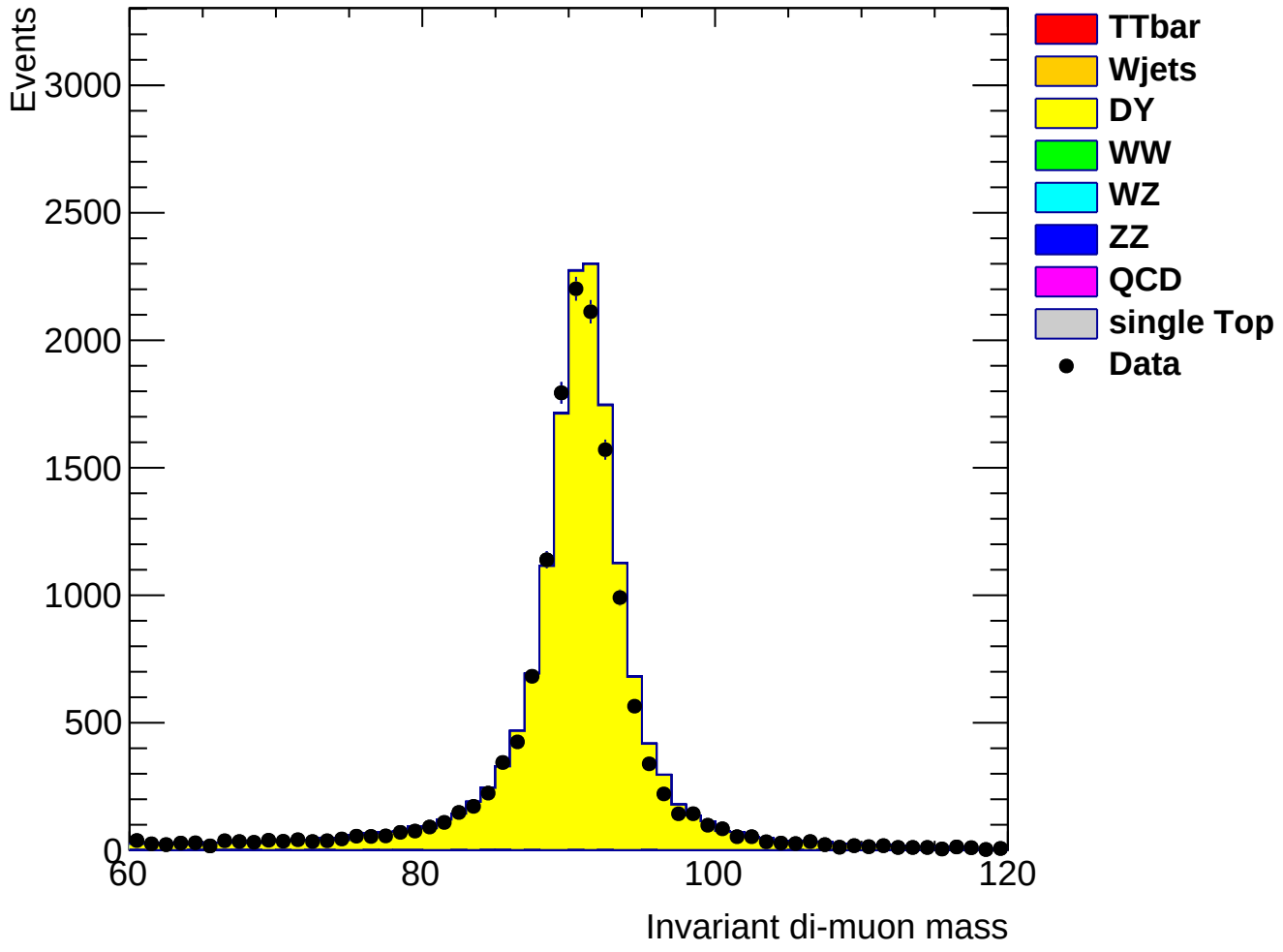
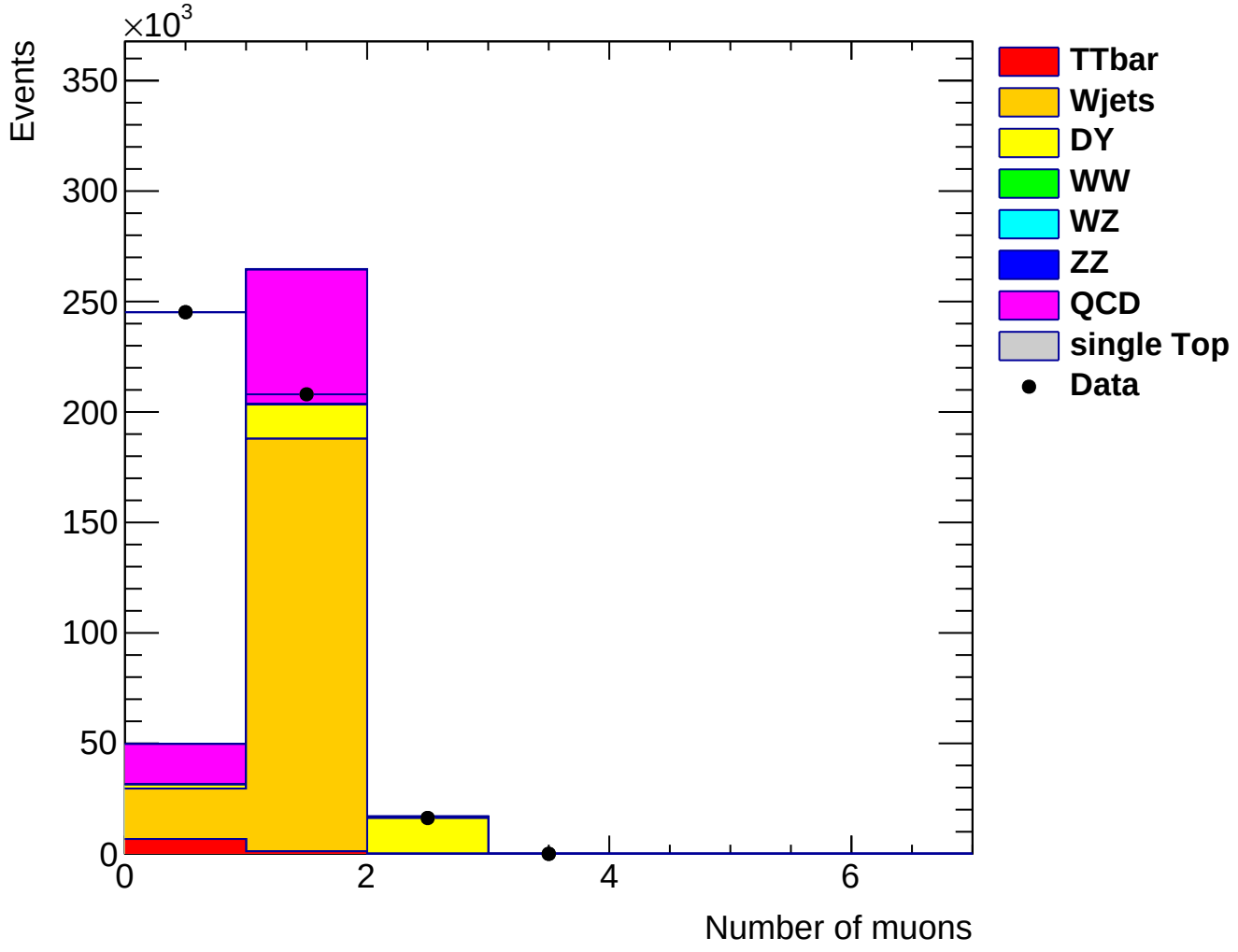
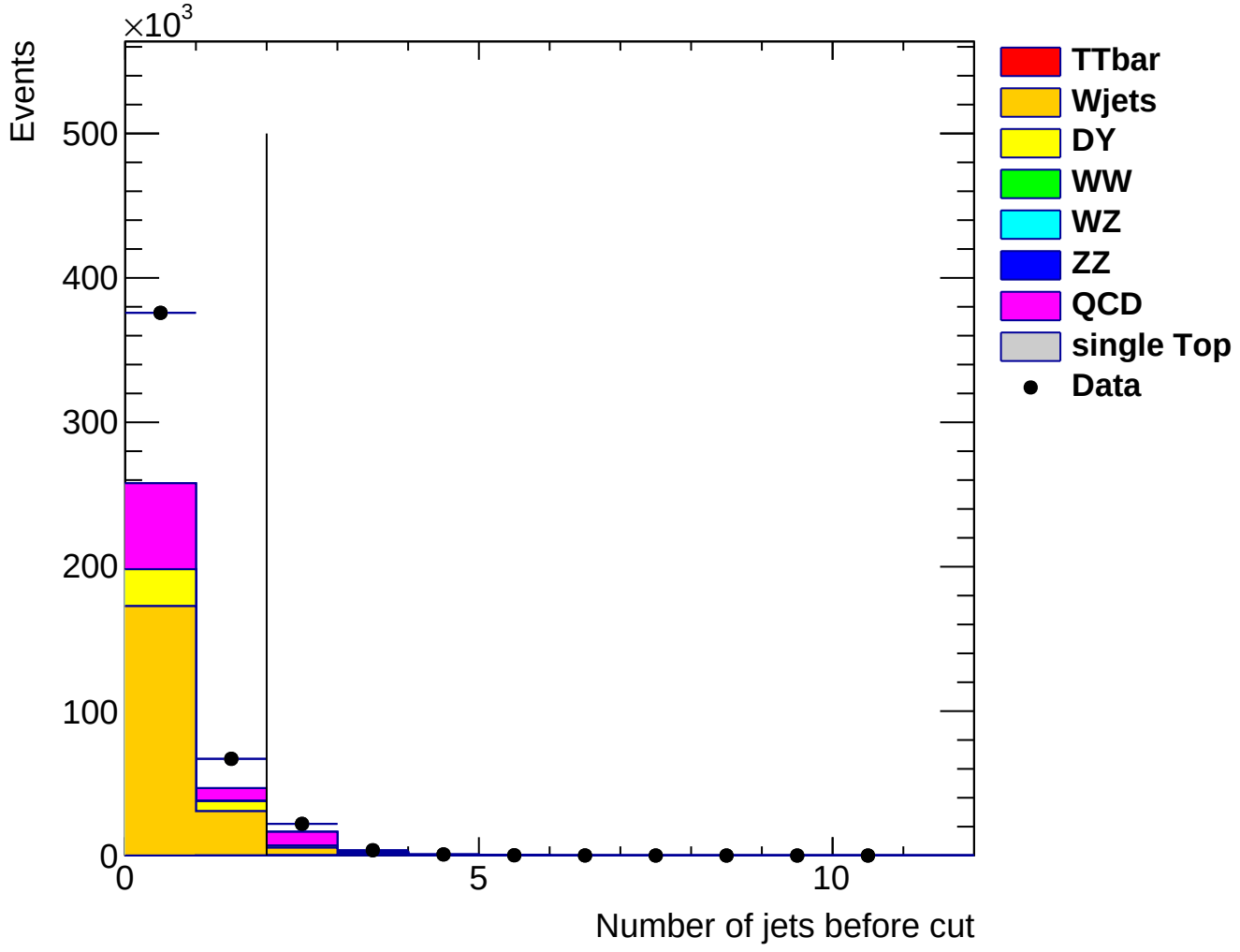
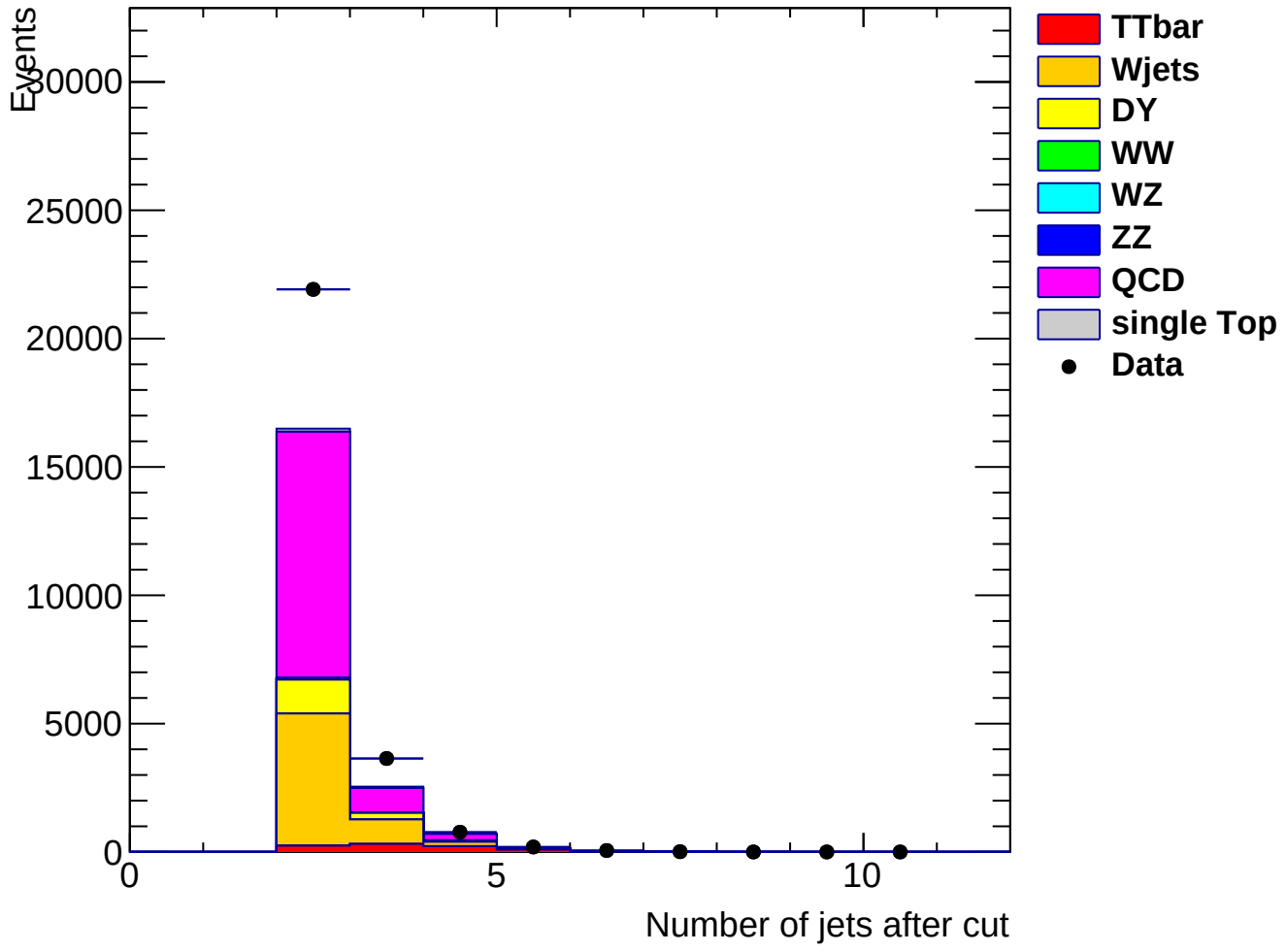
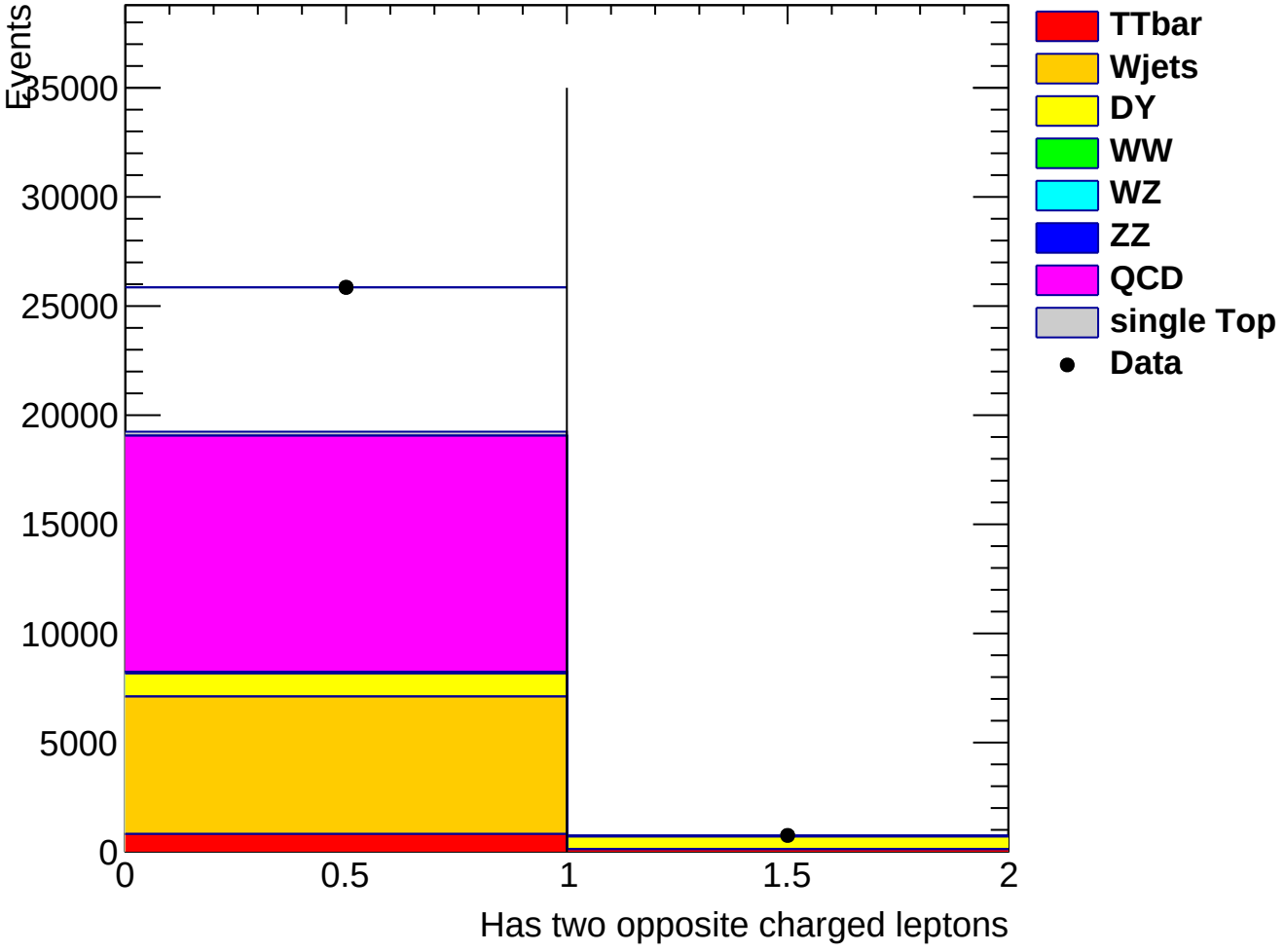
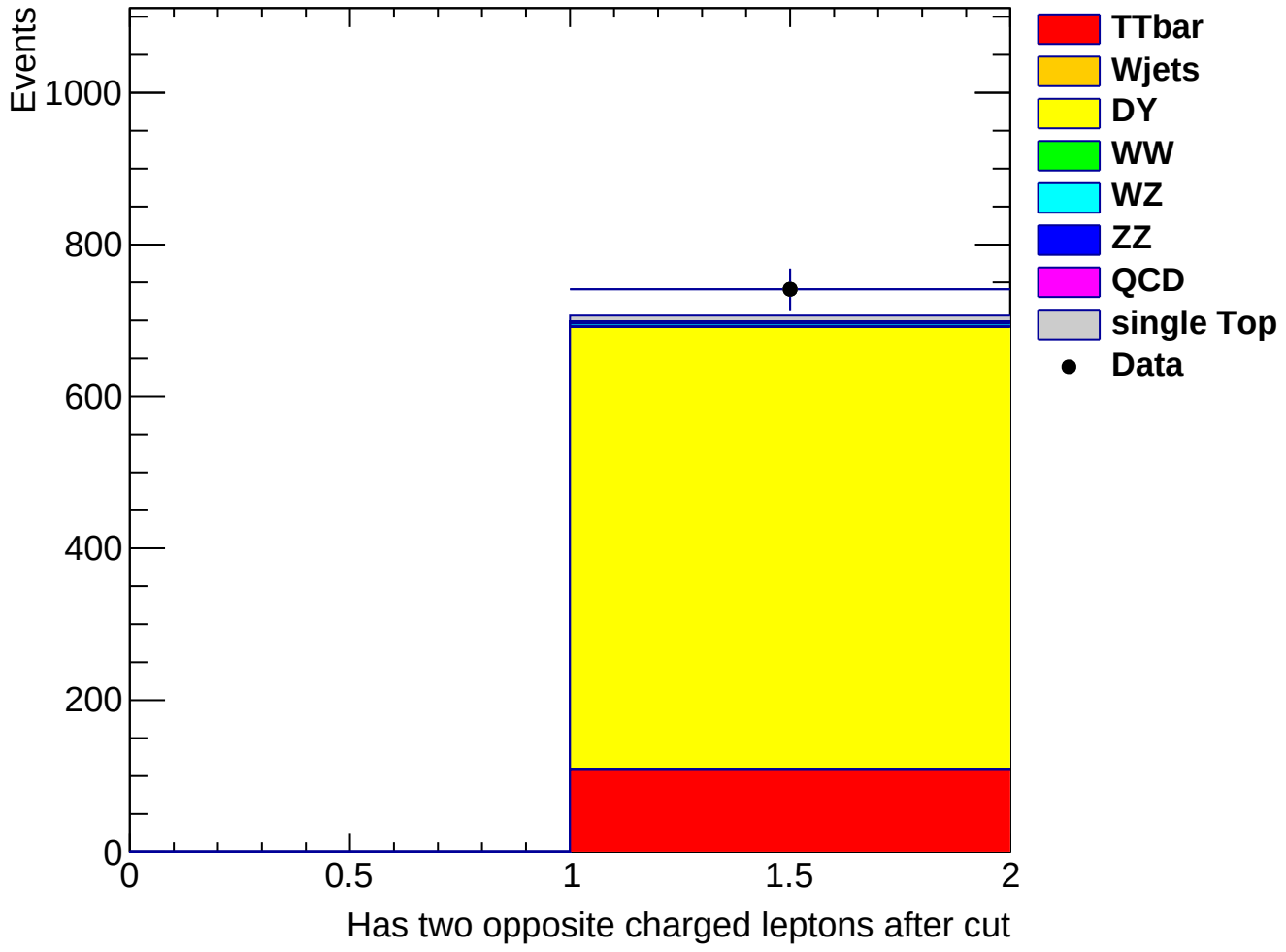

