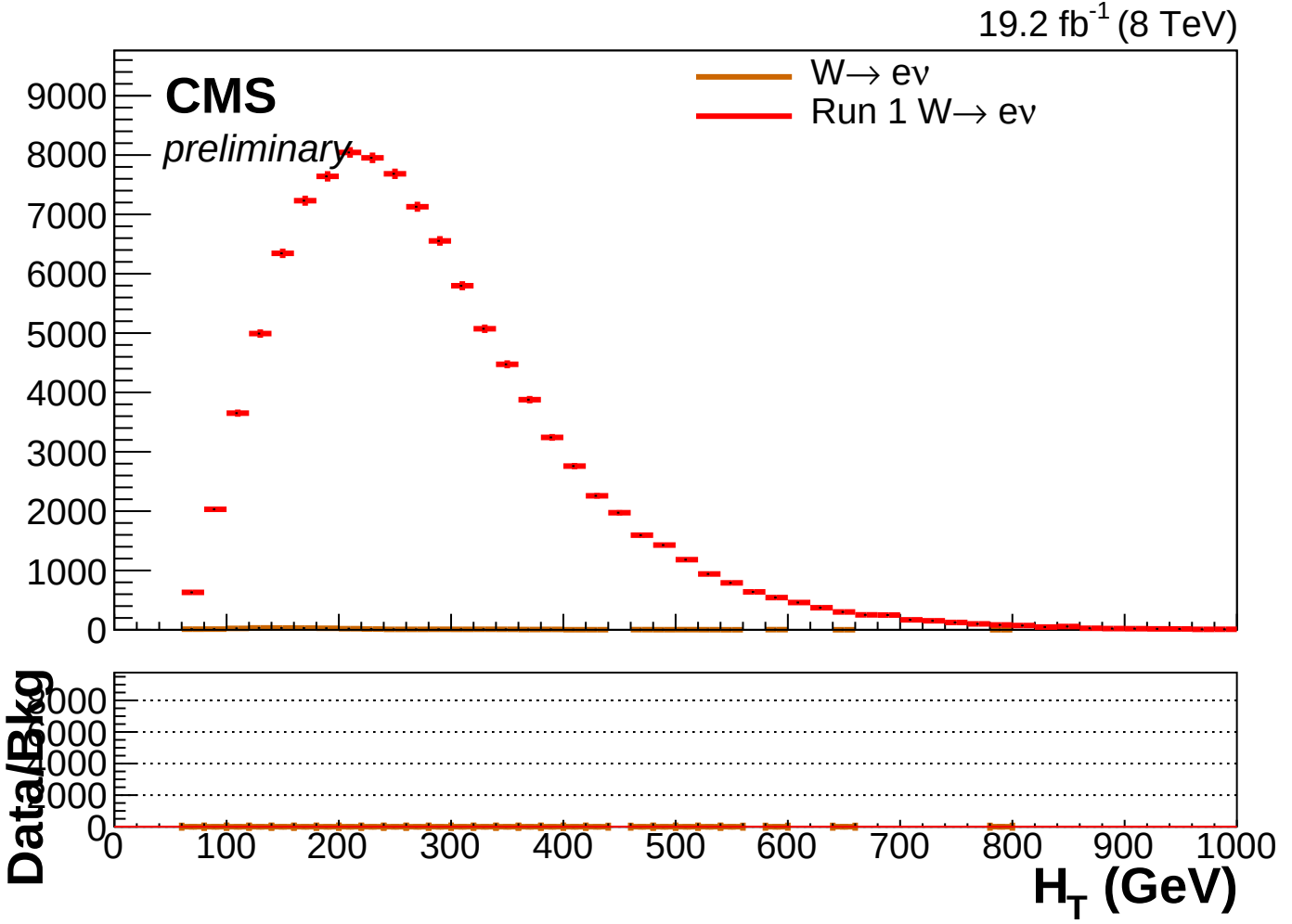

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
6000
5000
4000
3000
2000
1000
0
Data/Bkg
0
0.5
1
1.5
2
2.5
3
Δφ(E_T^miss, j_1,2)

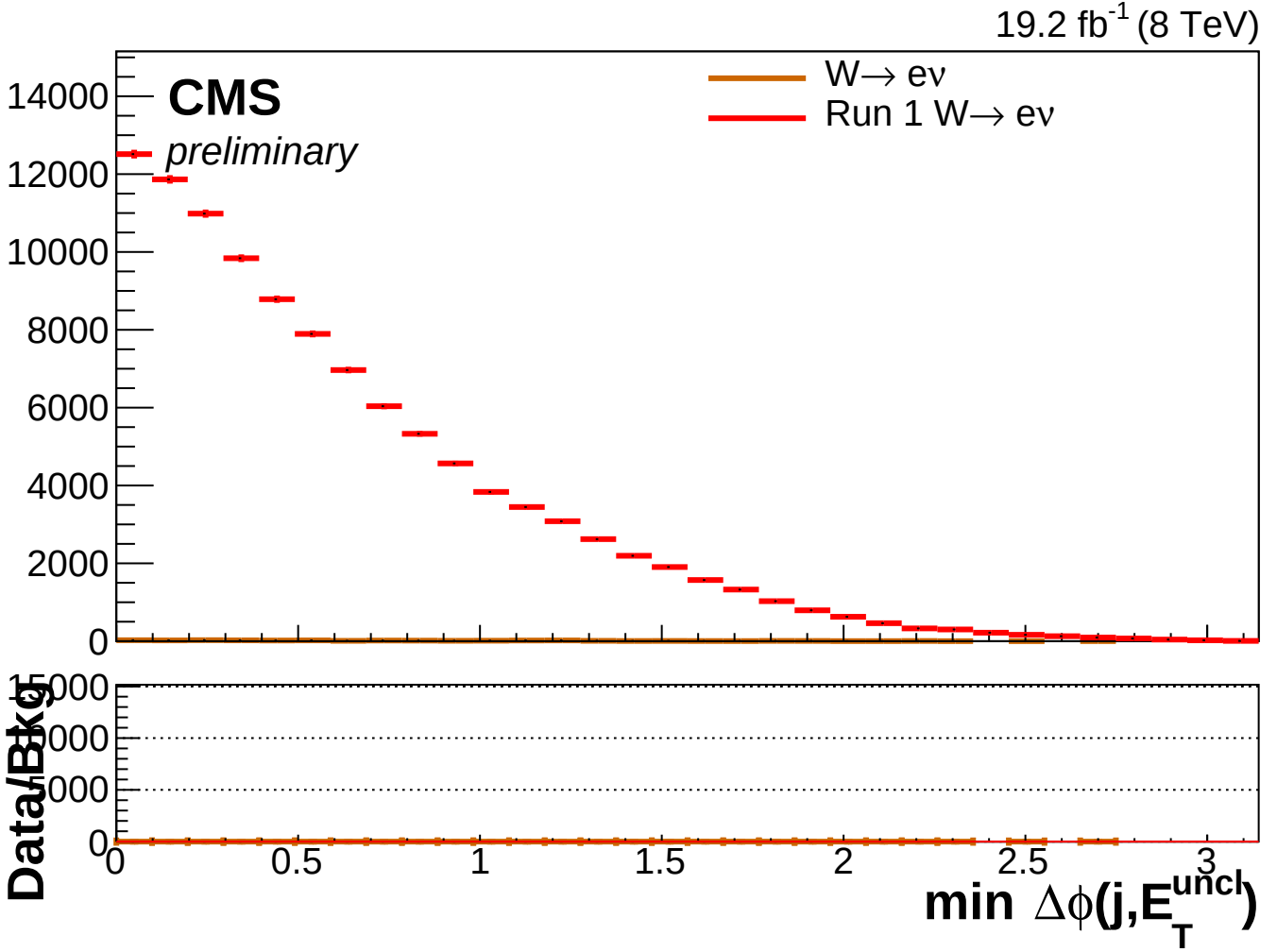

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
6000
5000
4000
3000
2000
1000
0
Data/Bkg
0
0.5
1
1.5
2
2.5
3
Δφ(E_T^miss,j)

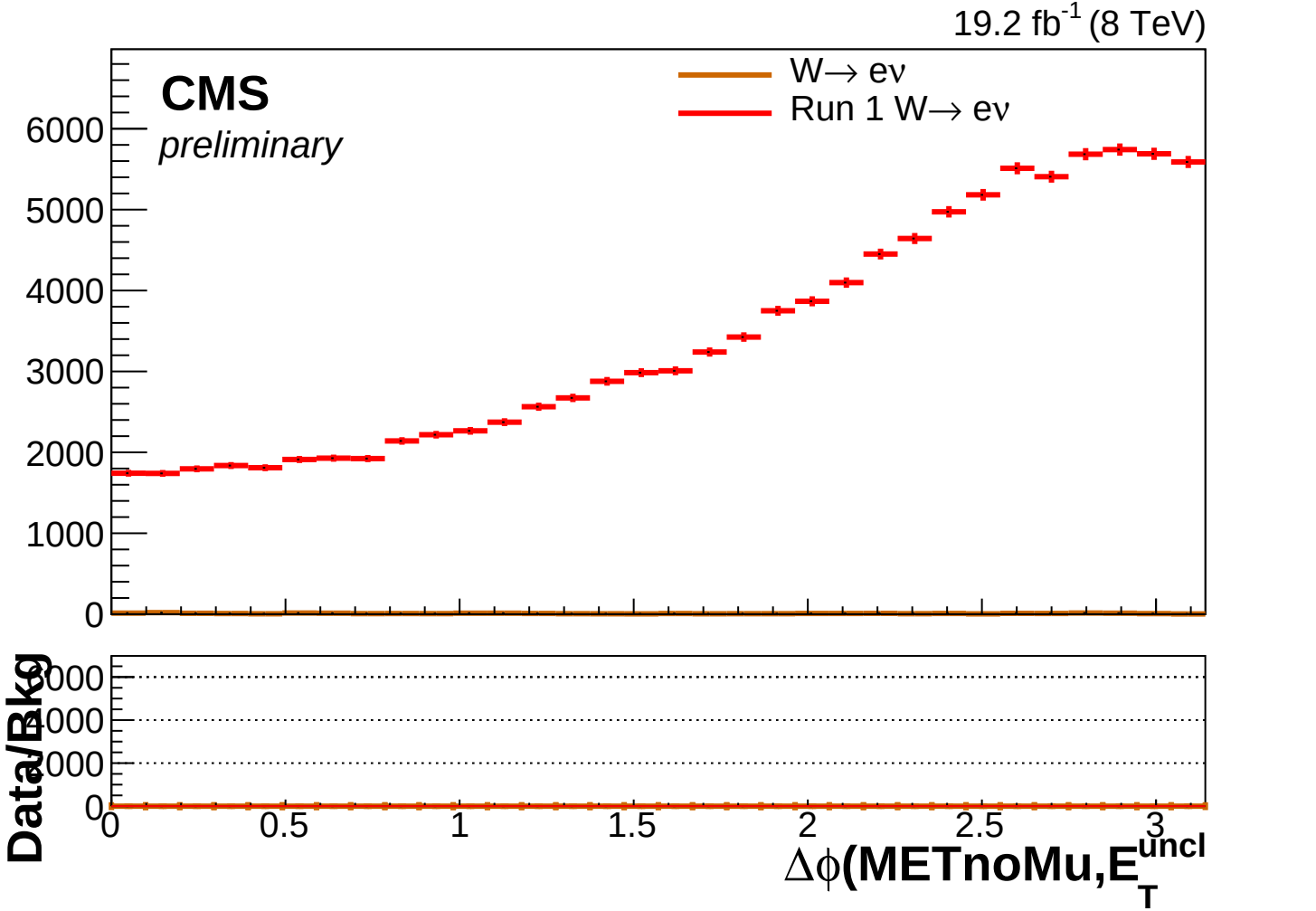

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
70000
60000
50000
40000
30000
20000
10000
0
Data/Bkg
0
10
20
30
40
50
60
70
80
90
100
S

