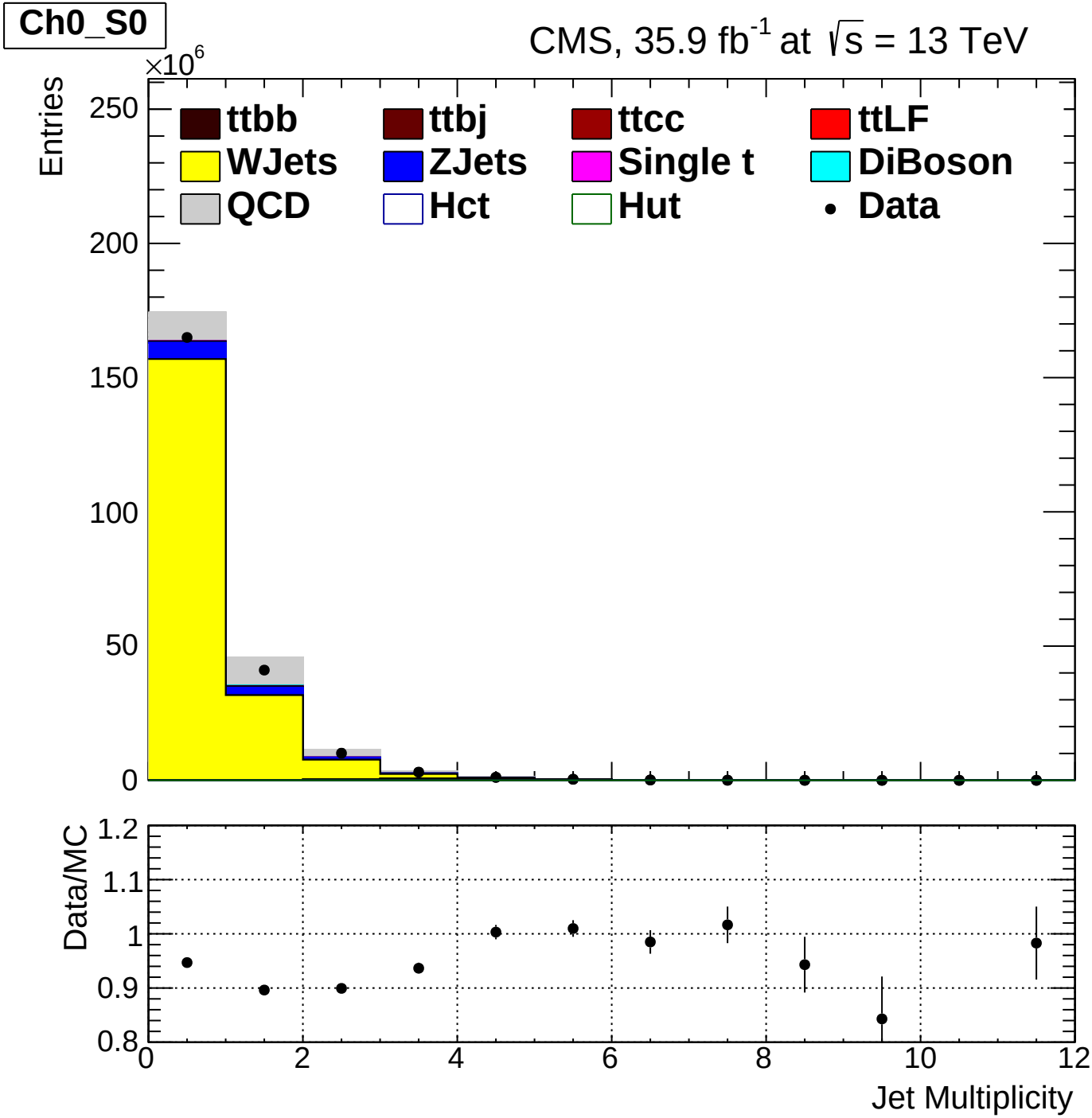
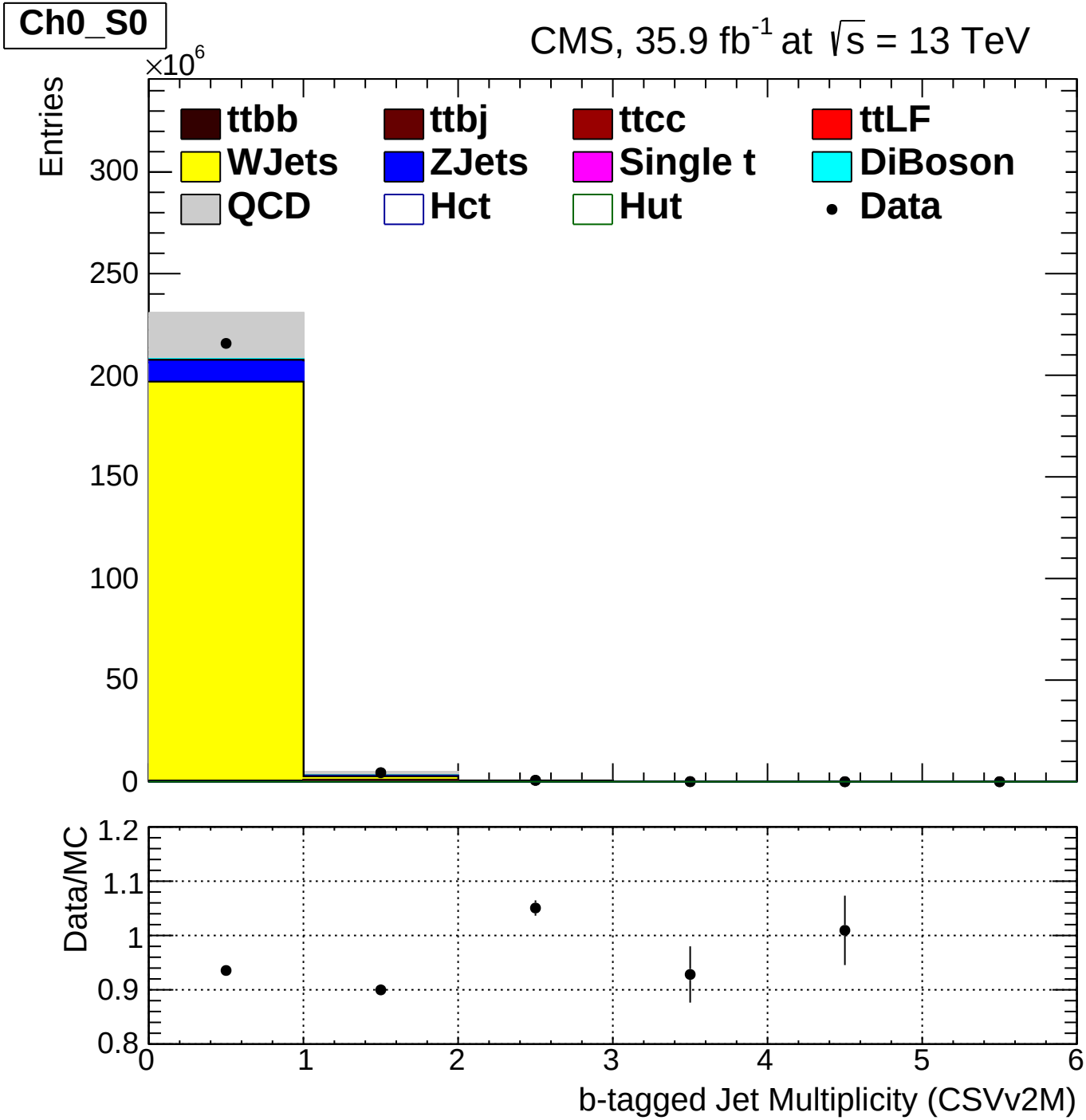
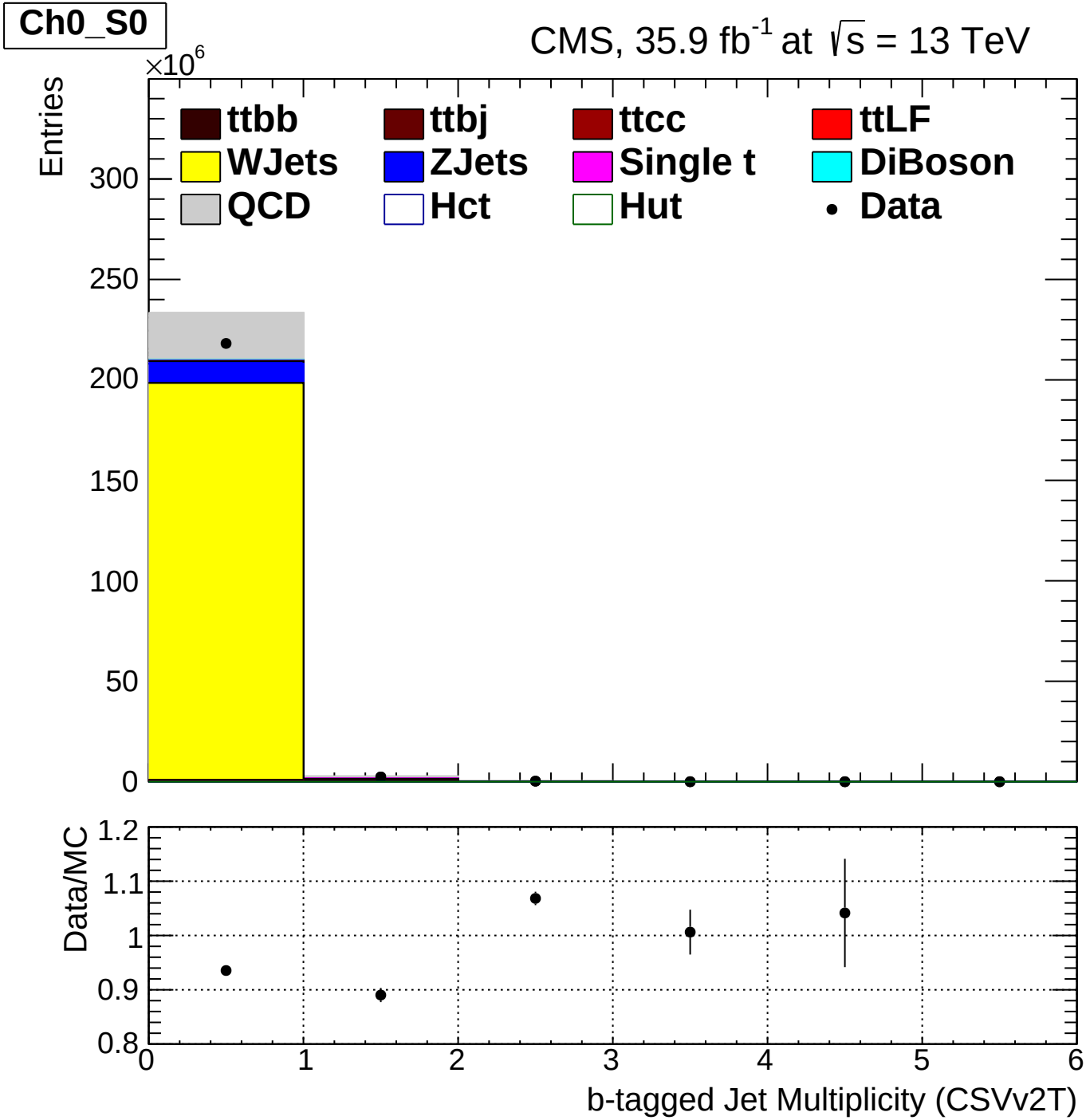
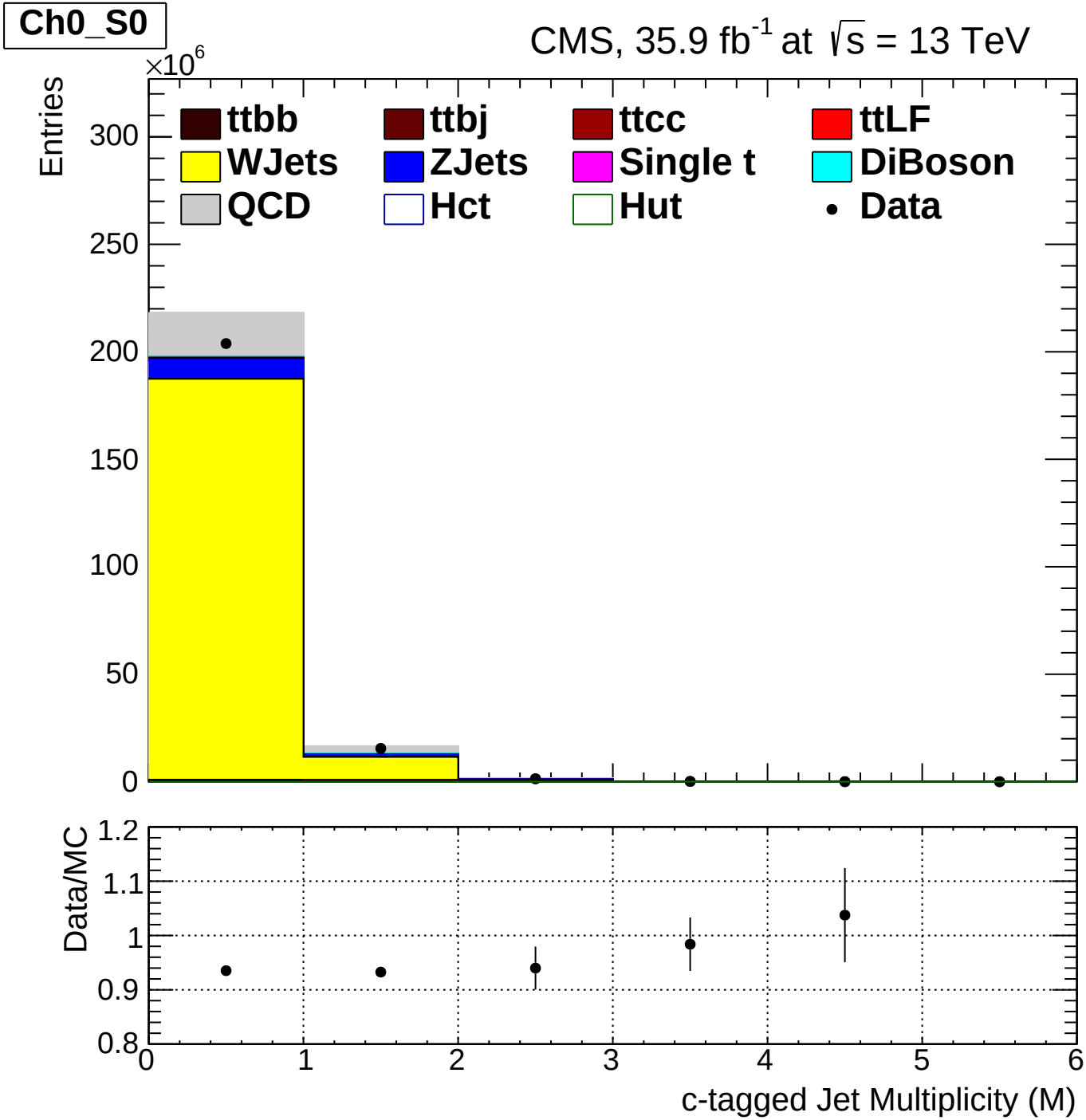
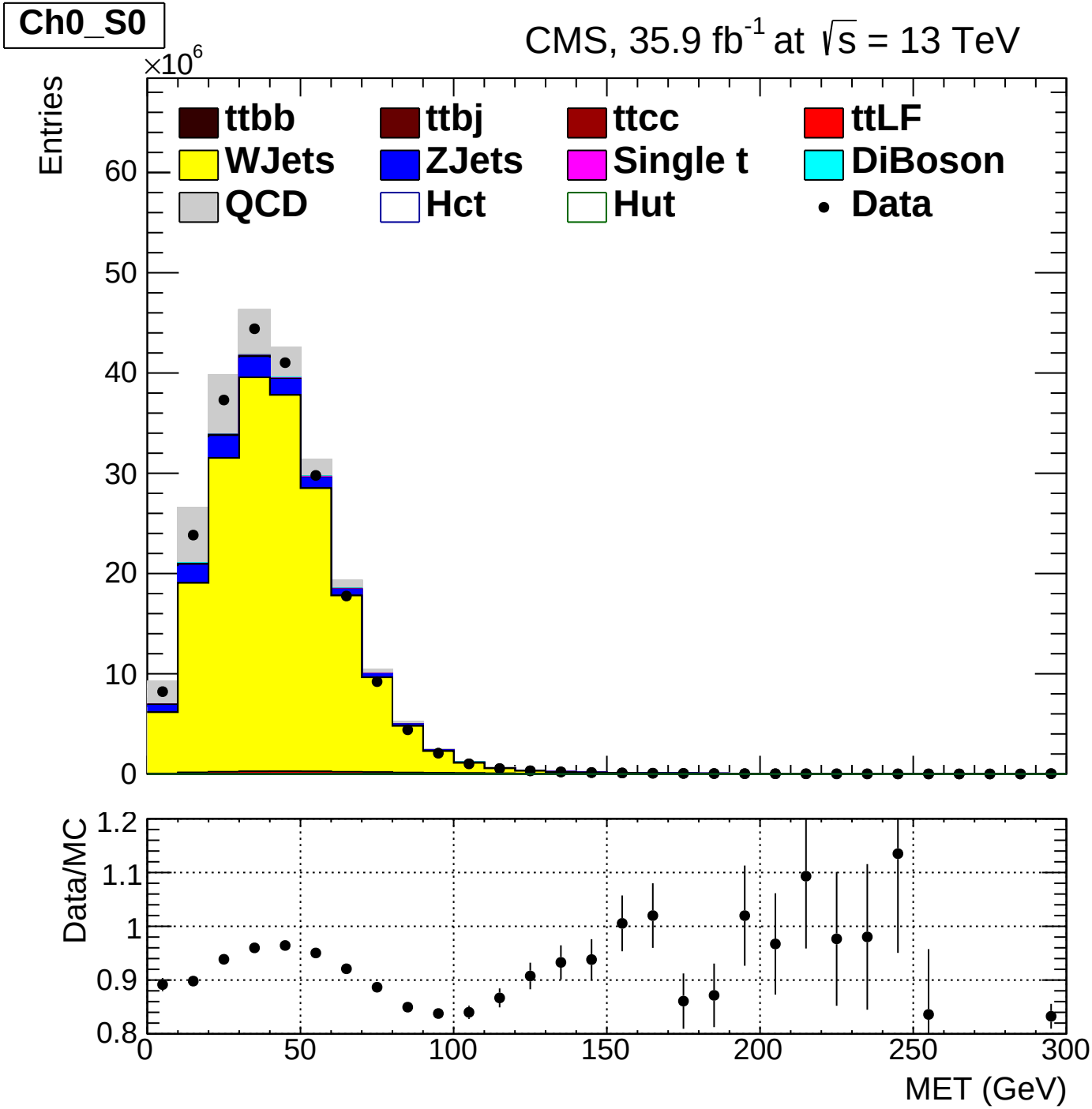
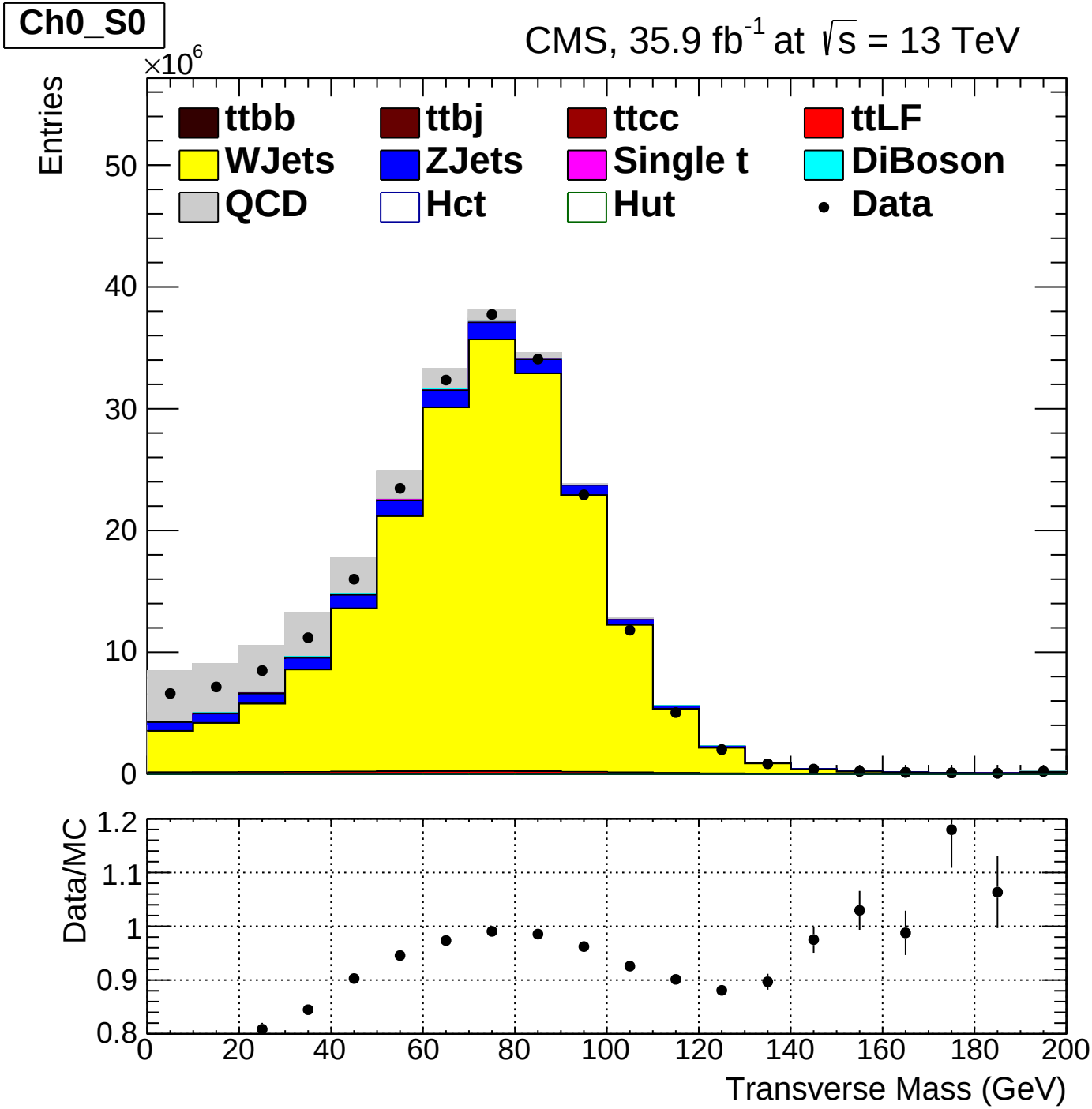

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^6
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