Events
3000
2500
2000
1500
1000
500
0
60
80
100
120
Invariant di-muon mass
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

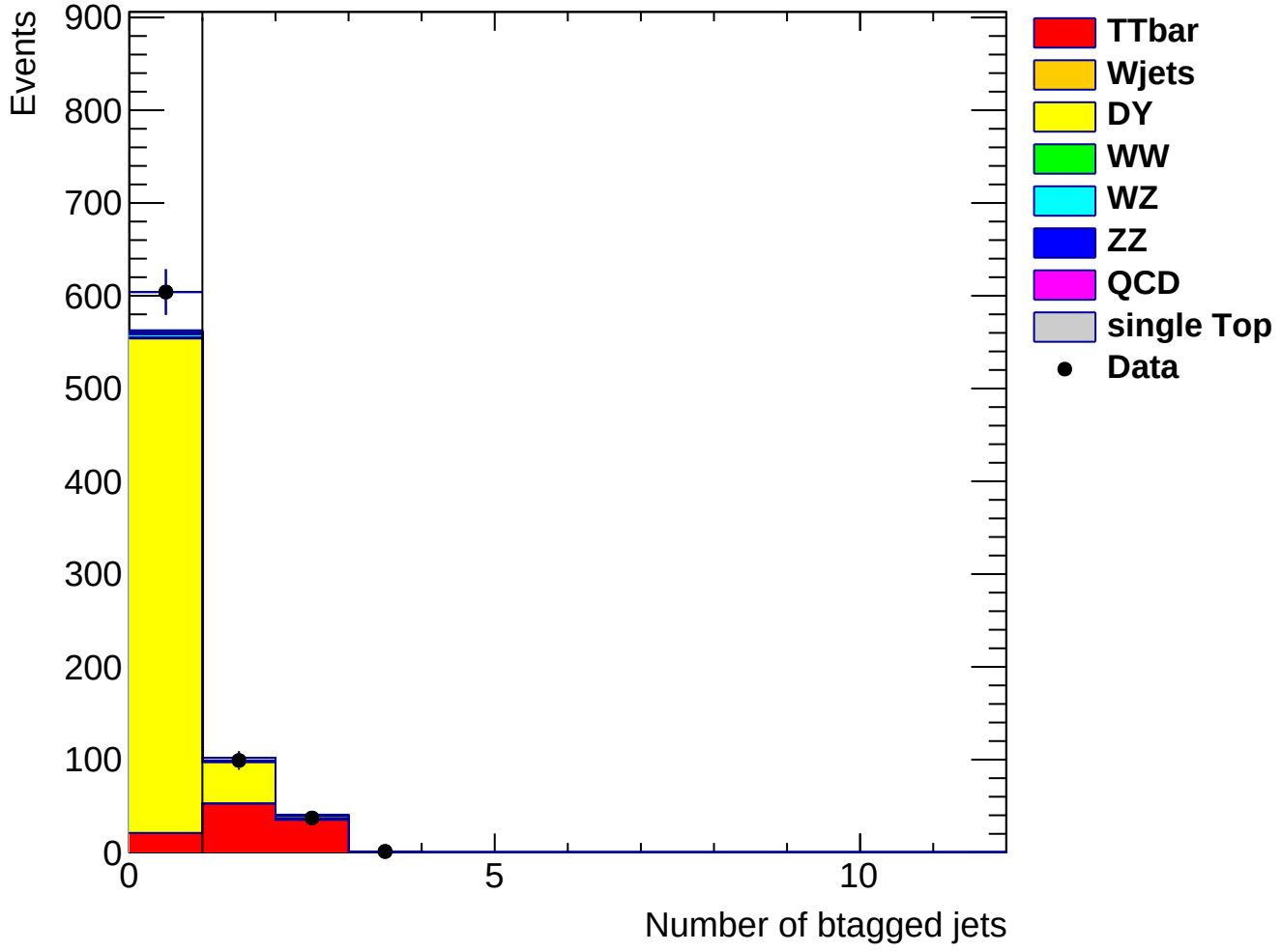

×10^3
Events
350
300
250
200
150
100
50
0
0
2
4
6
Number of muons
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