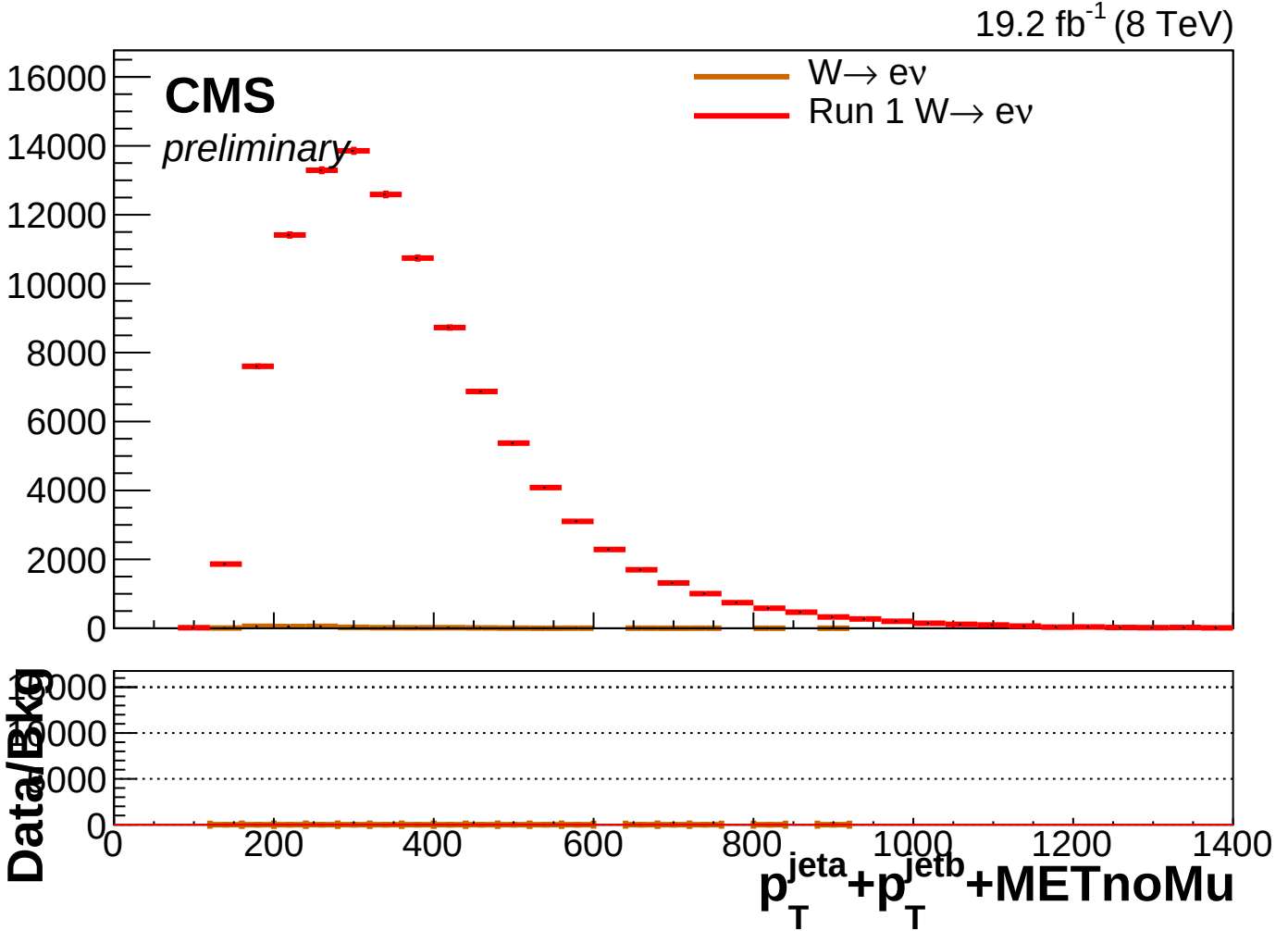

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
70000
60000
50000
40000
30000
20000
10000
0
Data/Bkg
0
10
20
30
40
50
60
70
80
90
100
Run 1 S

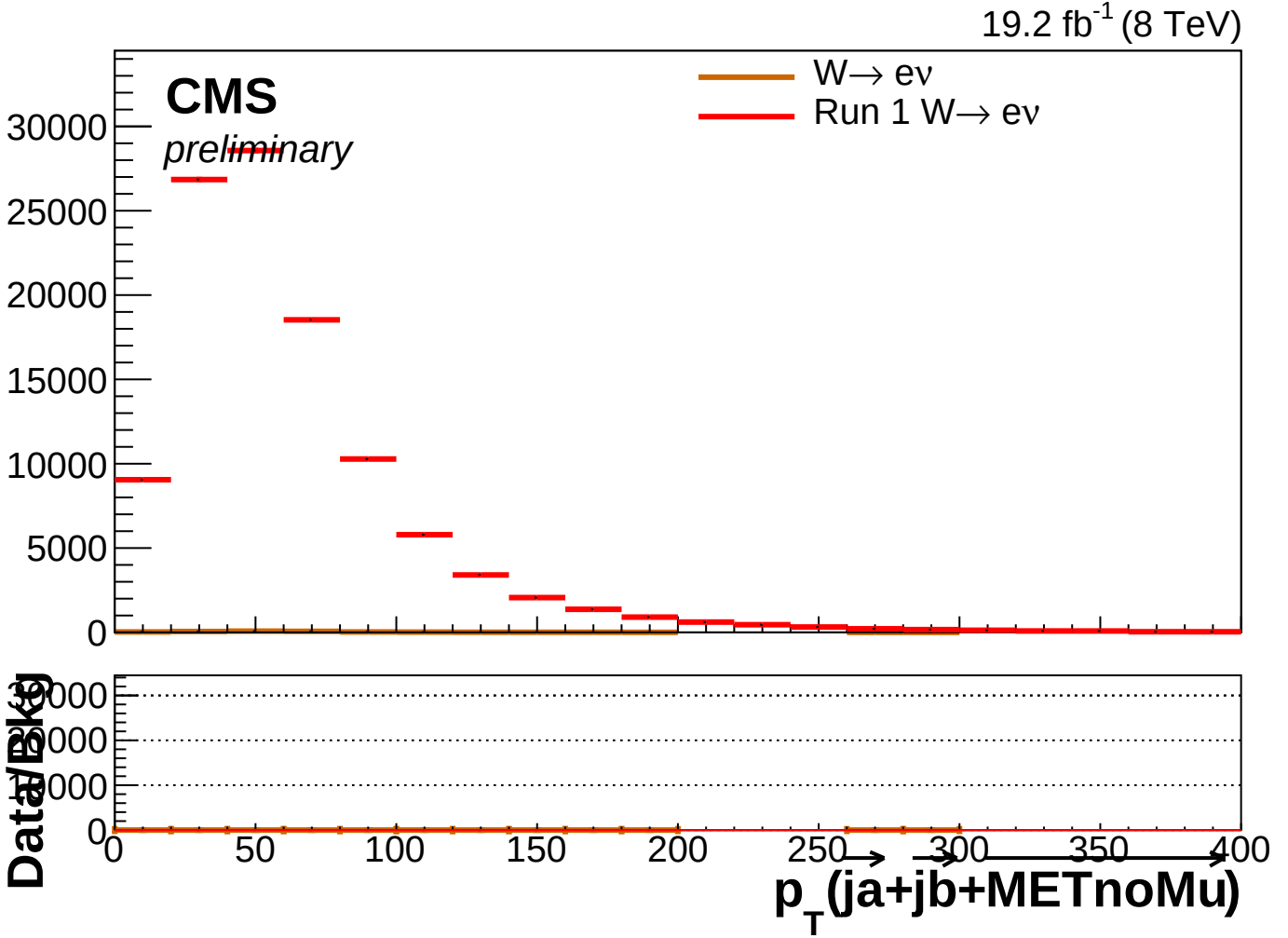

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
10000
8000
6000
4000
2000
0
Data/Bkg
2
1
0
-10
-8
-6
-4
-2
0
2
4
6
8
10
ηj1+ηj2

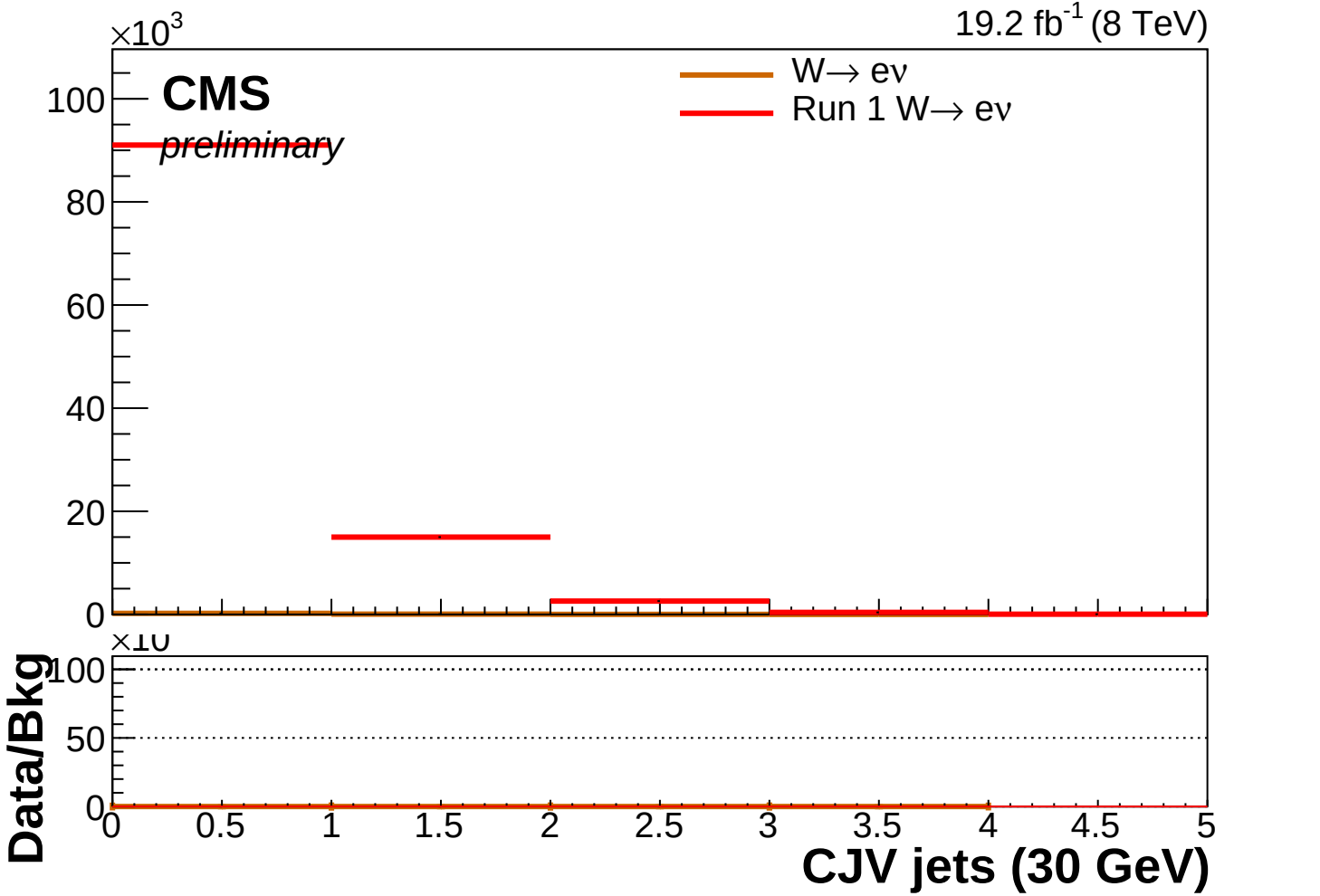

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
900
1000
HT (GeV)

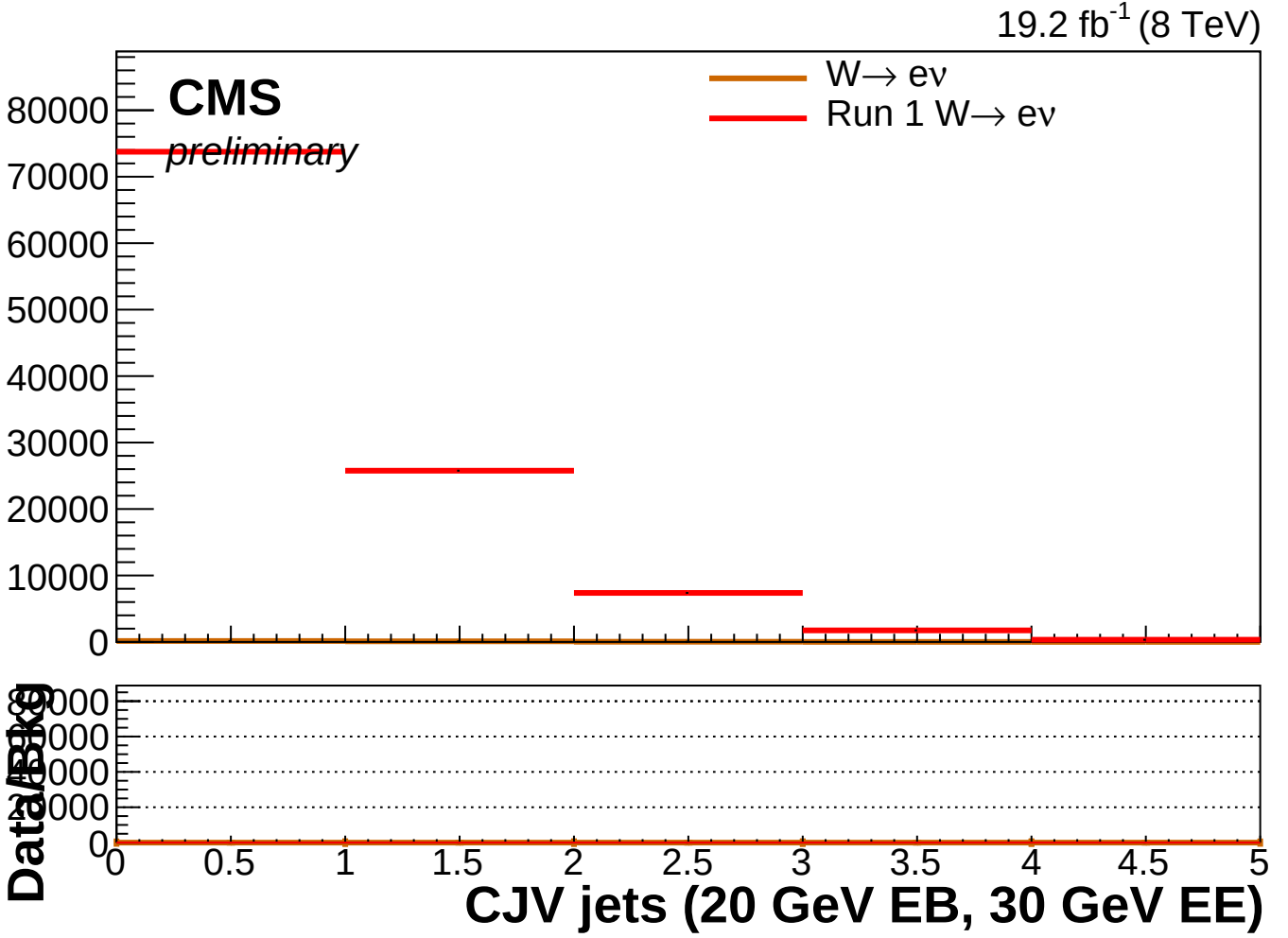

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
0
0.5
1
1.5
2
2.5
3
min Δφ(j,E_T^uncl)