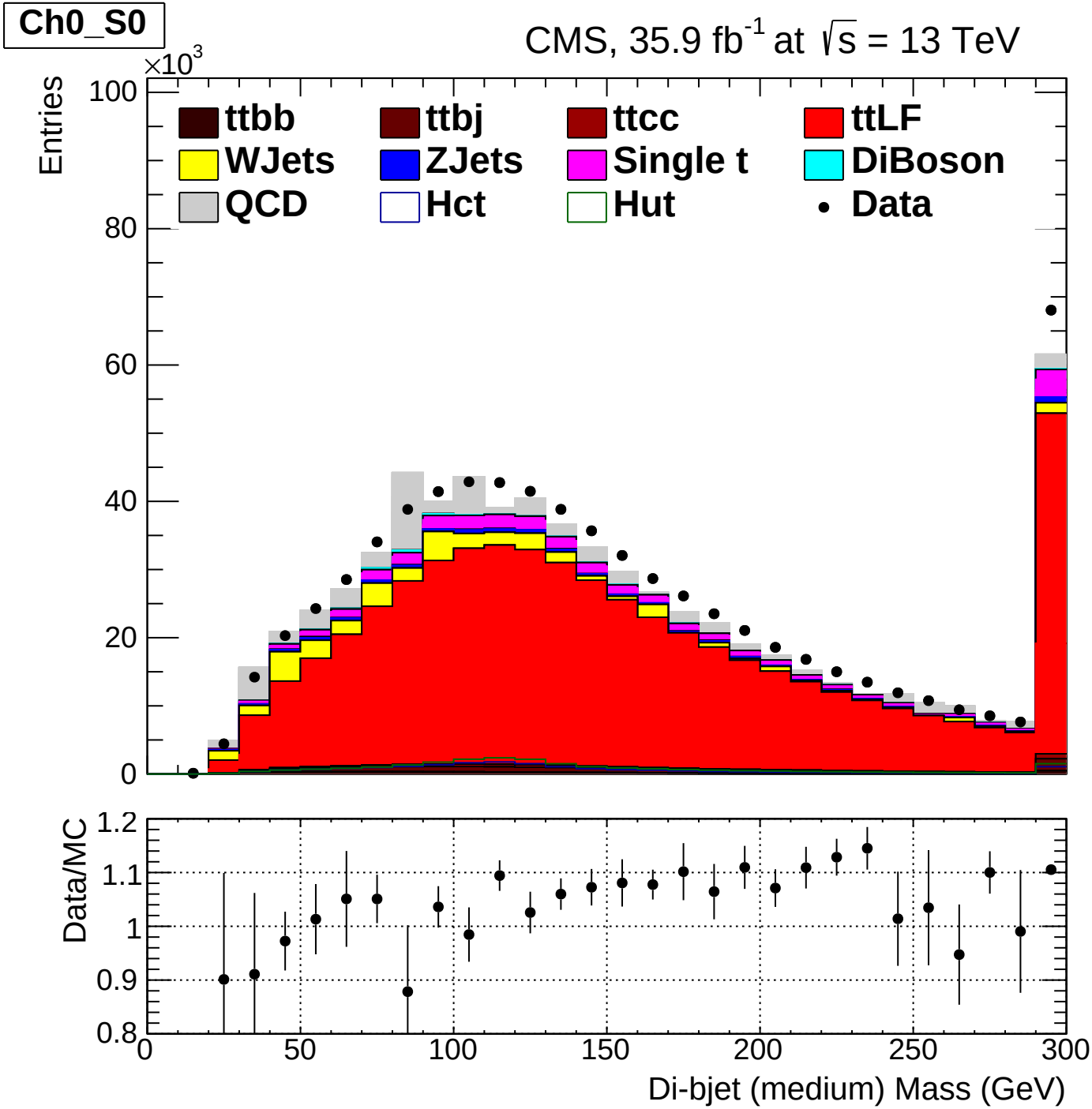

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

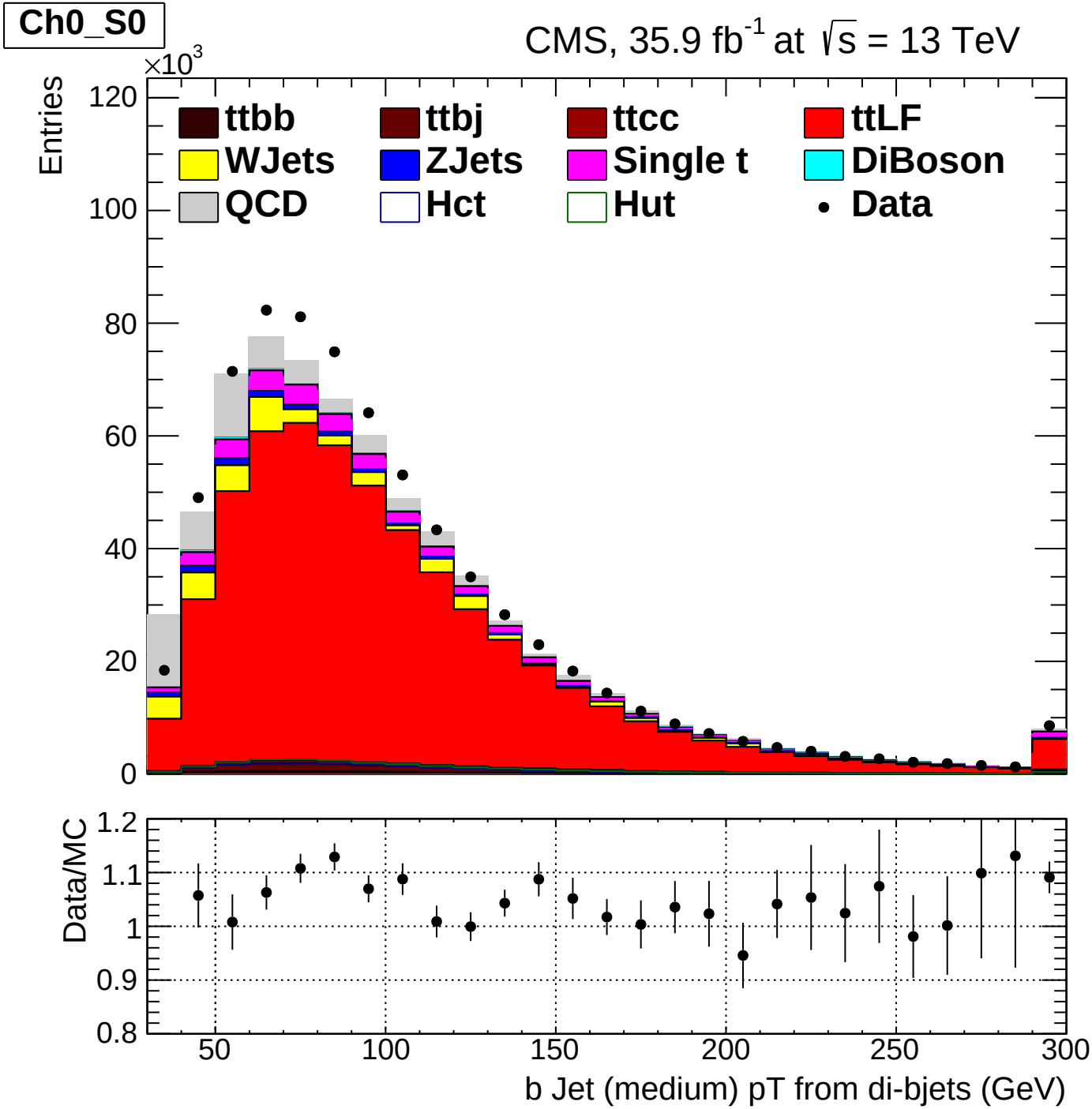

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

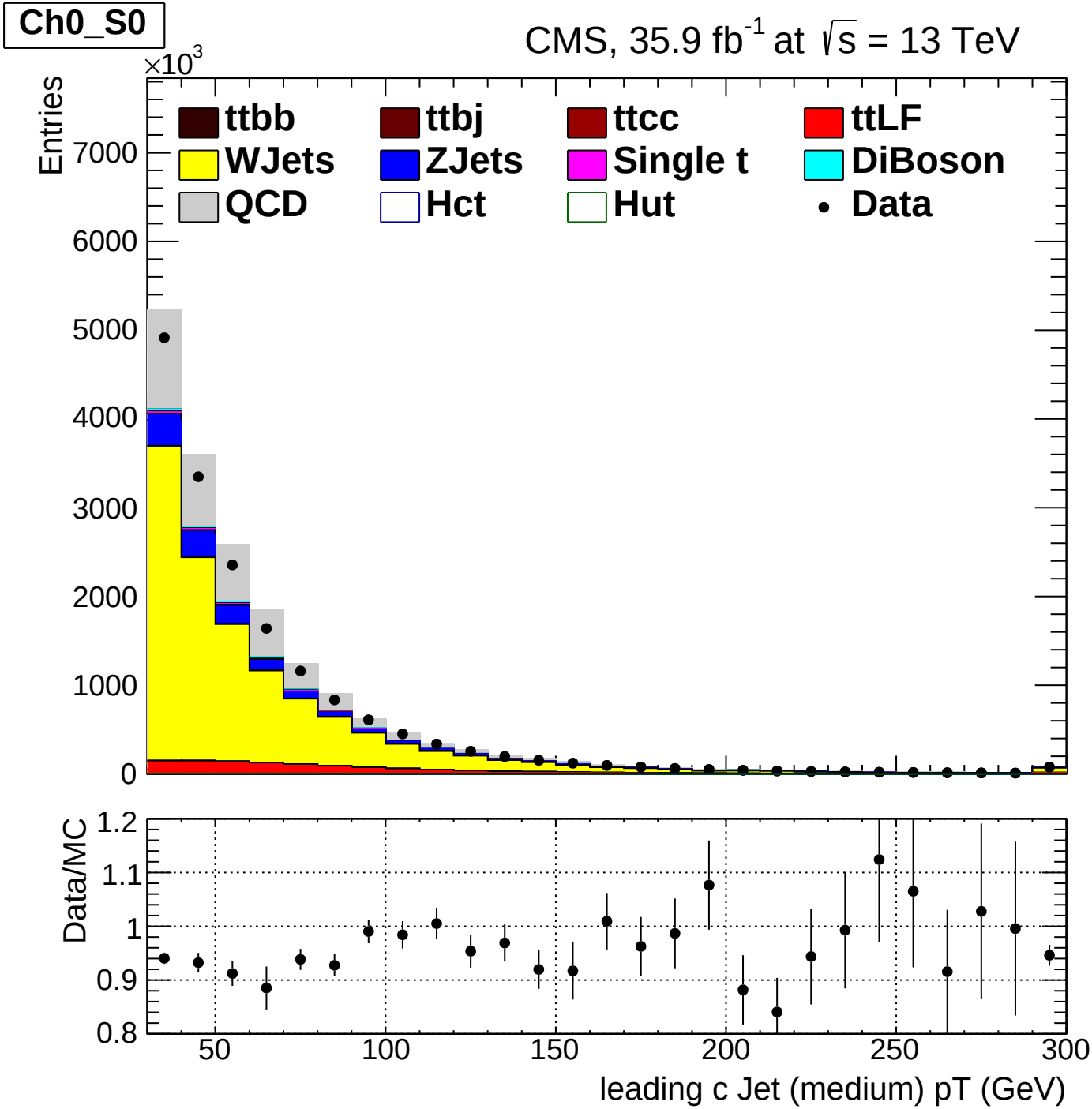

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

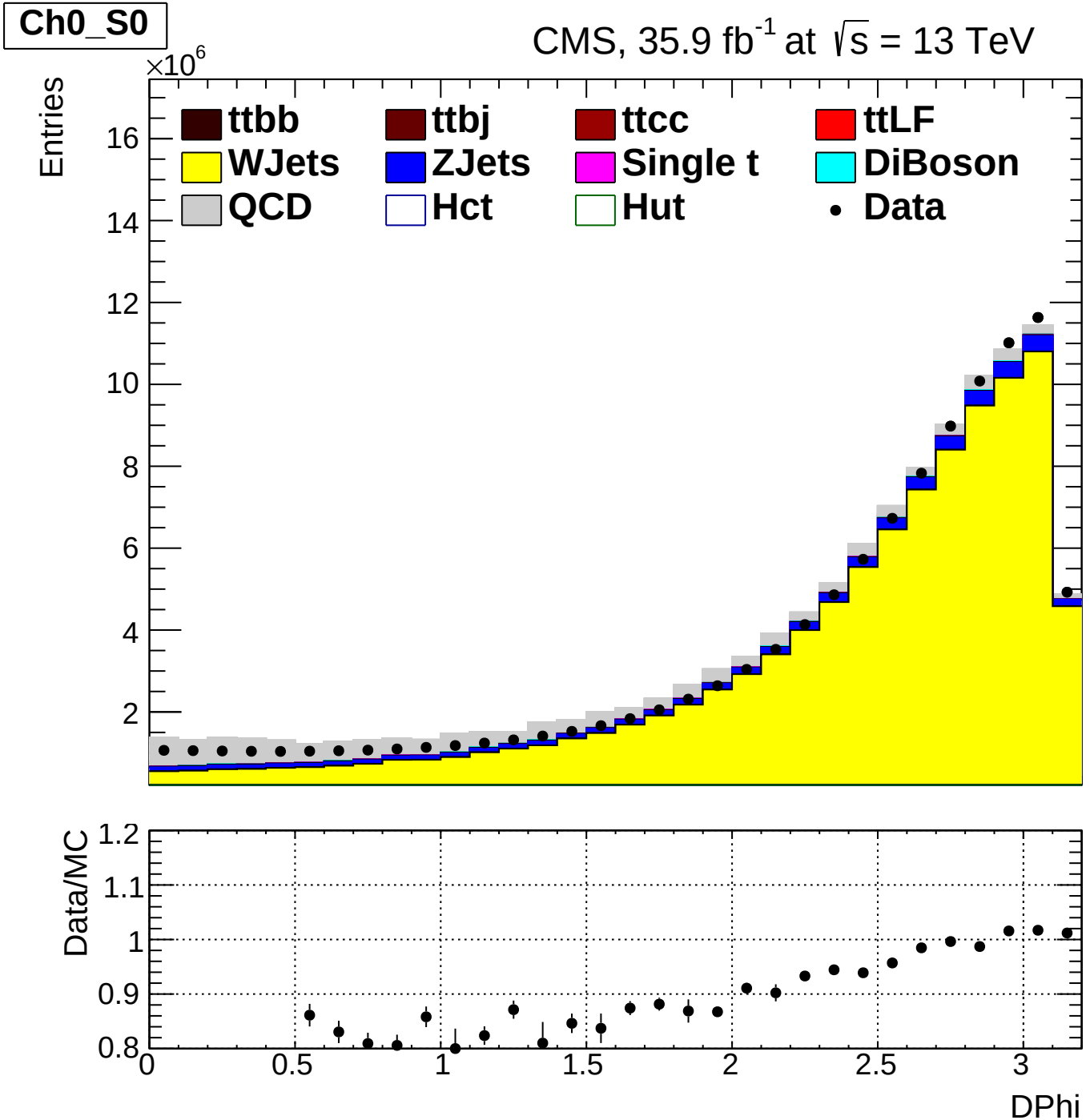

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

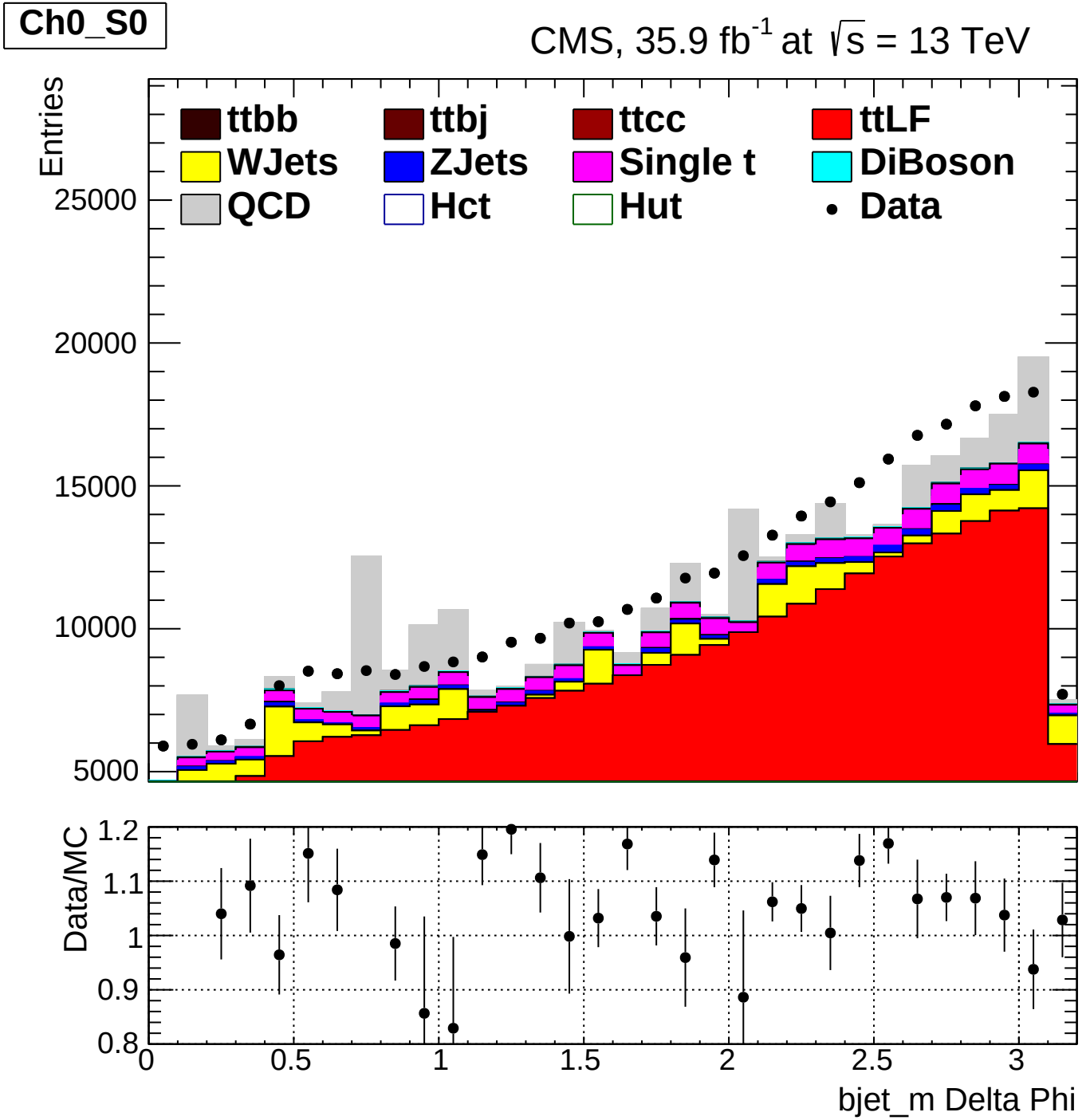

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

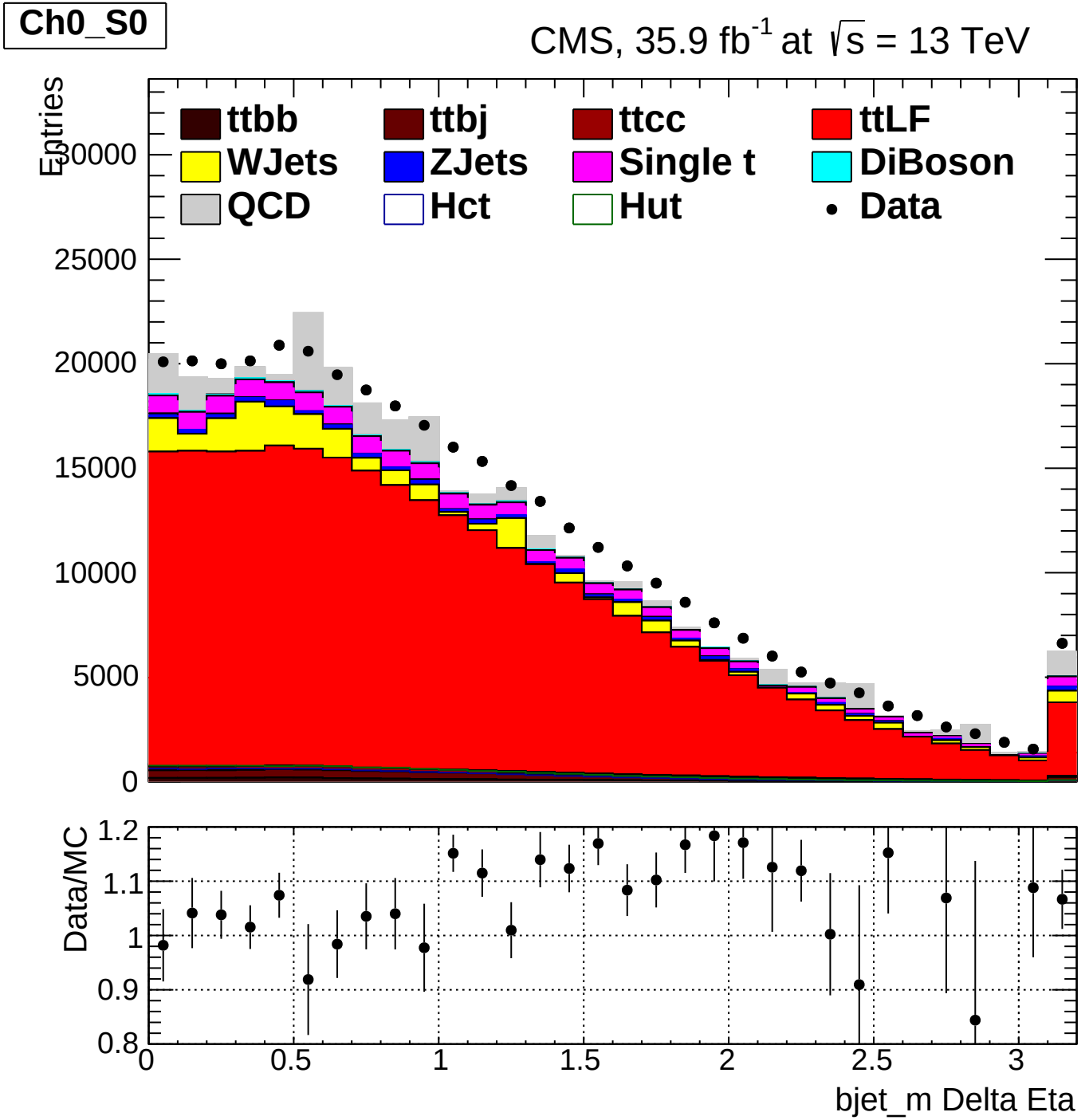

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

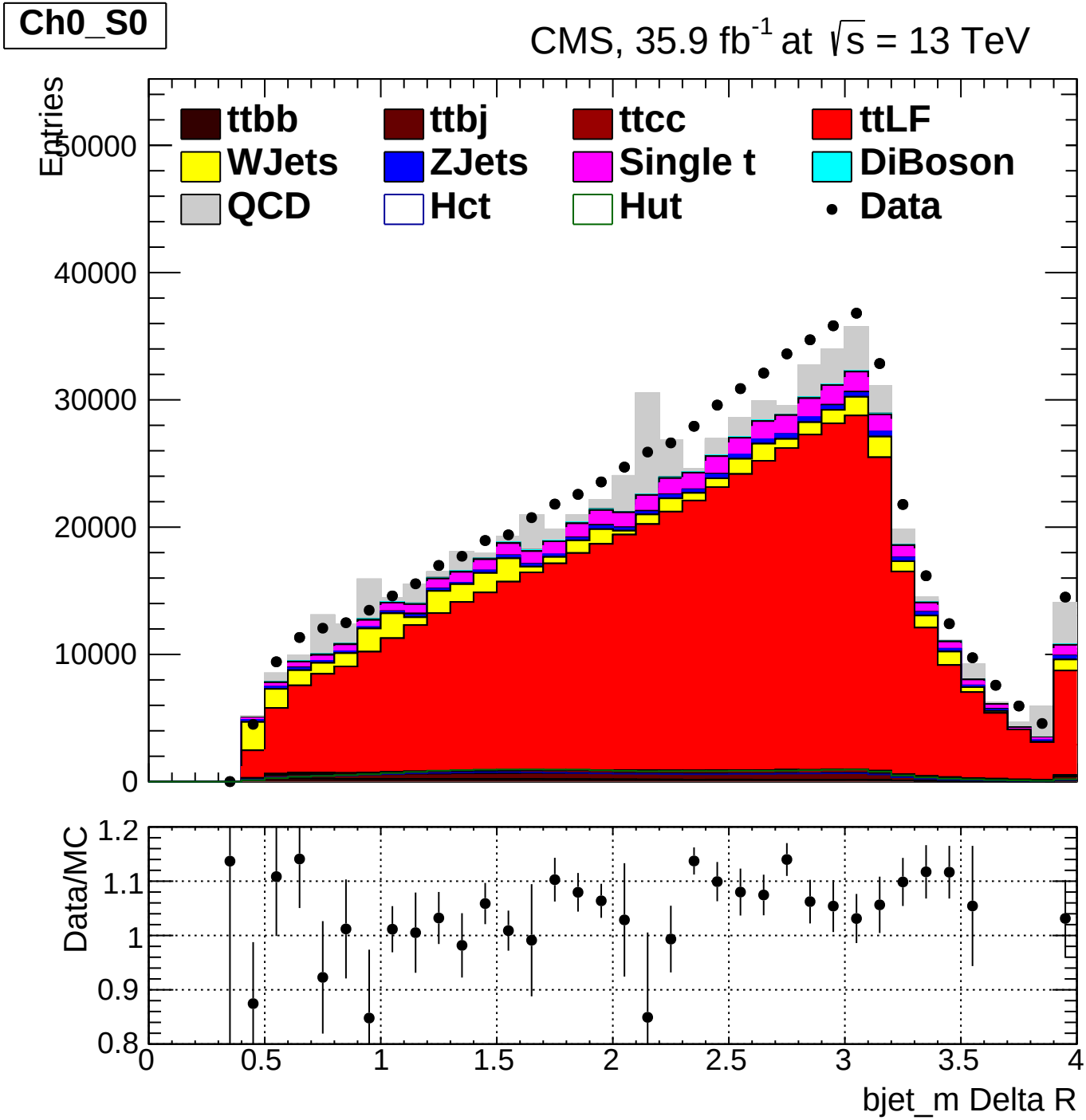

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

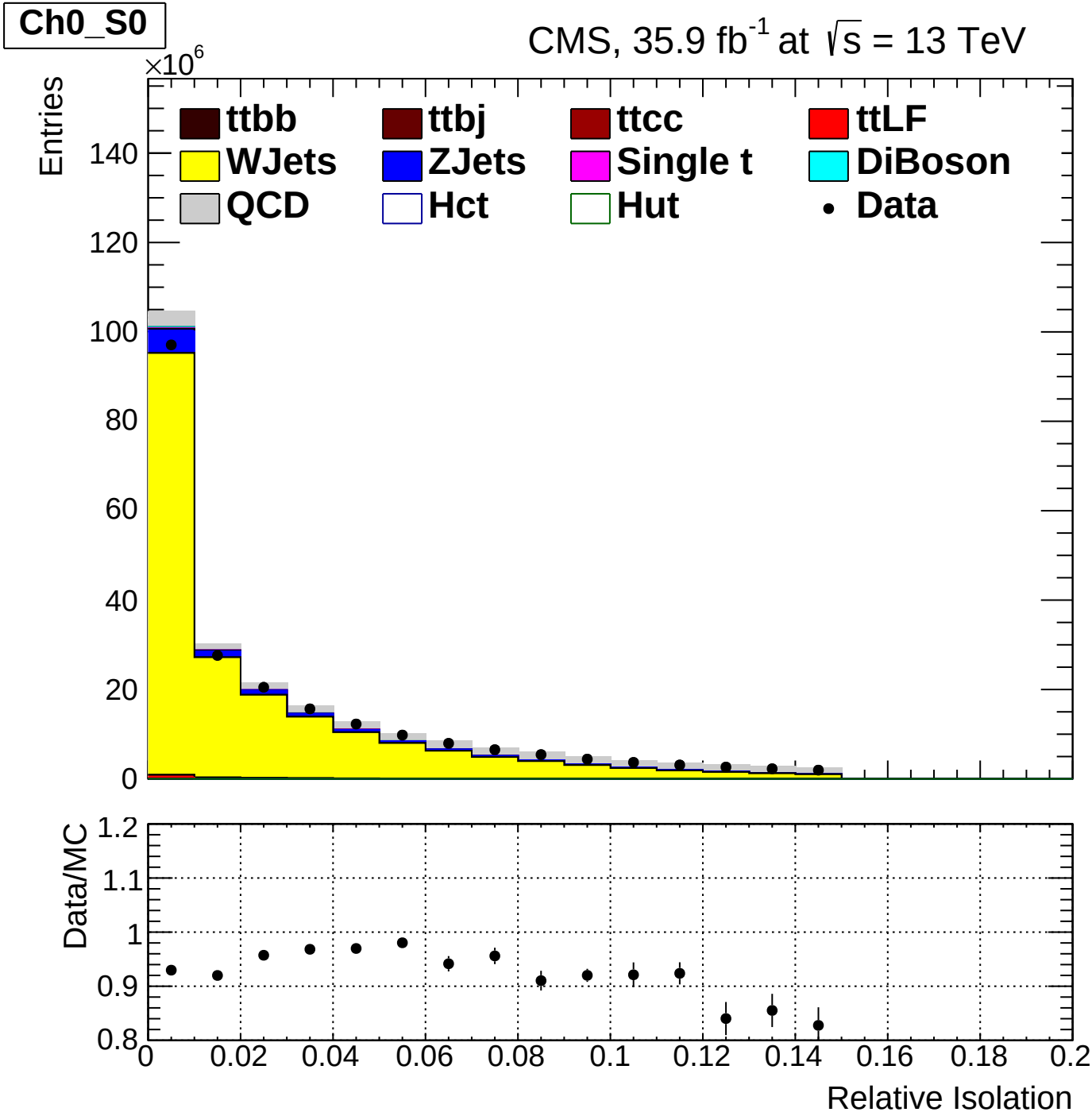

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

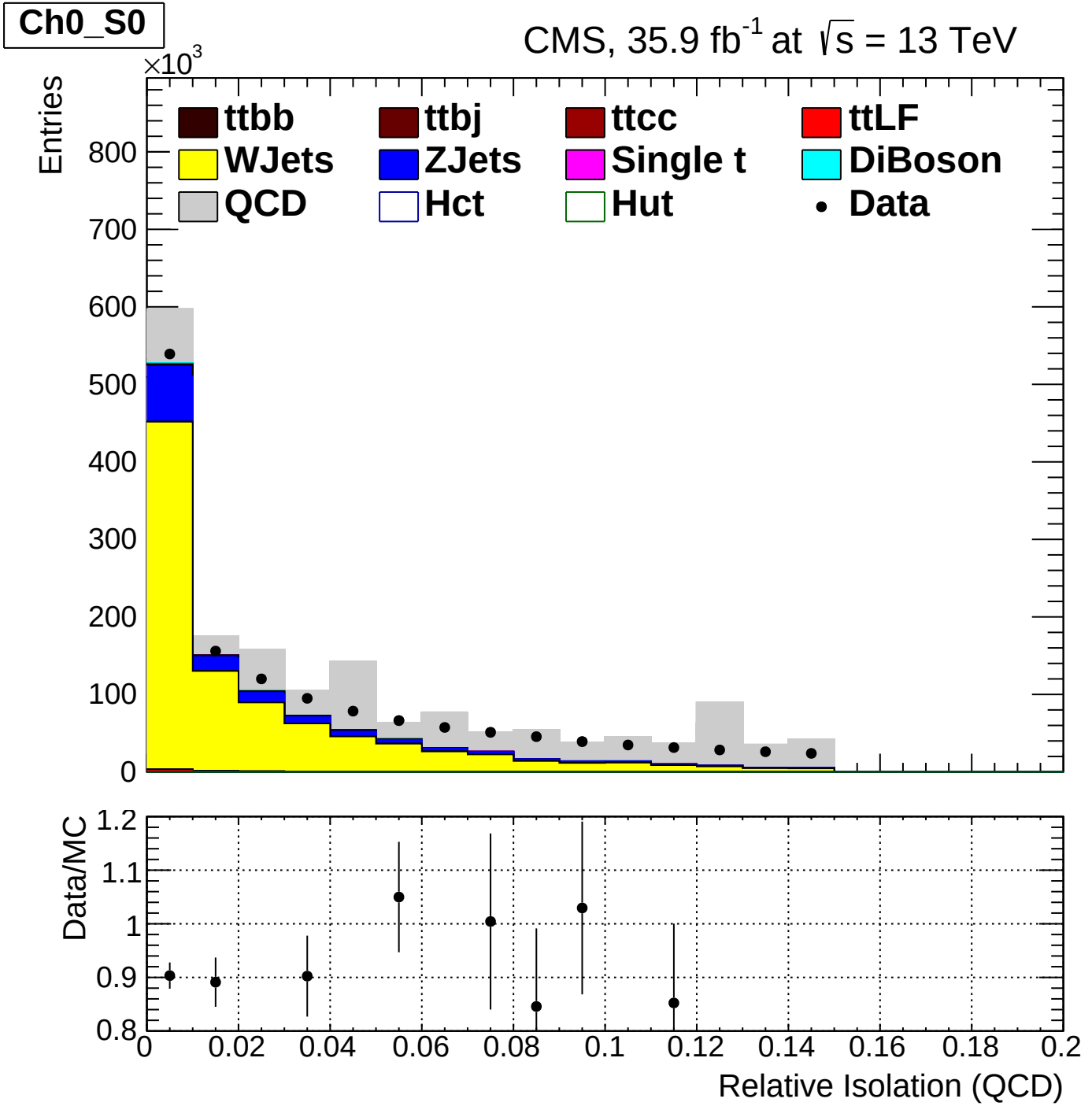

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi

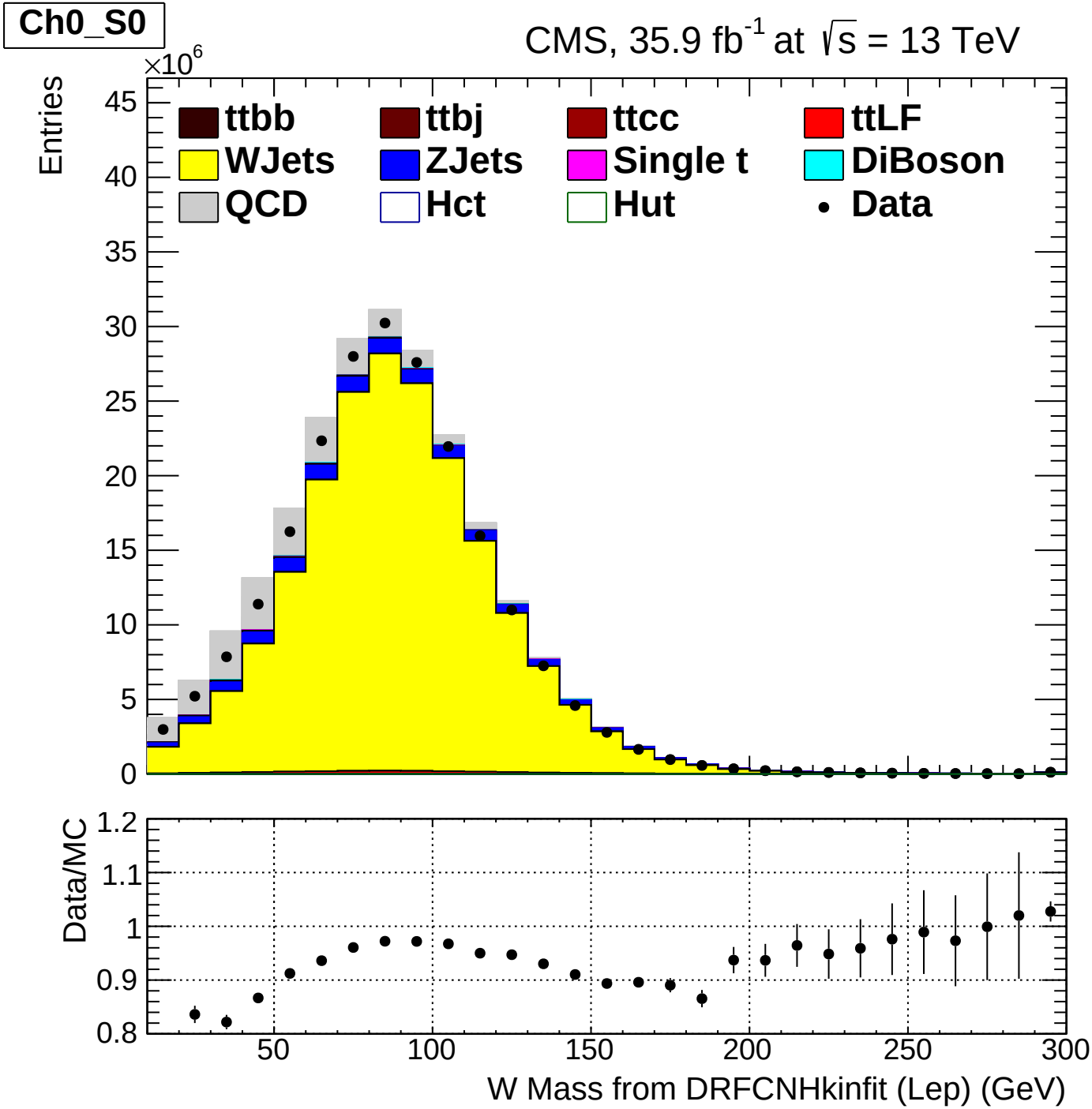