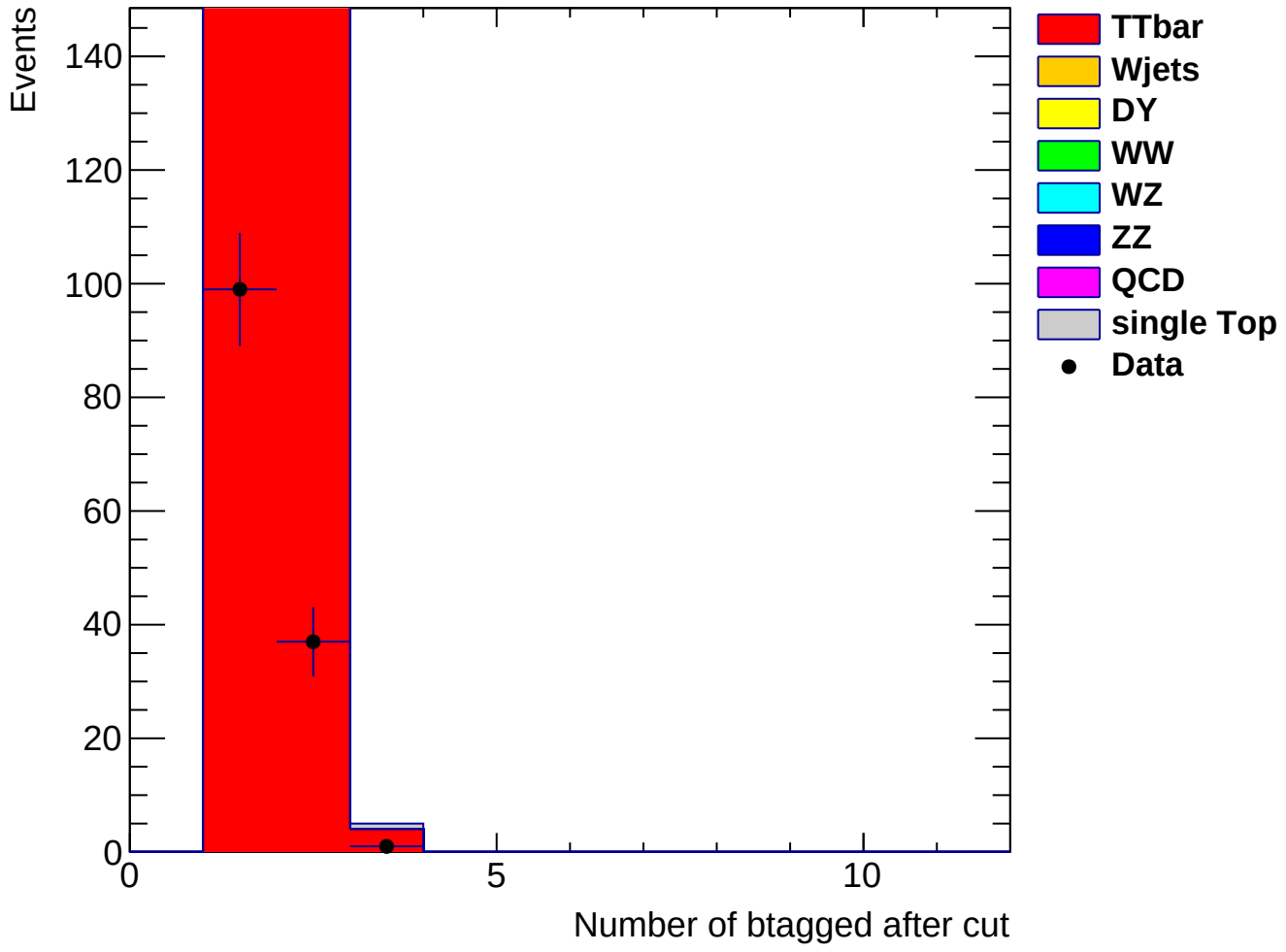

×10^3
Events
500
400
300
200
100
0
0
5
10
Number of jets before cut
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

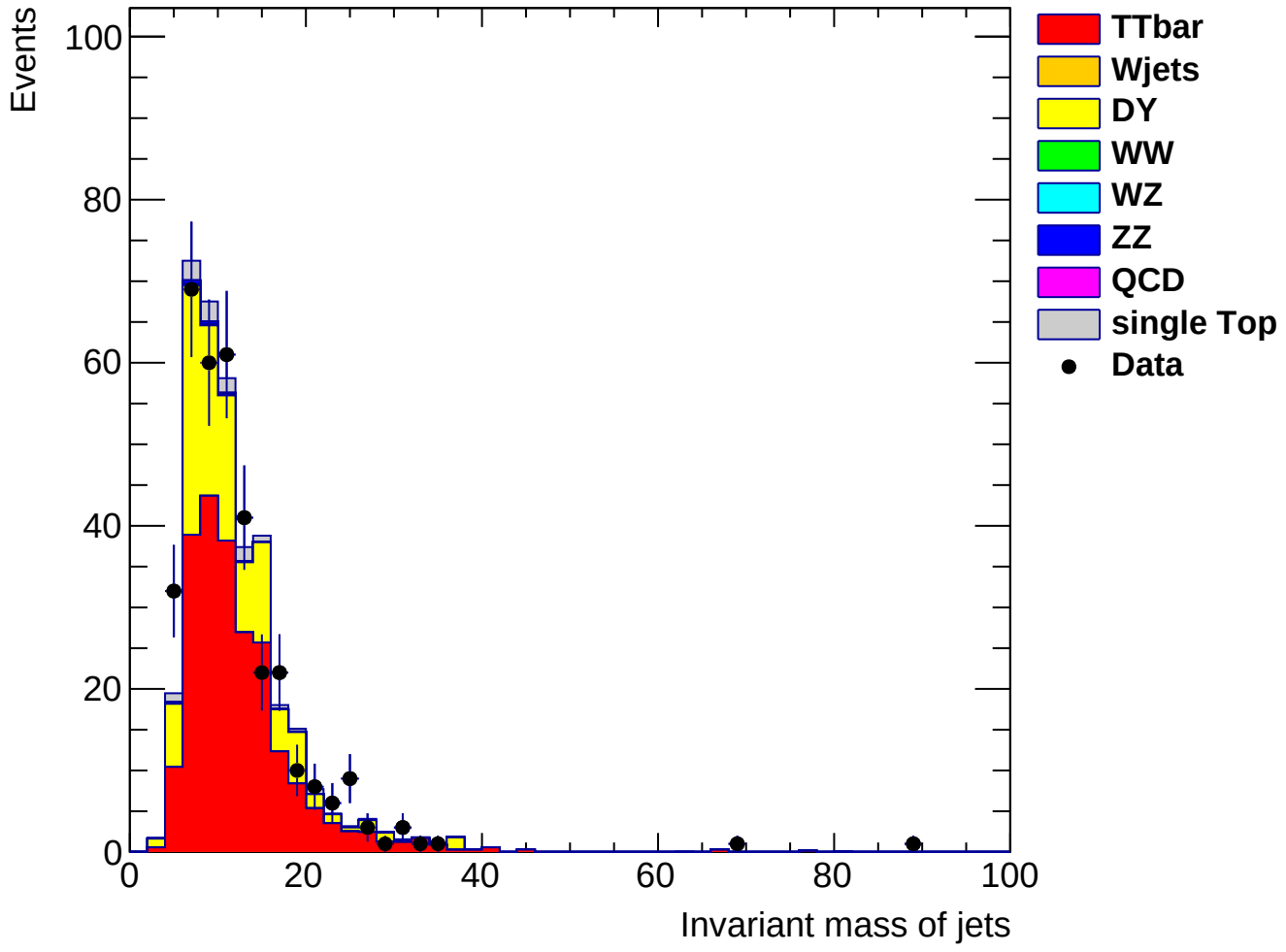

Events
30000
25000
20000
15000
10000
5000
0
0
5
10
Number of jets after cut
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

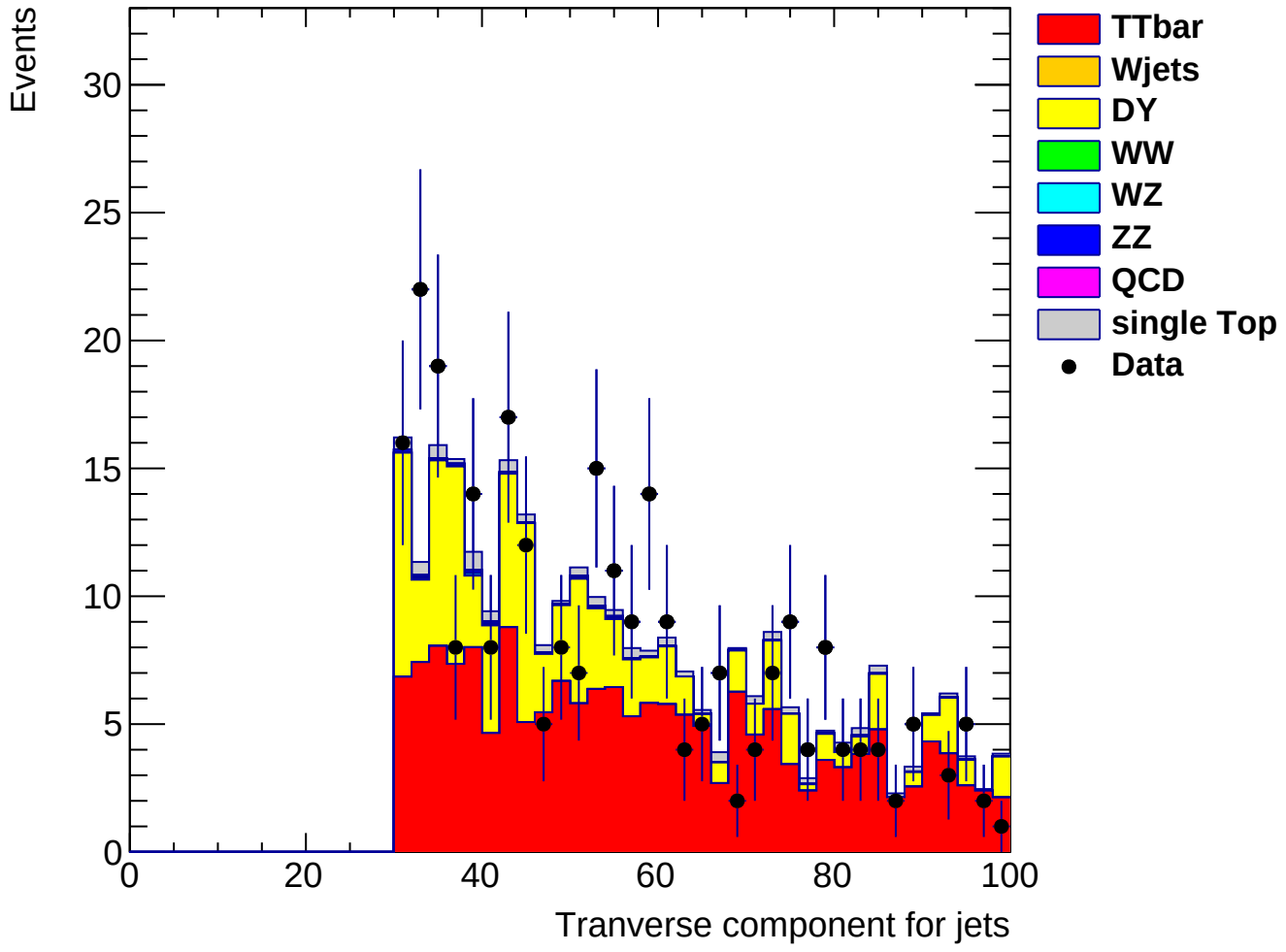

Events
35000
30000
25000
20000
15000
10000
5000
0
0
0.5
1
1.5
2
Has two opposite charged leptons
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

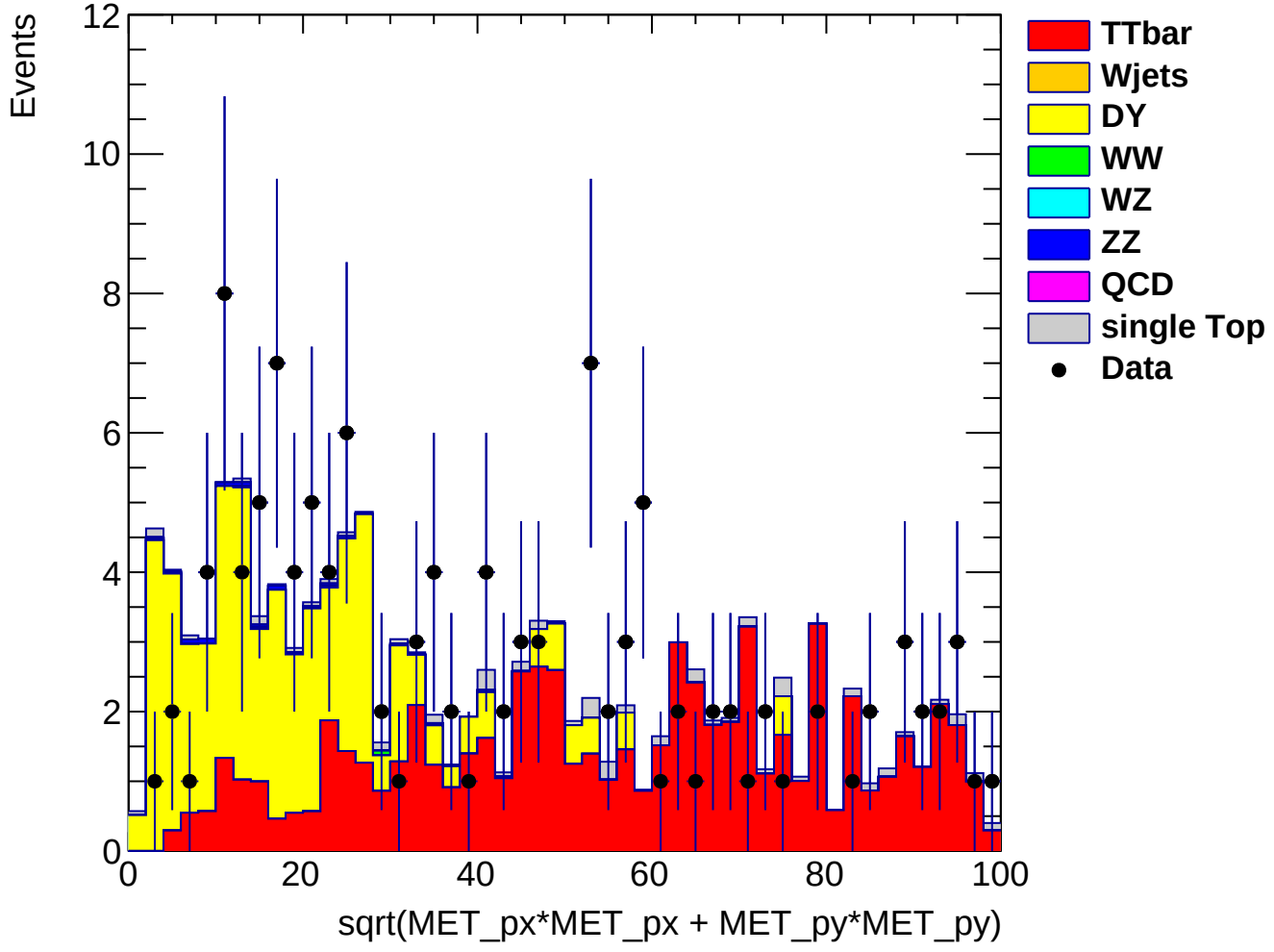

Events
1000
800
600
400
200
0
0
0.5
1
1.5
2
Has two opposite charged leptons after cut
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