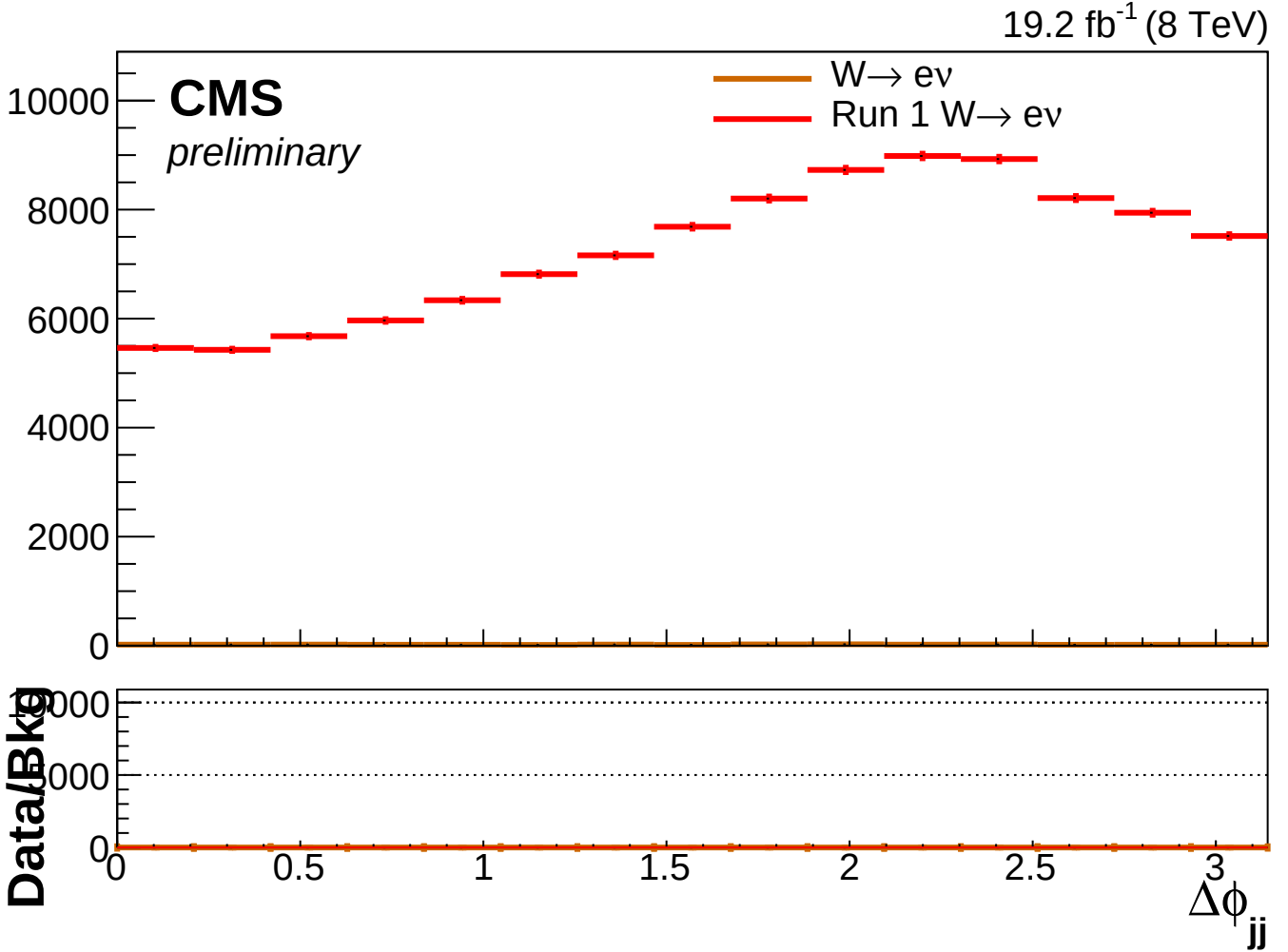

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
6000
5000
4000
3000
2000
1000
0
Data/Bkg
3000
4000
2000
0
0
0.5
1
1.5
2
2.5
3
Δφ(METnoMu,E Tuncl

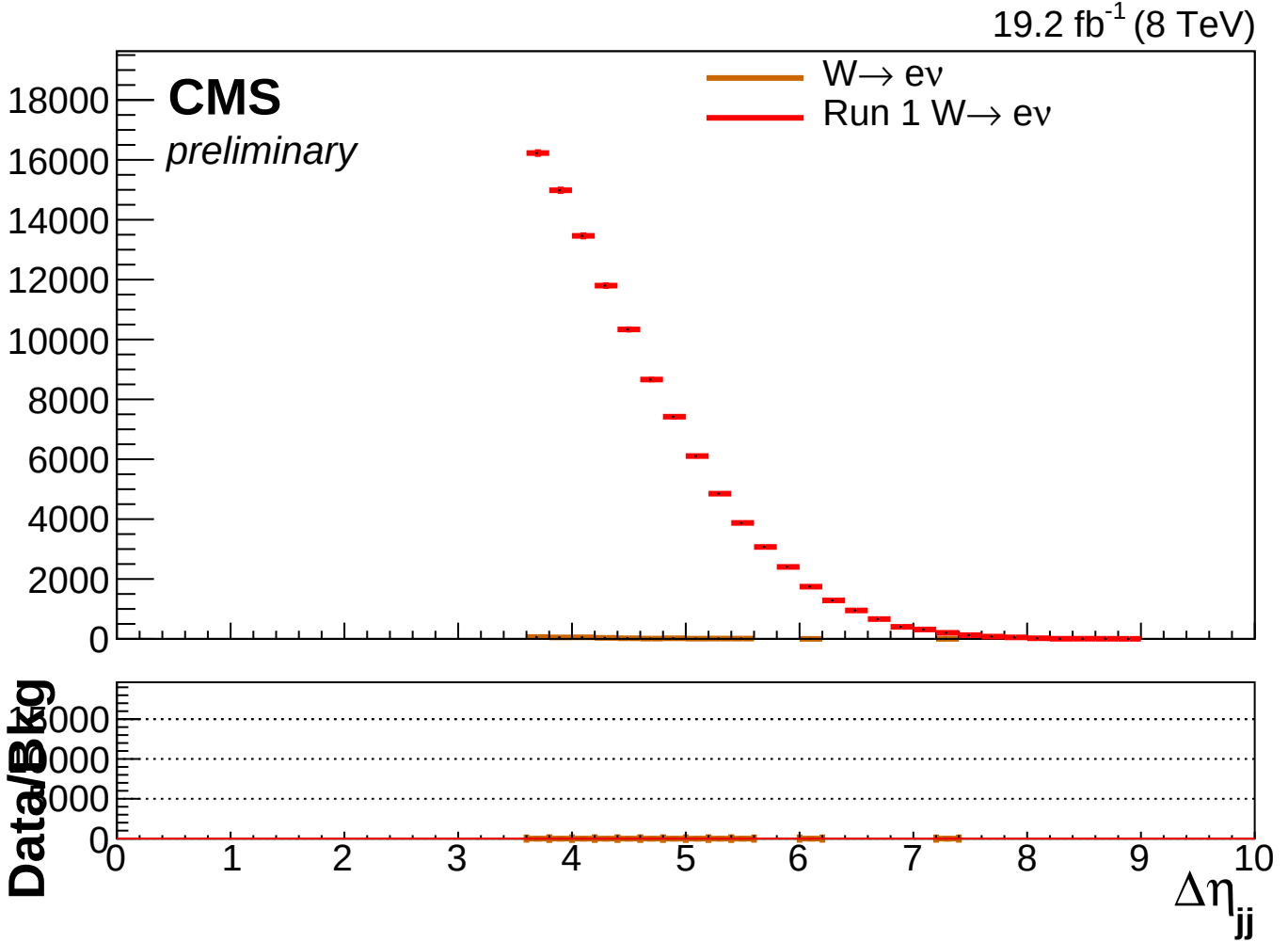

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
0
200
400
600
800
1000
1200
1400
pjeta+pjetb+METnoMu

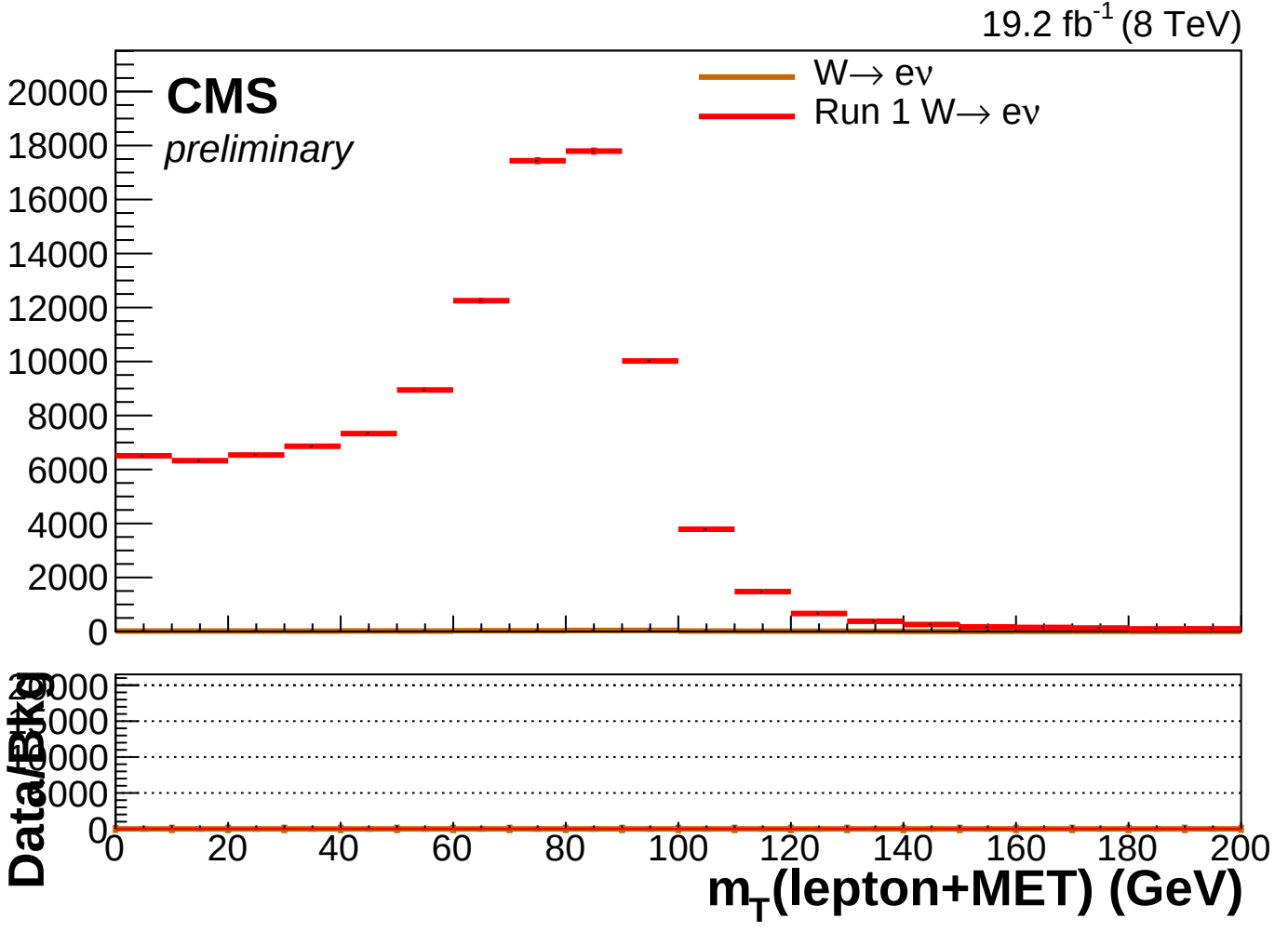

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
30000
25000
20000
15000
10000
5000
0
Data/Bkg
0
50
100
150
200
250
300
350
400
pT(ja+jb+METnoMu)