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

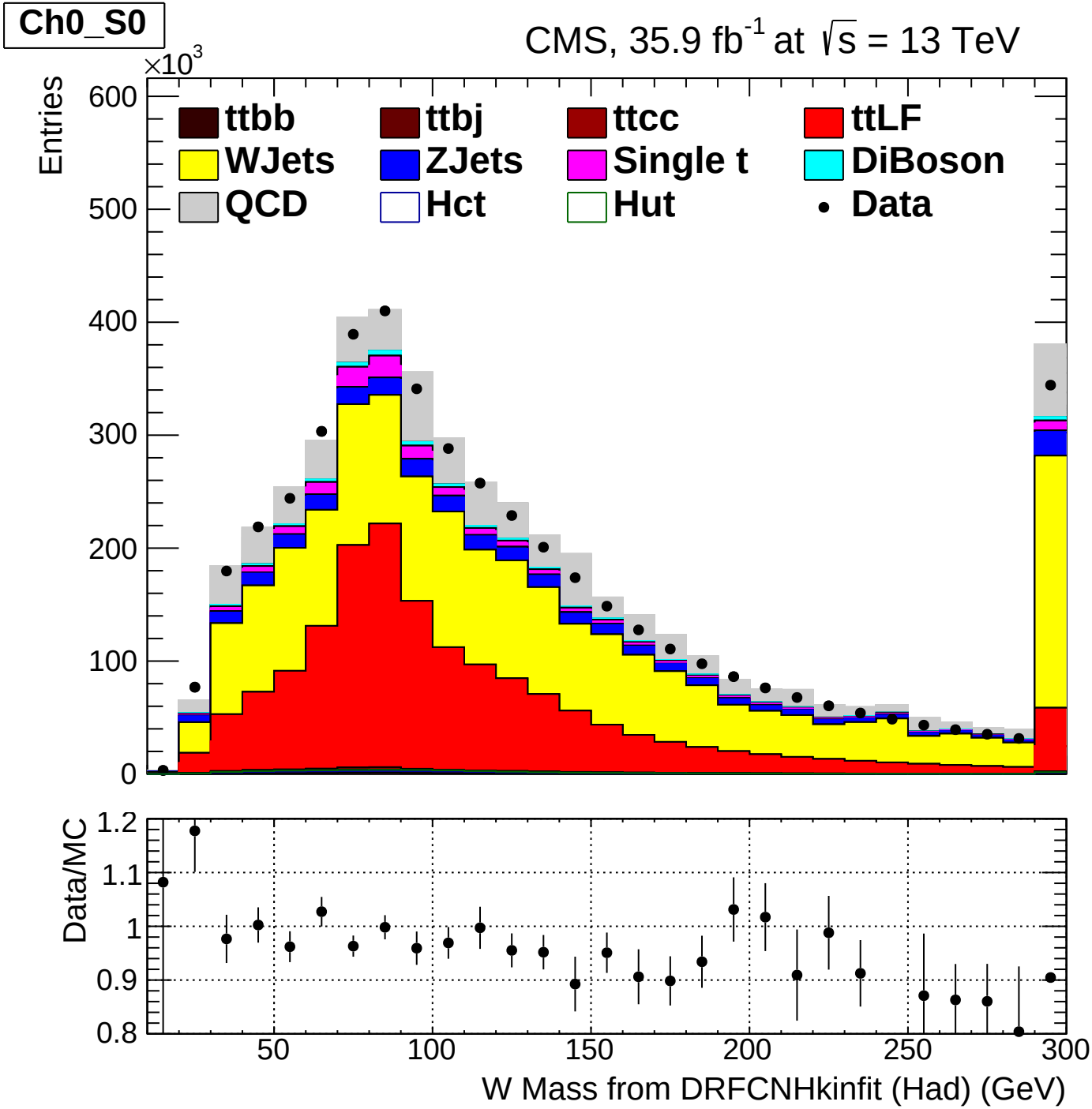

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

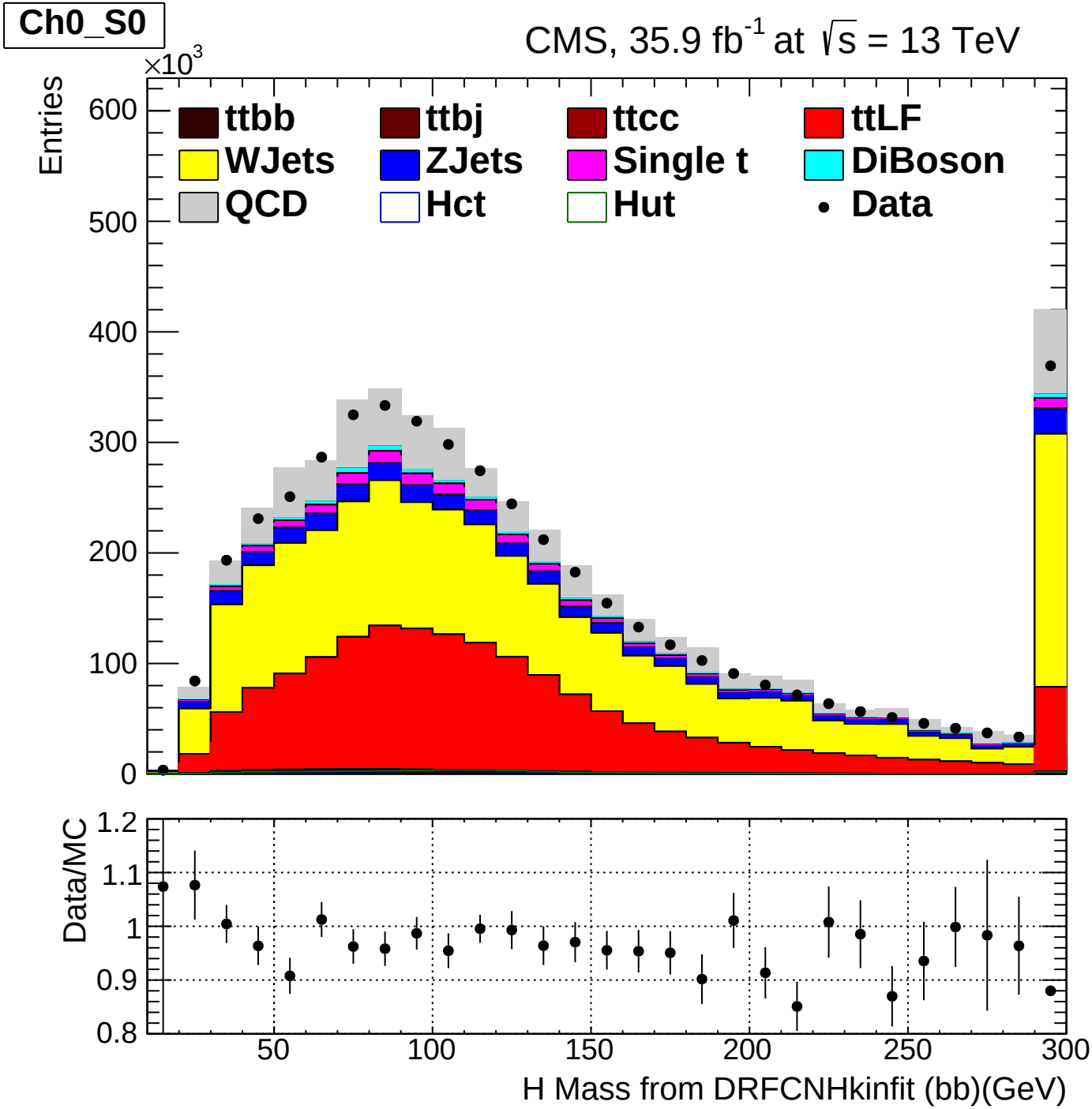

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R

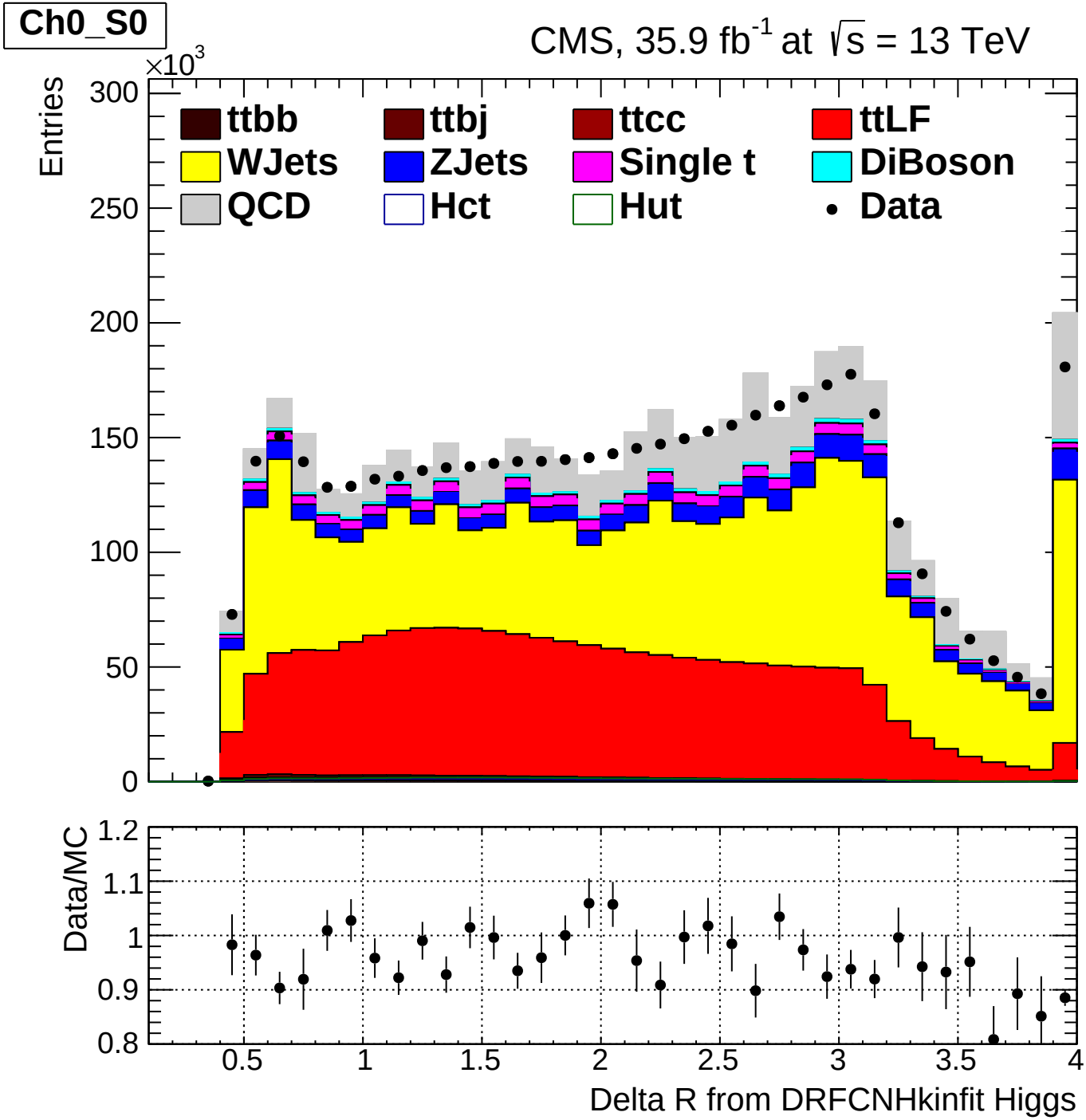

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

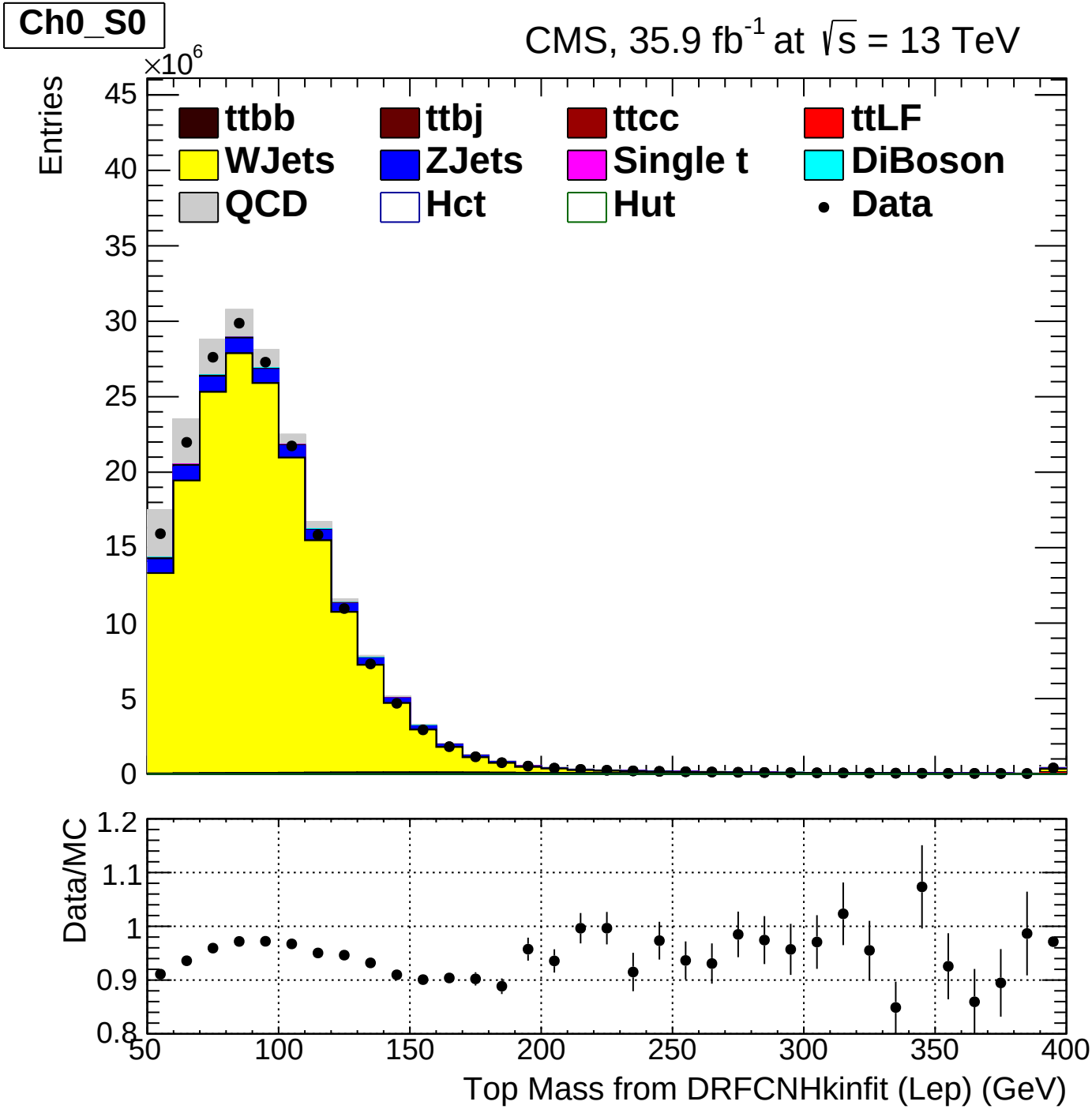

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

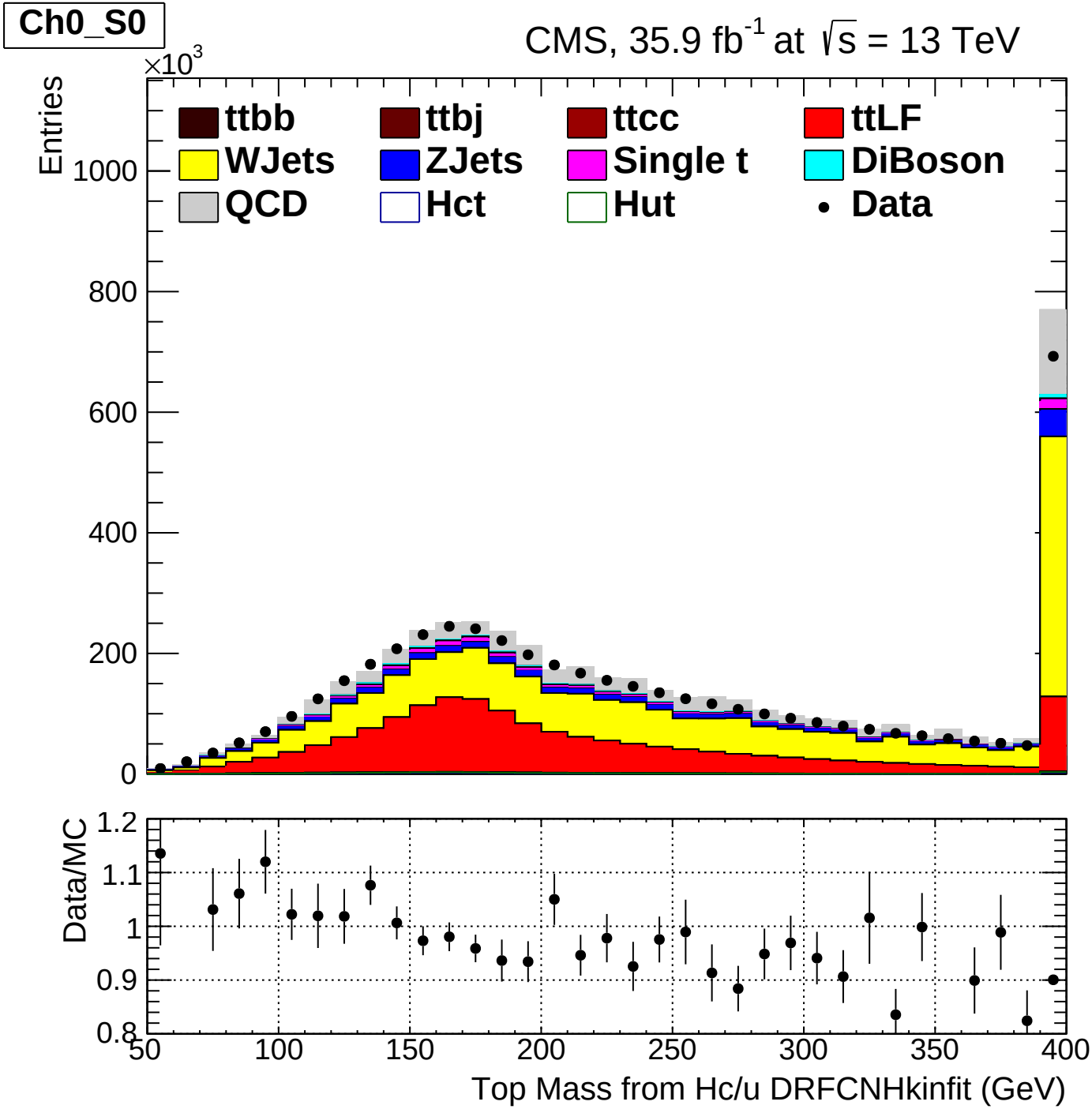

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

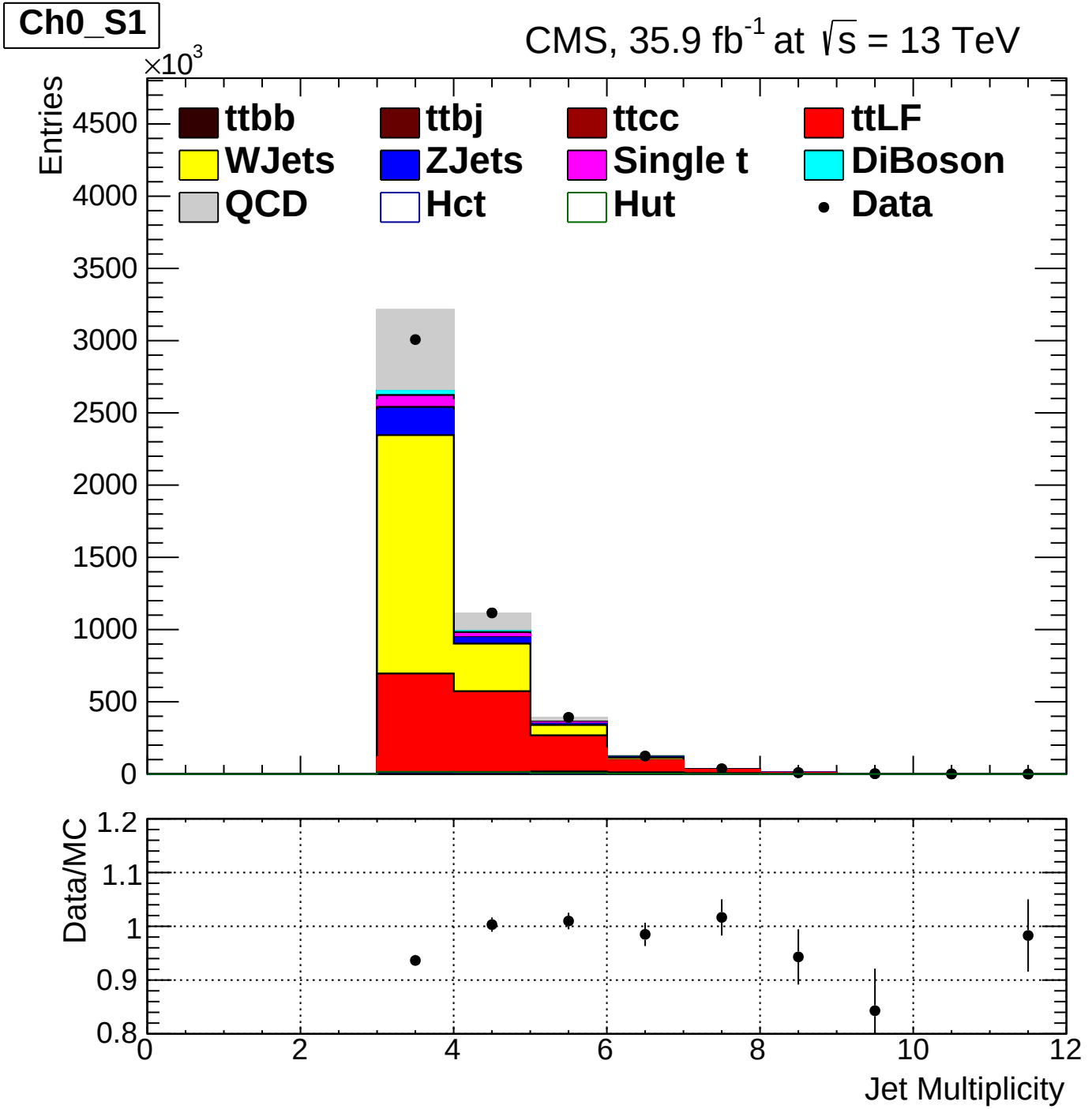

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

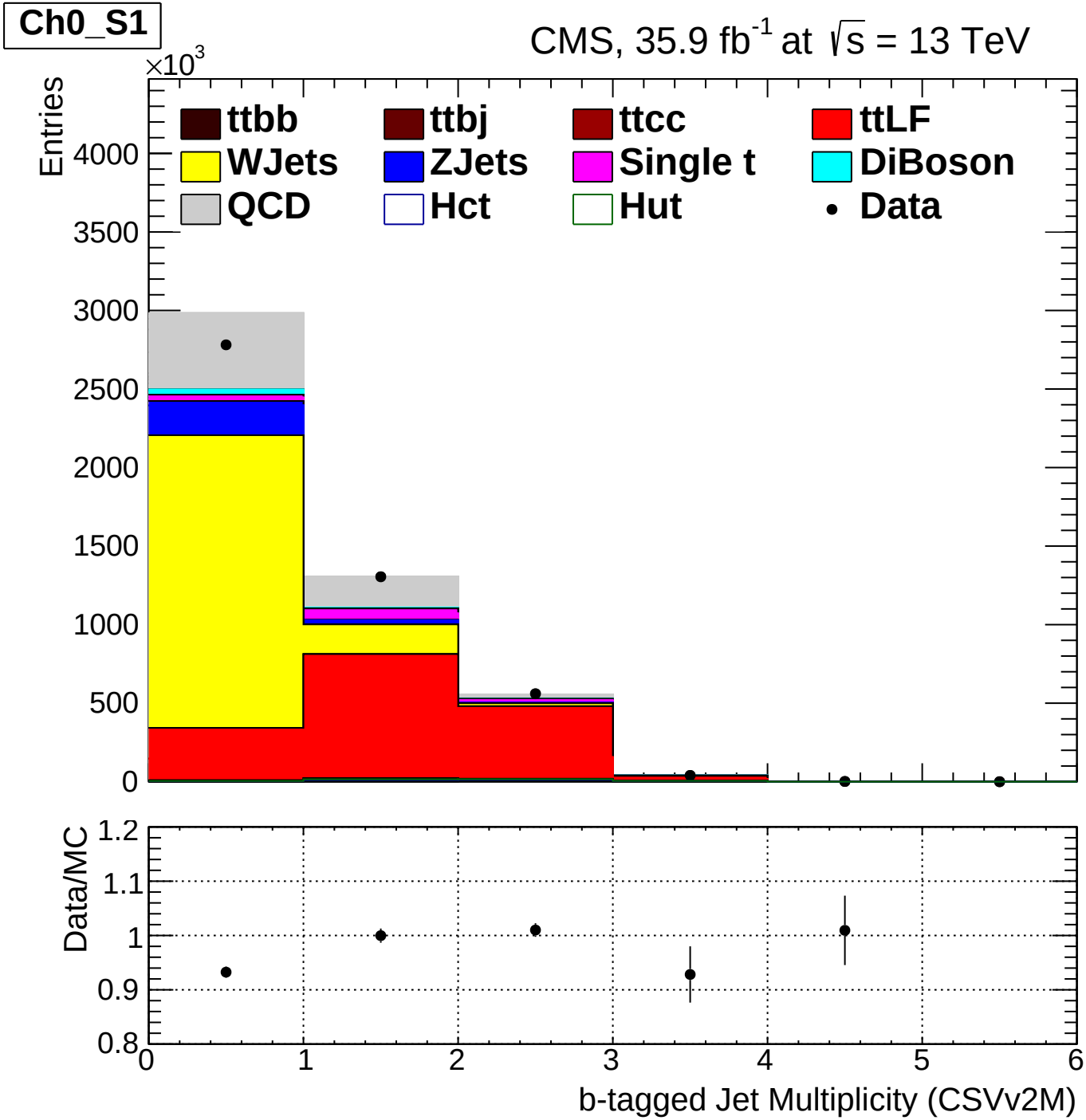

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

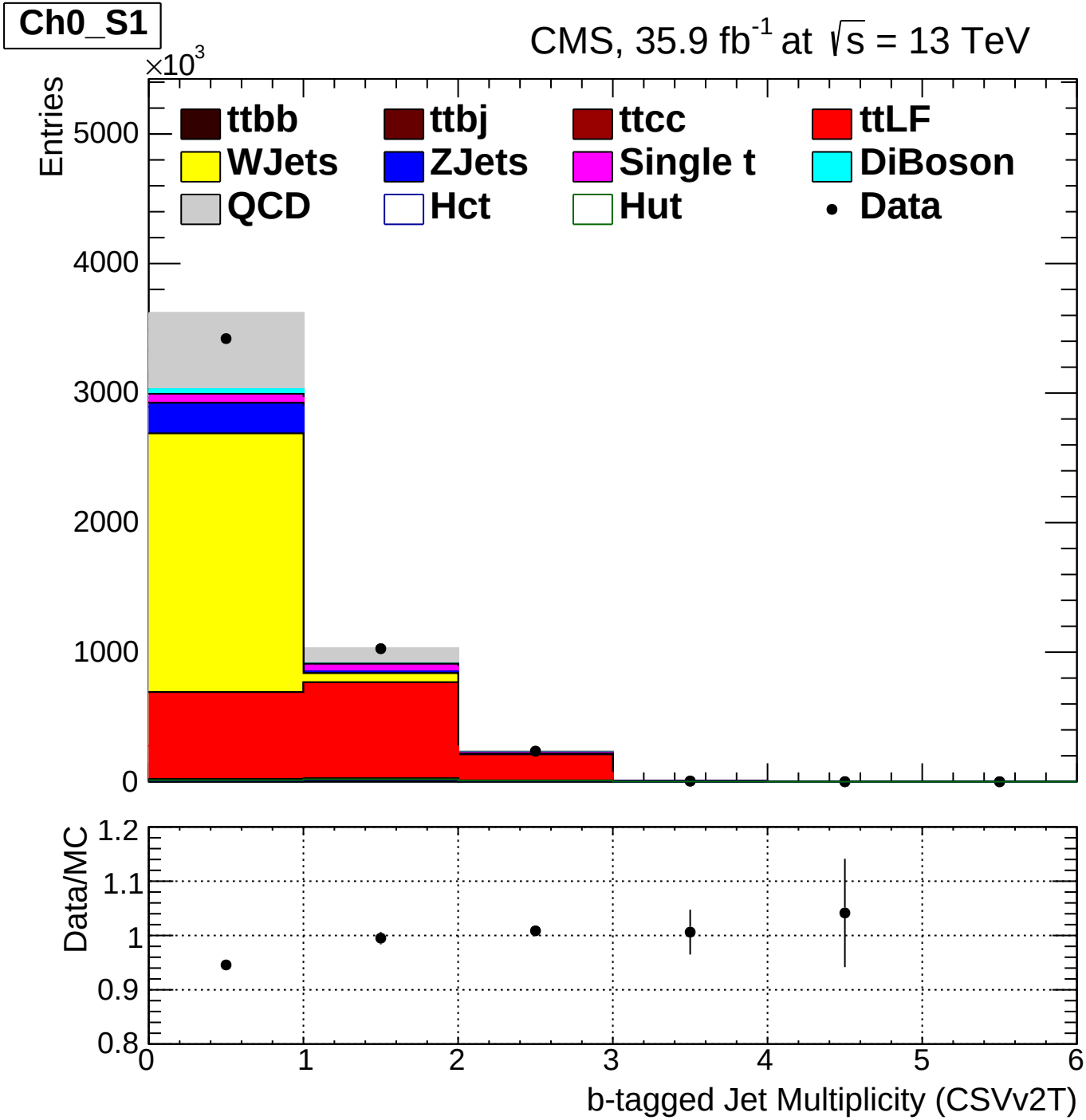

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

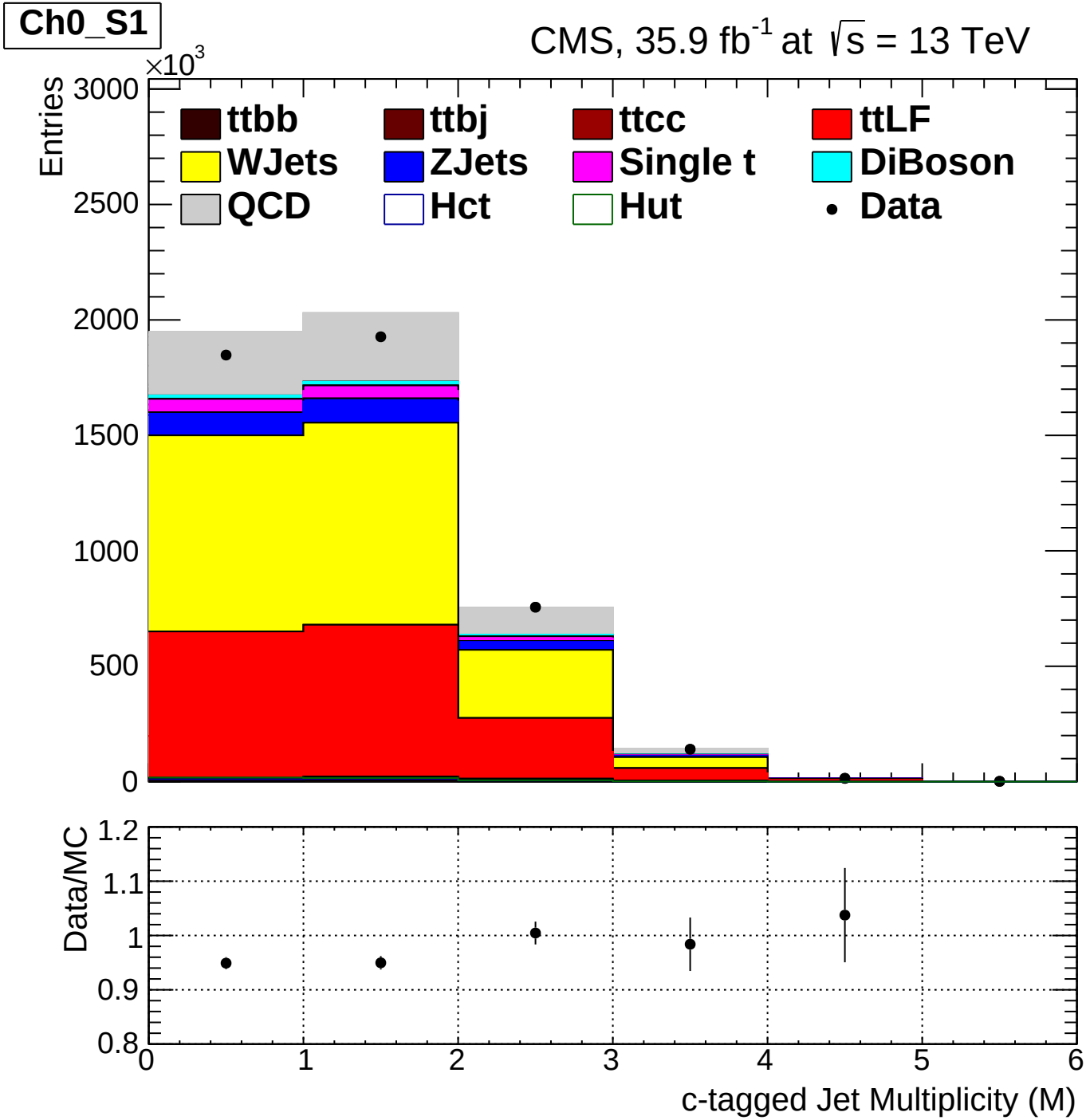