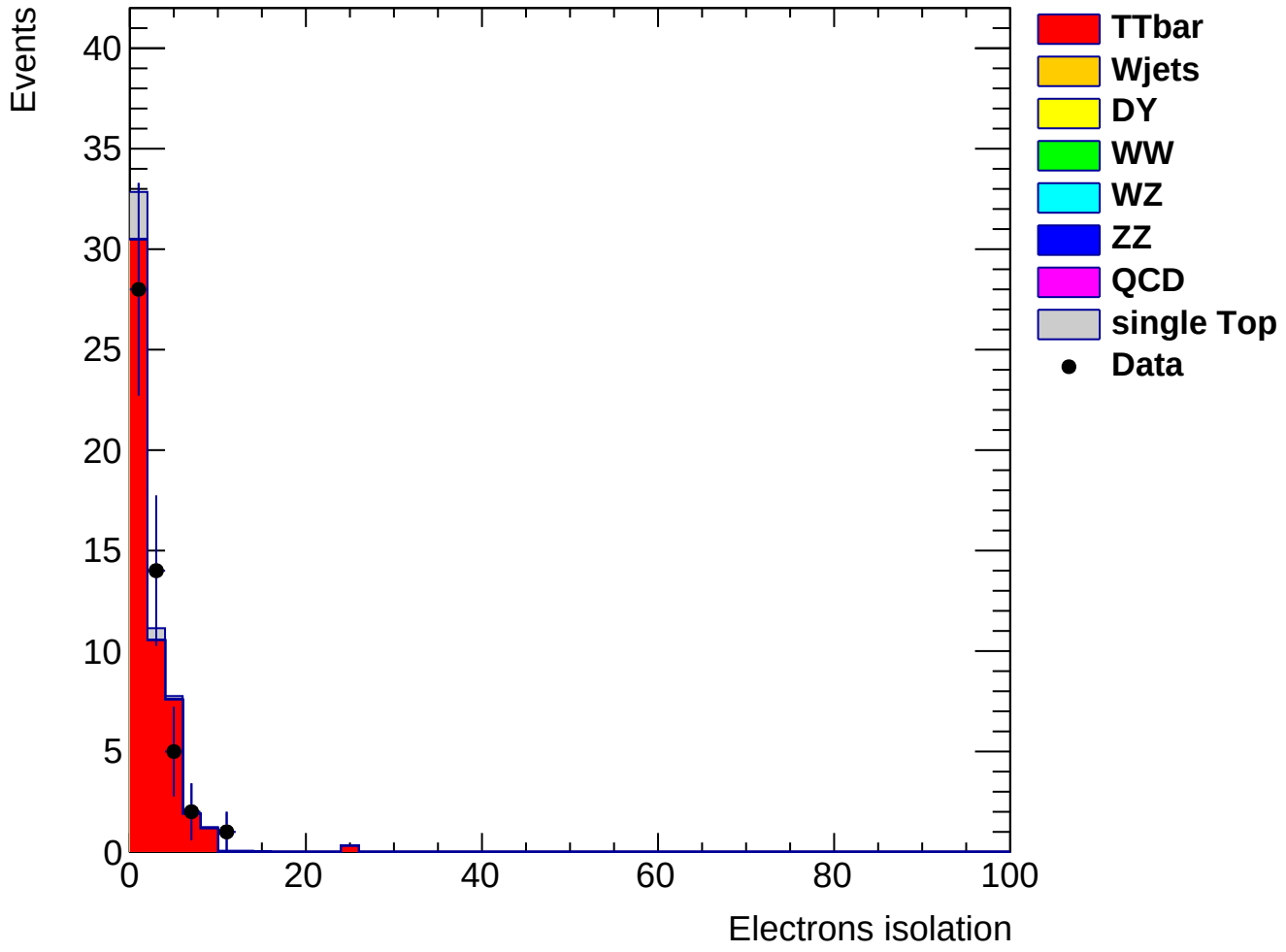

Events
900
800
700
600
500
400
300
200
100
0
0
5
10
Number of btagged jets
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

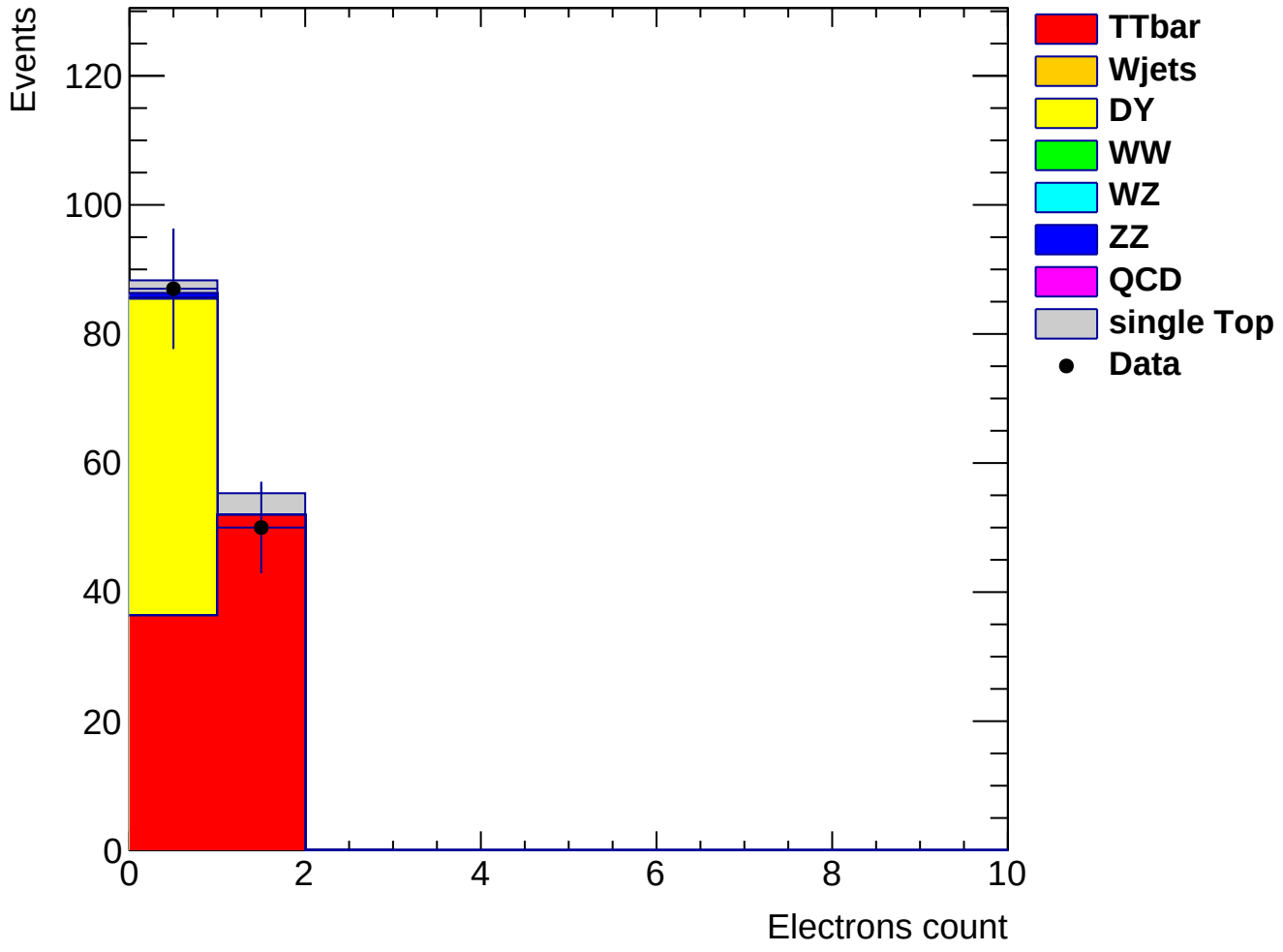

Events
140
120
100
80
60
40
20
0
0
5
10
Number of btagged after cut
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

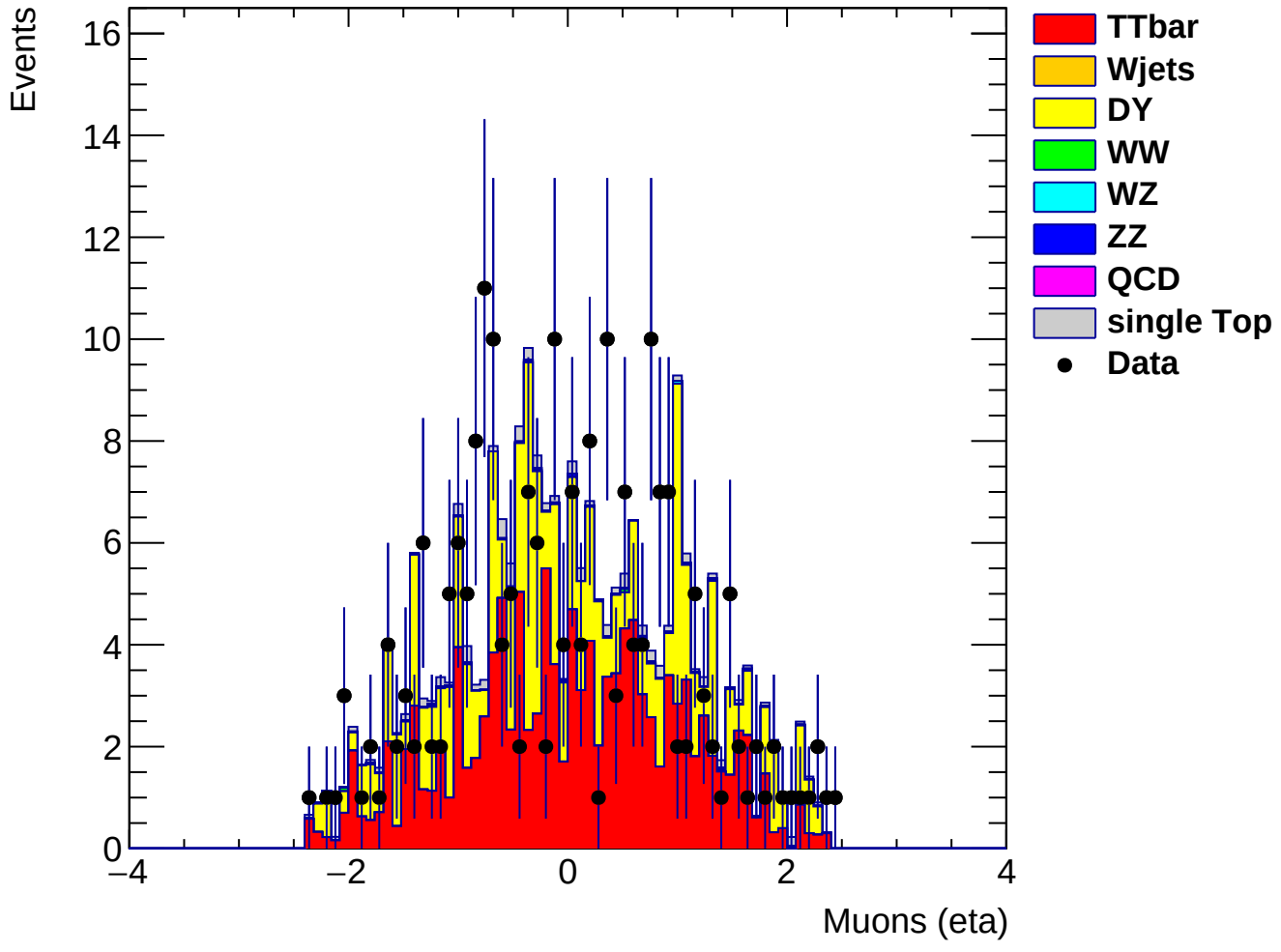

Events
100
80
60
40
20
0
0
20
40
60
80
100
Invariant mass of jets
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

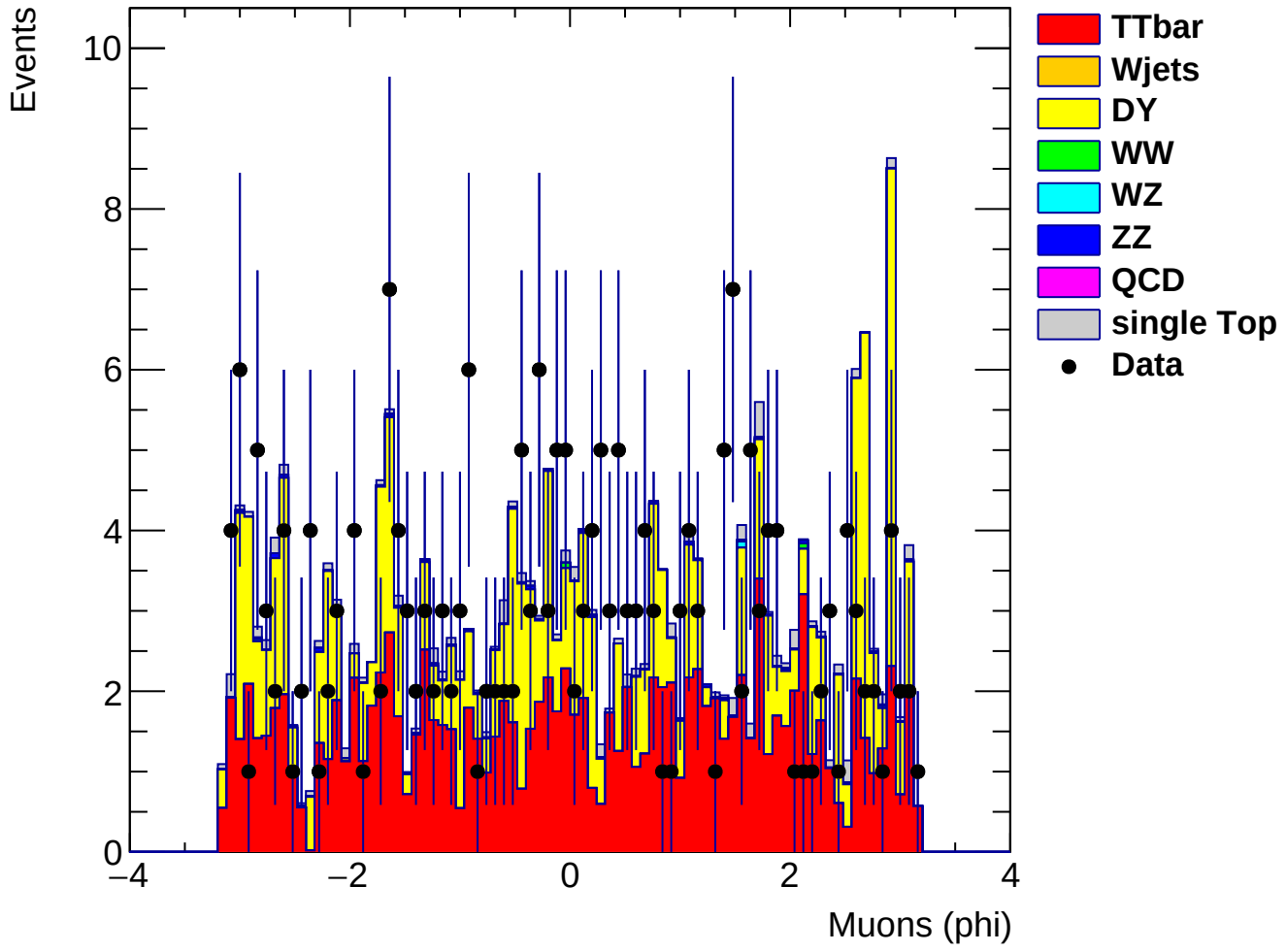

Events
0
5
10
15
20
25
30
0
20
40
60
80
100
Tranverse component for jets
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