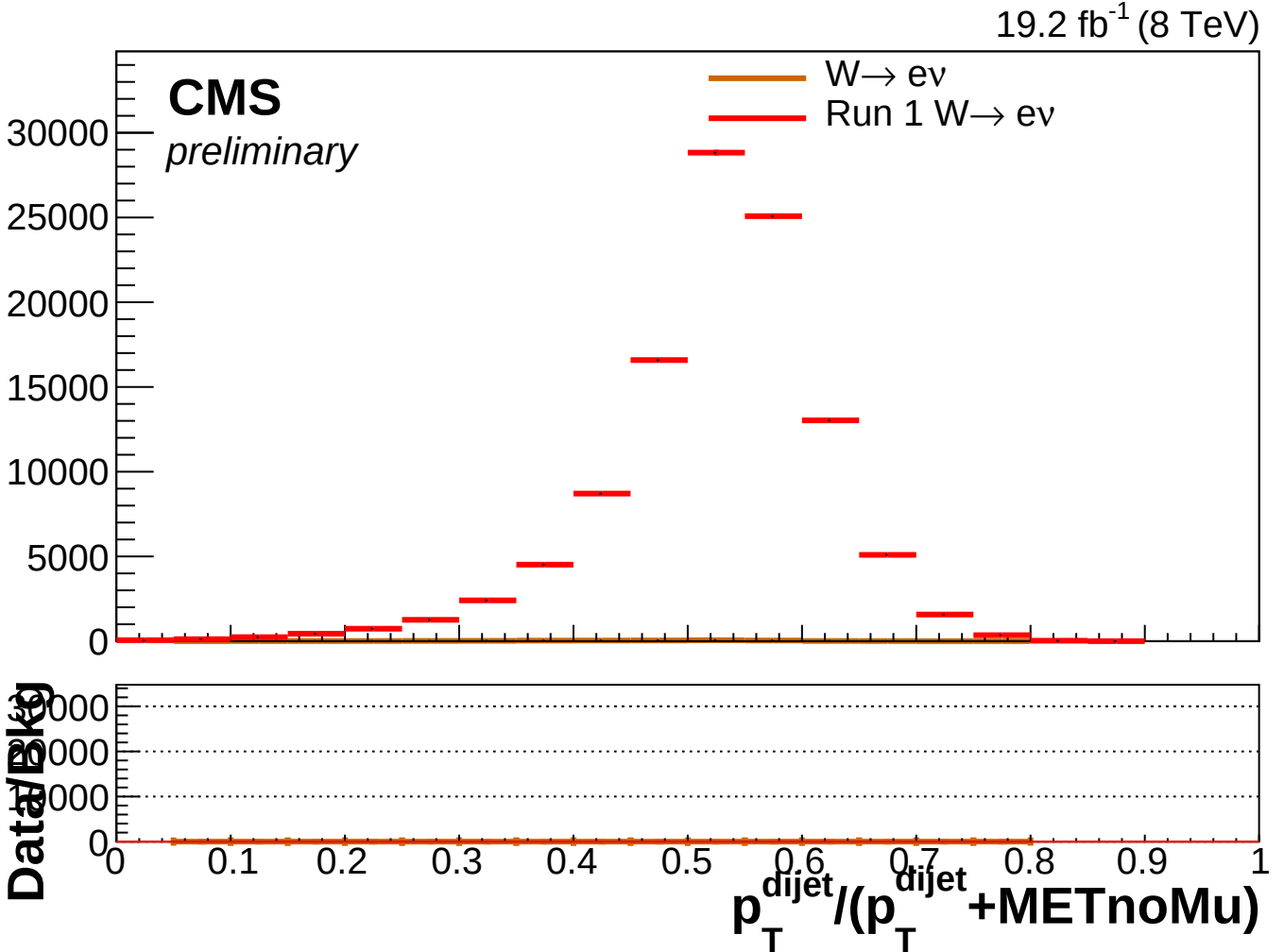

19.2 fb-1 (8 TeV)
×10^3
CMS
preliminary
W→ eν
Run 1 W→ eν
100
80
60
40
20
0
Data/Bkg
100
50
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
CJV jets (30 GeV)

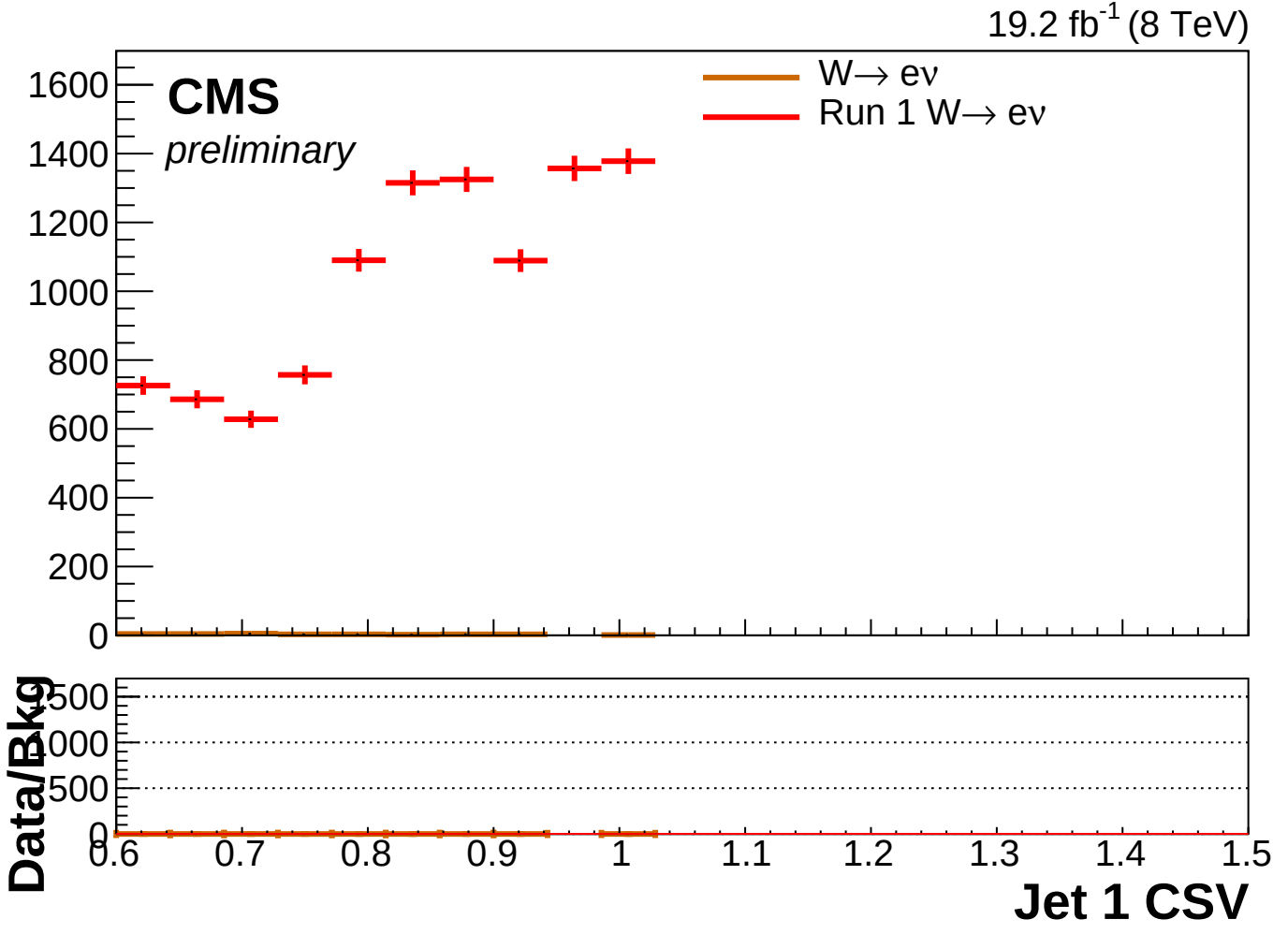

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/Bkg
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
CJV jets (20 GeV EB, 30 GeV EE)

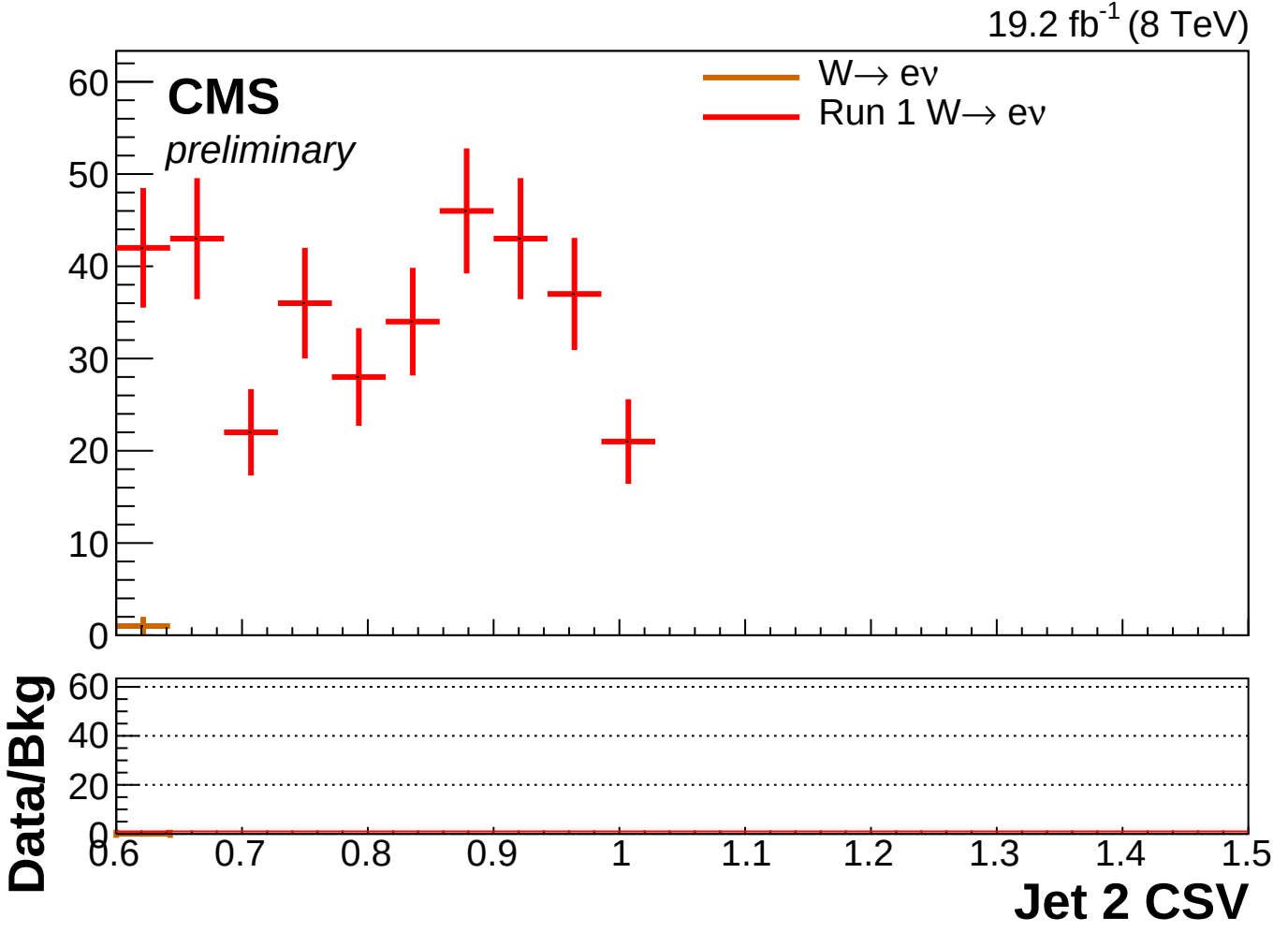

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
10000
8000
6000
4000
2000
0
Data/Bkg
2000
0
0
0.5
1
1.5
2
2.5
3
Δφjj

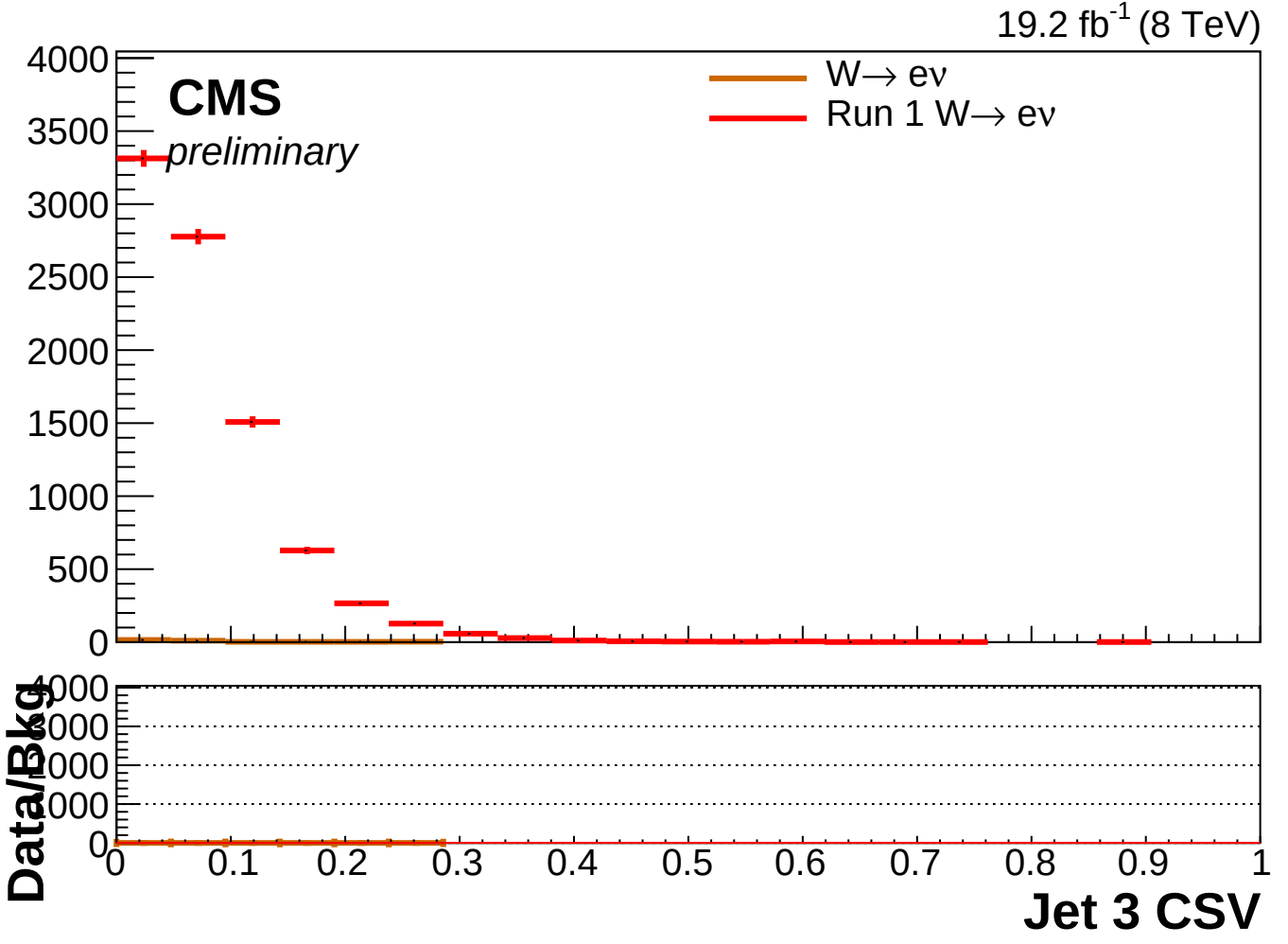

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2000
0
0
1
2
3
4
5
6
7
8
9
10
Δηjj