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

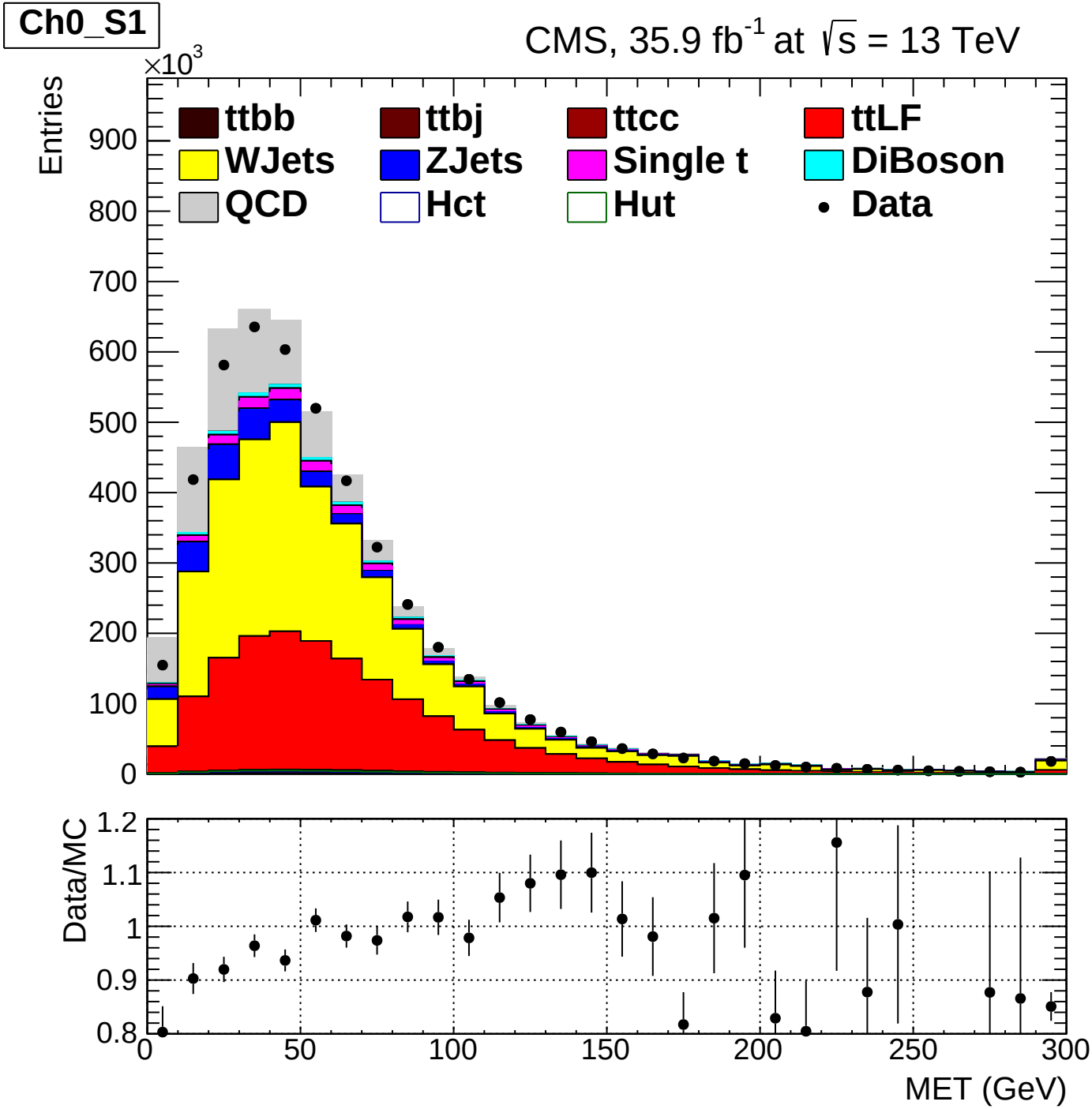

Ch0_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

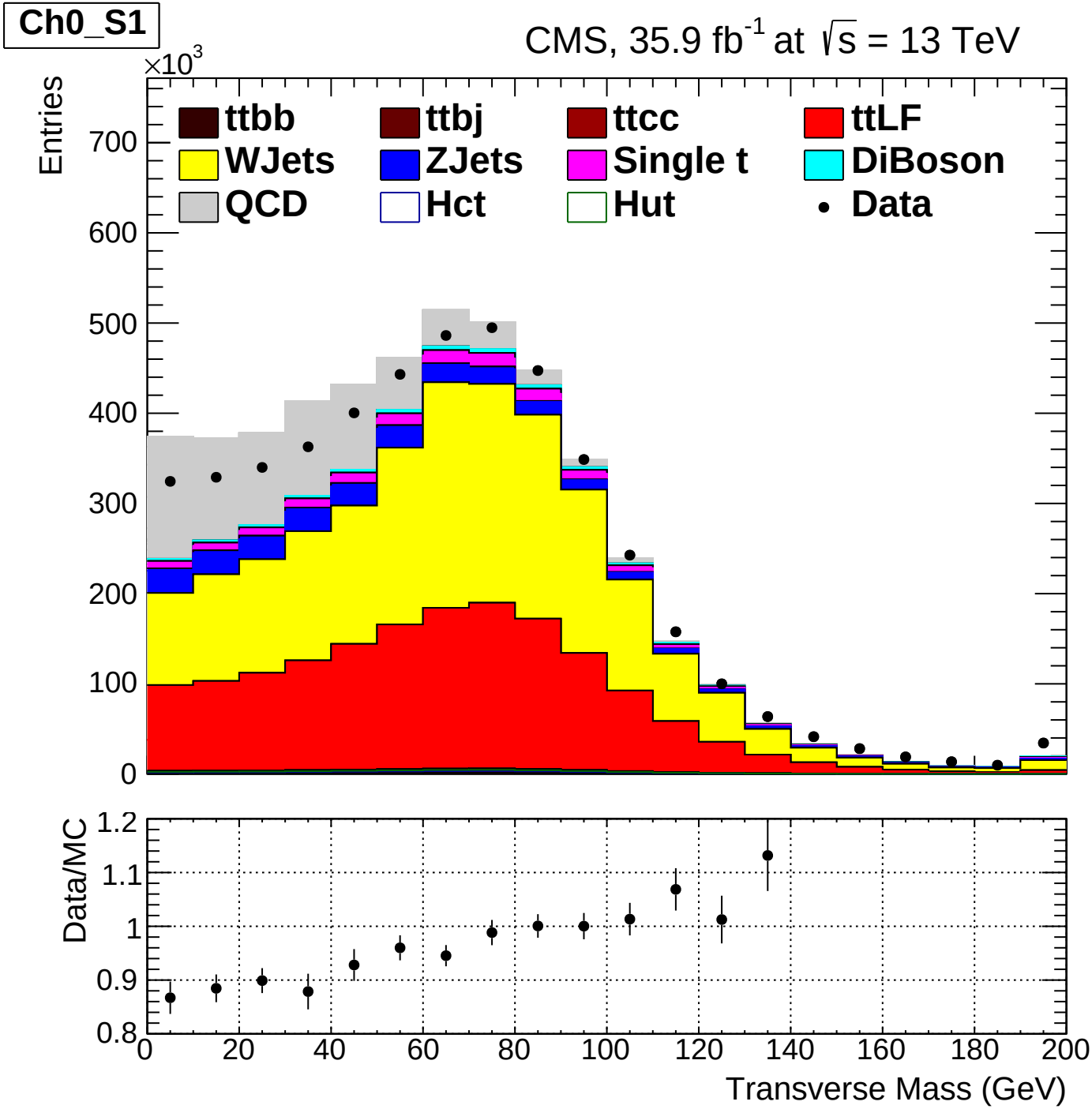

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

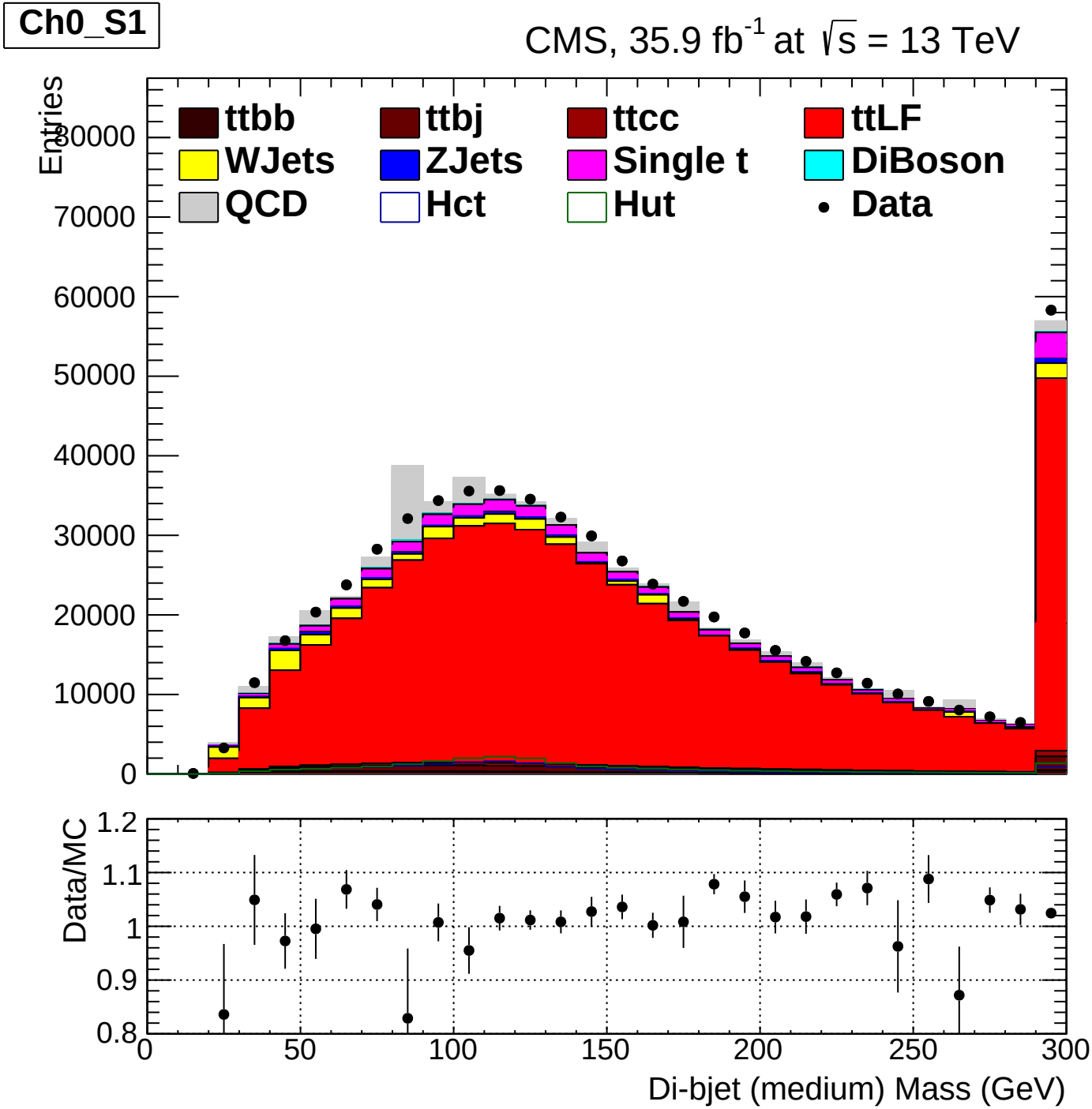

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

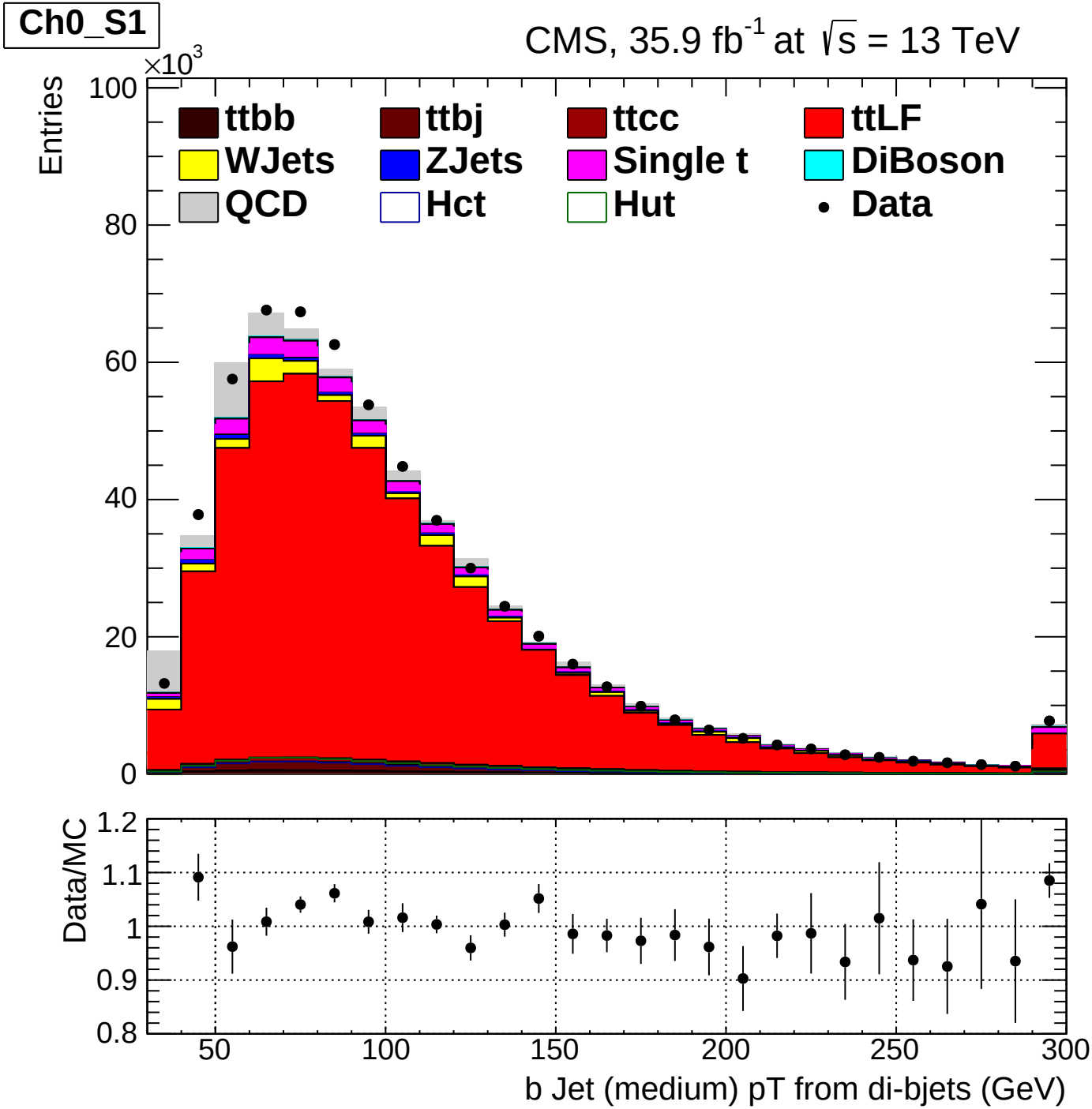

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

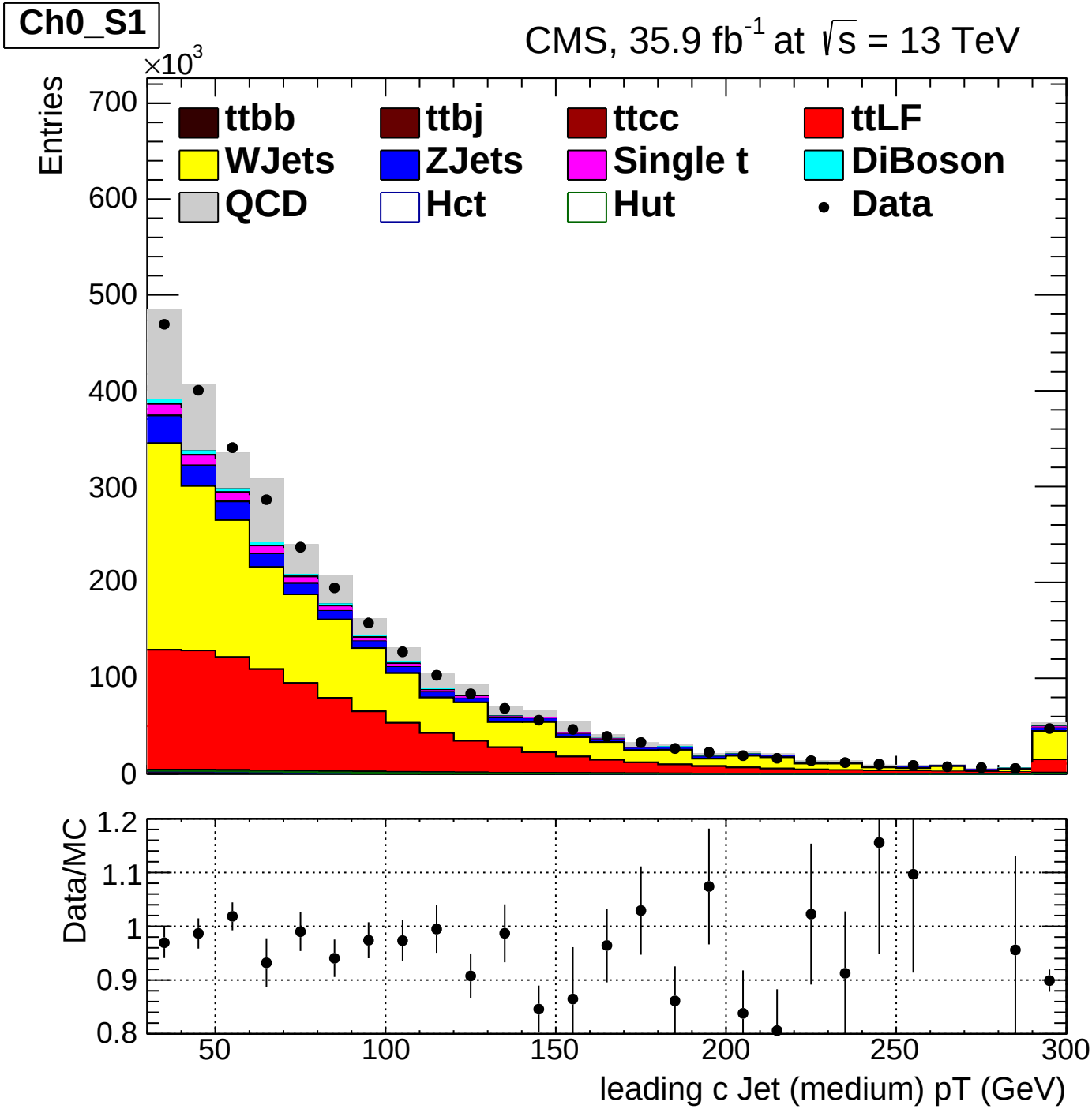

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
3000
2500
2000
1500
1000
500
0
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

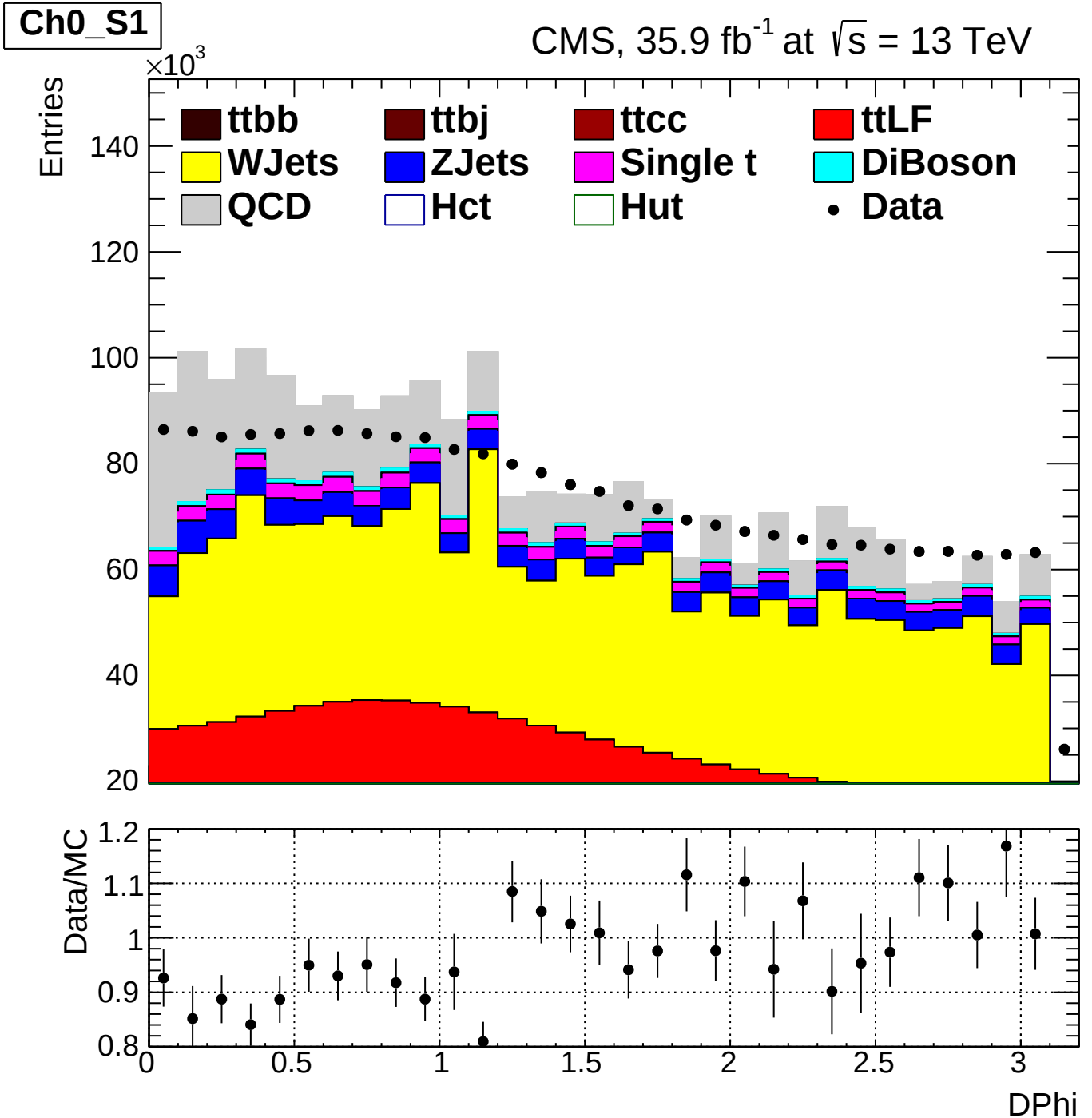

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

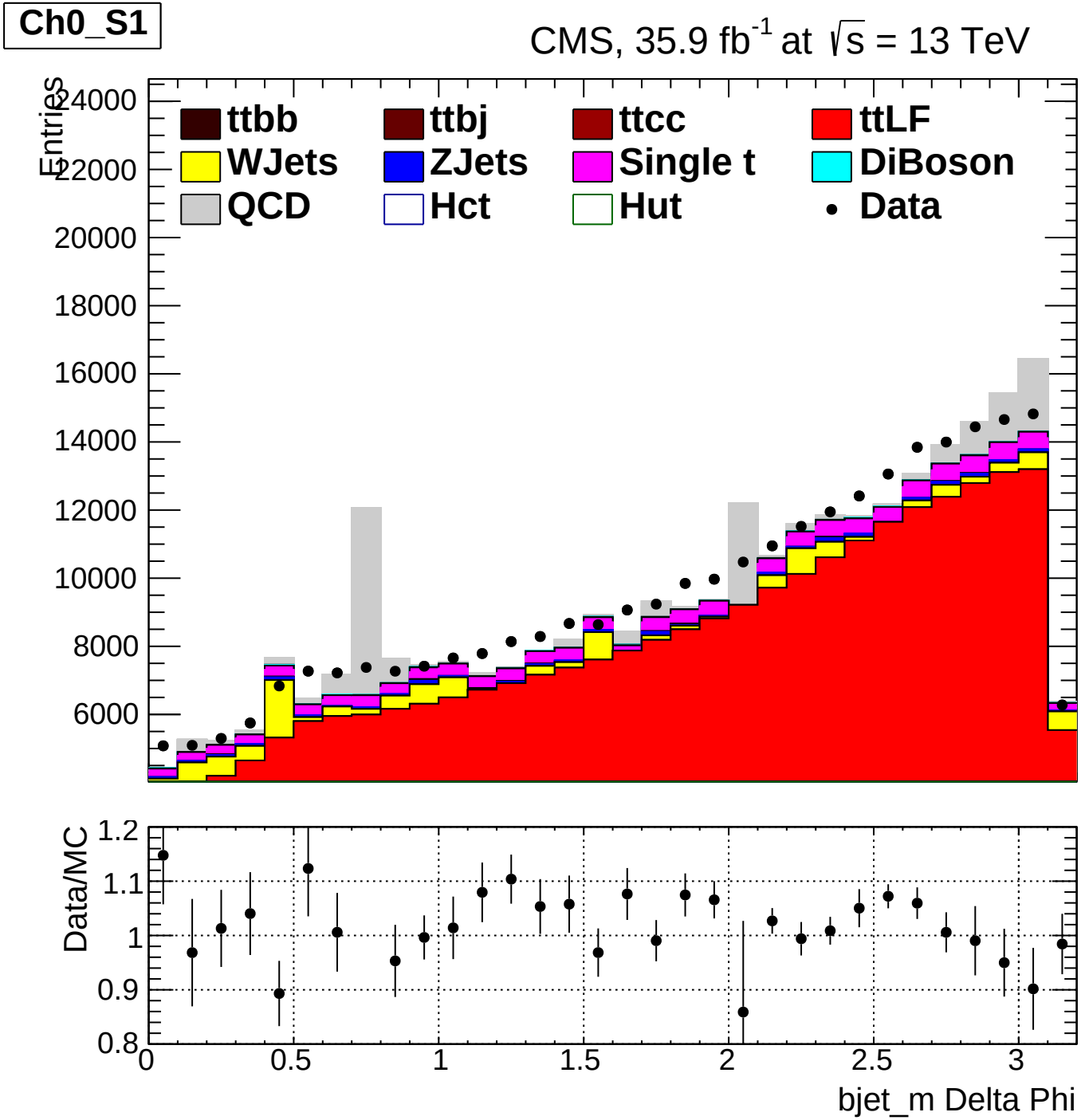

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

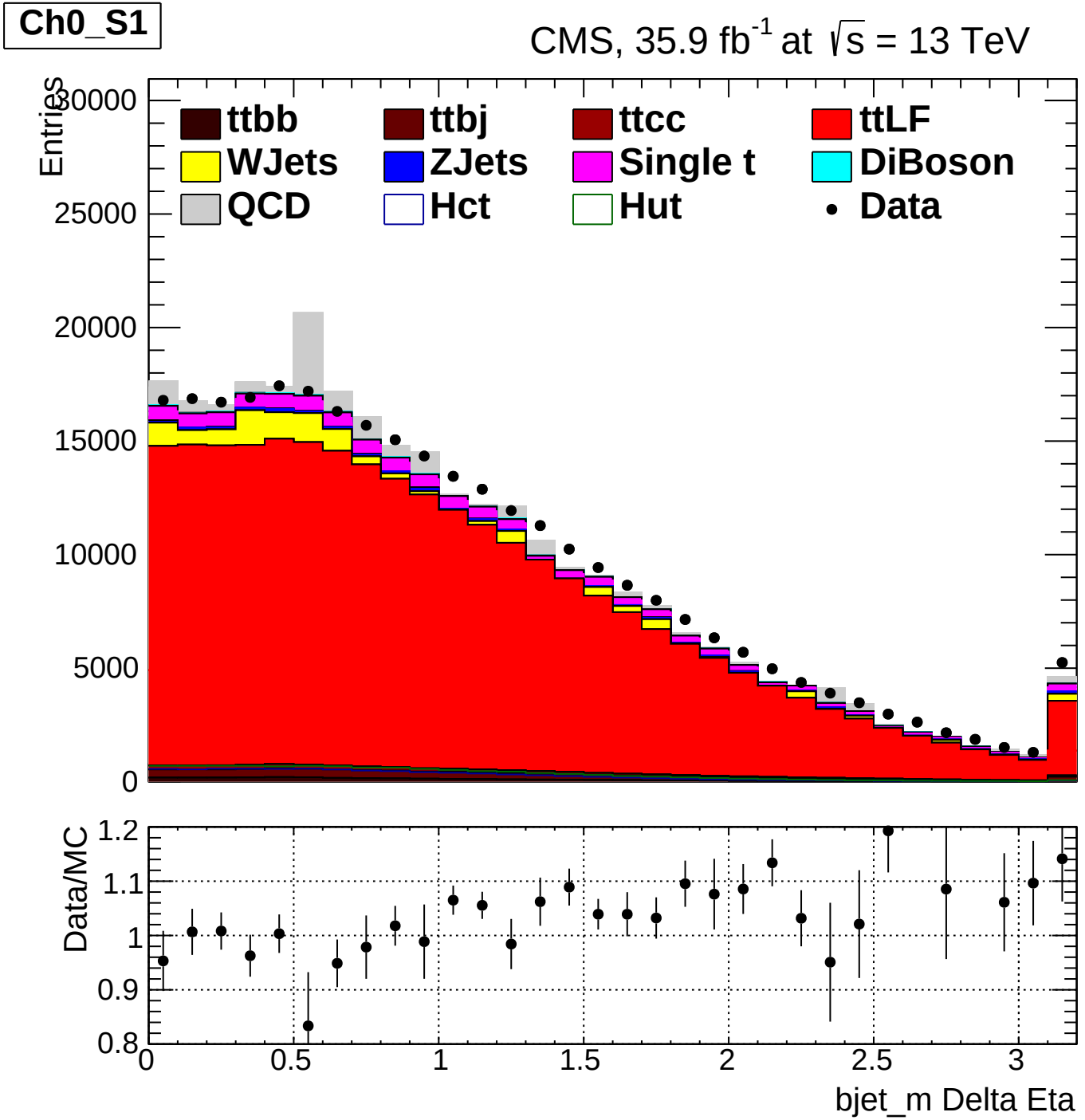

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)