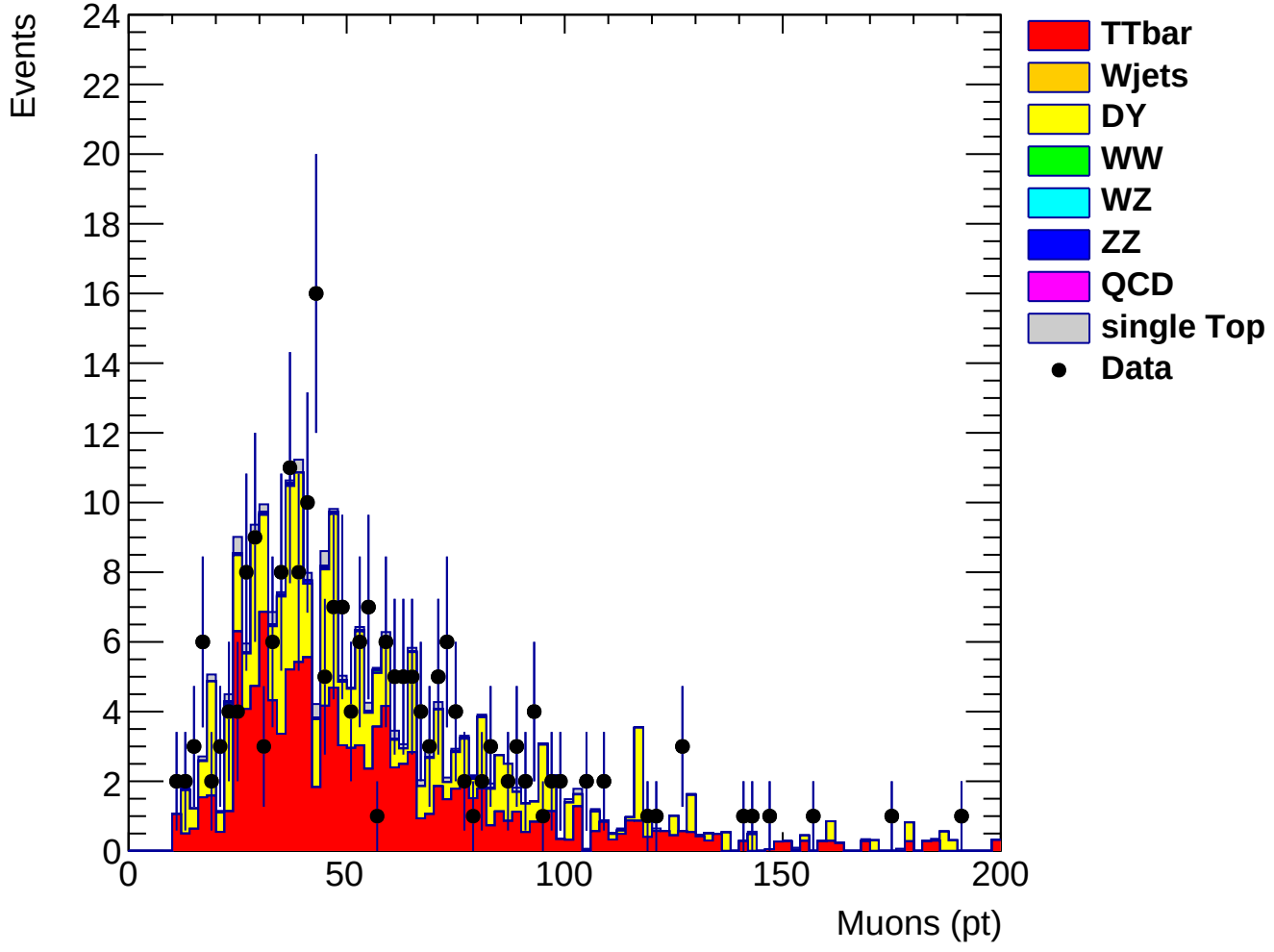

Events
12
10
8
6
4
2
0
0
20
40
60
80
100
sqrt(MET_px*MET_px + MET_py*MET_py)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

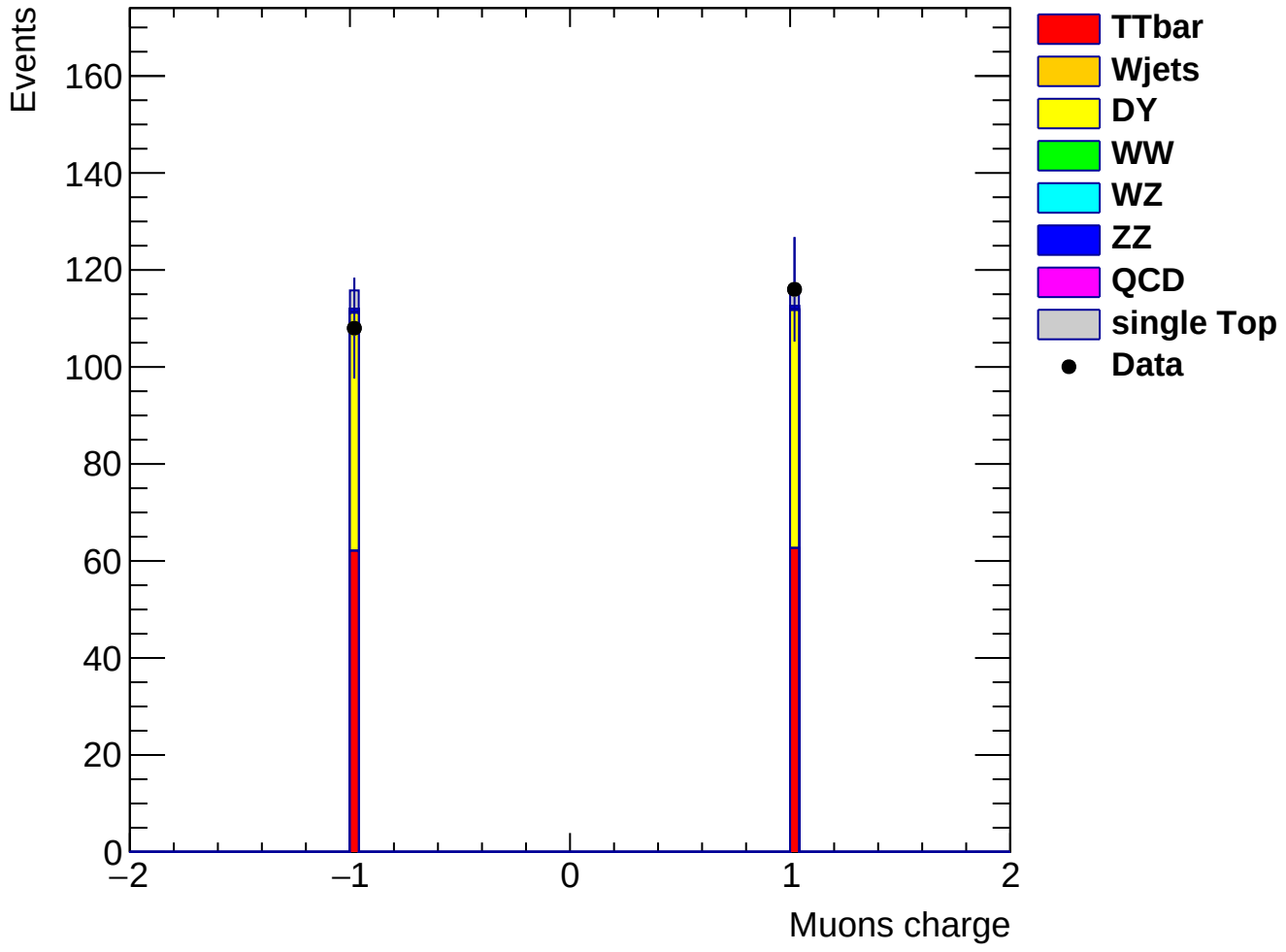

Events
40
35
30
25
20
15
10
5
0
0
20
40
60
80
100
Electrons isolation
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

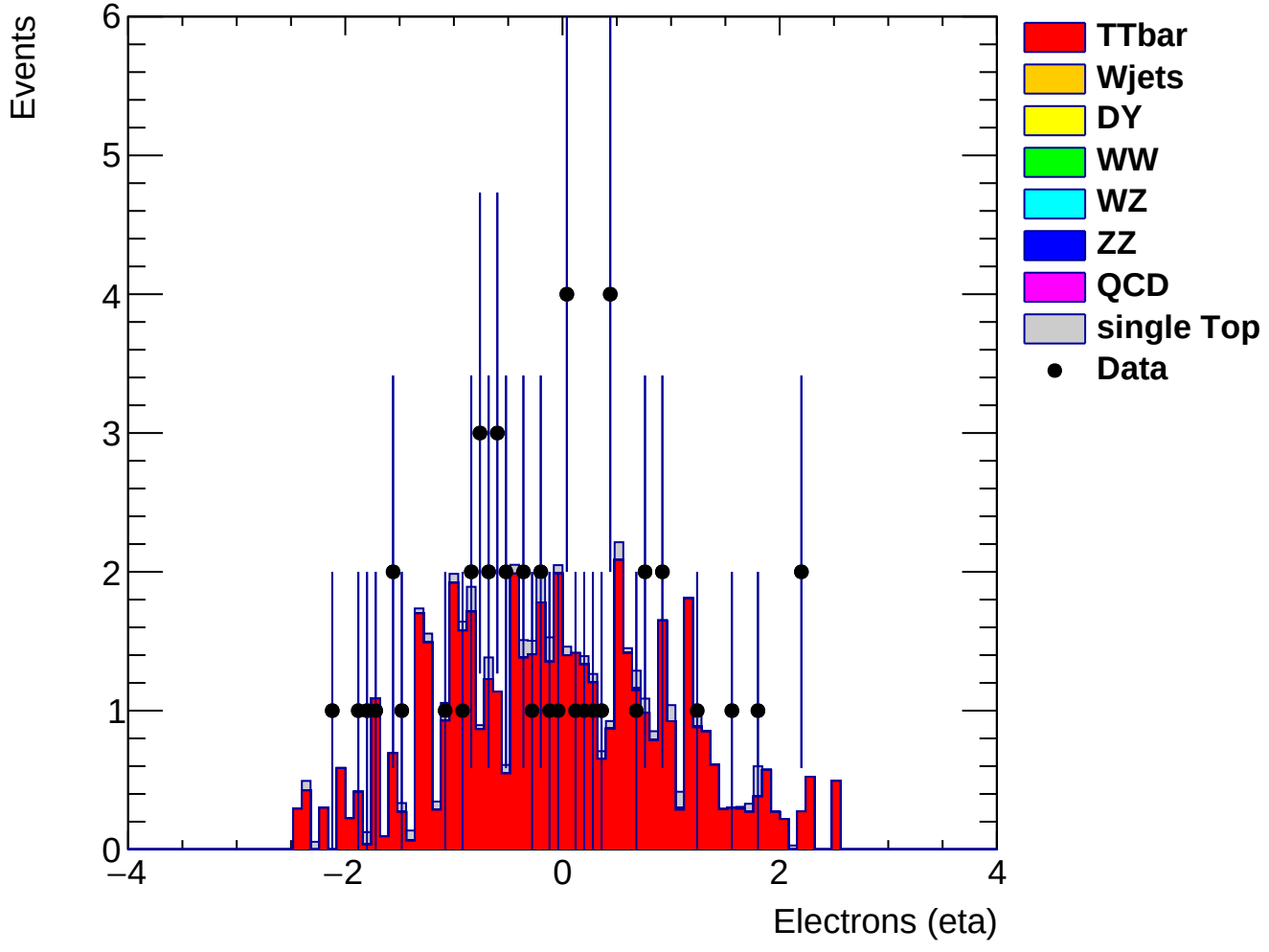

Events
120
100
80
60
40
20
0
0
2
4
6
8
10
Electrons count
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