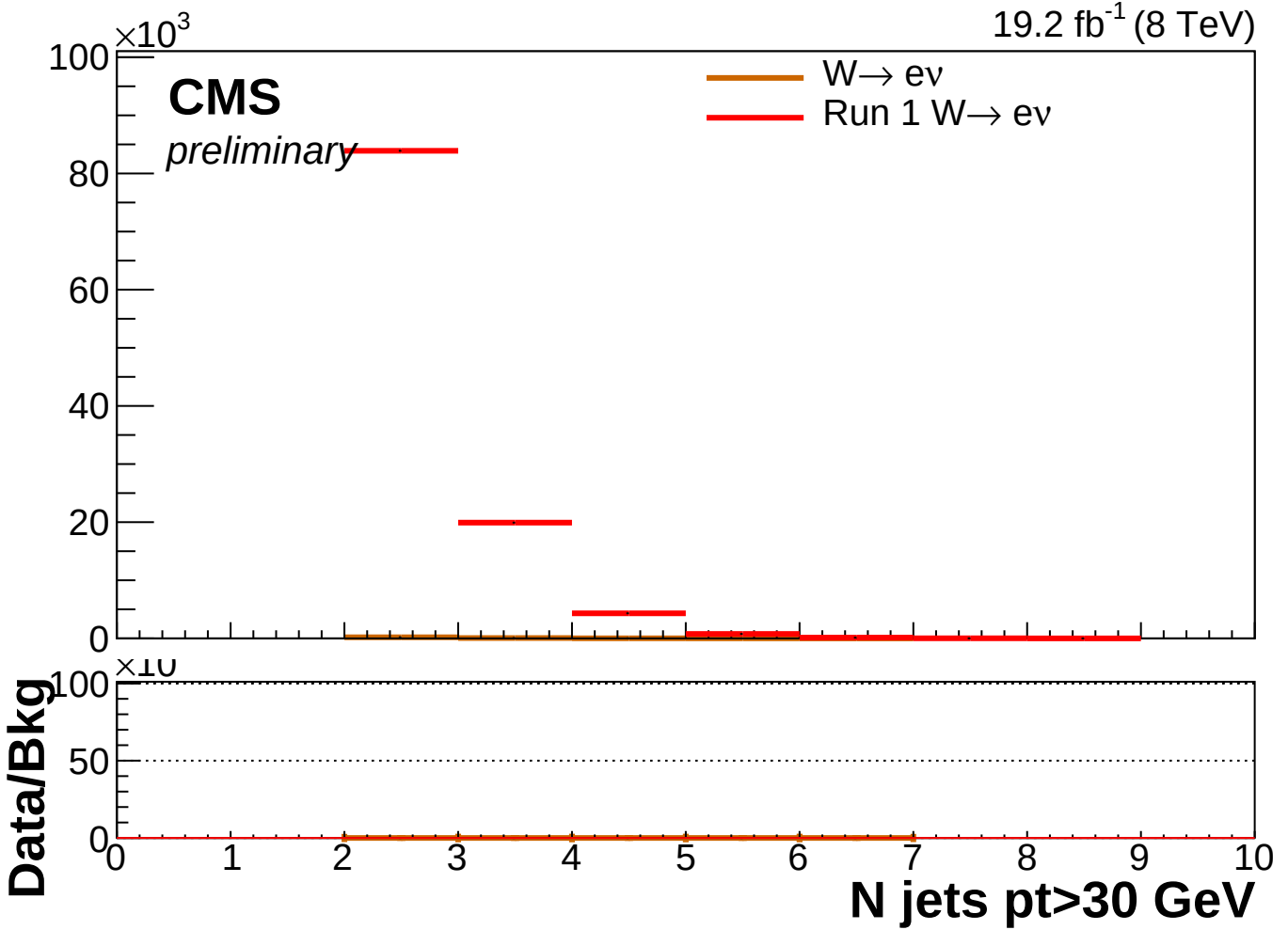

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
0
20
40
60
80
100
120
140
160
180
200
mT(lepton+MET) (GeV)

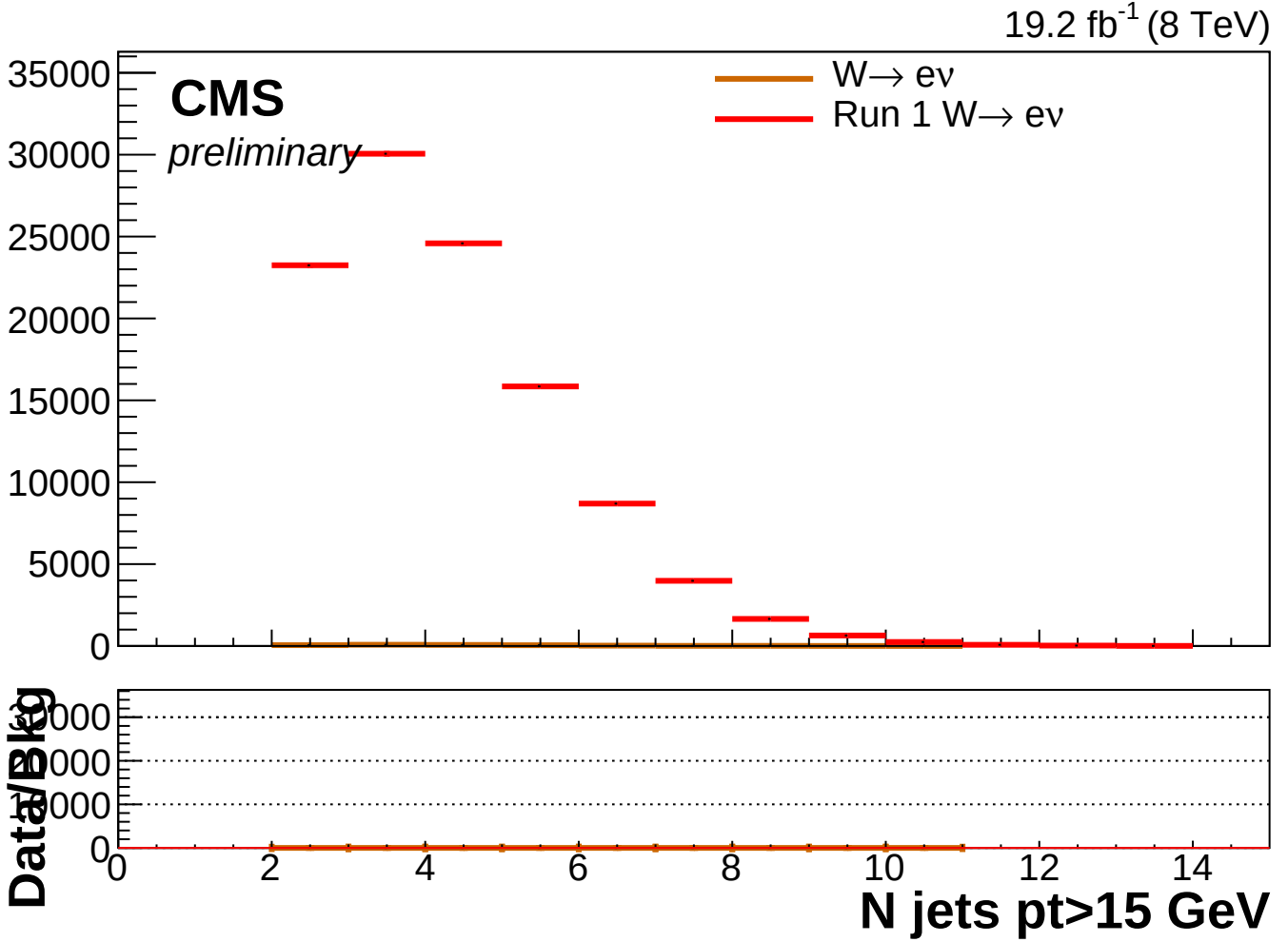

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
30000
25000
20000
15000
10000
5000
0
Data/Bkg
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
p_T^dijet/(p_T^dijet+METnoMu)

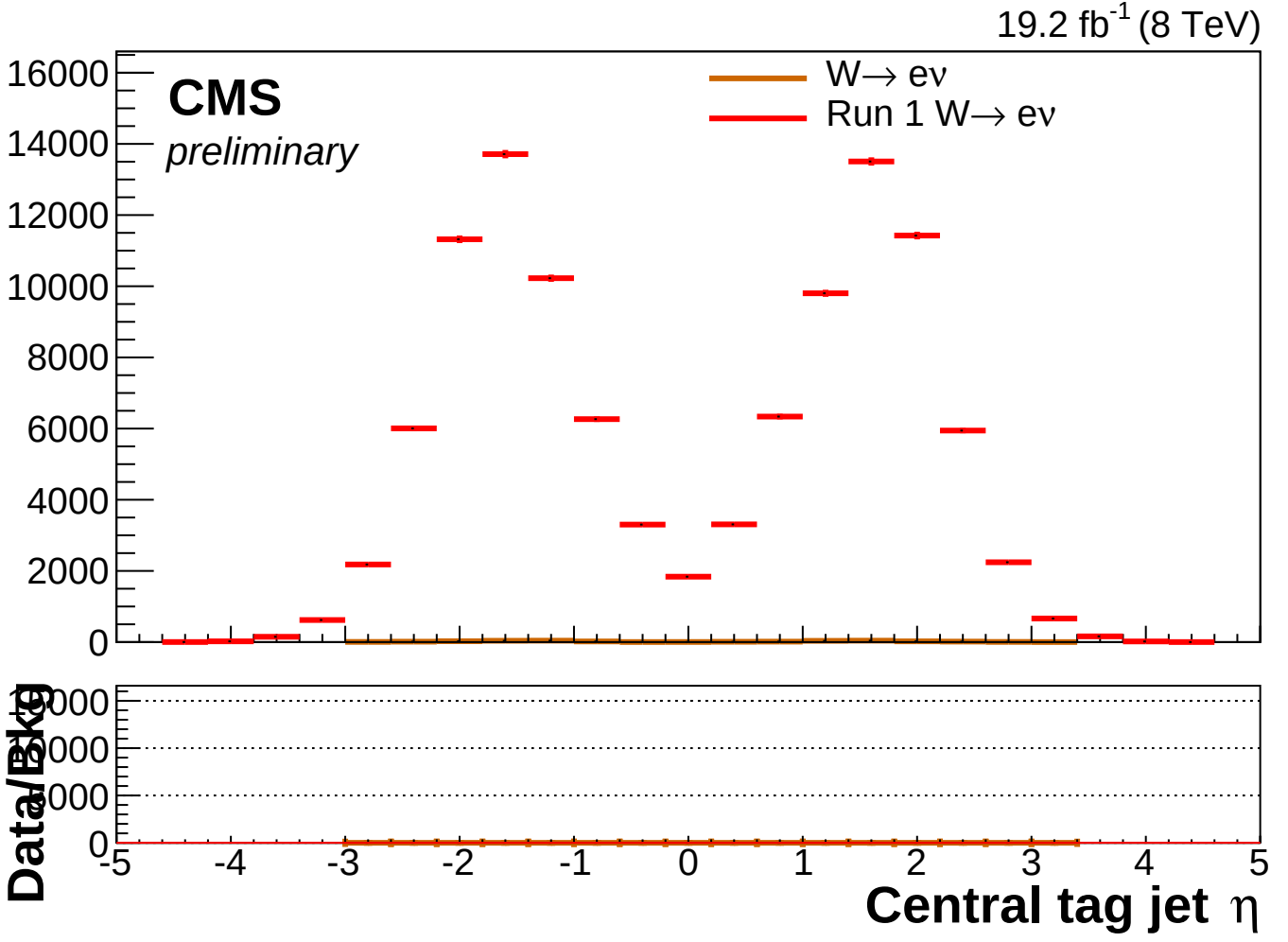

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
1600
1400
1200
1000
800
600
400
200
0
Data/Bkg
2500
2000
1500
1000
500
0
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
Jet 1 CSV