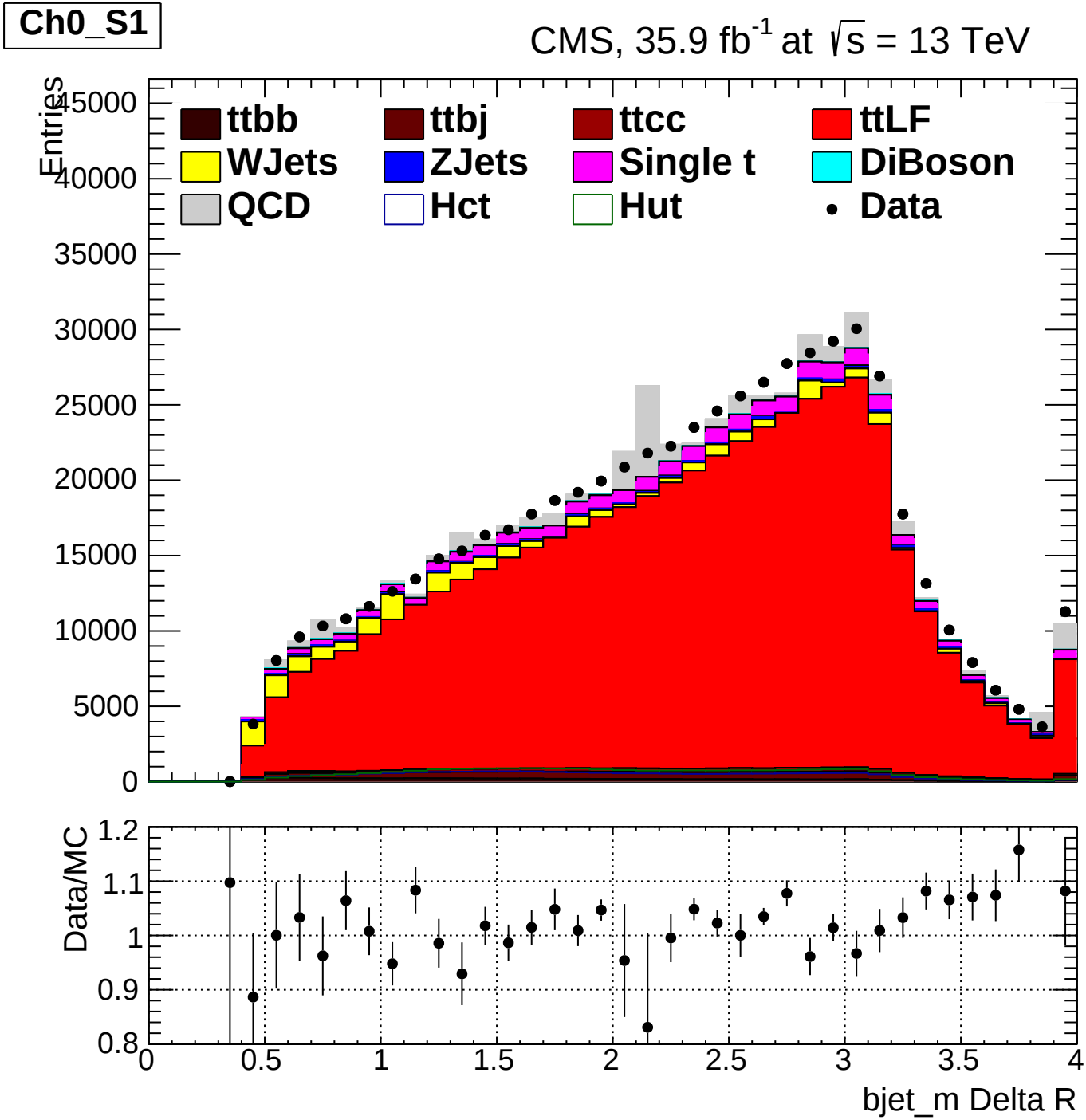

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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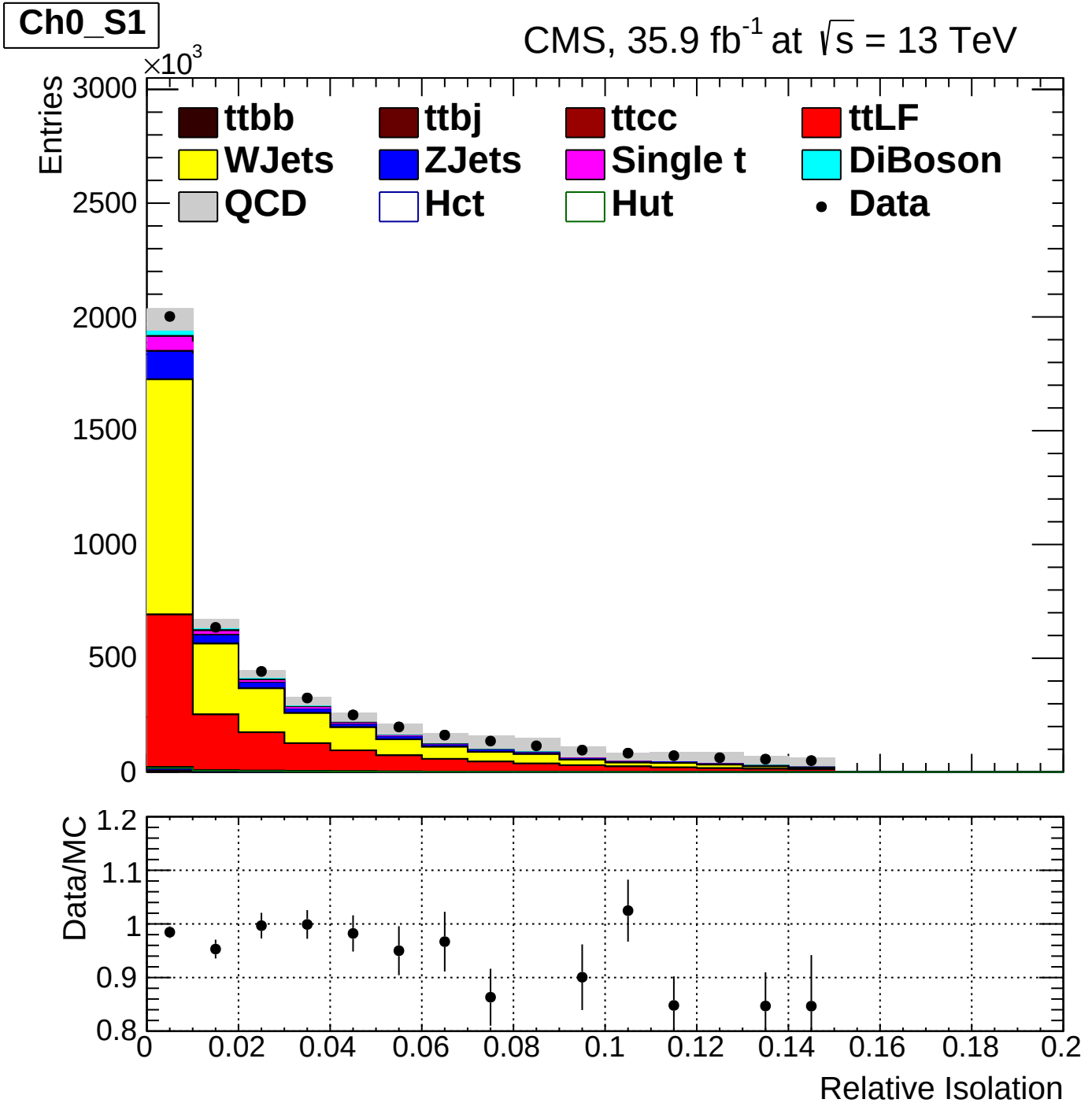
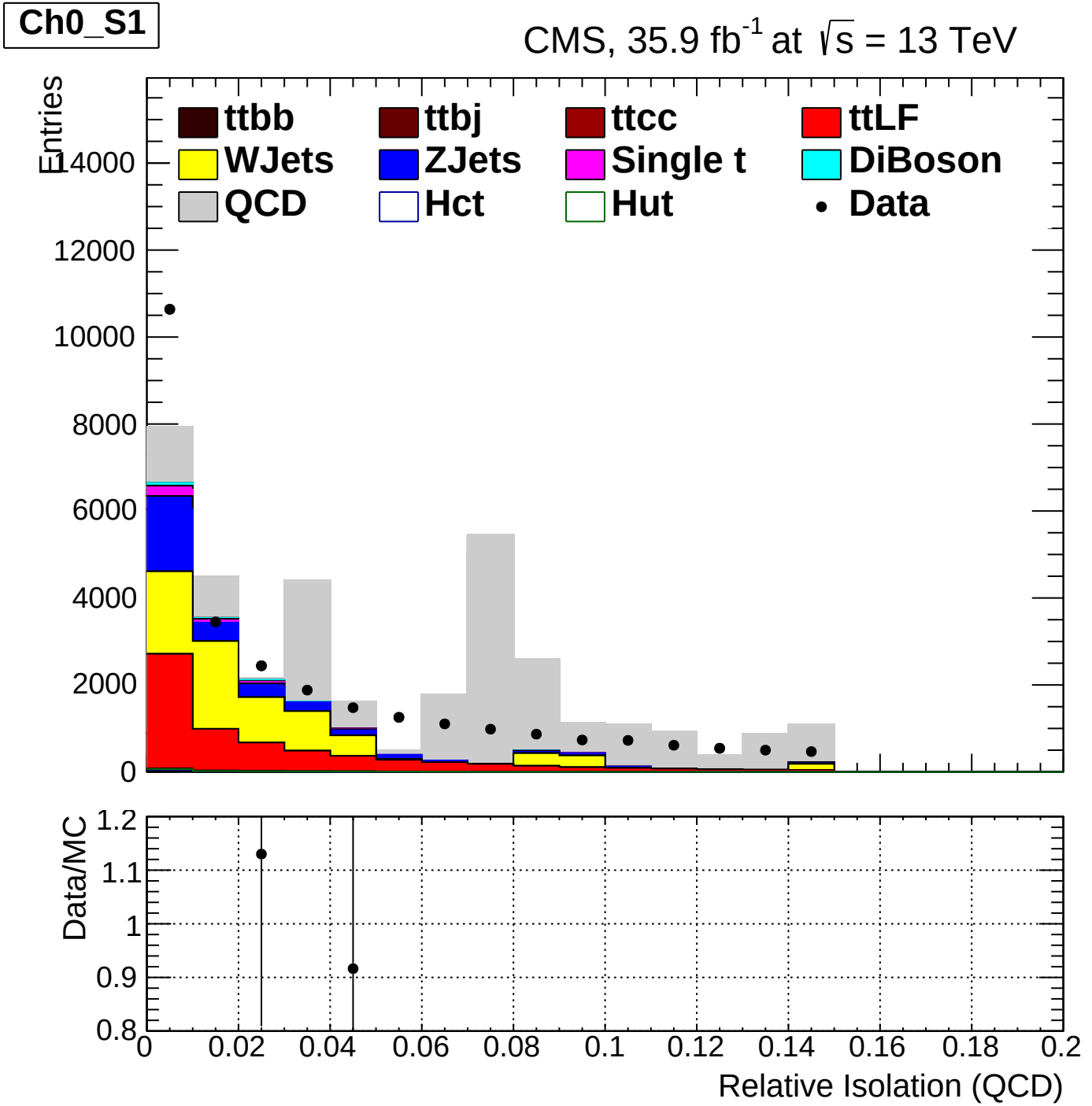
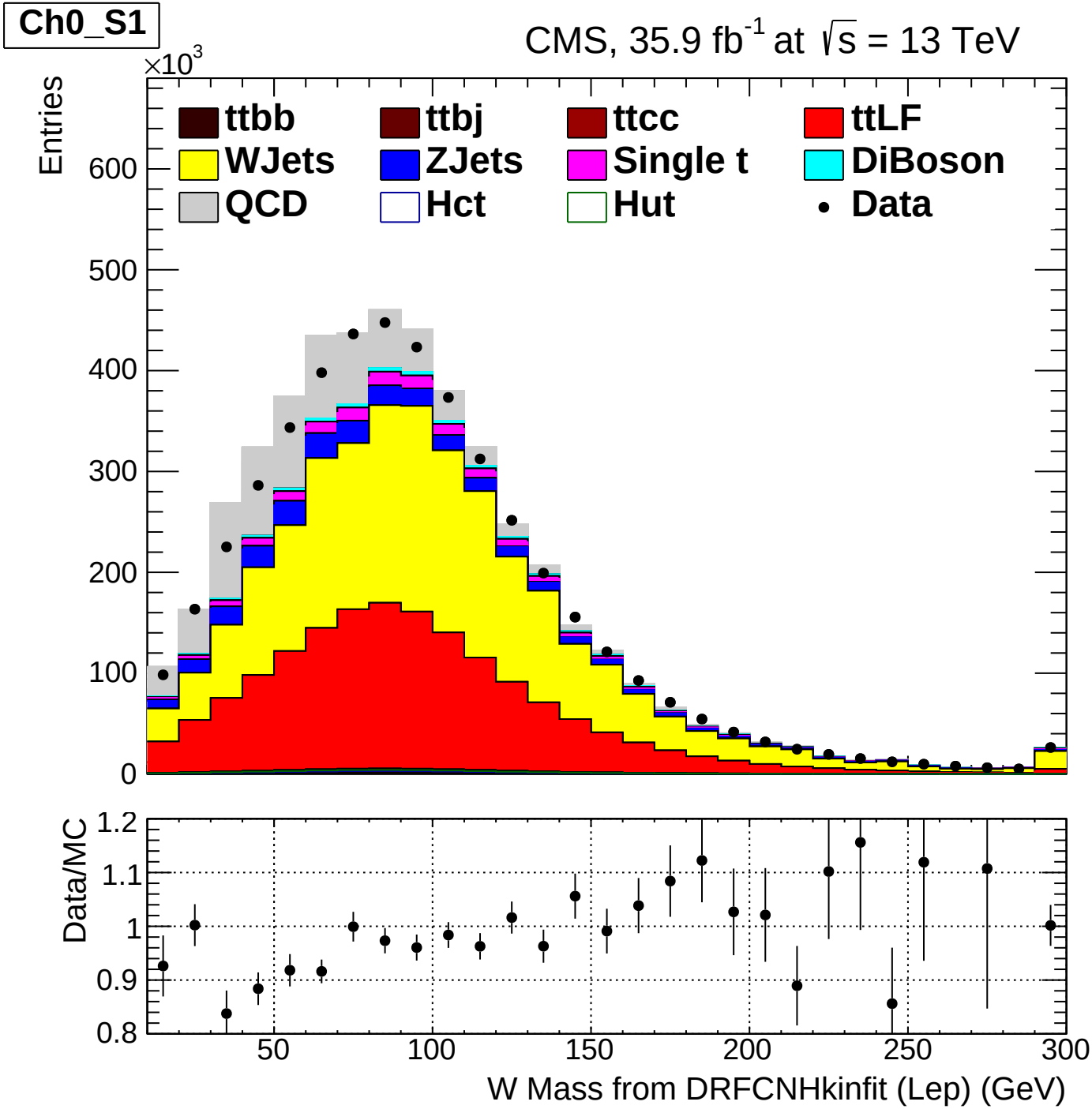
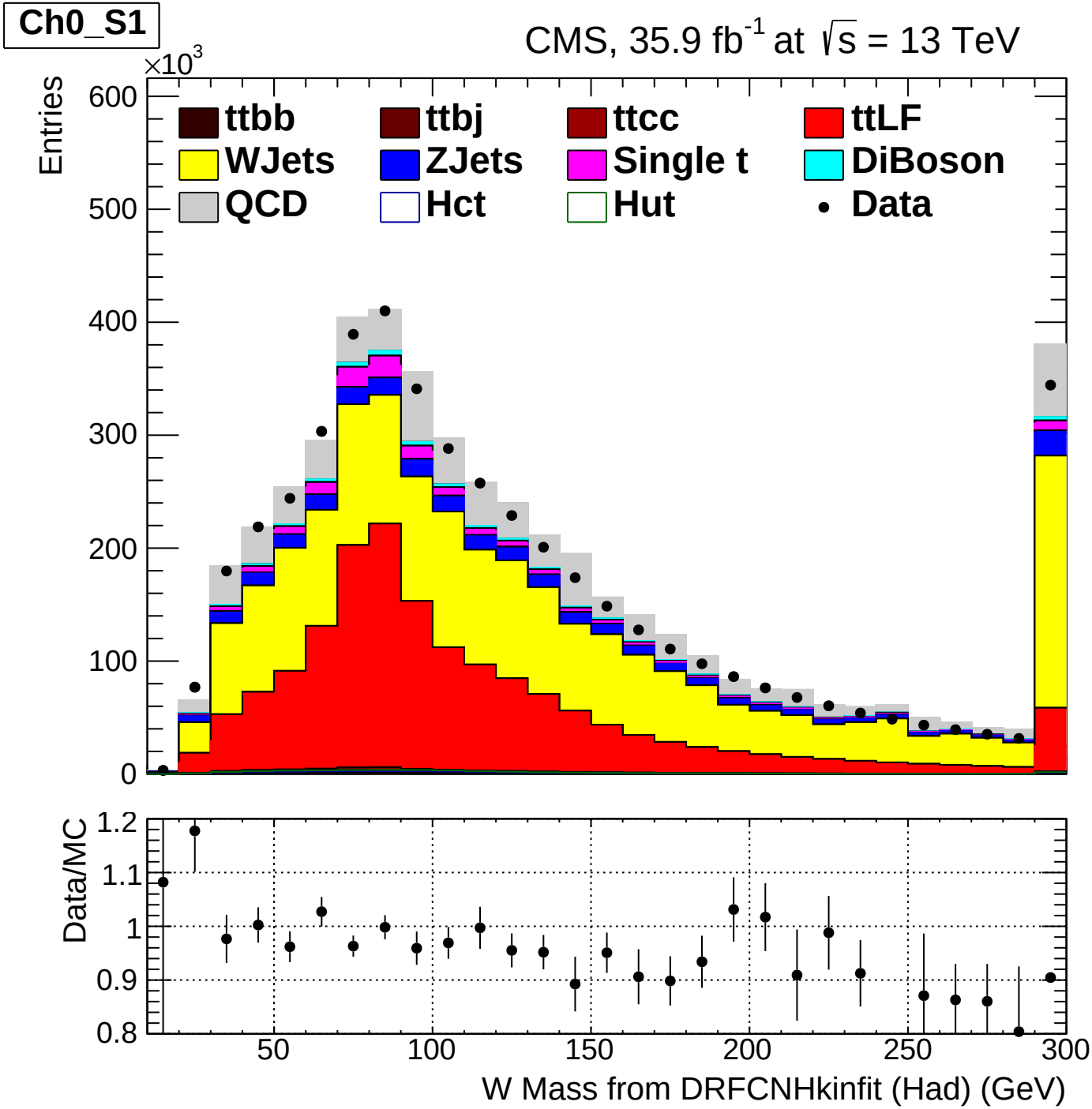
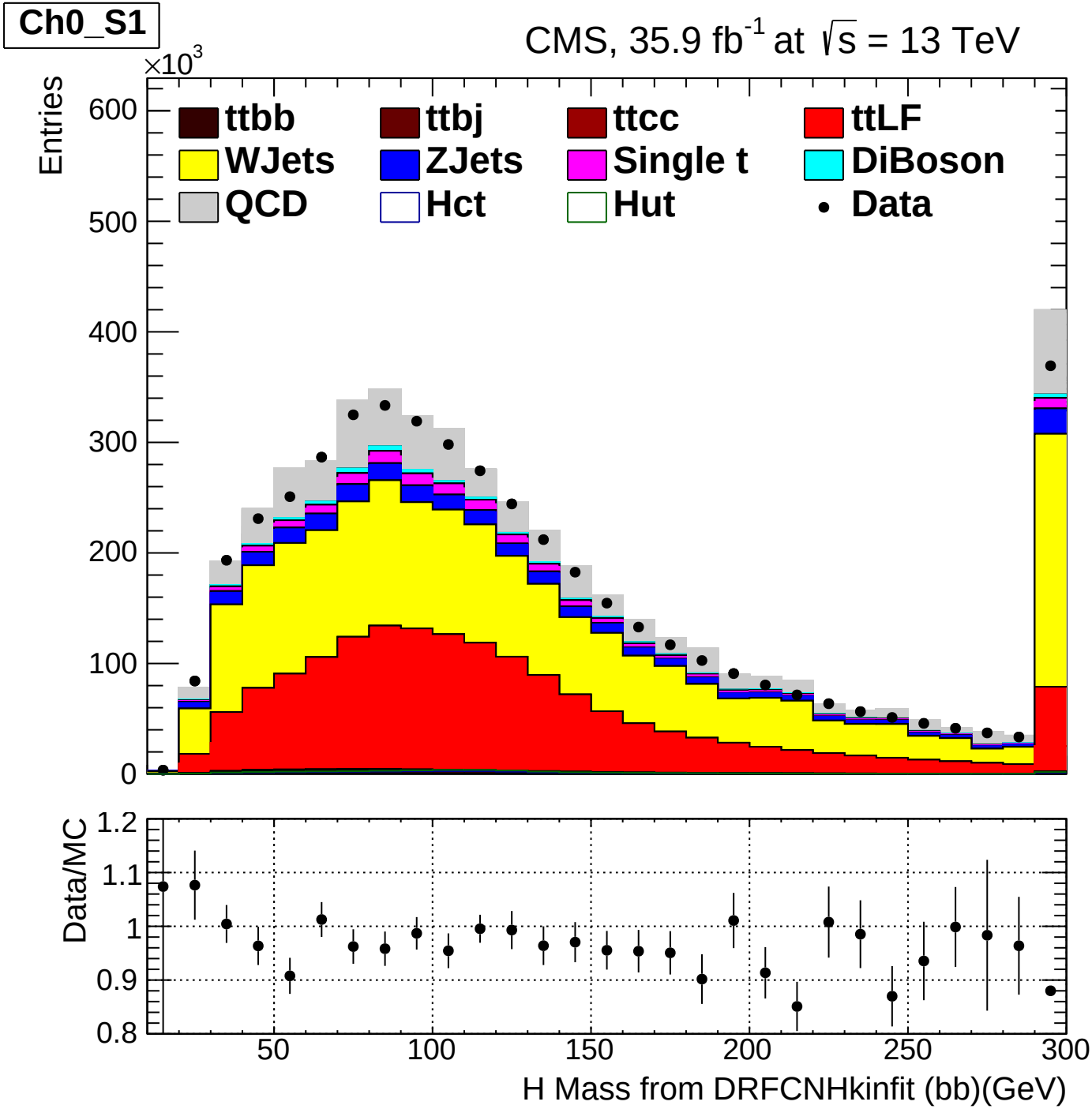
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

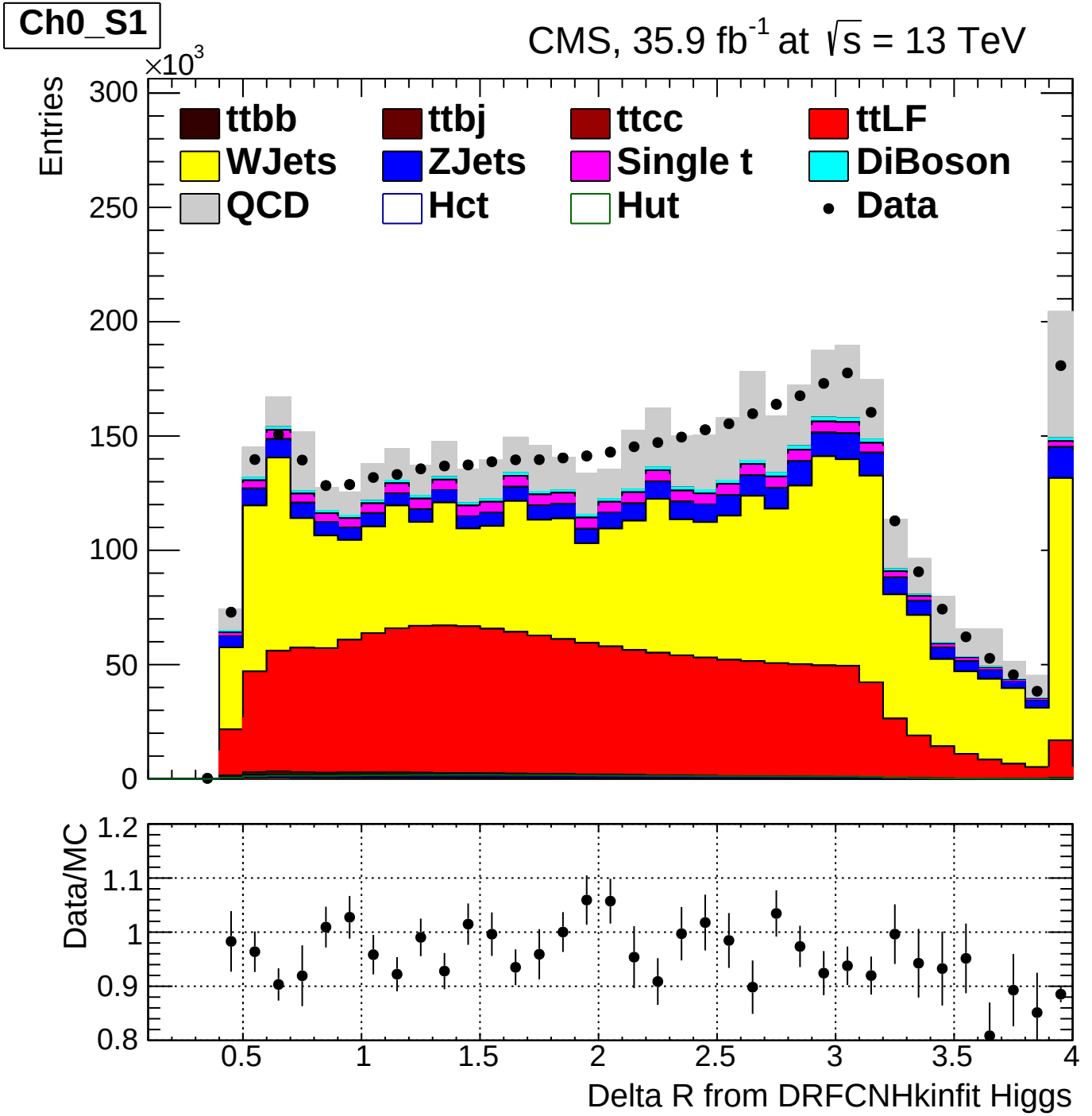

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

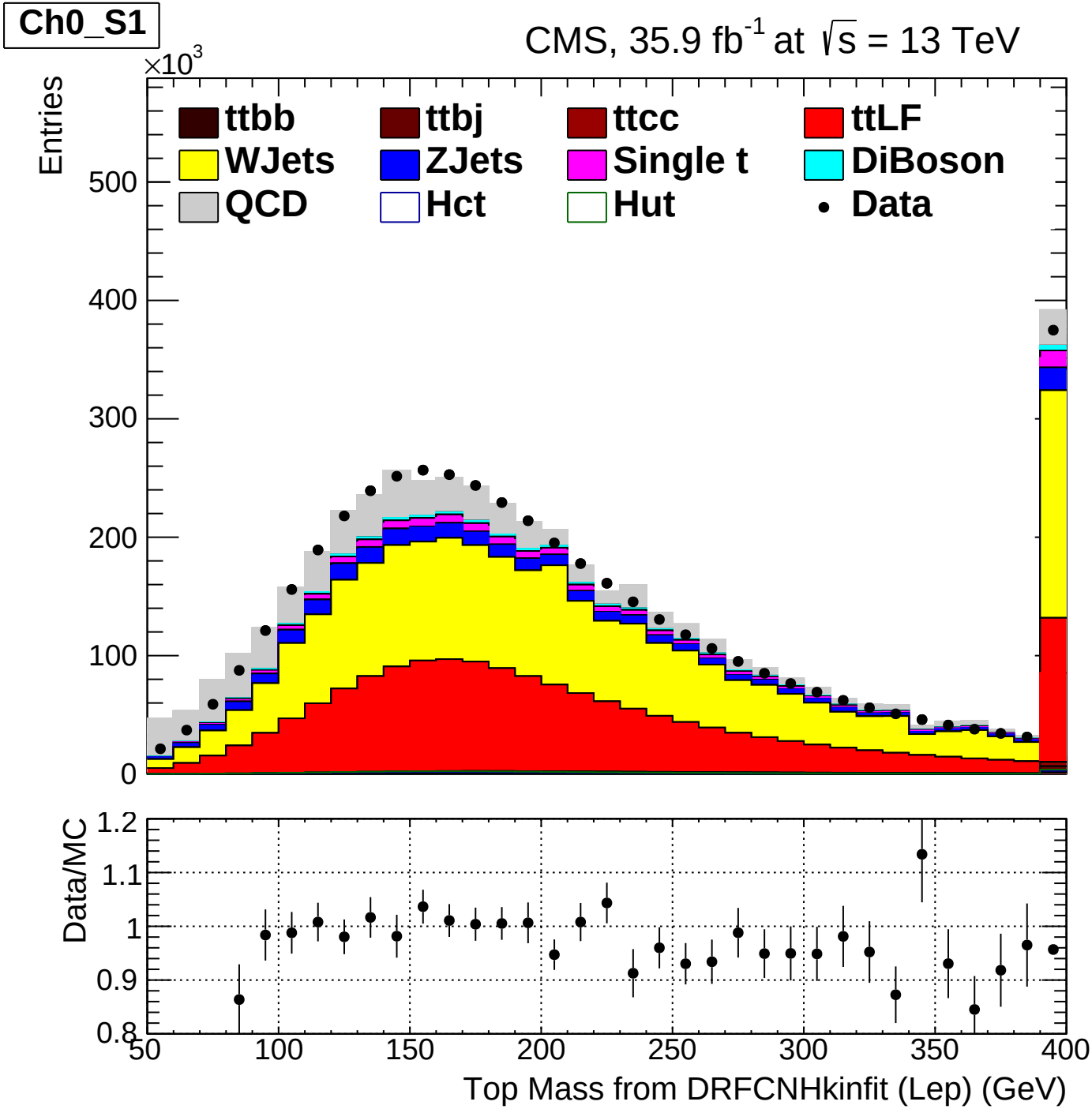

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
12000
14000
Data/MC
0.8
0.9
1
1.1
1.2
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation (QCD)