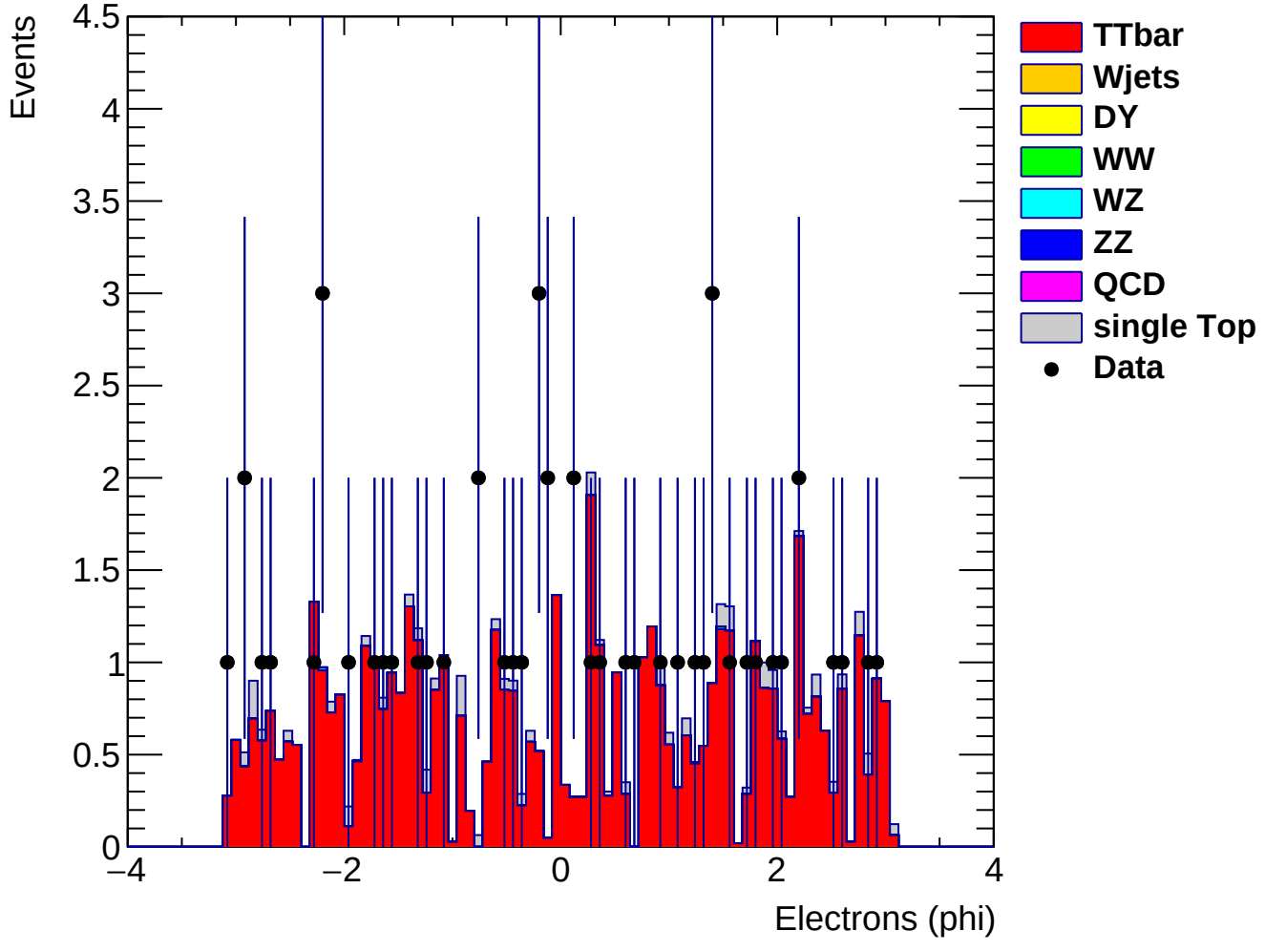

Events
16
14
12
10
8
6
4
2
0
−4
−2
0
2
4
Muons (eta)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

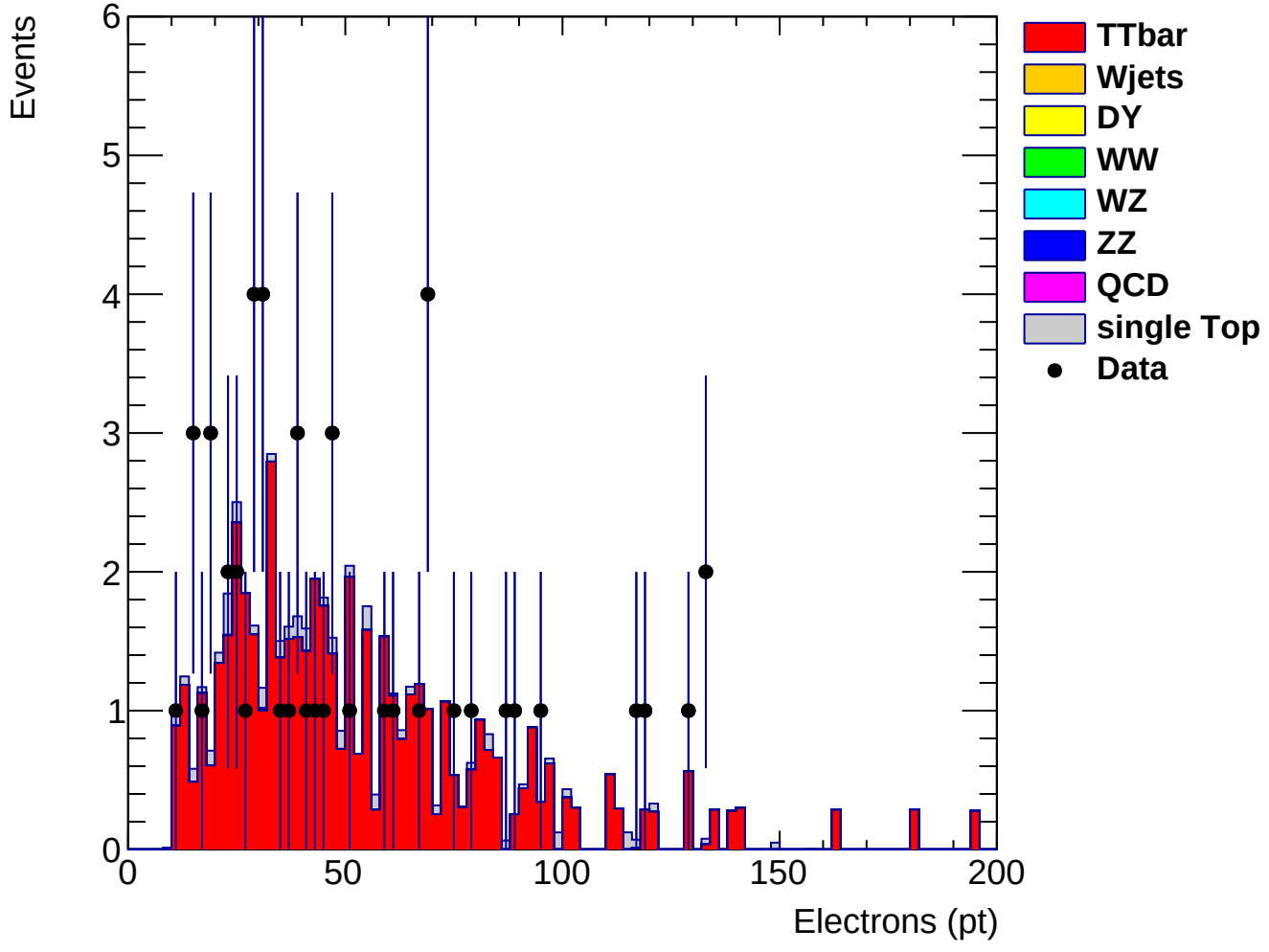

Events
10
8
6
4
2
0
−4
−2
0
2
4
Muons (phi)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

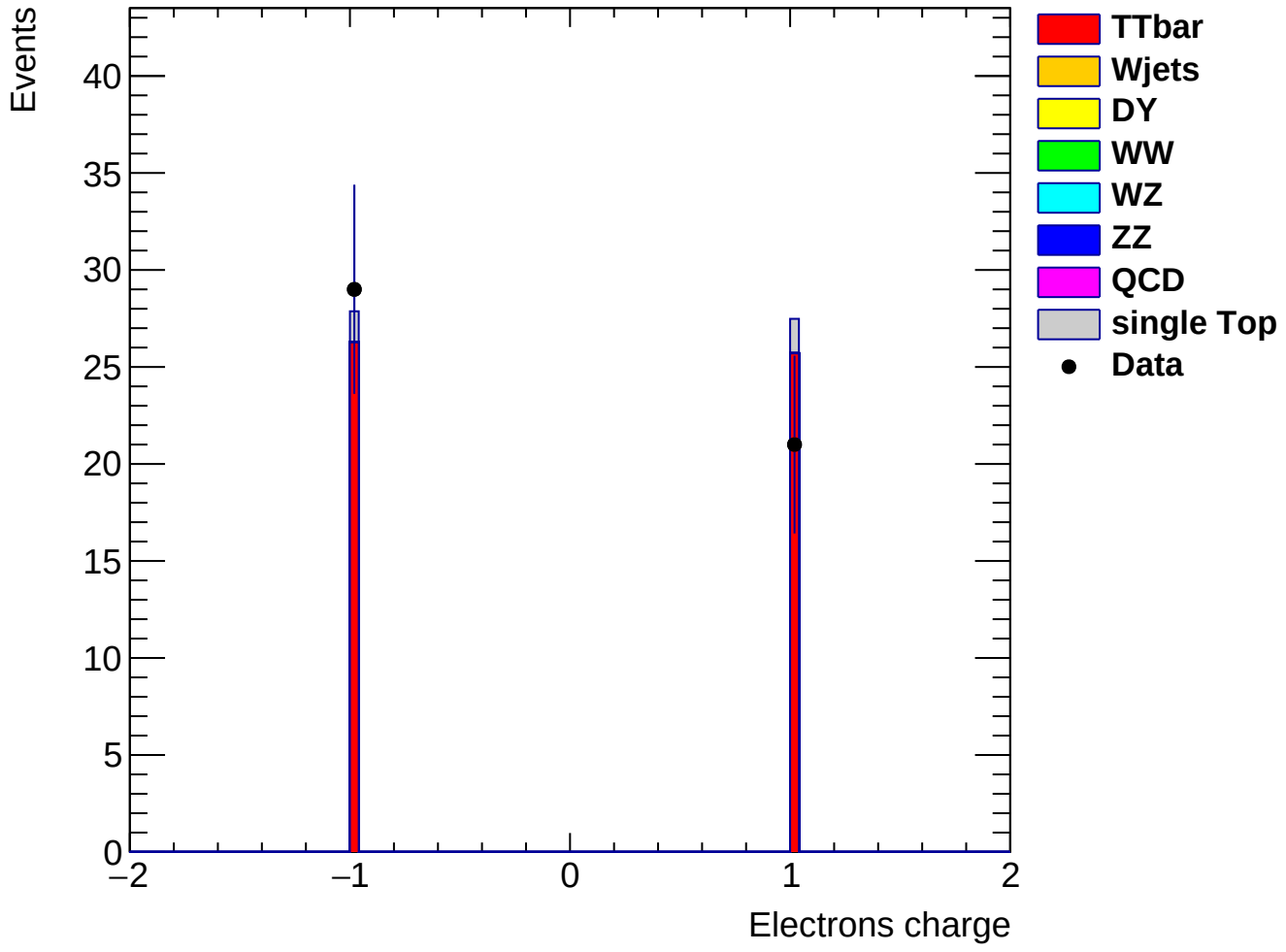

Events
24
22
20
18
16
14
12
10
8
6
4
2
0
0
50
100
150
200
Muons (pt)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

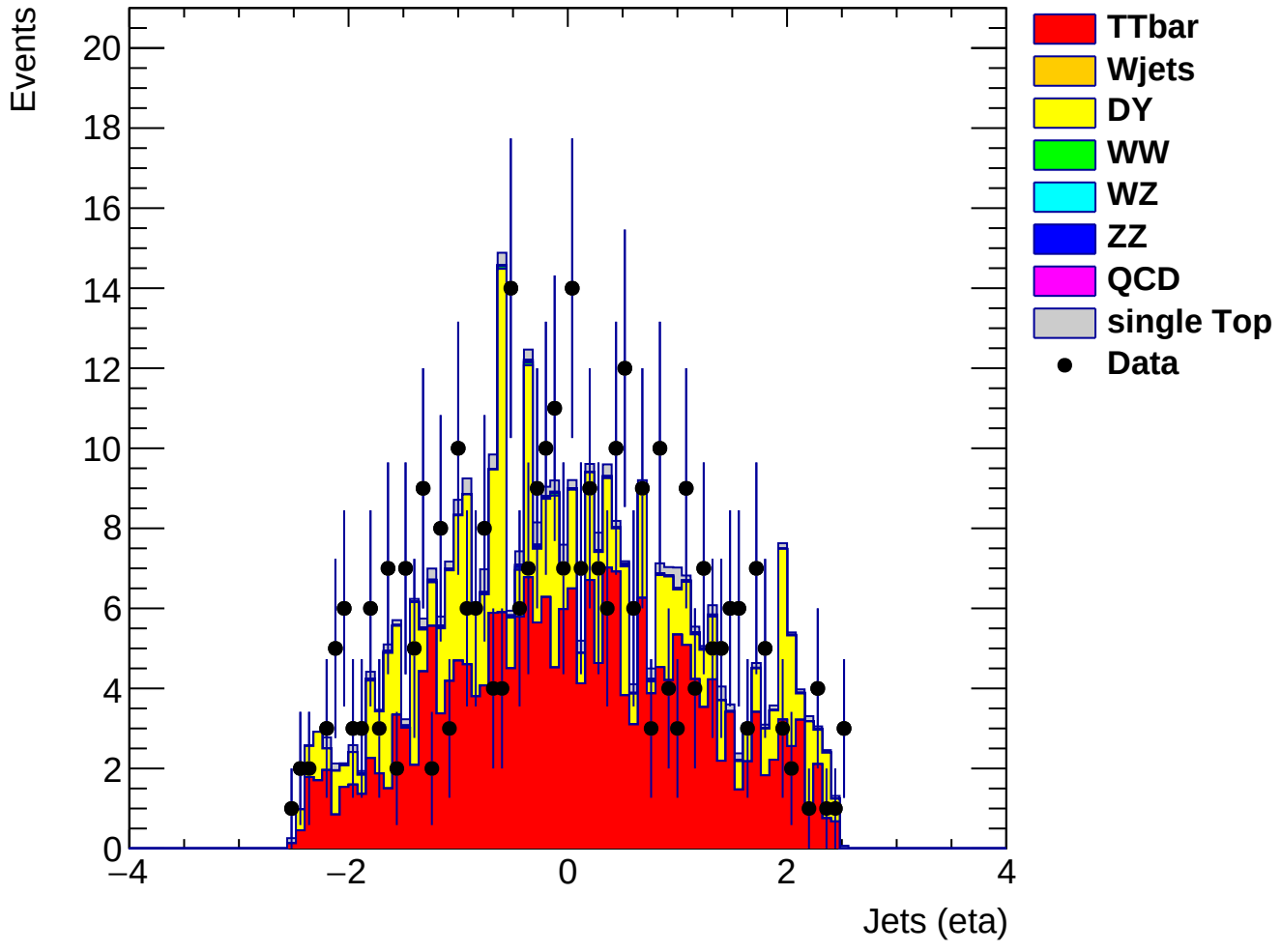

Events
160
140
120
100
80
60
40
20
0
−2
−1
0
1
2
Muons charge
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