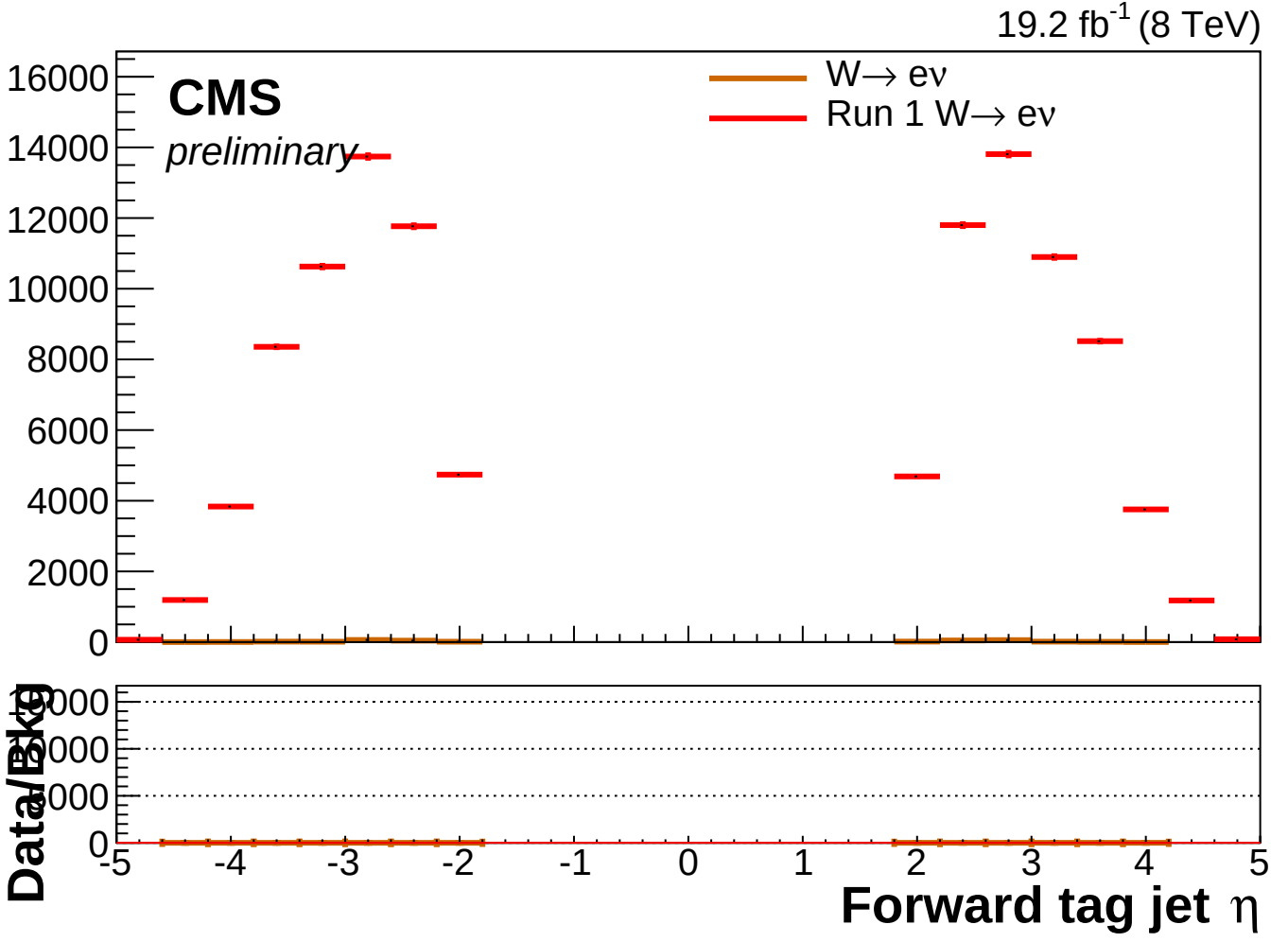

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
60
50
40
30
20
10
0
Data/Bkg
60
40
20
0
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
Jet 2 CSV

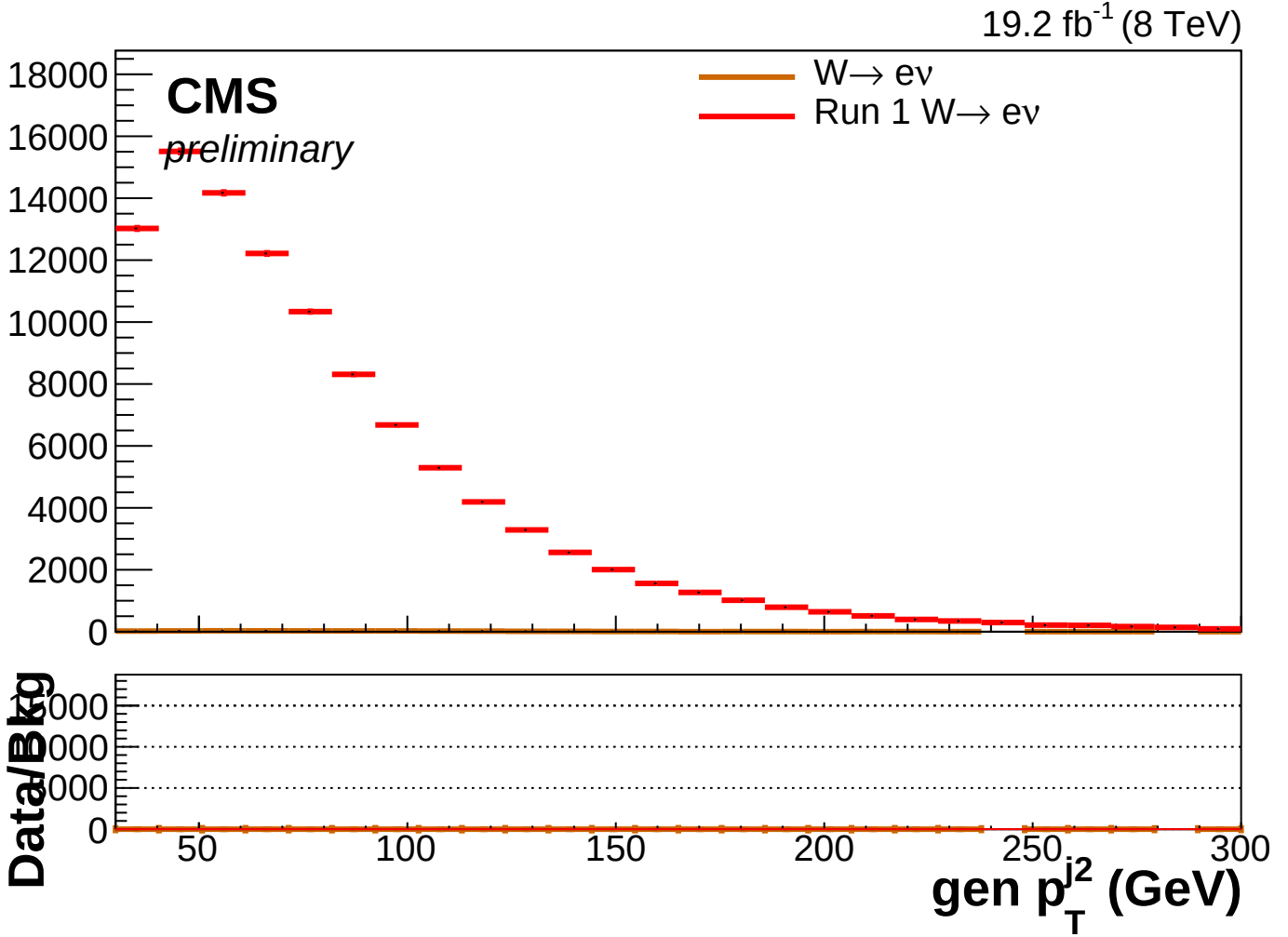

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
4000
3500
3000
2500
2000
1500
1000
500
0
Data/Bkg
2
1.5
1
0.5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Jet 3 CSV

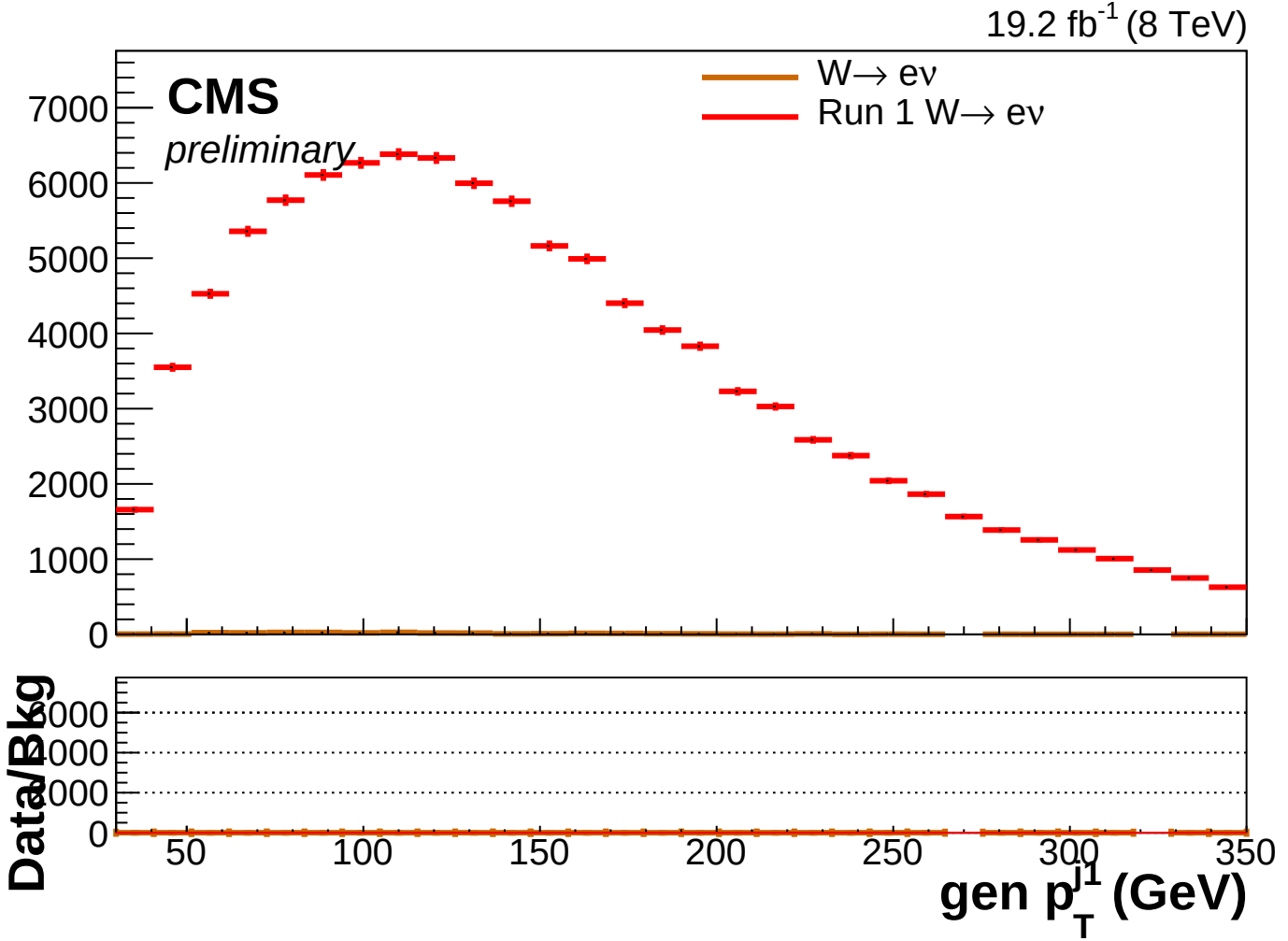

19.2 fb-1 (8 TeV)
×10^3
100
80
60
40
20
0
CMS
preliminary
W→ eν
Run 1 W→ eν
×10
100
50
0
Data/Bkg
0
1
2
3
4
5
6
7
8
9
10
N jets pt>30 GeV