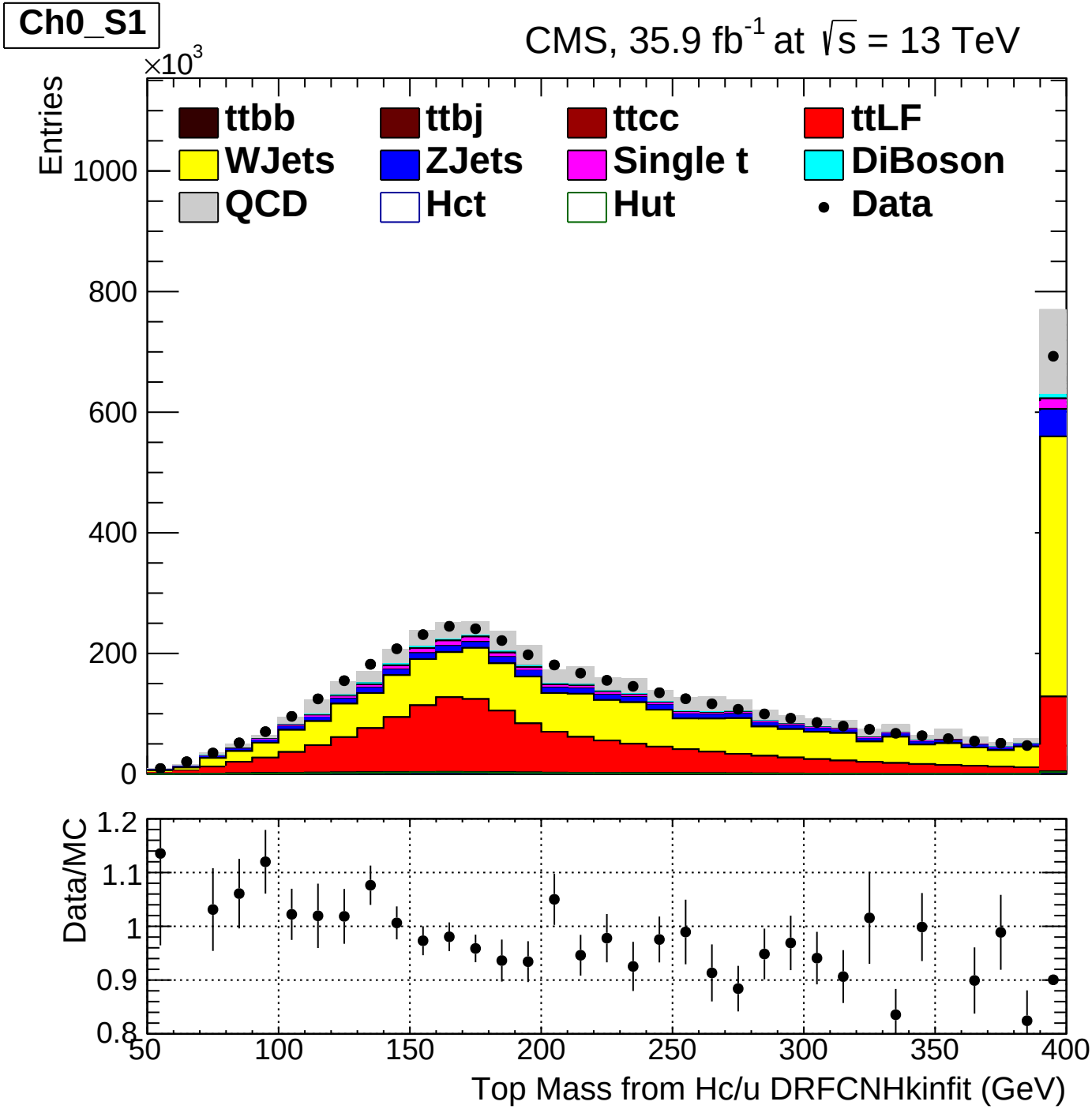

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

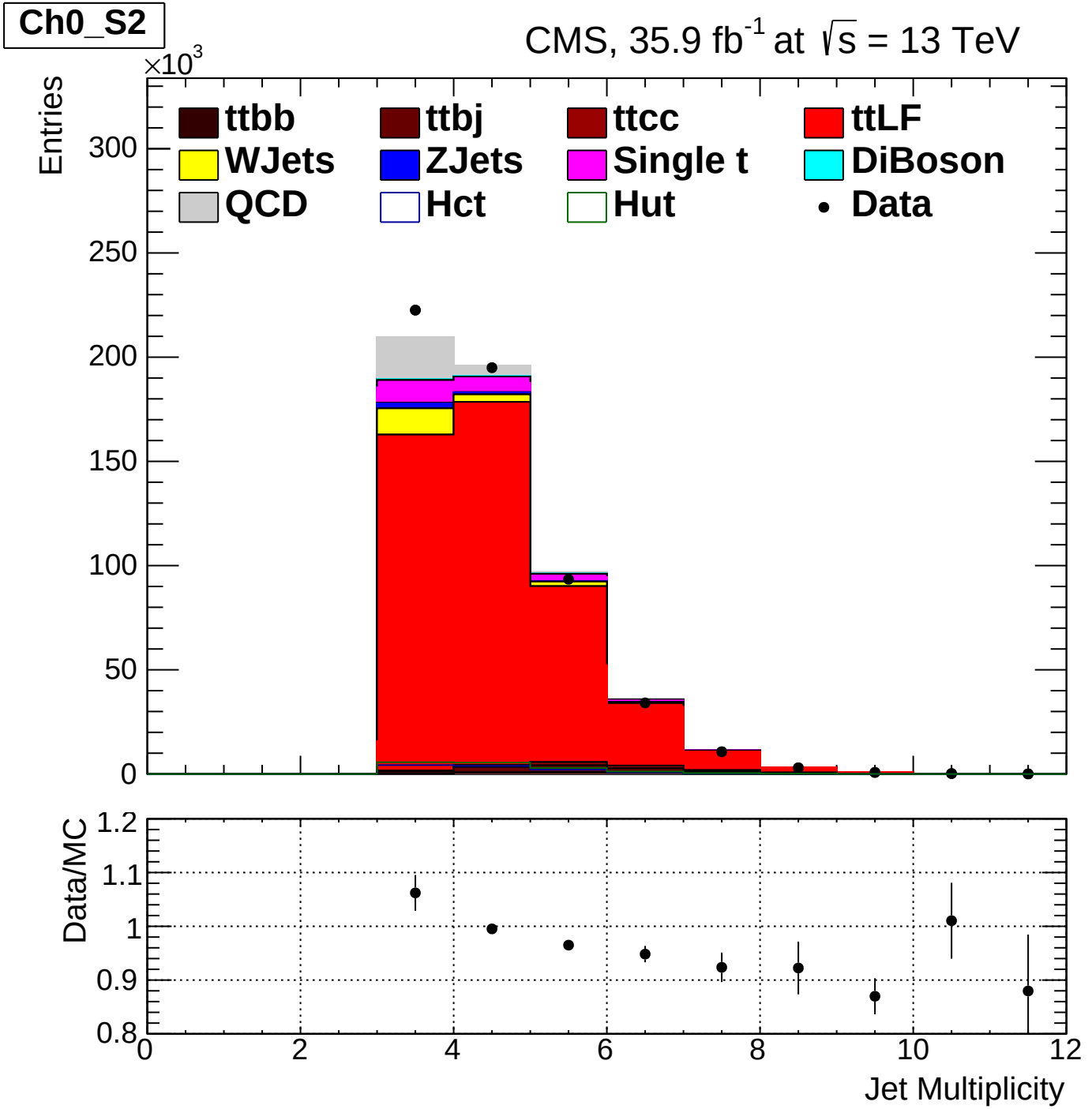

Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
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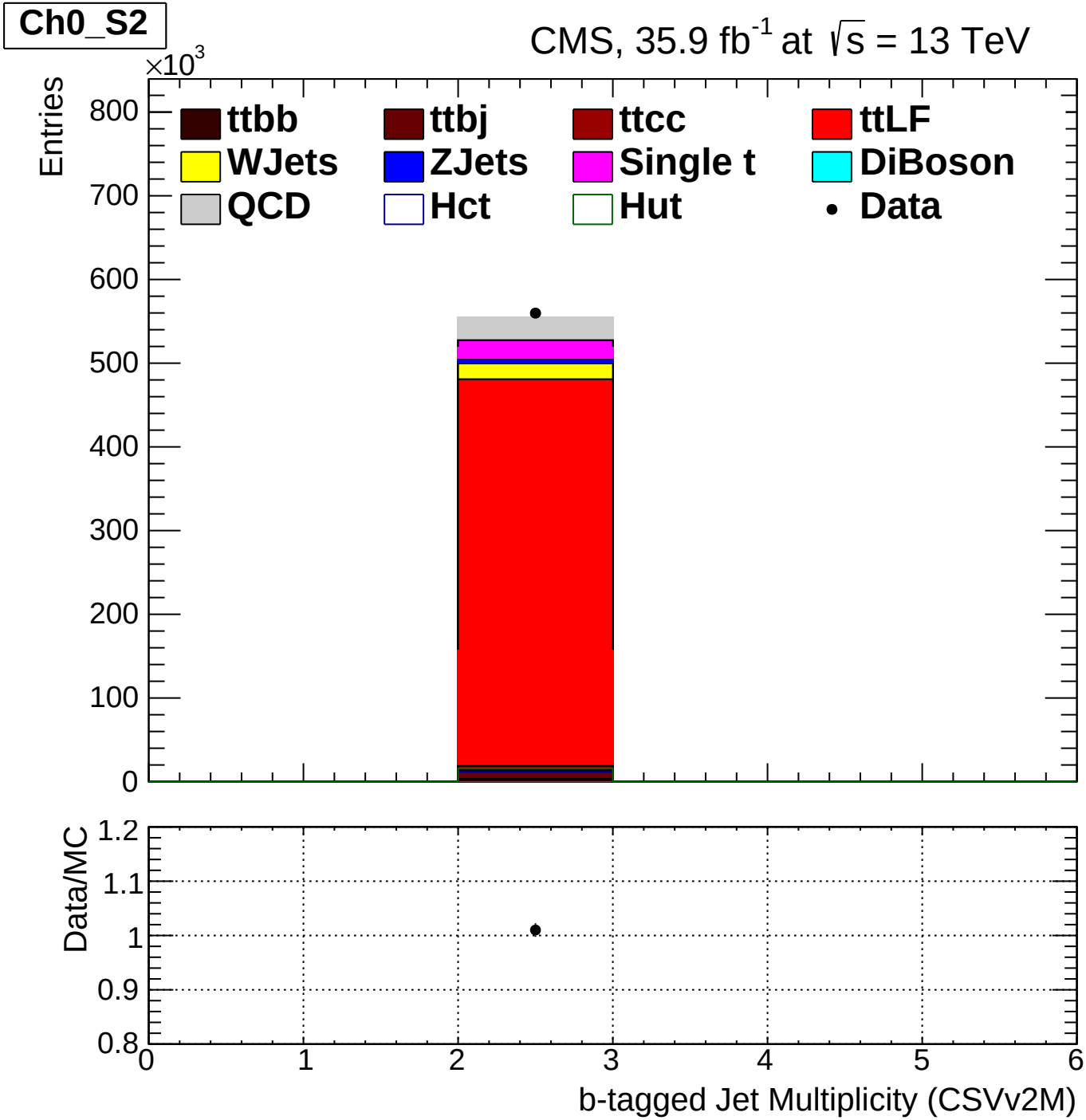
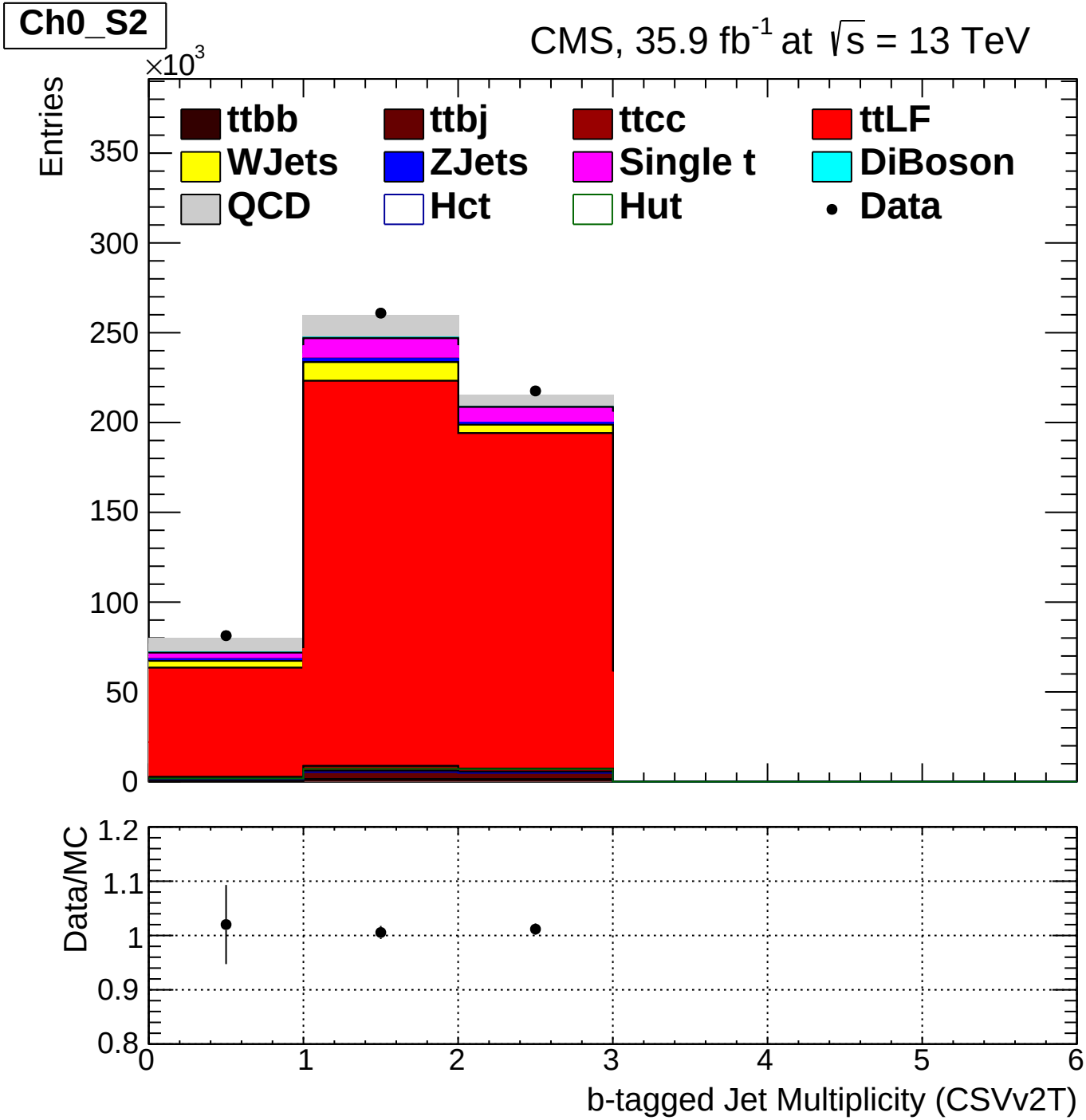
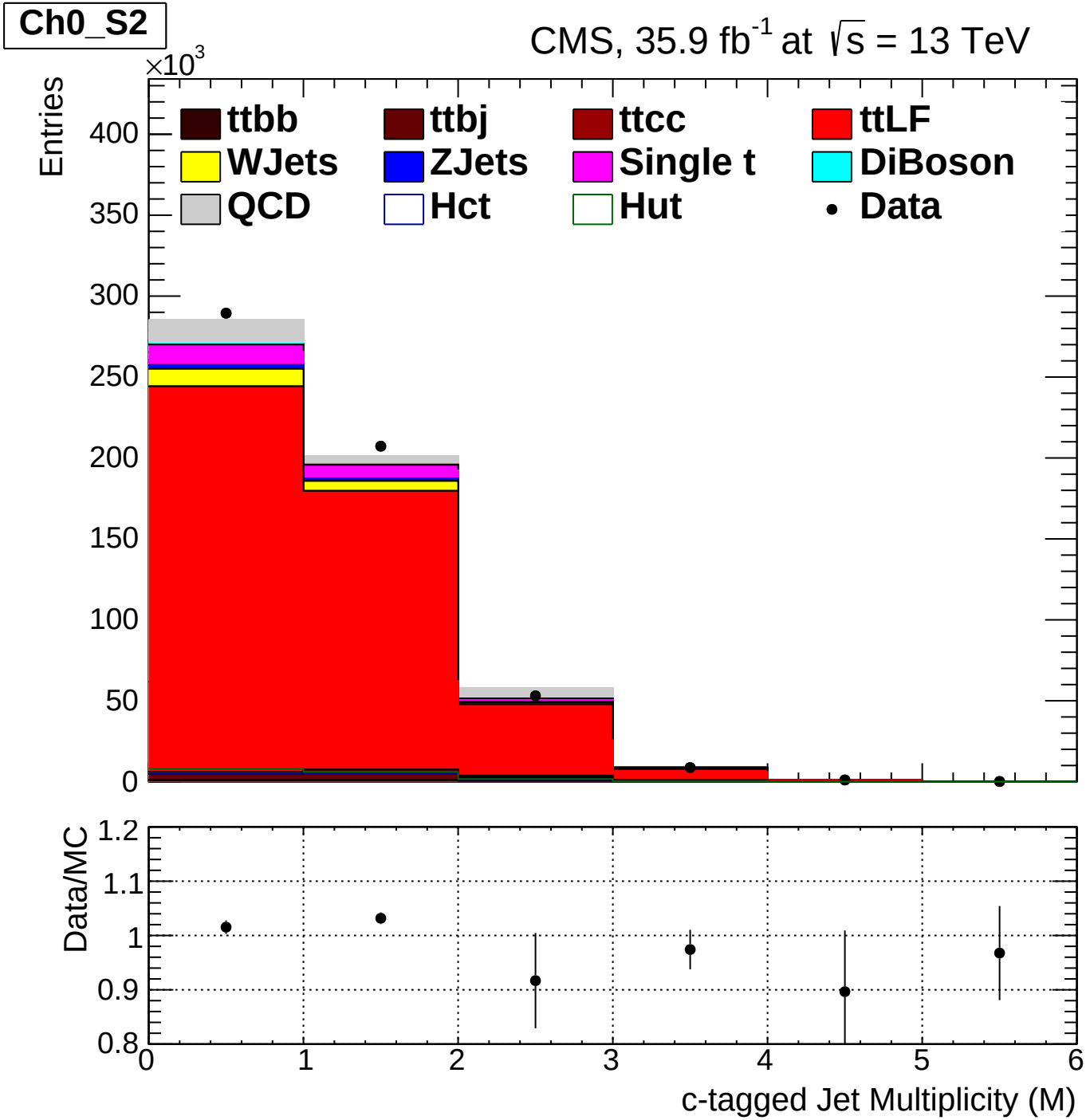
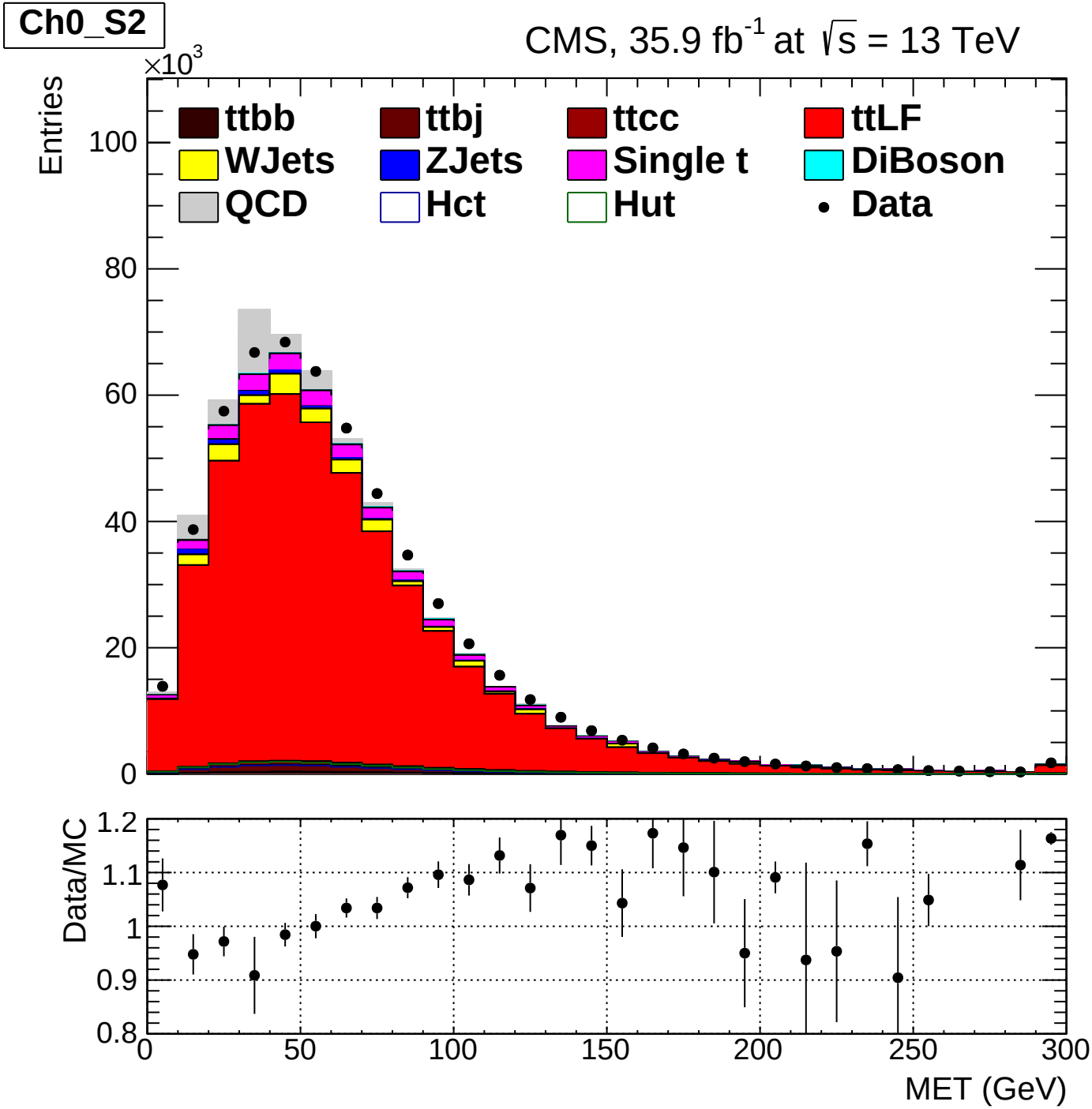
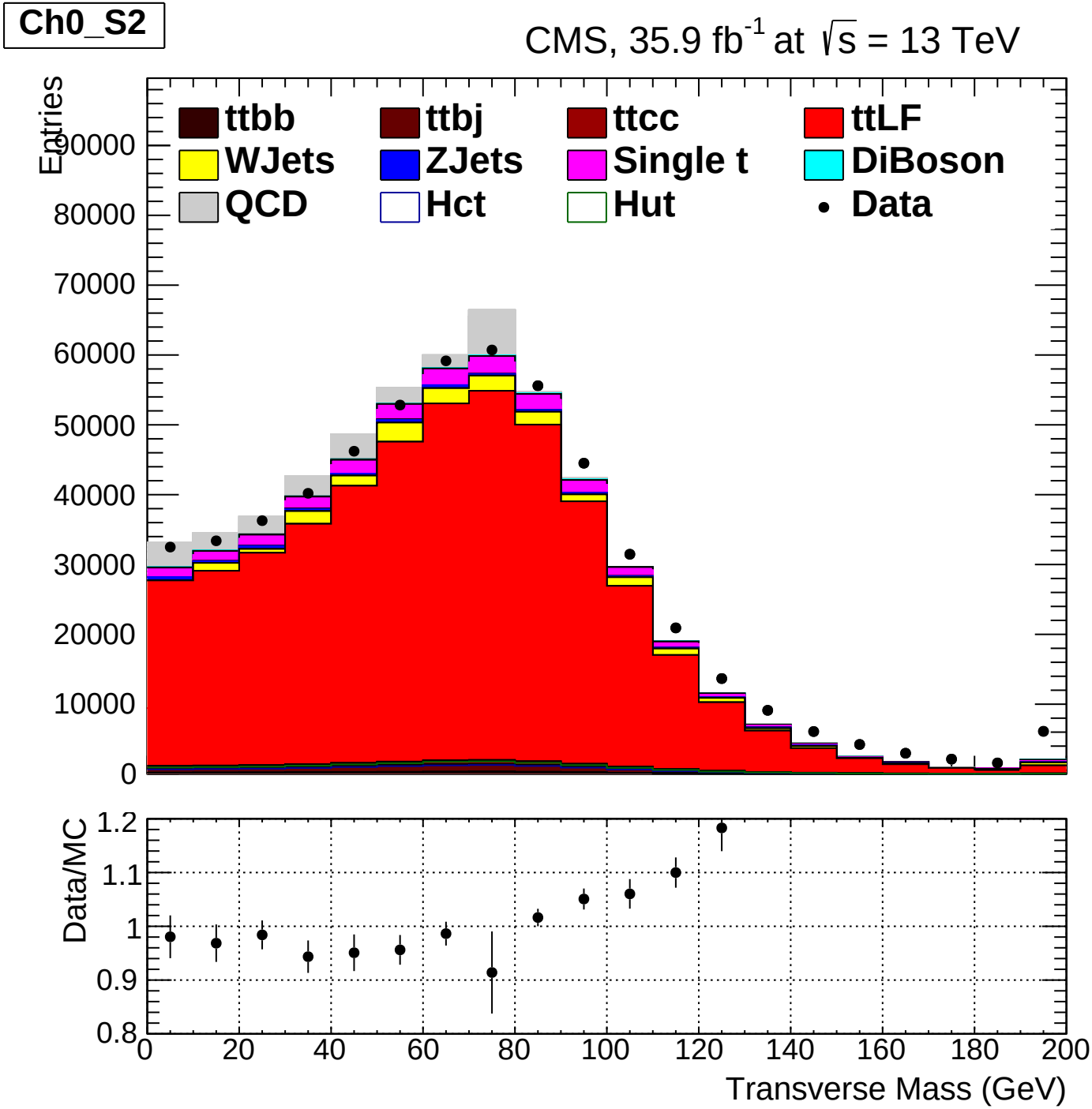
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