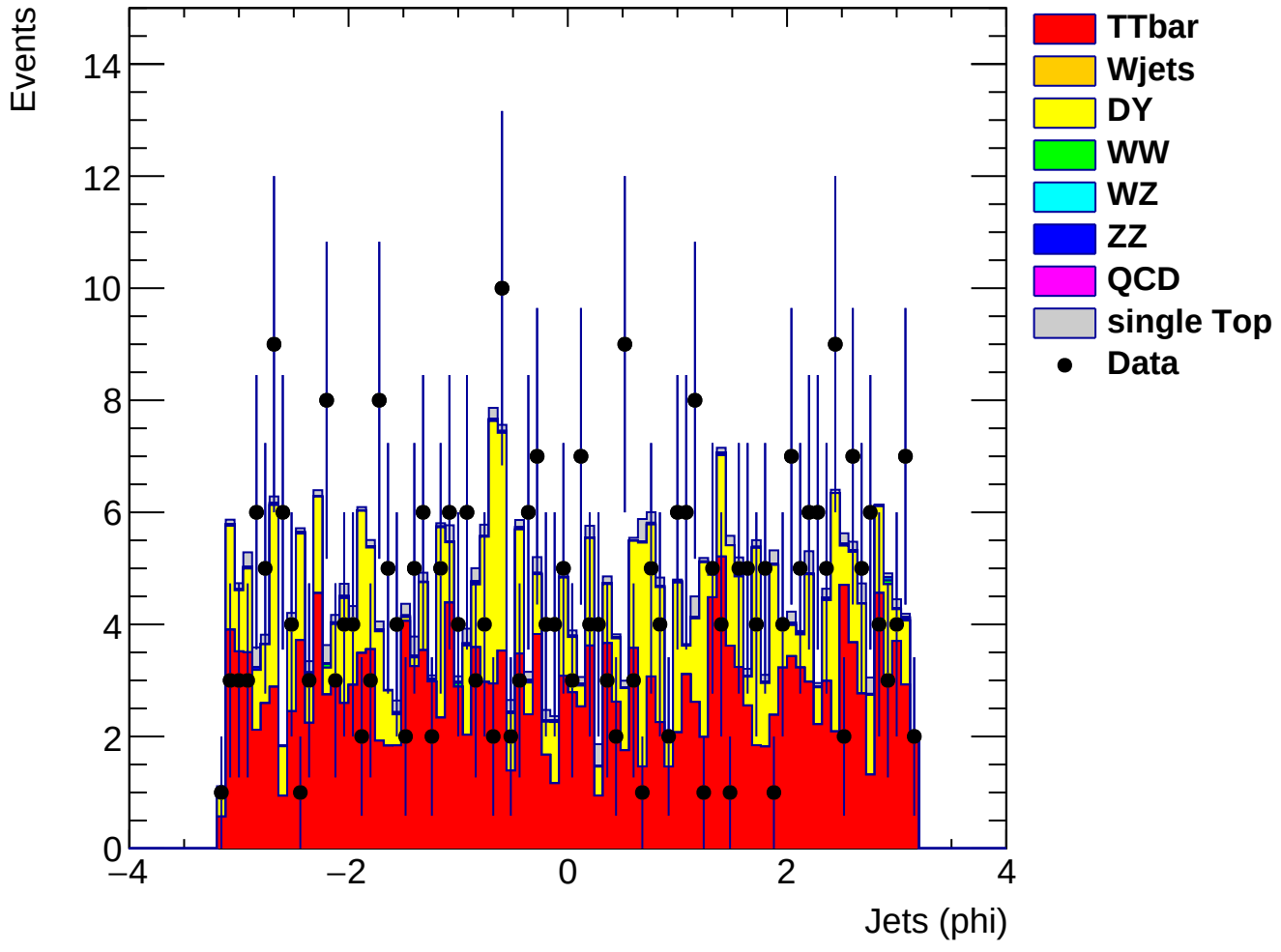

Events
6
5
4
3
2
1
0
−4
−2
0
2
4
Electrons (eta)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

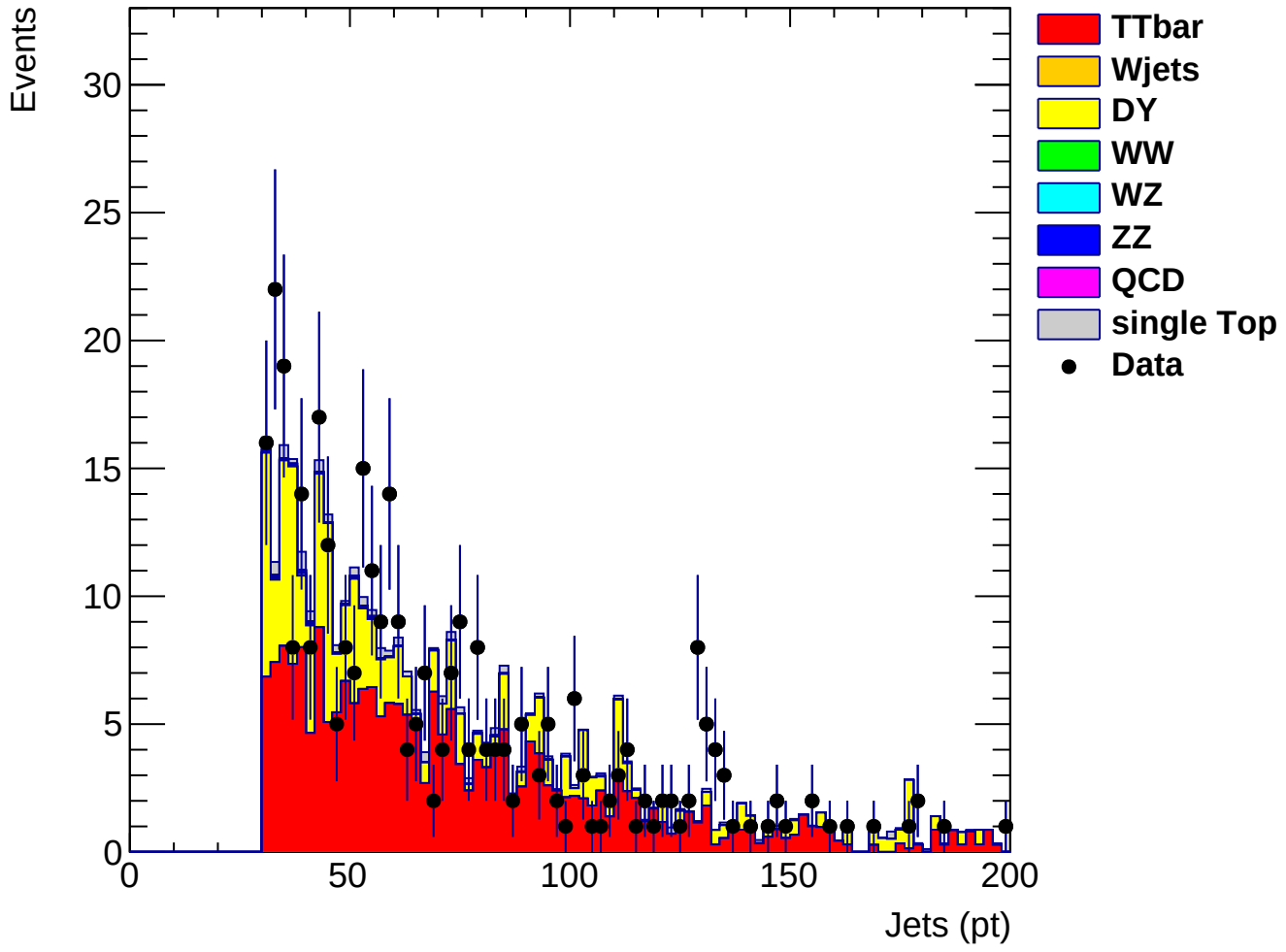

Events
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
−4
−2
0
2
4
Electrons (phi)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

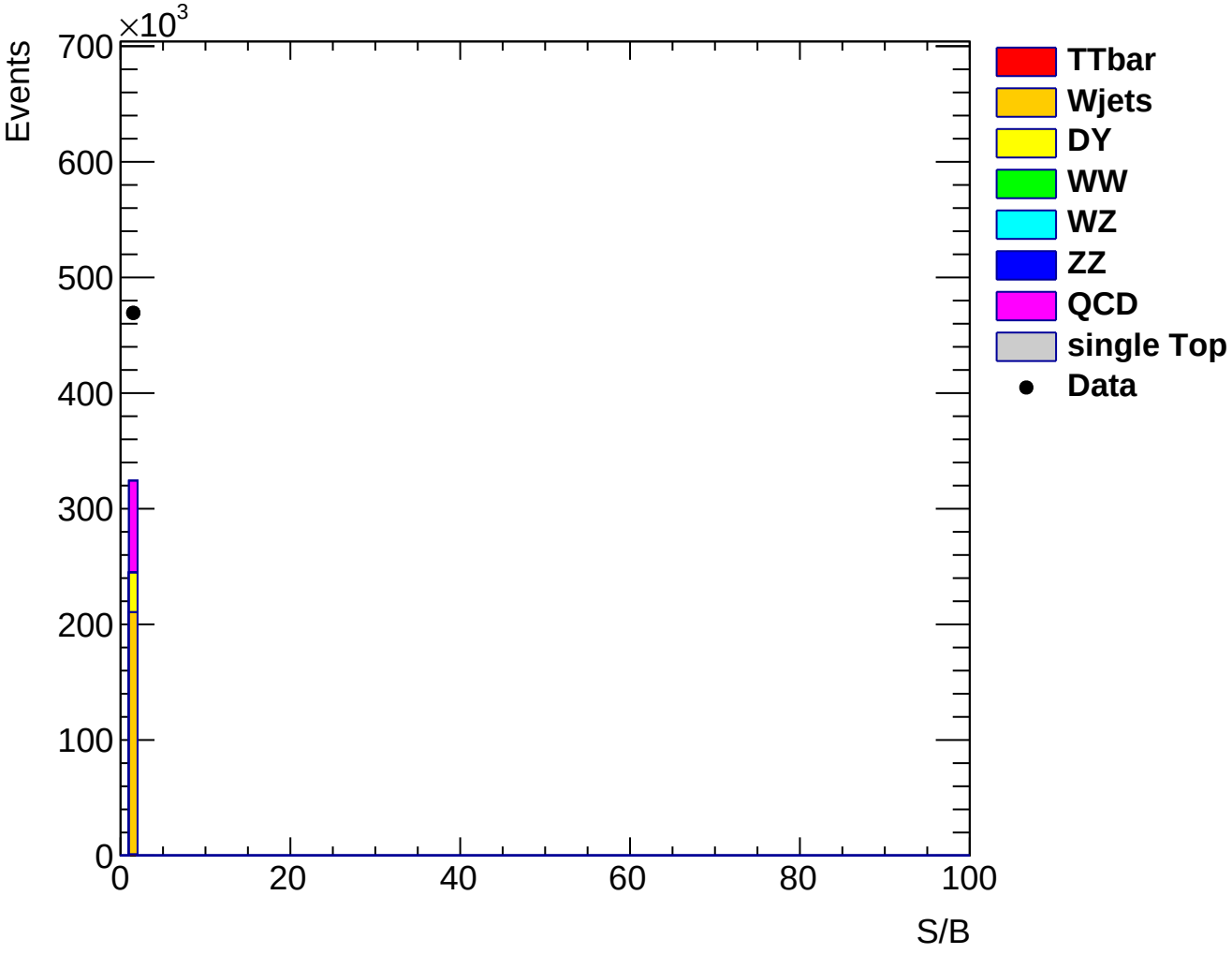

Events
Electrons (pt)
0
1
2
3
4
5
6
0
50
100
150
200
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

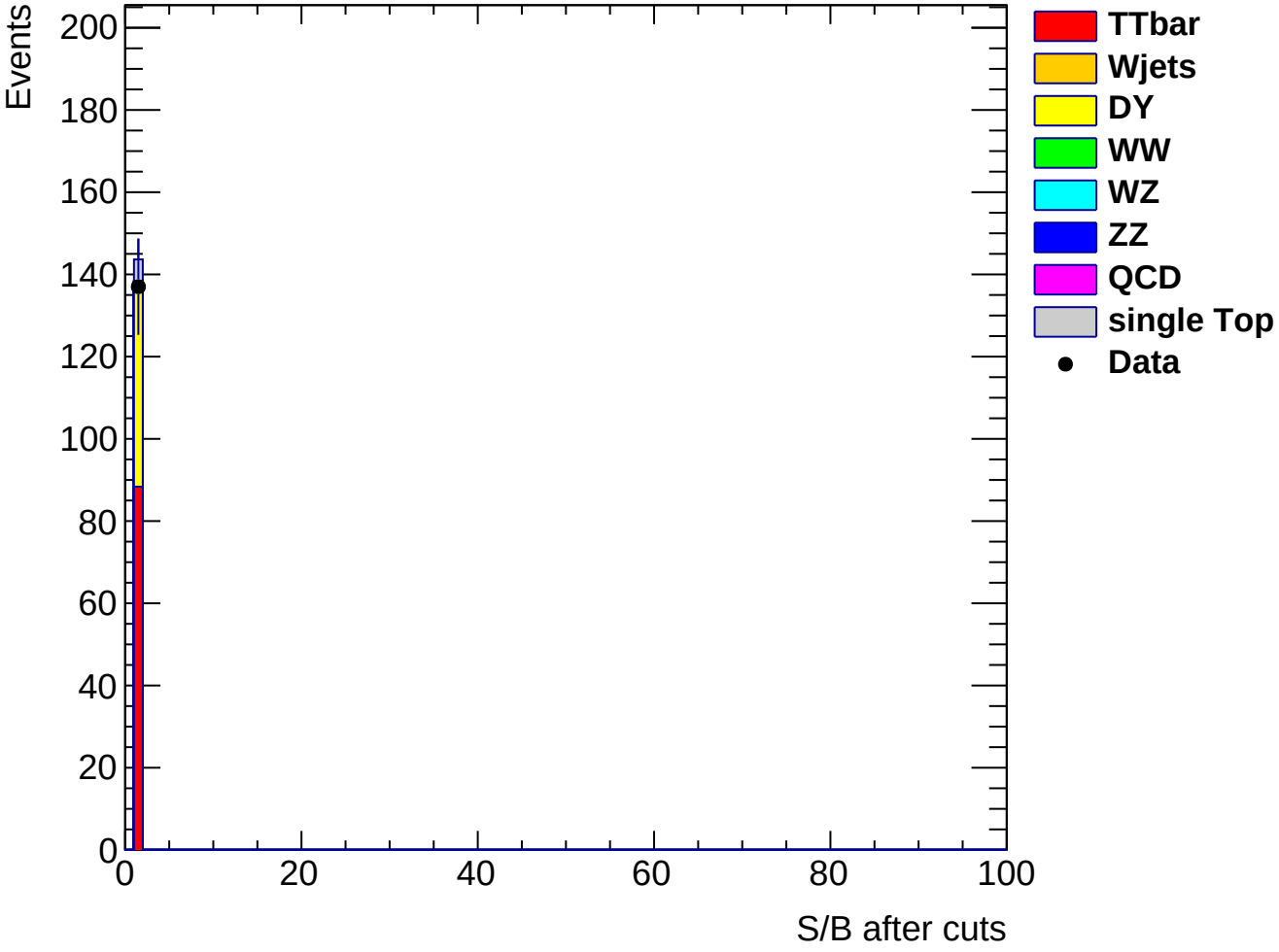

Events
40
35
30
25
20
15
10
5
0
−2
−1
0
1
2
Electrons charge
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