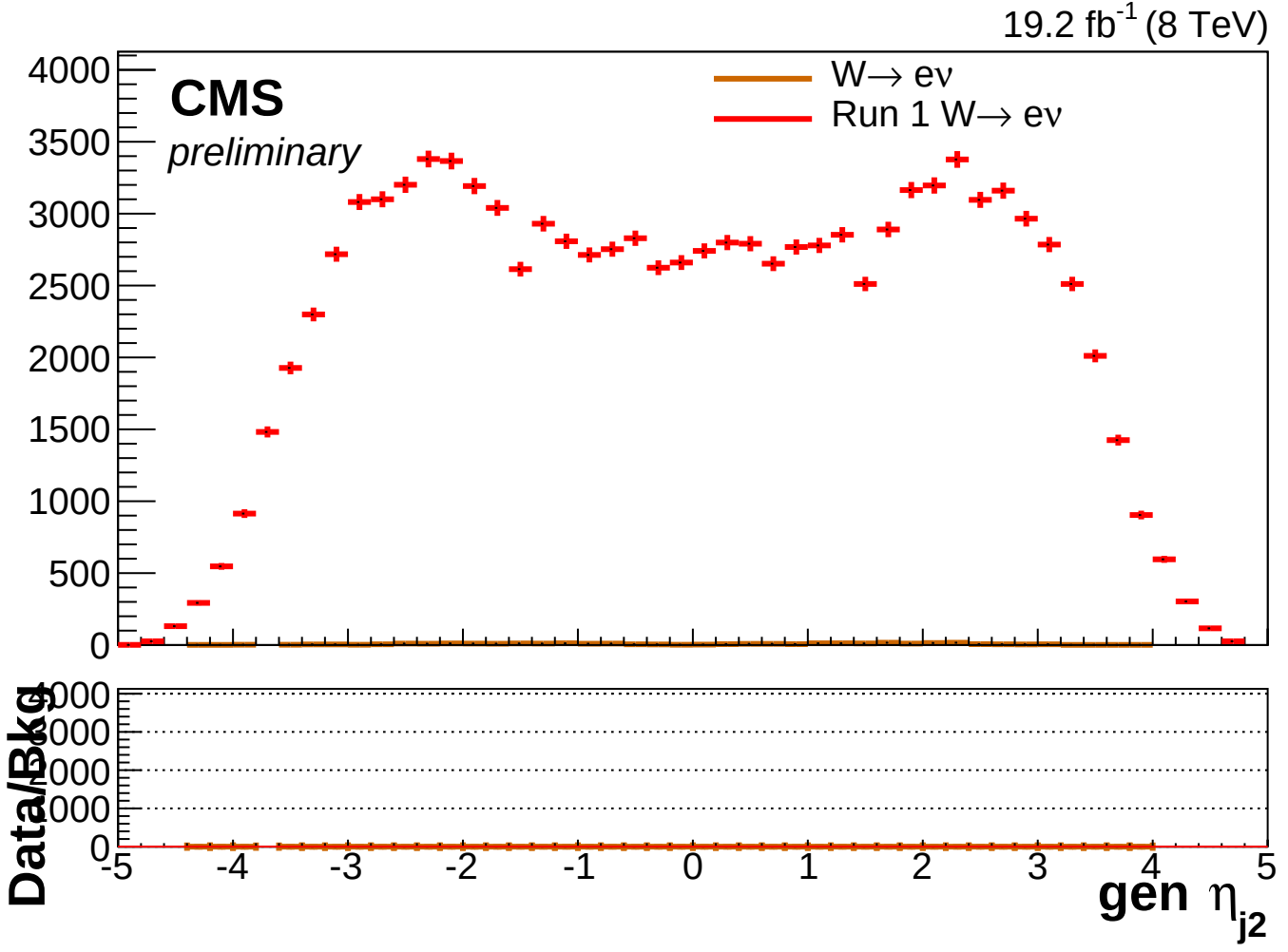

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
35000
30000
25000
20000
15000
10000
5000
0
Data/Bkg
0
2
4
6
8
10
12
14
N jets pt>15 GeV

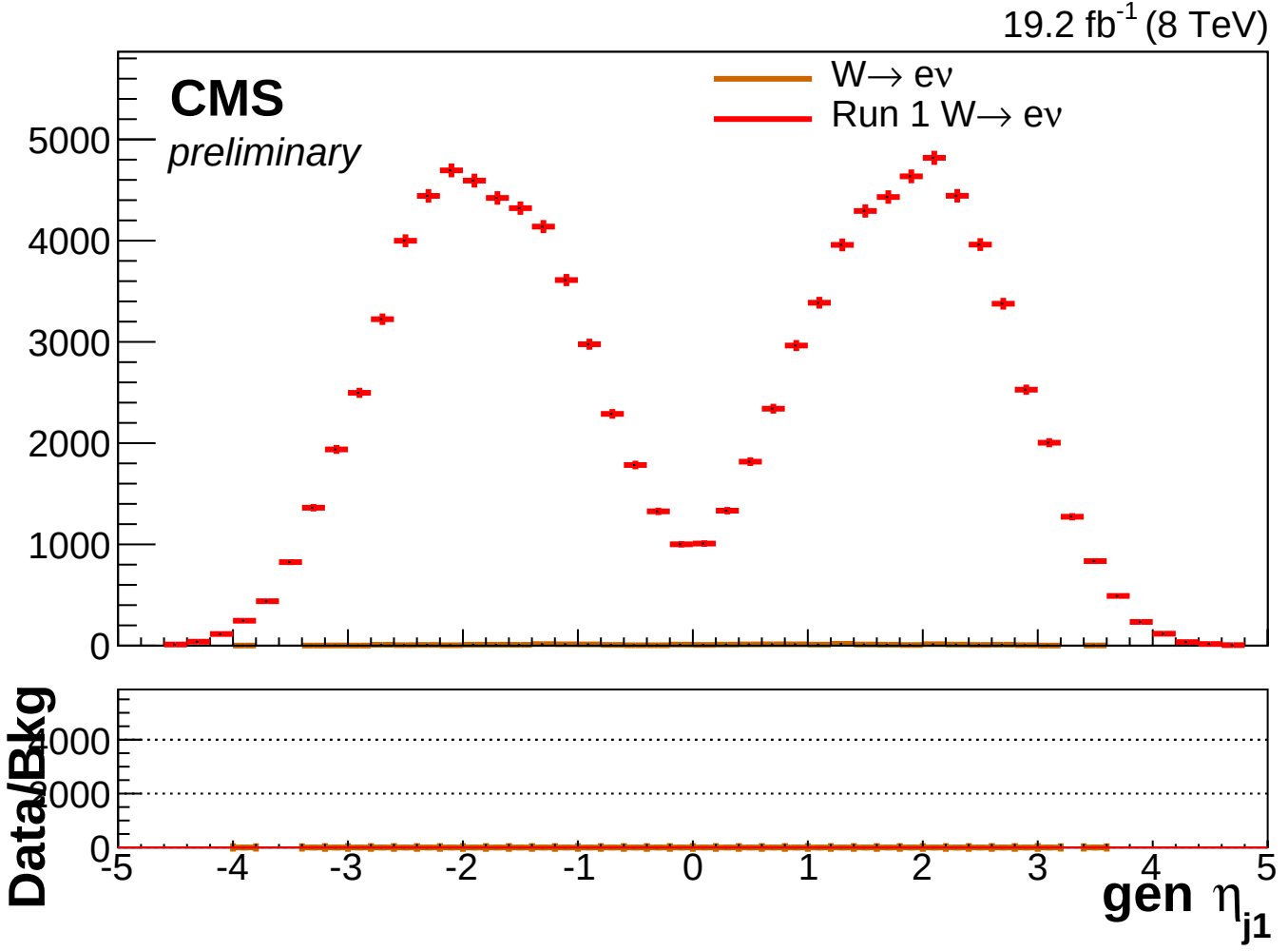

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
-5
-4
-3
-2
-1
0
1
2
3
4
5
Central tag jet η

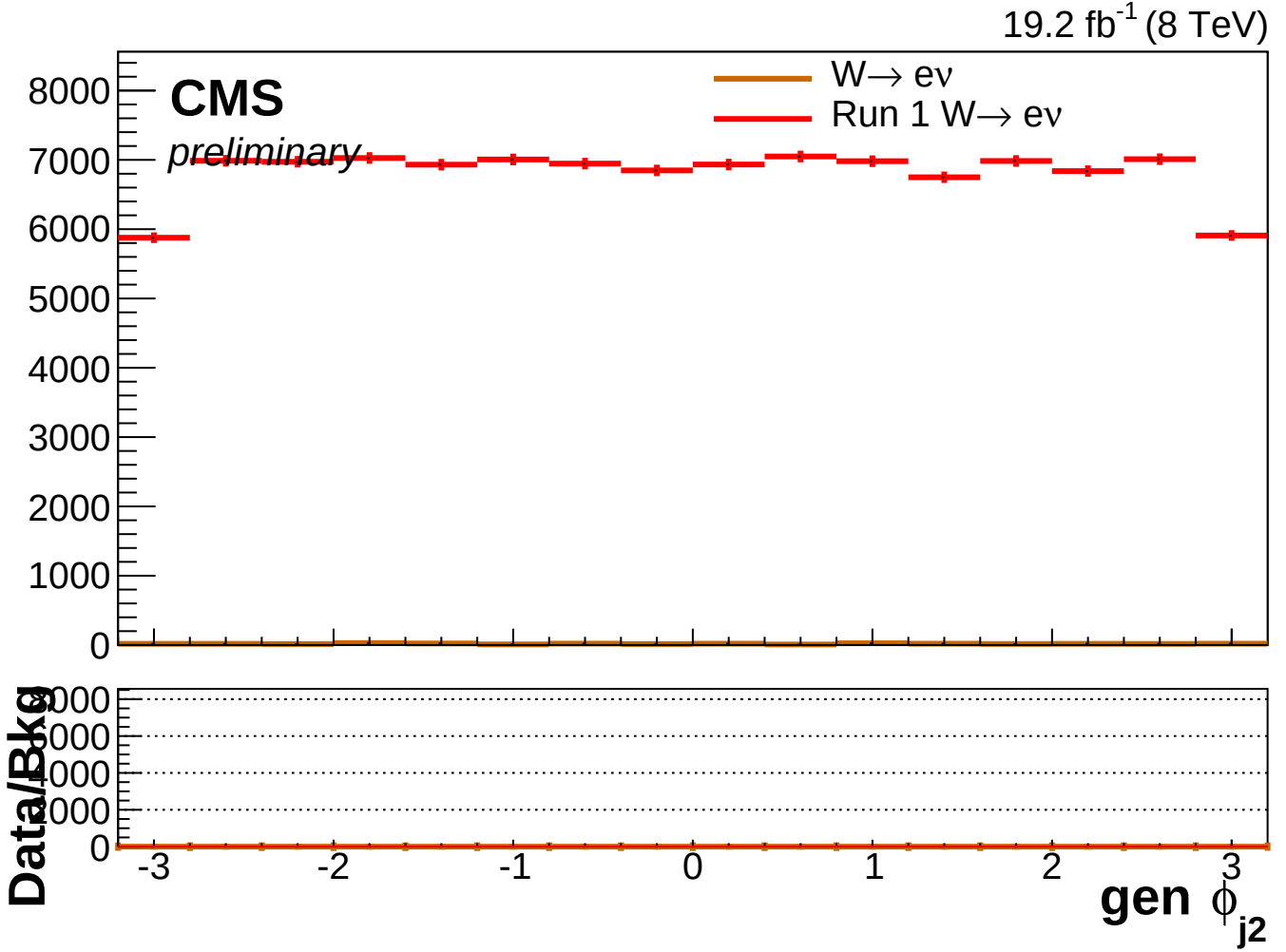

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
-5
-4
-3
-2
-1
0
1
2
3
4
5
Forward tag jet η

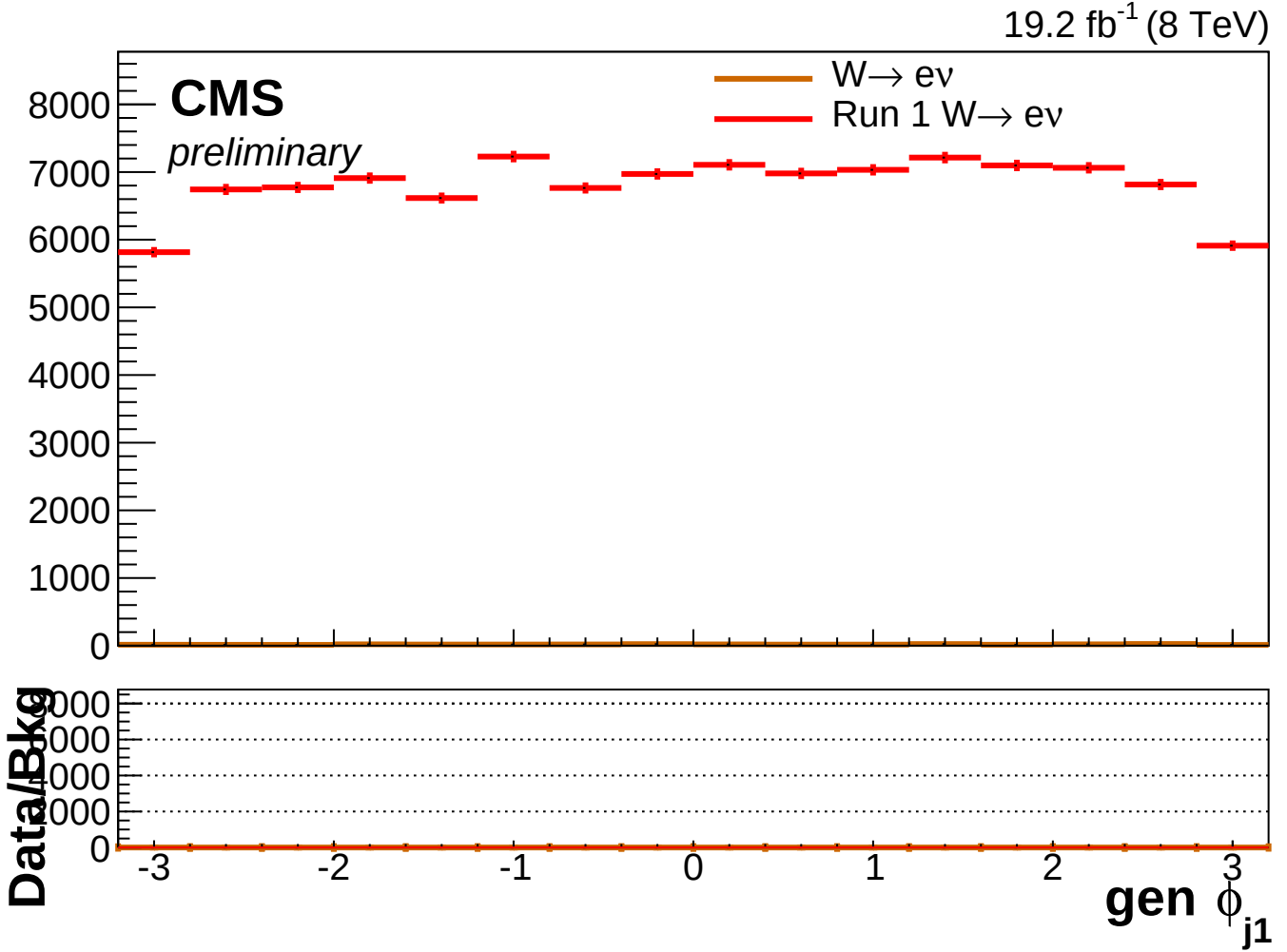

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
3000
2000
1000
0
50
100
150
200
250
300
gen pTj2 (GeV)