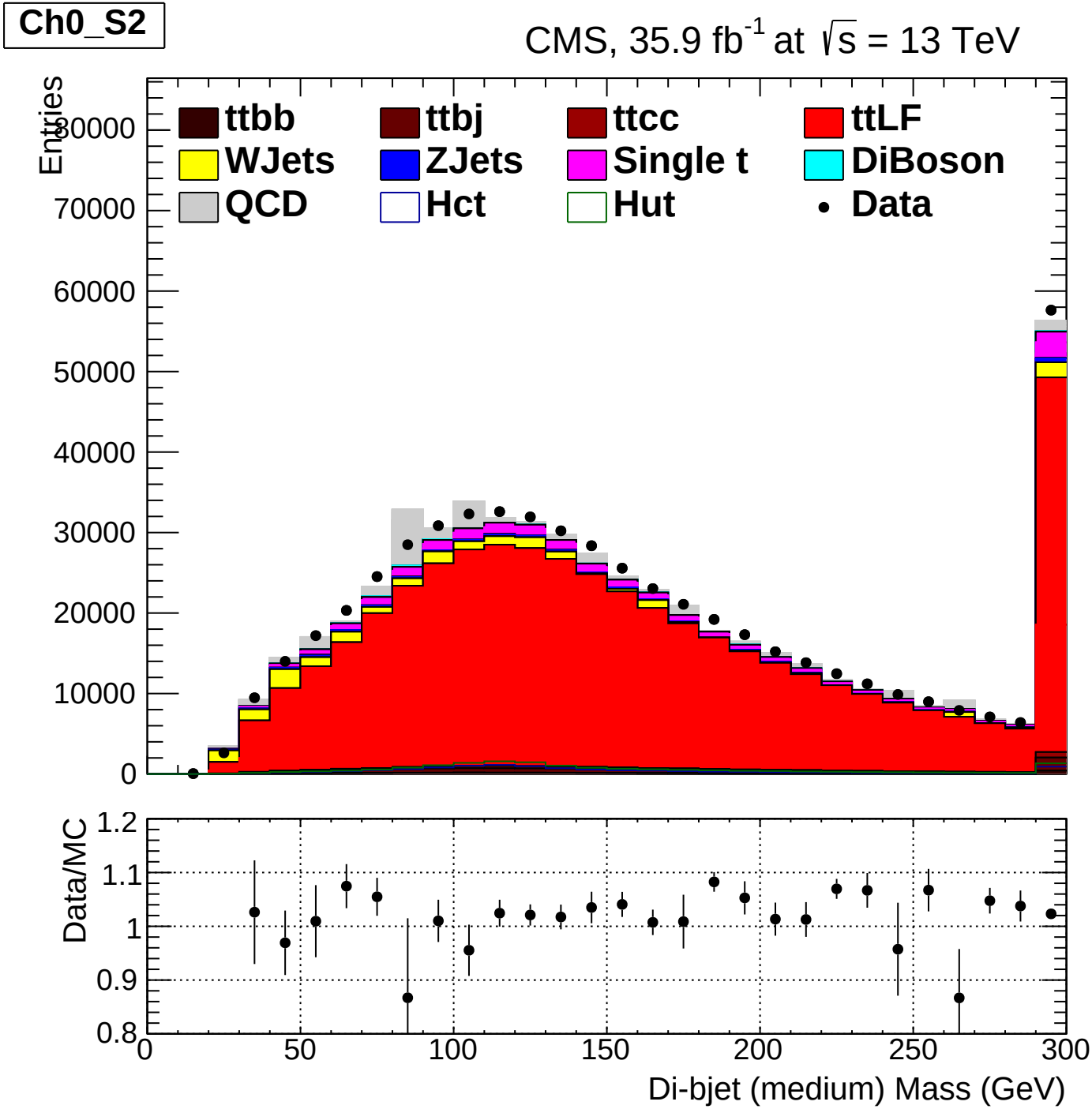

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

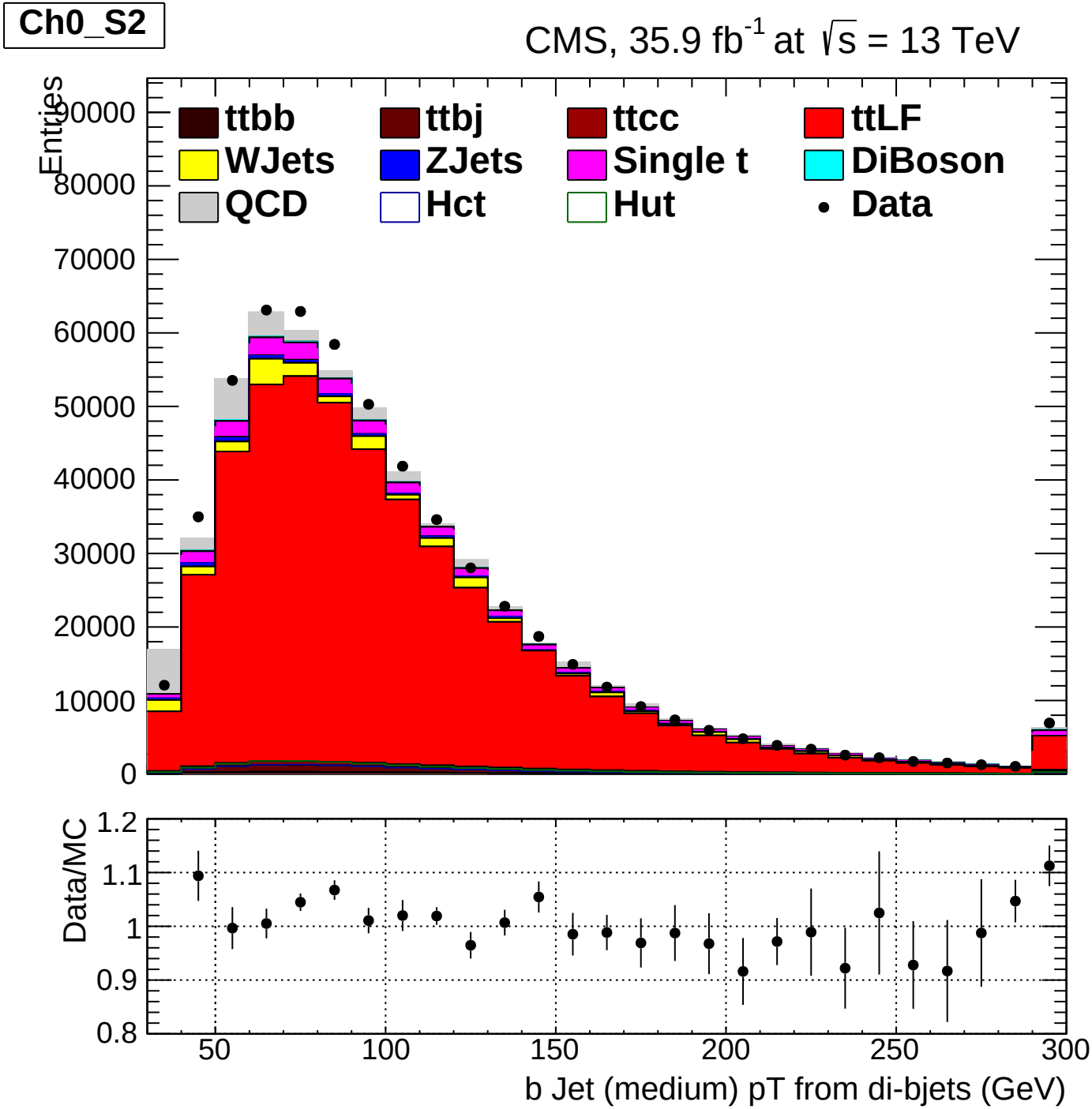

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

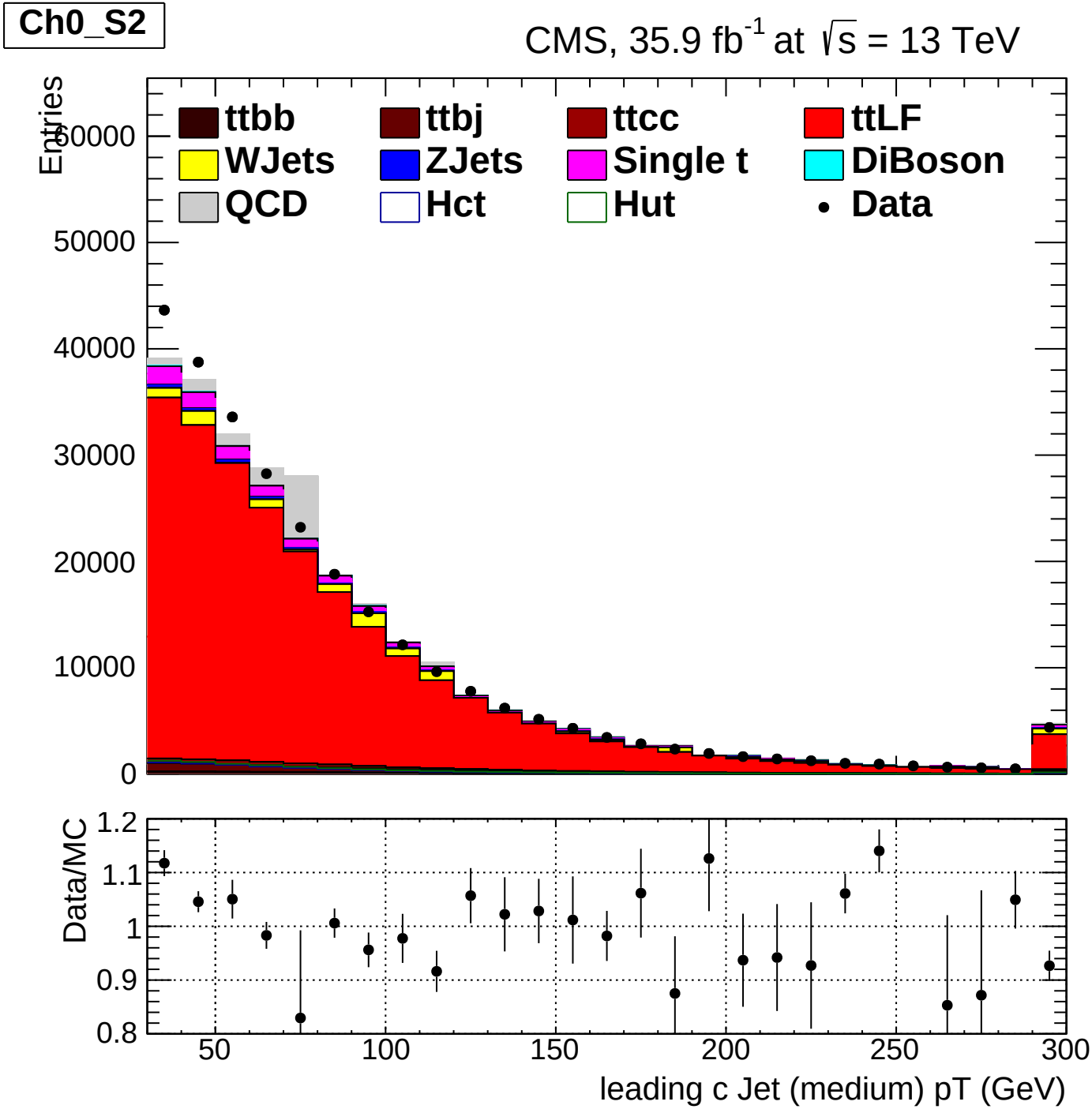

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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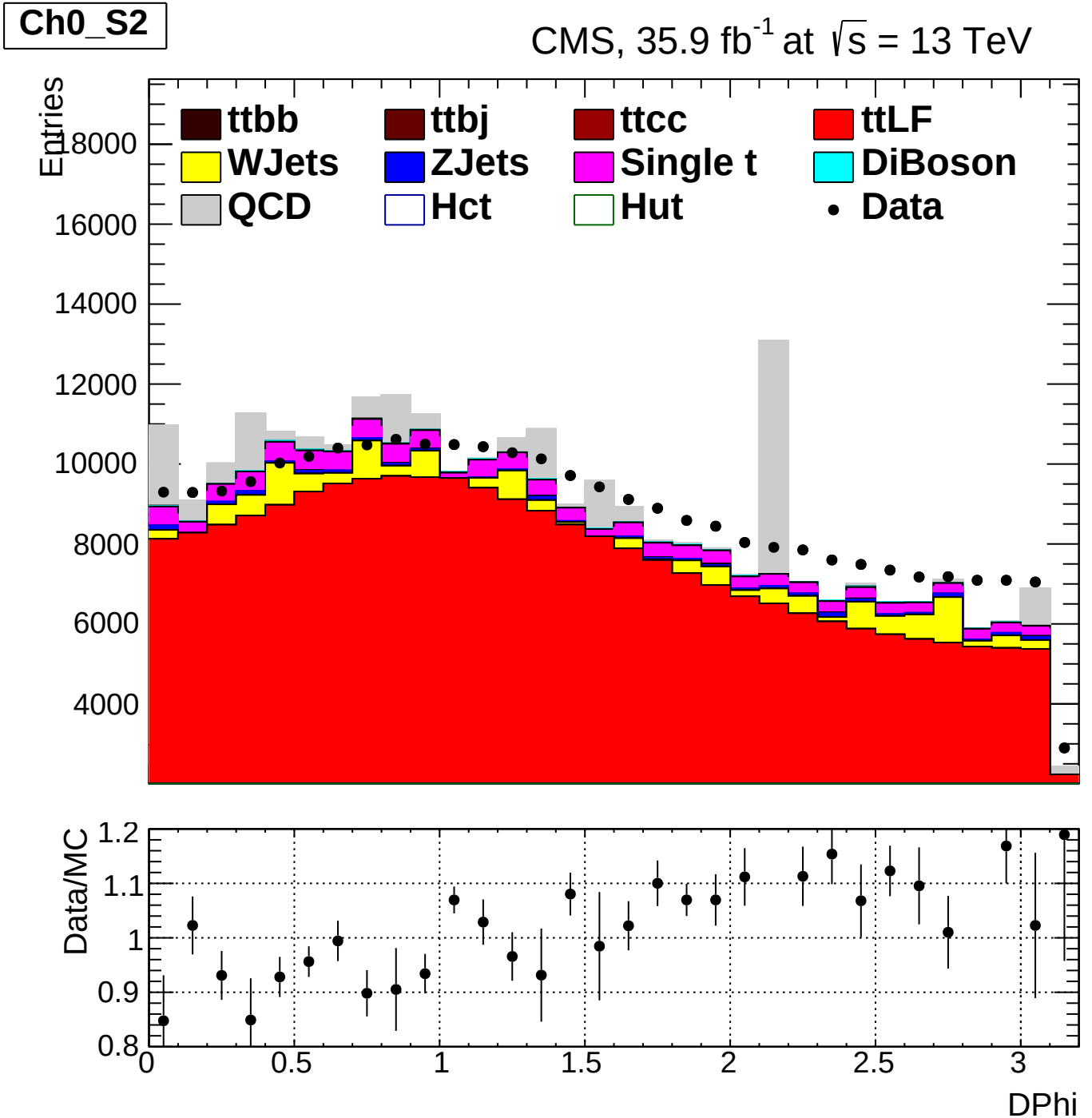
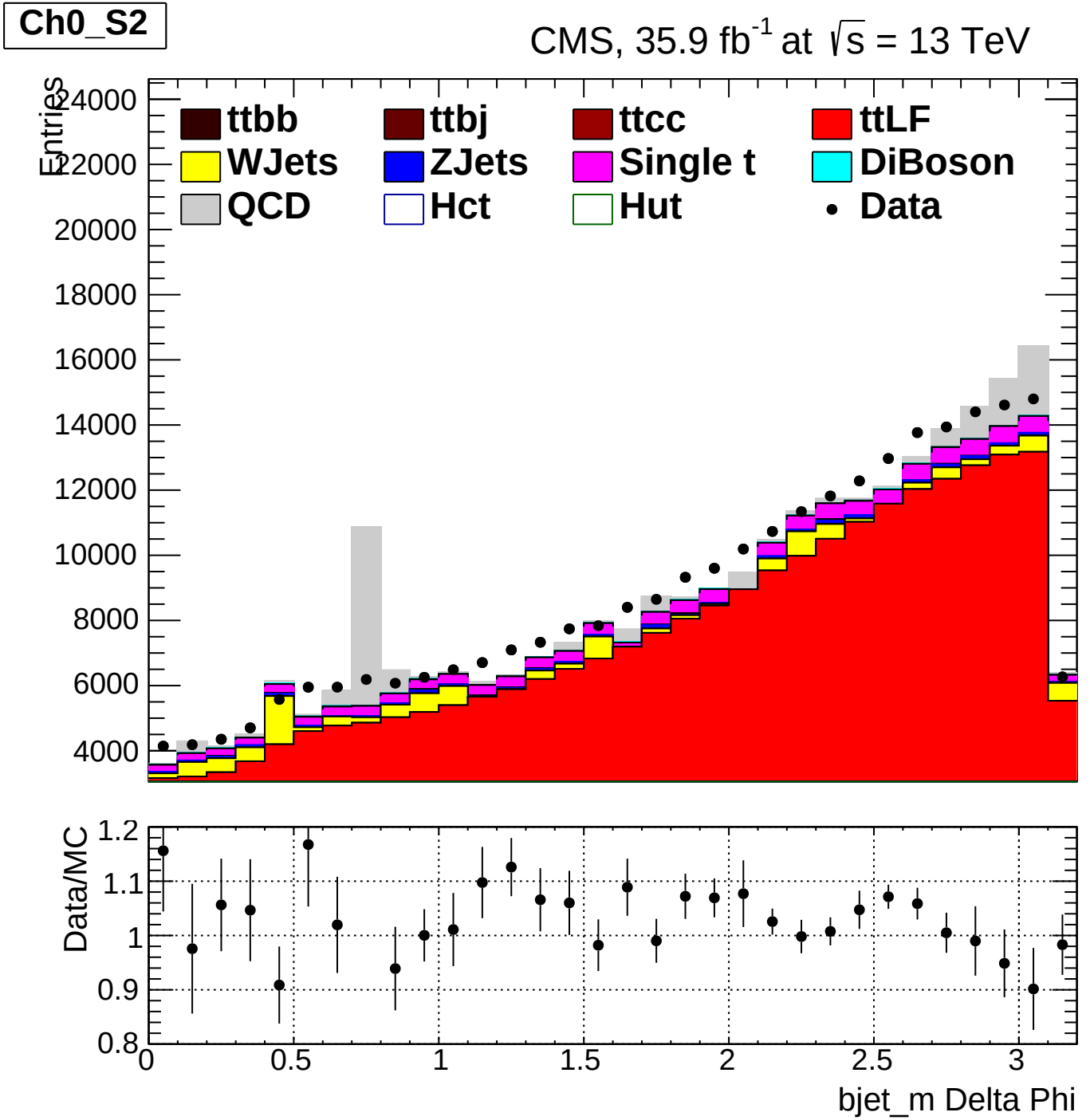
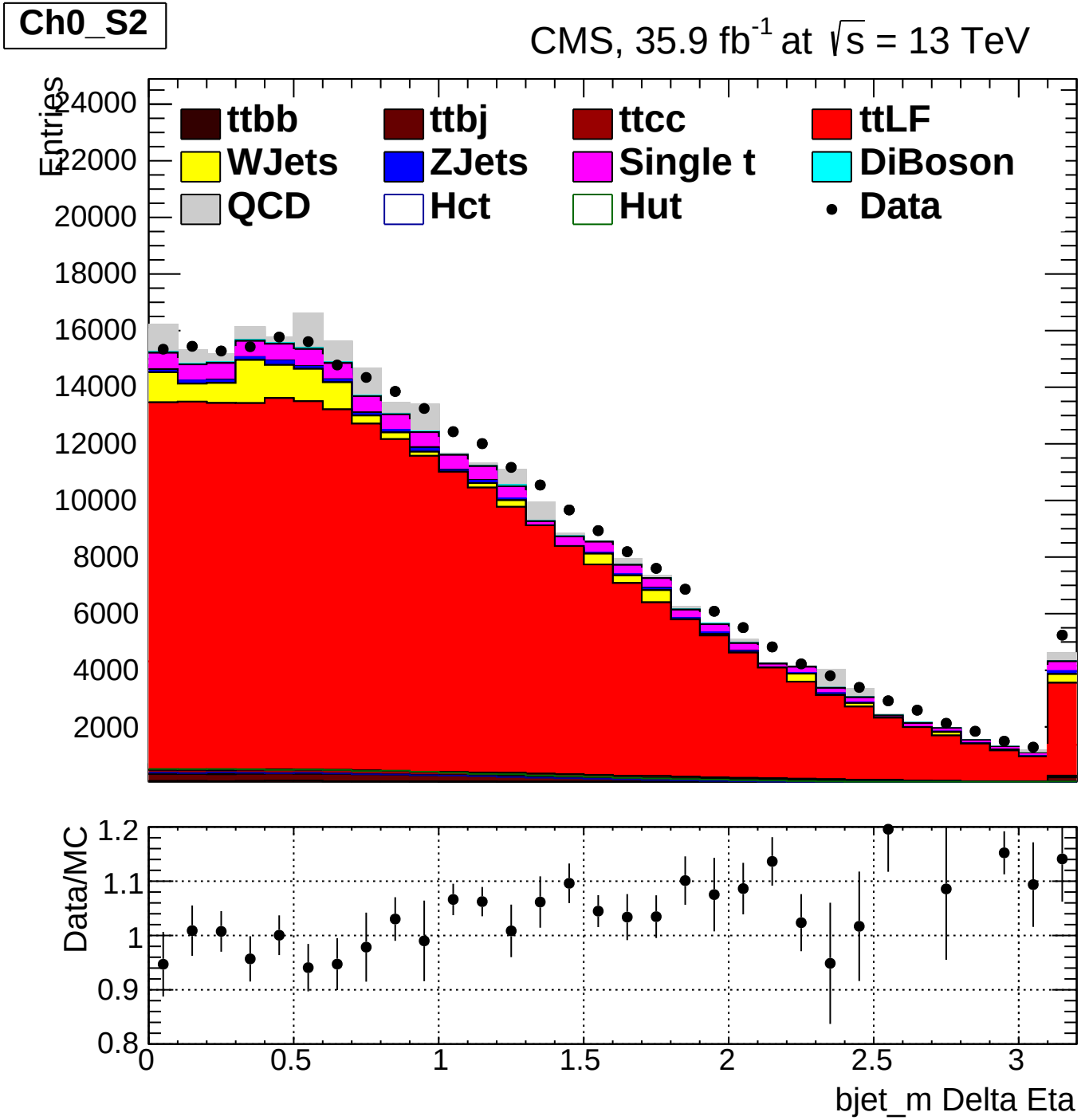
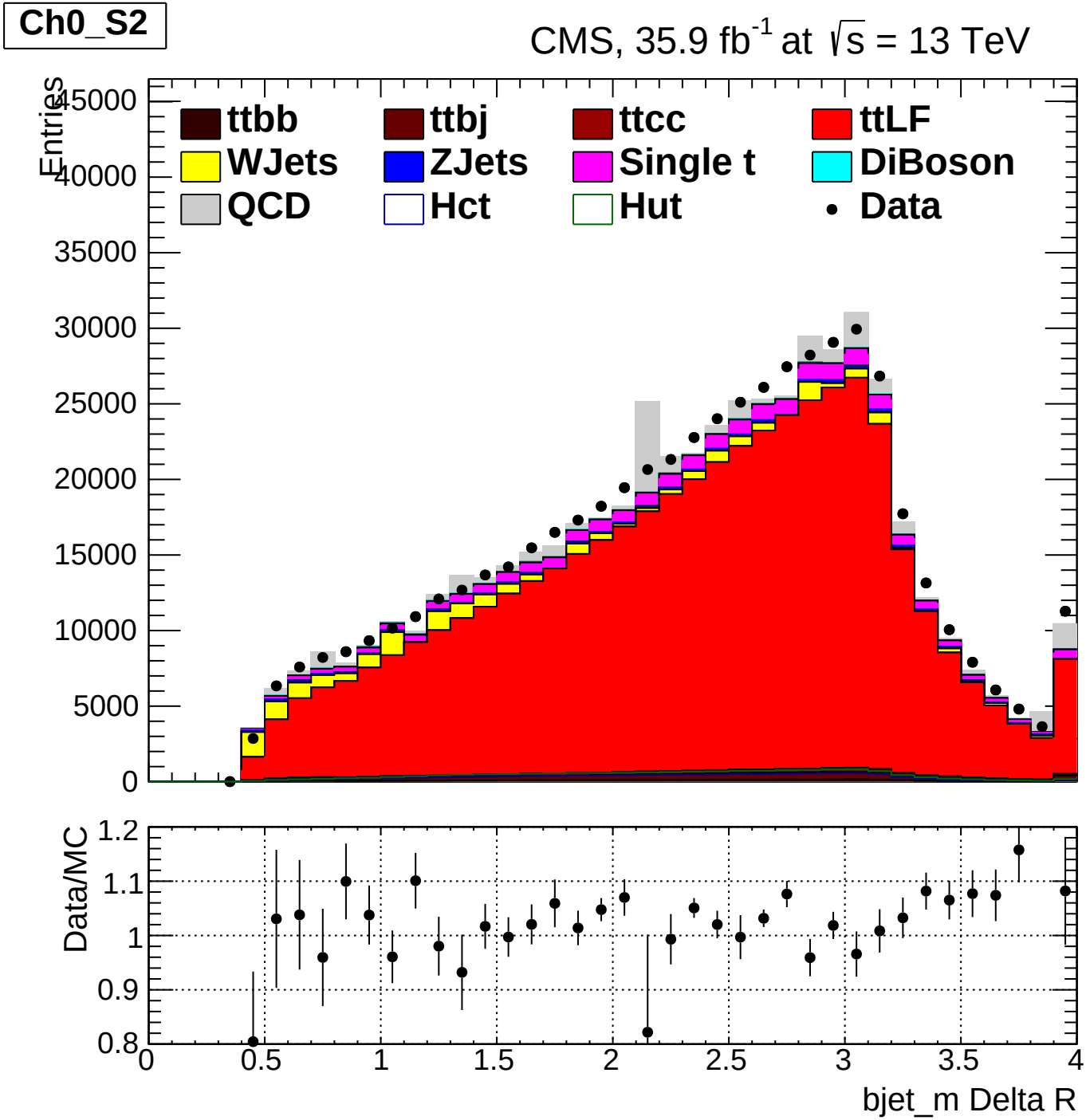
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
18000
16000
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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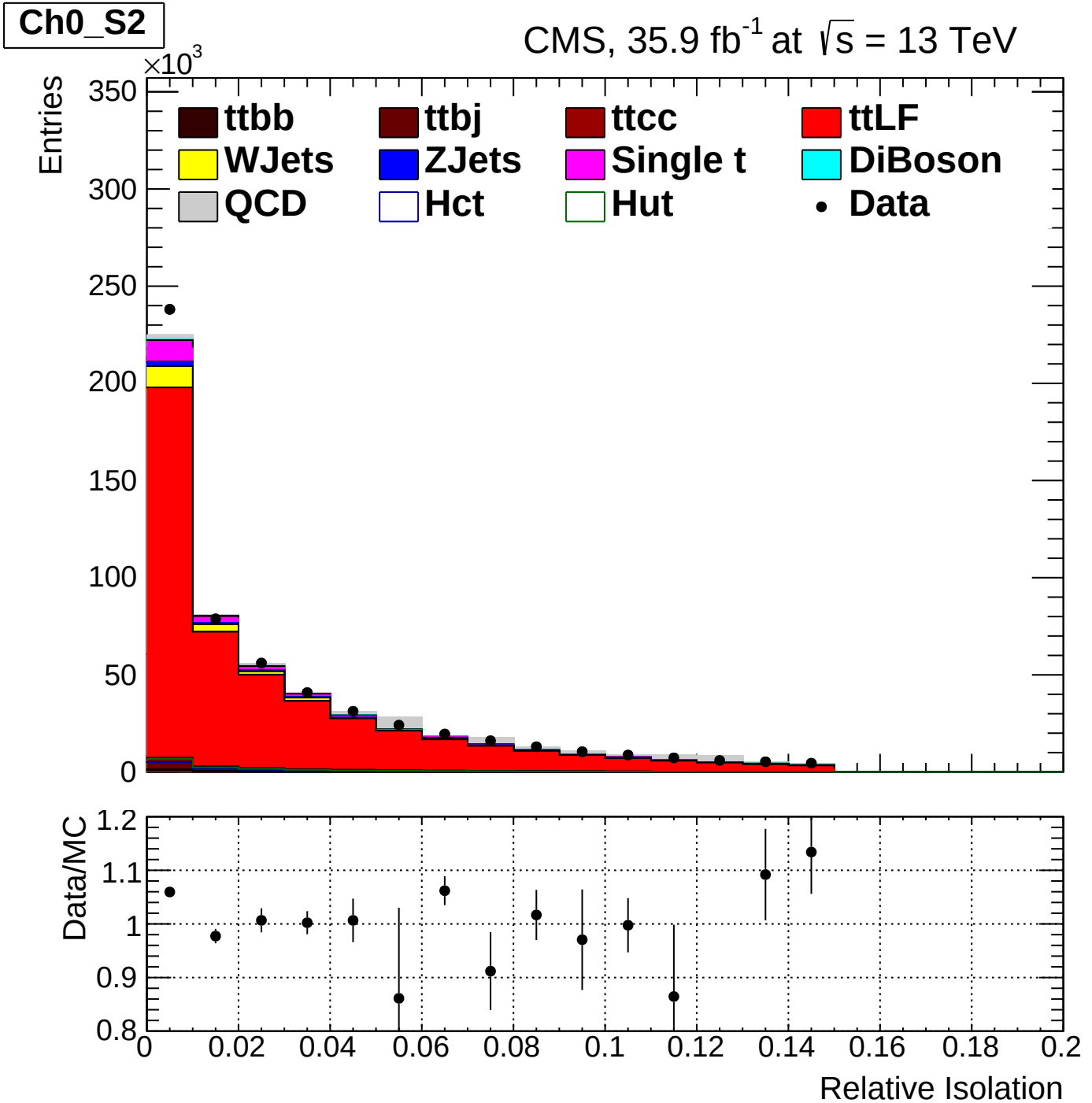
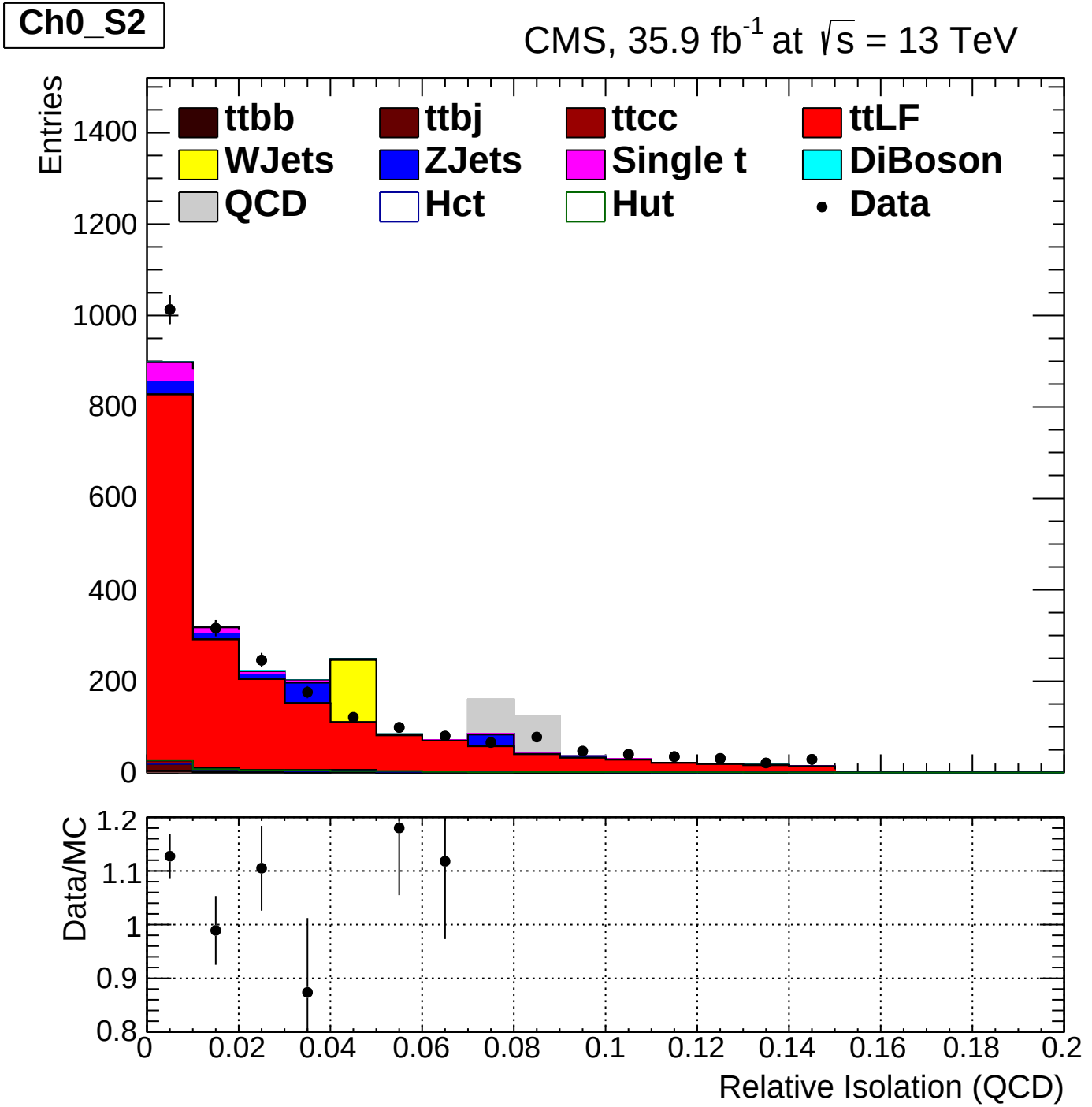
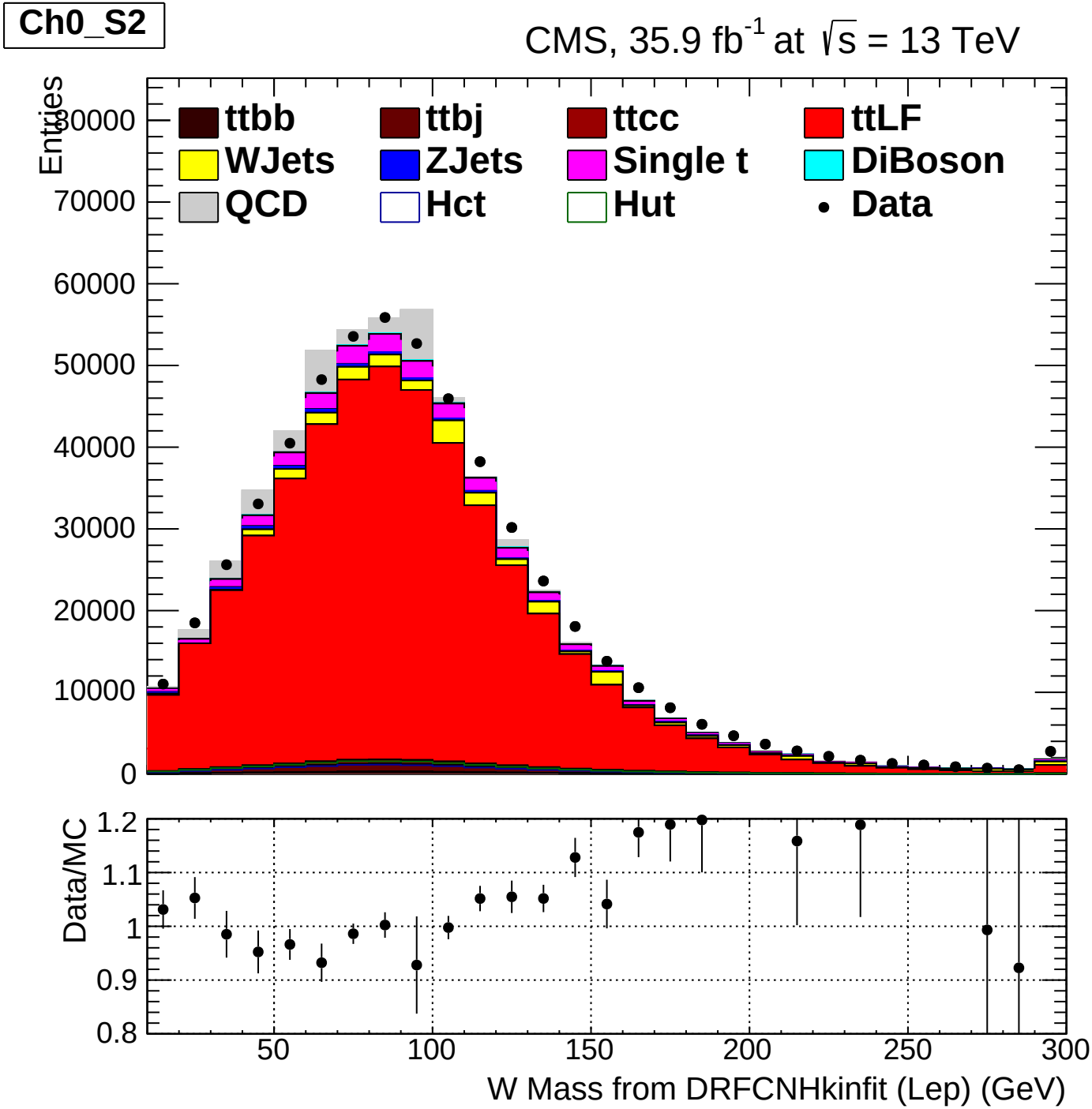
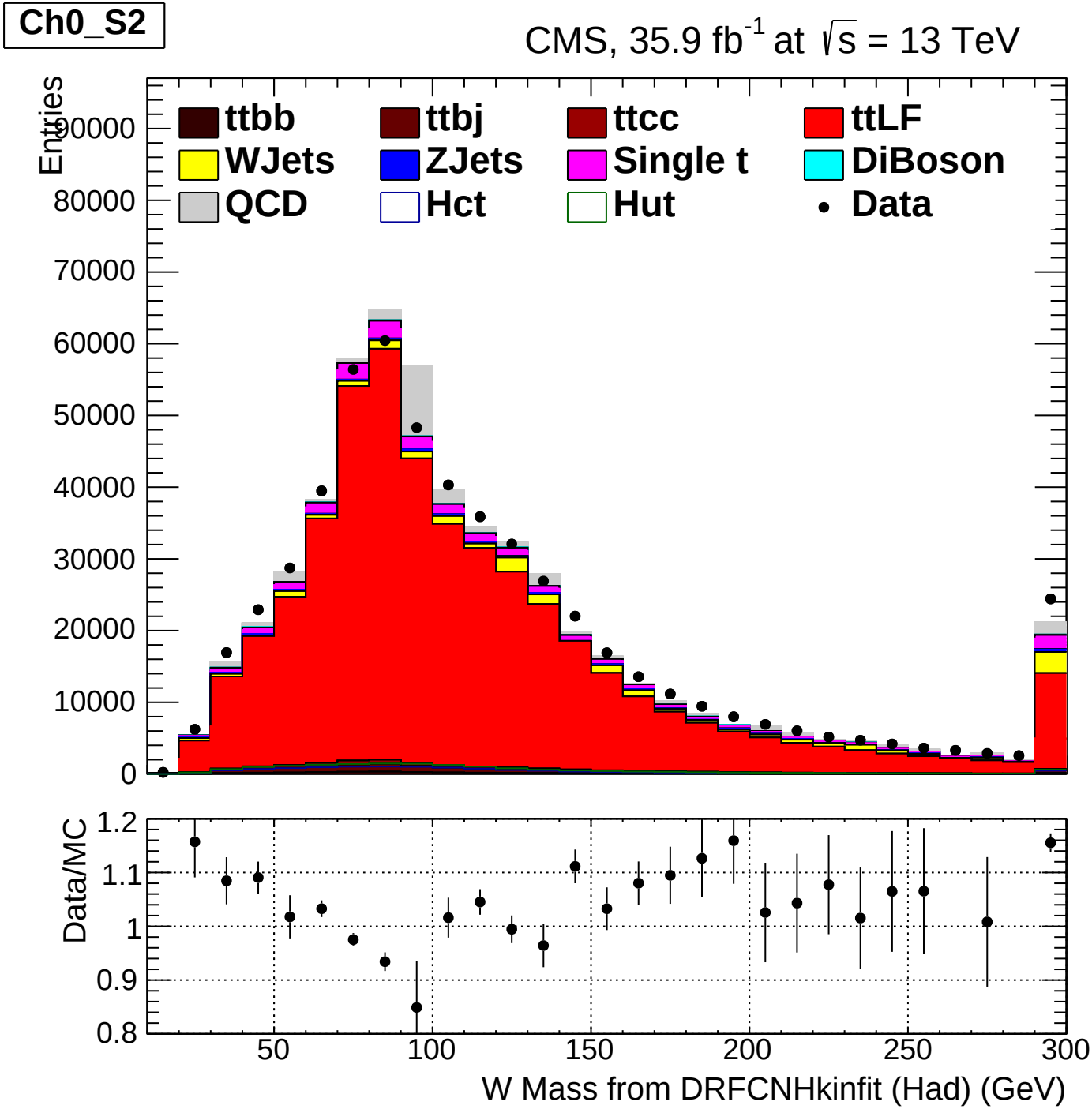
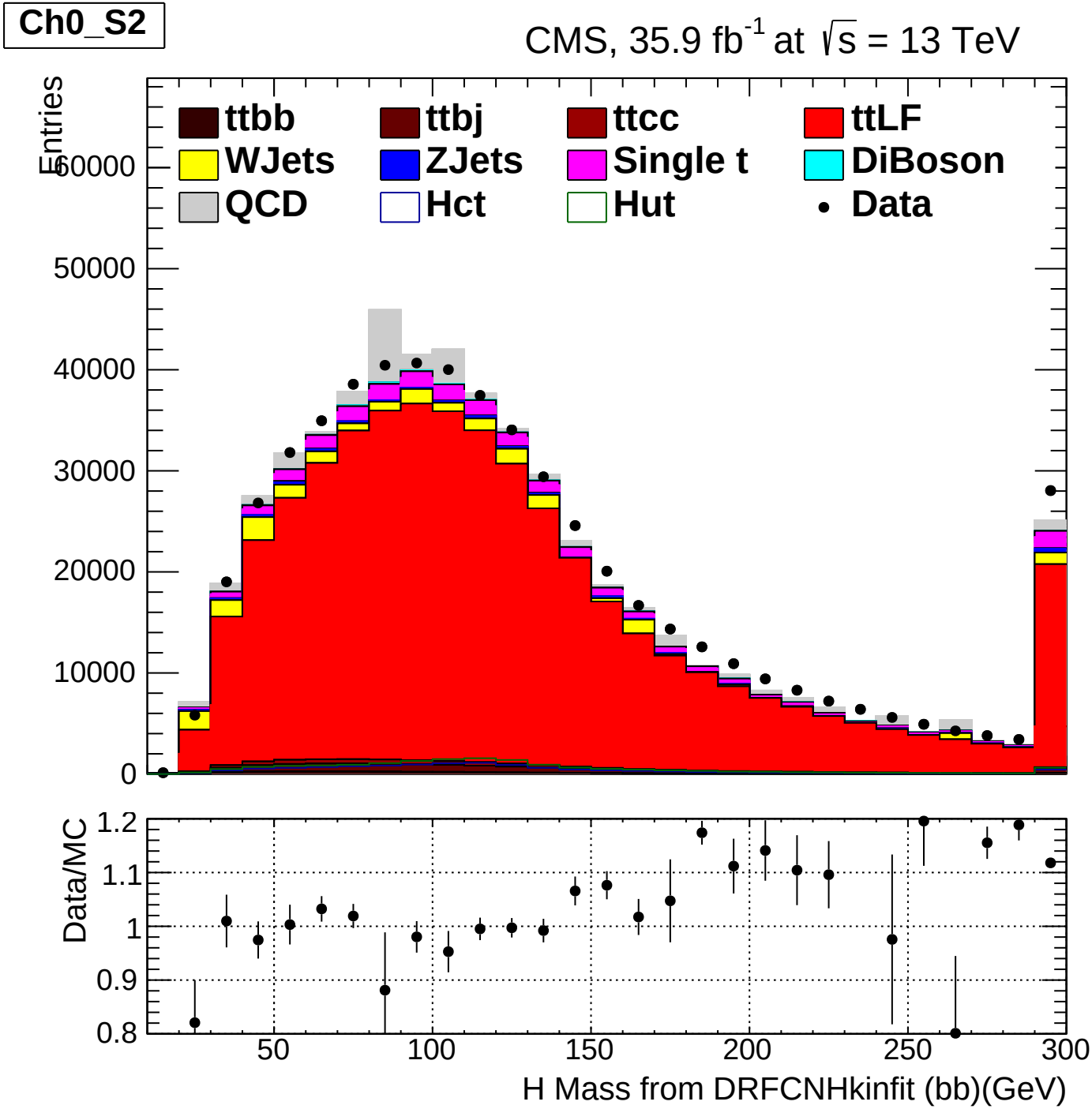
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