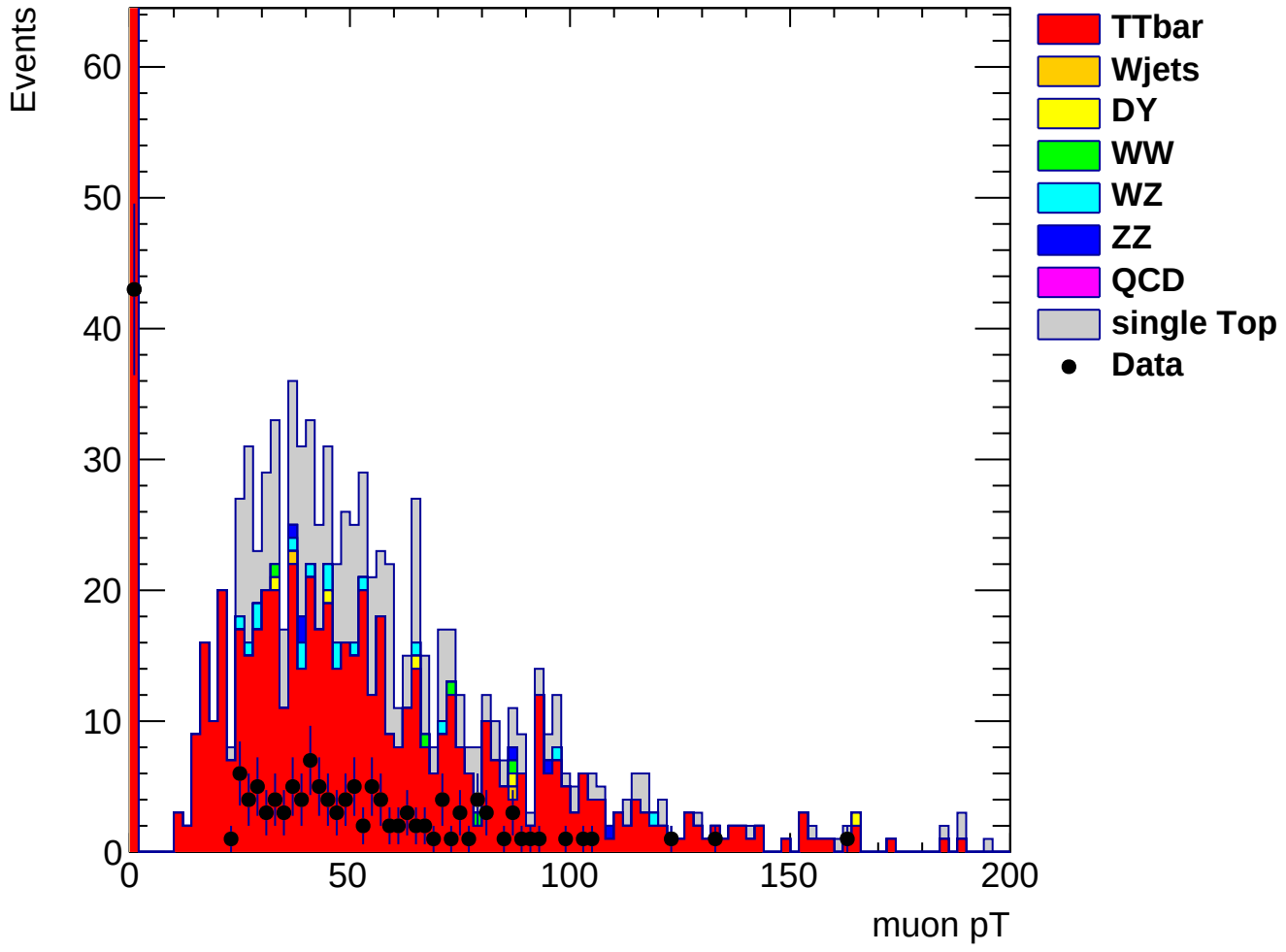

Events
20
18
16
14
12
10
8
6
4
2
0
−4
−2
0
2
4
Jets (eta)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

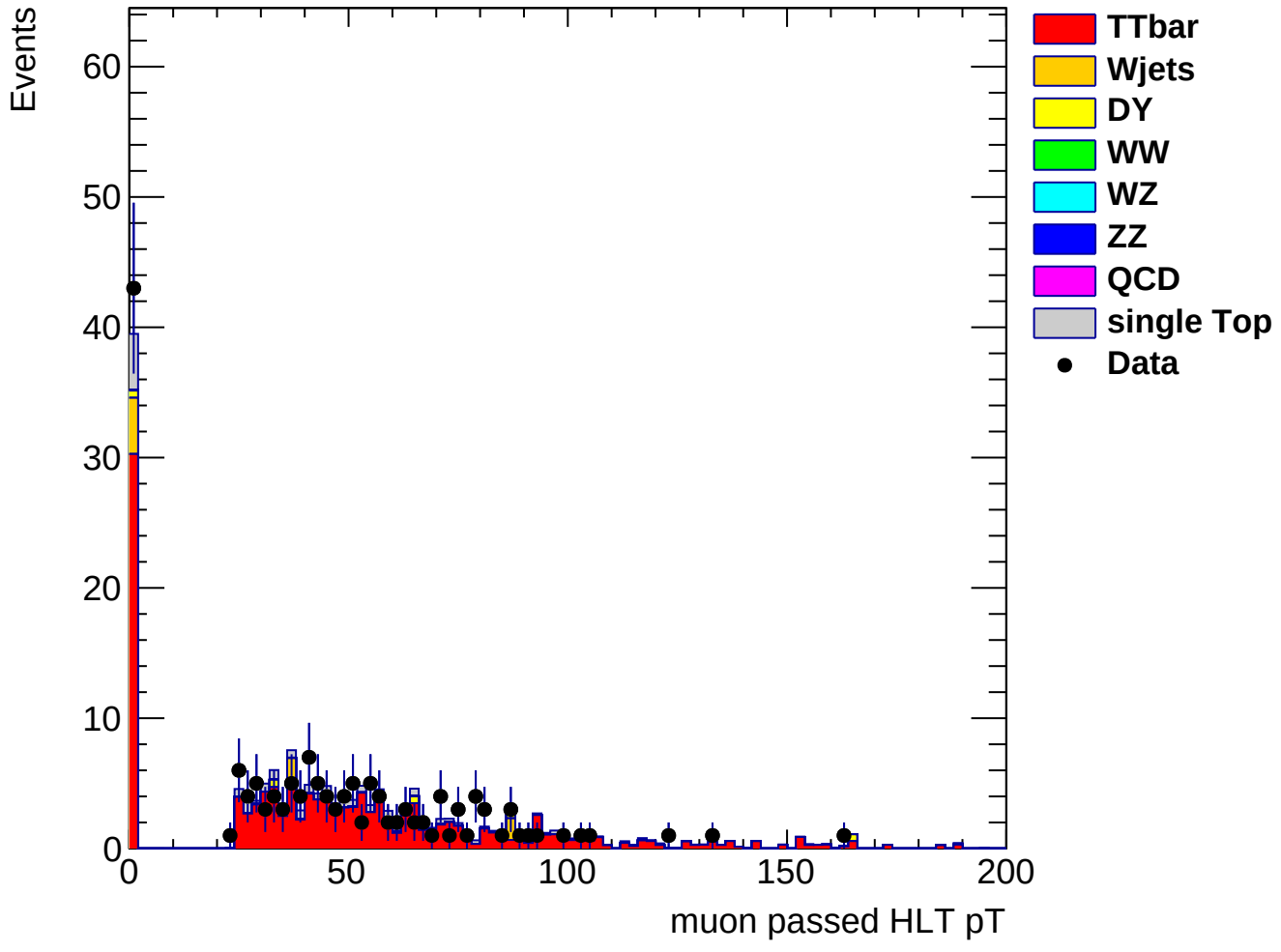

Events
14
12
10
8
6
4
2
0
−4
−2
0
2
4
Jets (phi)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data

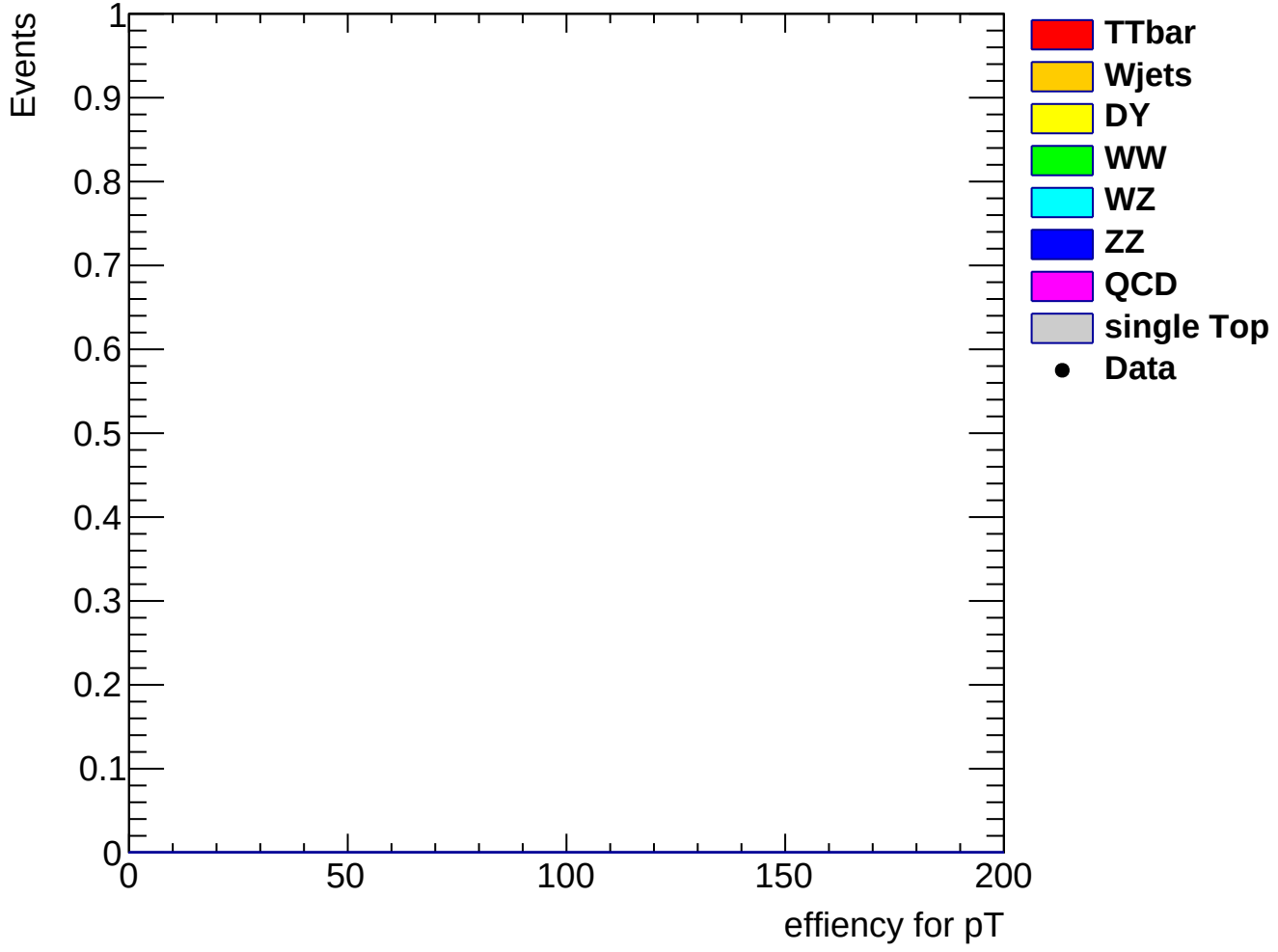

Events
30
25
20
15
10
5
0
0
50
100
150
200
Jets (pt)
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data


×10^3
Events
700
600
500
400
300
200
100
0
0
20
40
60
80
100
S/B
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data


Events
200
180
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
S/B after cuts
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data


Events
60
50
40
30
20
10
0
0
50
100
150
200
muon pT
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data


Events
60
50
40
30
20
10
0
0
50
100
150
200
muon passed HLT pT
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data


Events
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
50
100
150
200
effiency for pT
TTbar
Wjets
DY
WW
WZ
ZZ
QCD
single Top
Data