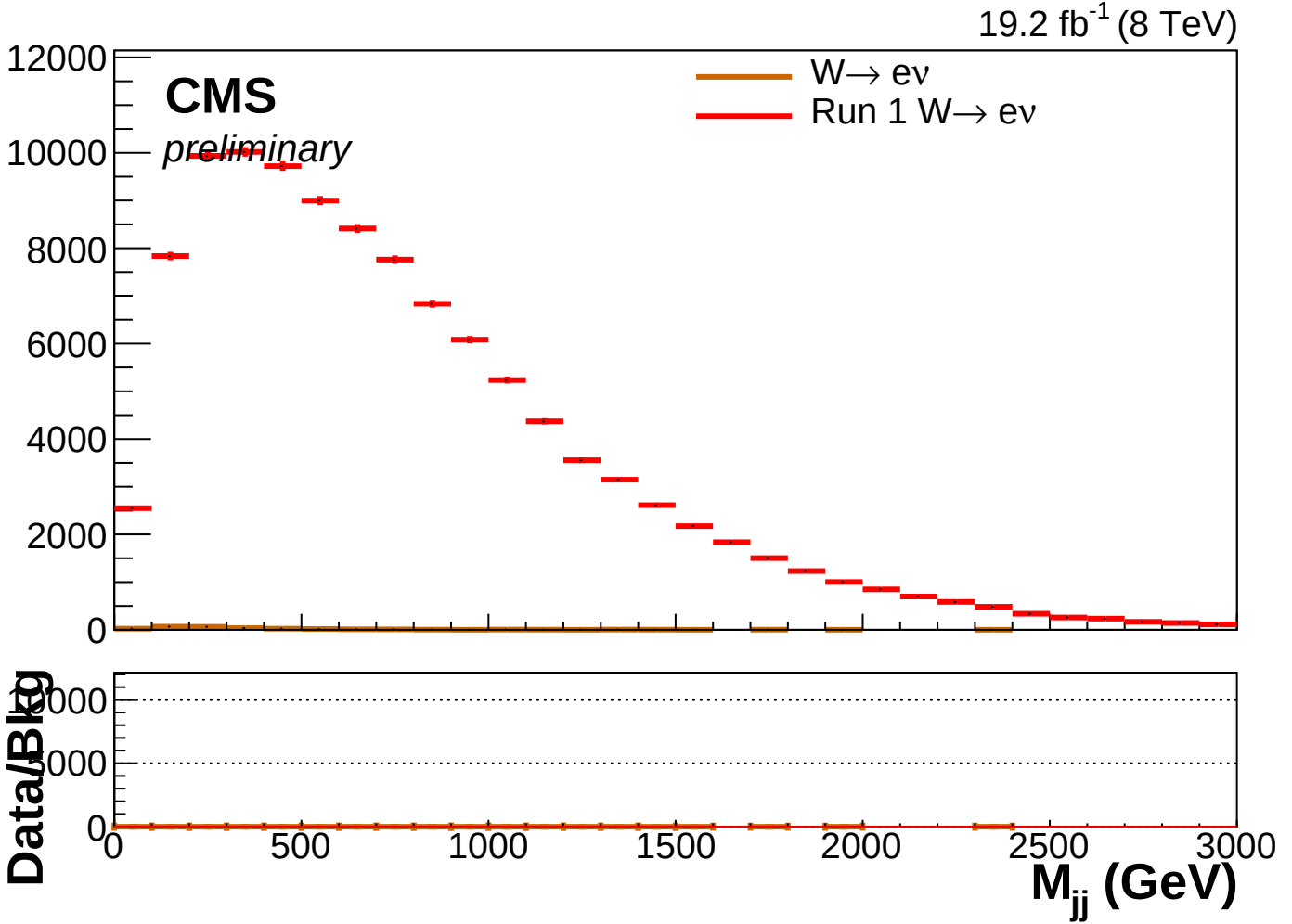

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1000
0
50
100
150
200
250
300
350
gen pTj1 (GeV)

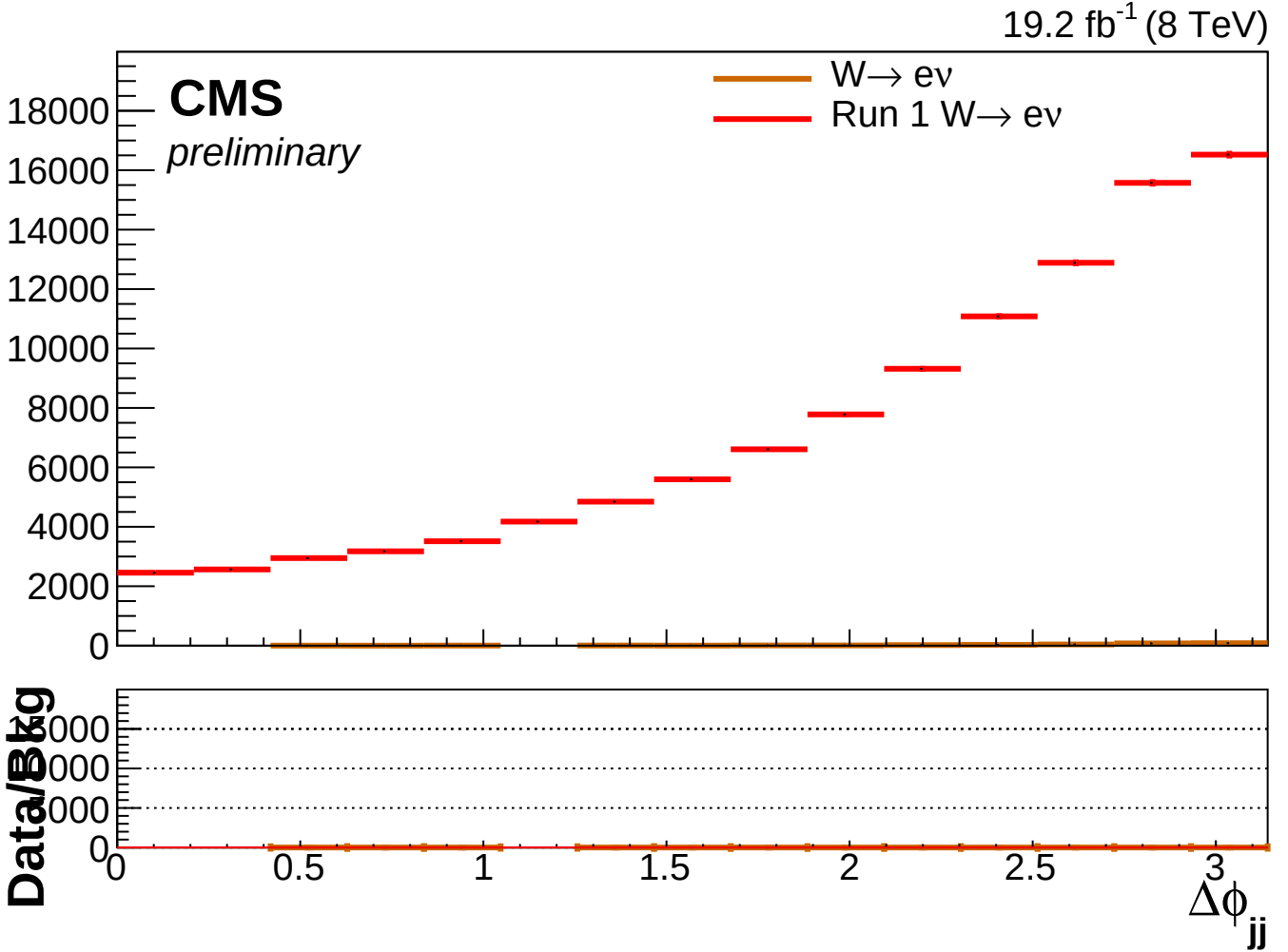

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
4000
3500
3000
2500
2000
1500
1000
500
0
Data/Bkg
2000
1500
1000
500
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
gen ηj2

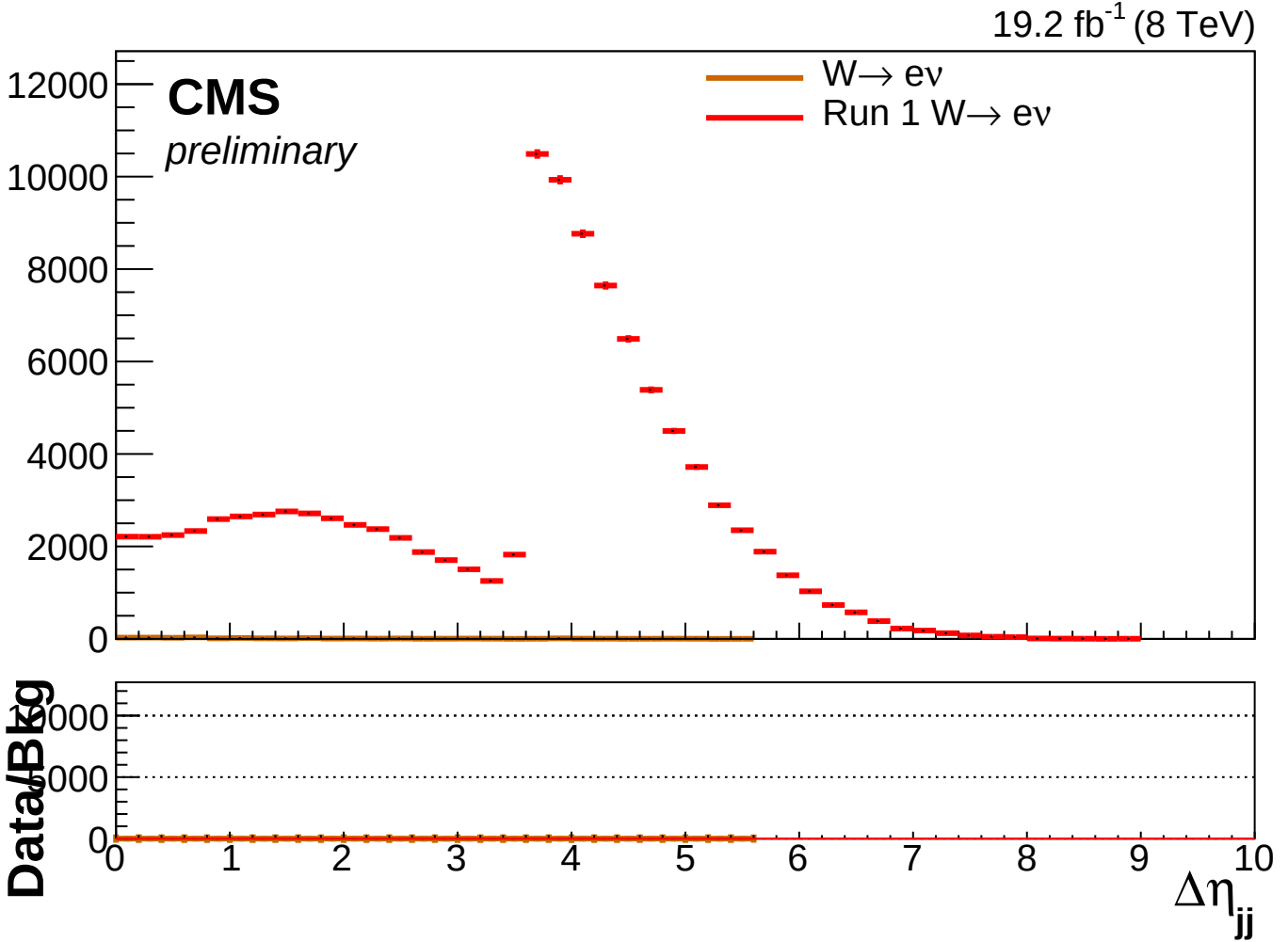

19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1000
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
gen ηj1


19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
8000
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
2000
1000
0
-3
-2
-1
0
1
2
3
gen φj2


19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
8000
7000
6000
5000
4000
3000
2000
1000
0
Data/Bkg
-3
-2
-1
0
1
2
3
gen ϕj1


19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2000
0
0
500
1000
1500
2000
2500
3000
Mjj (GeV)


19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2
1.5
1
0.5
0
0
0.5
1
1.5
2
2.5
3
Δφjj


19.2 fb-1 (8 TeV)
CMS
preliminary
W→ eν
Run 1 W→ eν
12000
10000
8000
6000
4000
2000
0
Data/Bkg
2
1
0
0
1
2
3
4
5
6
7
8
9
10
Δηjj