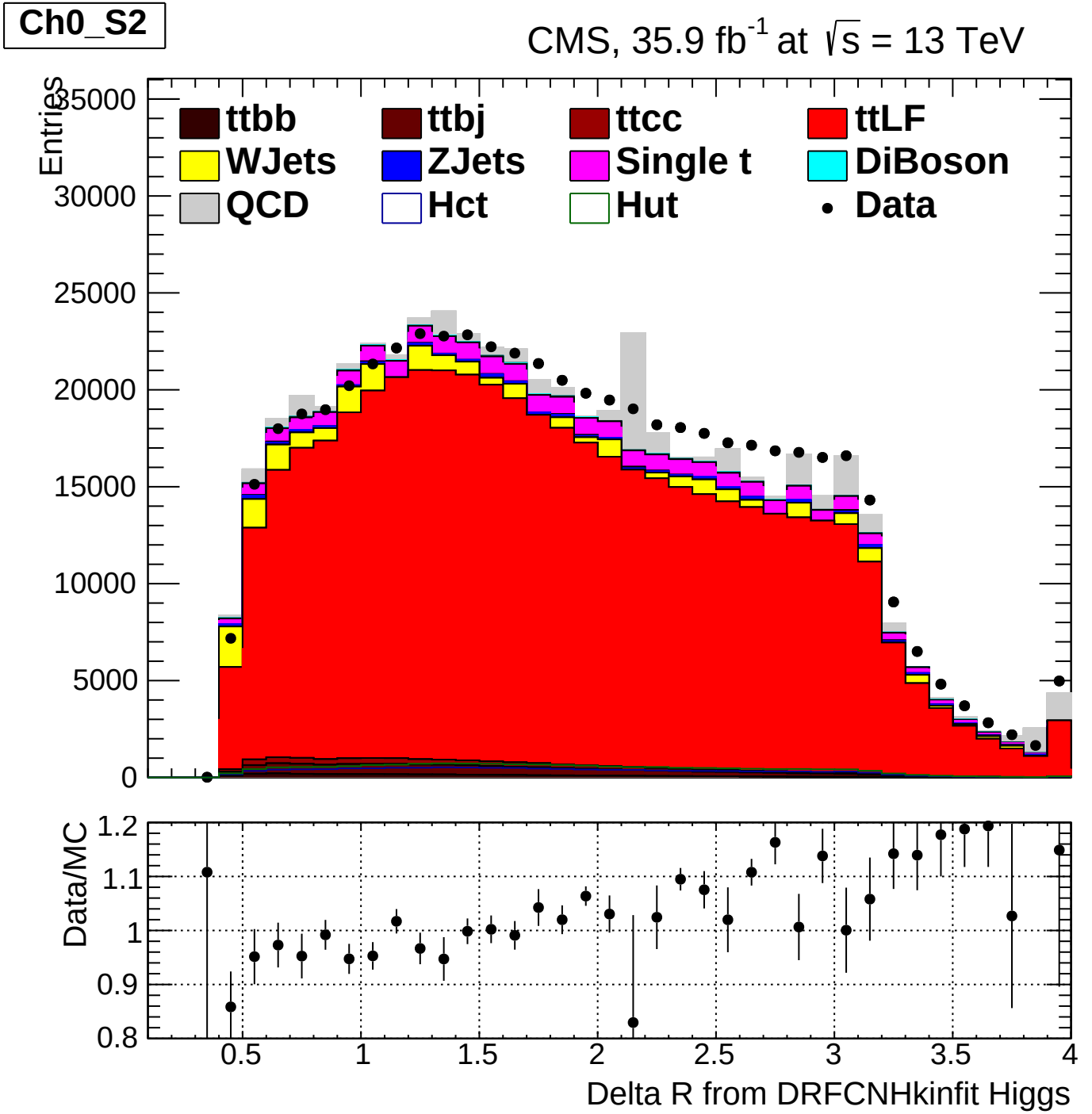

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

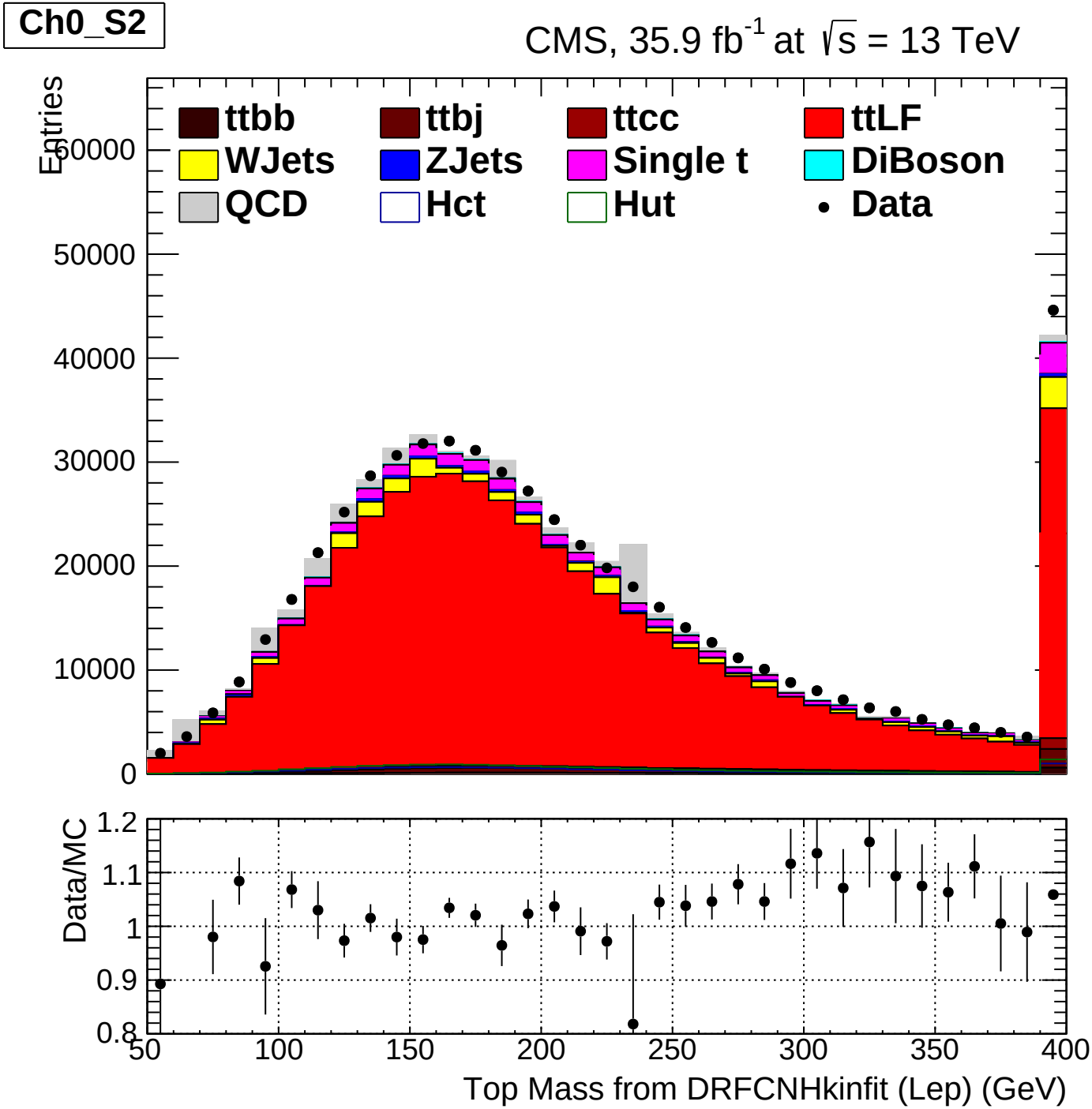

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

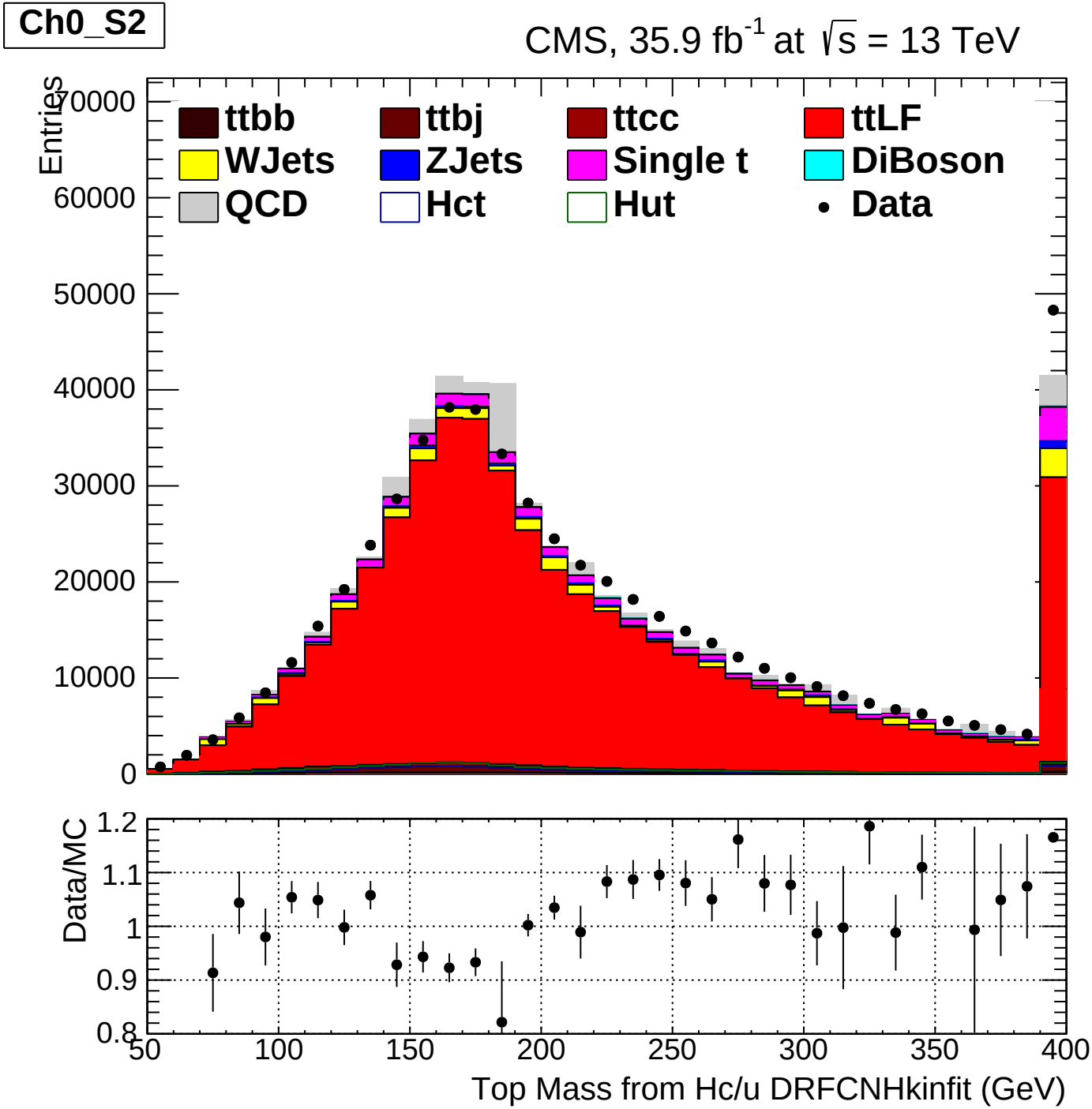

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

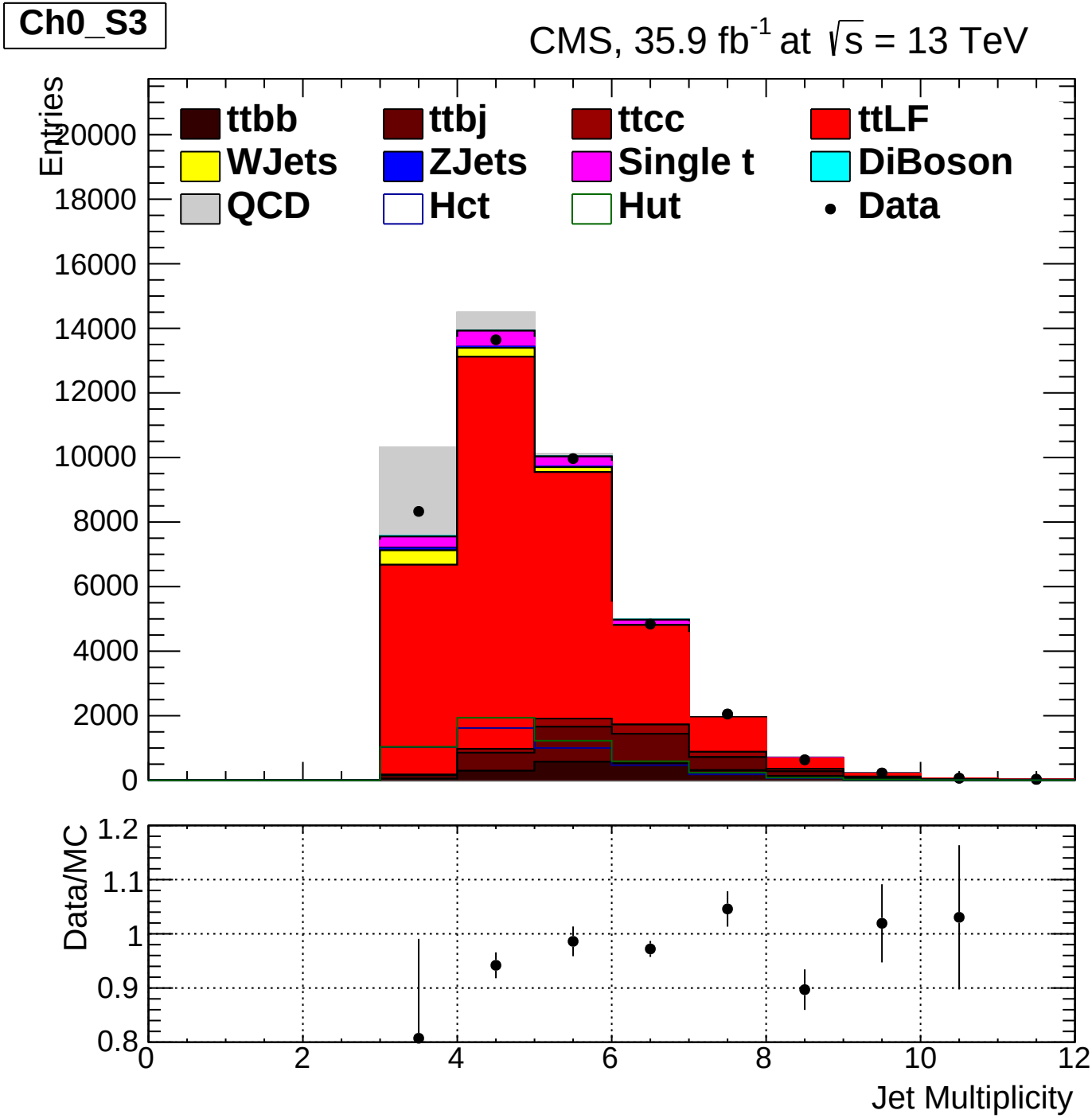

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

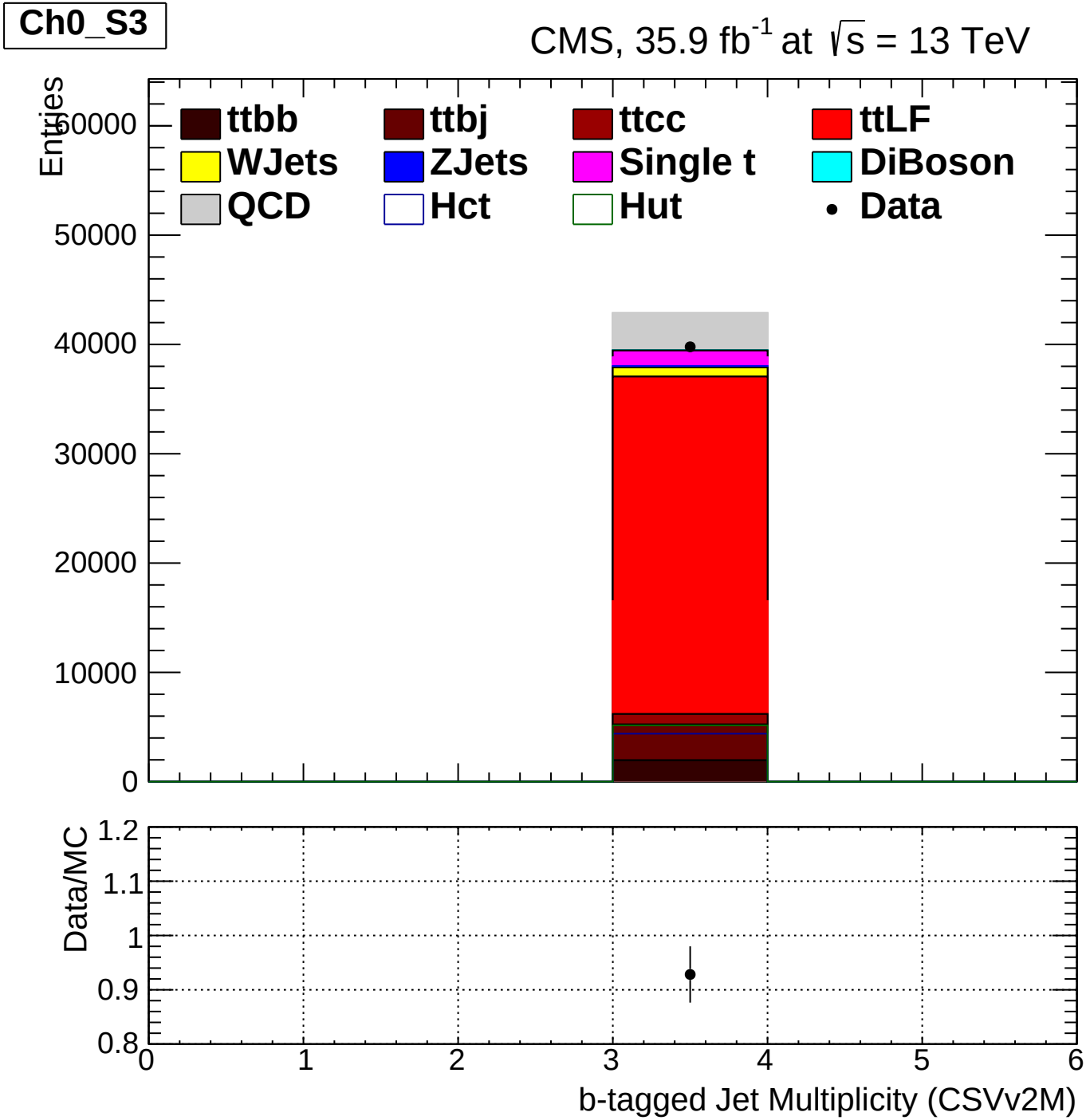

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)

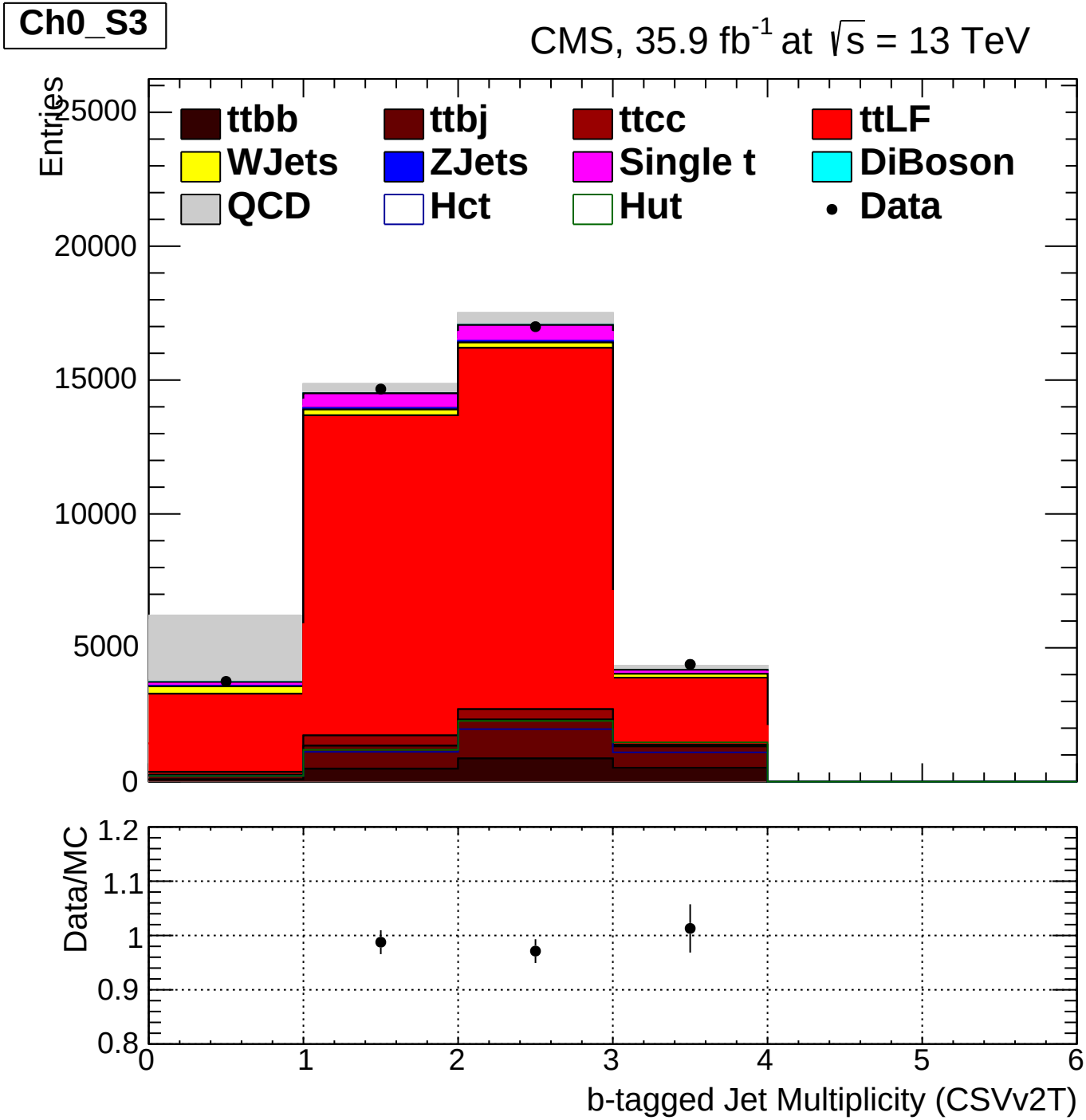

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

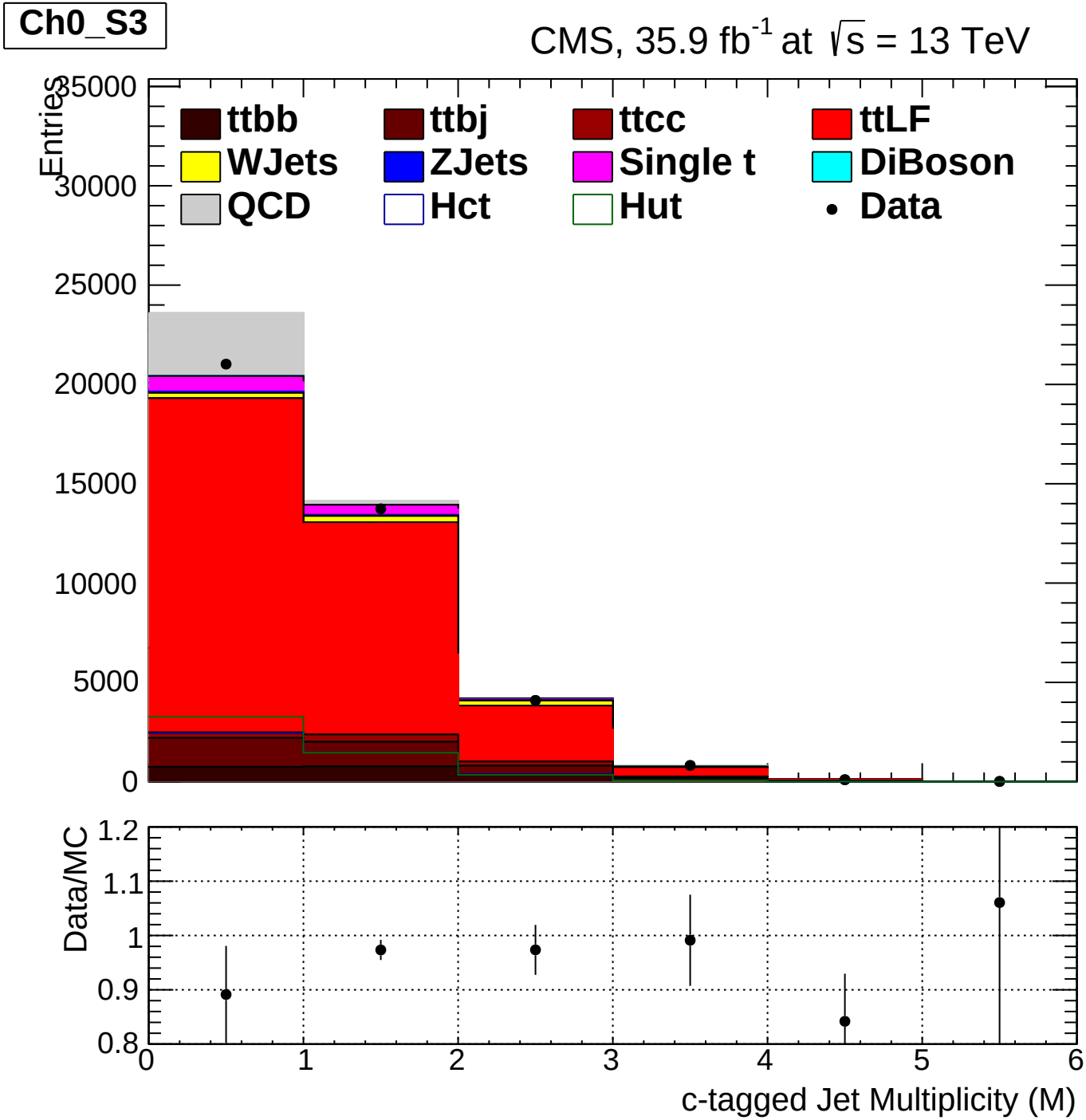

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

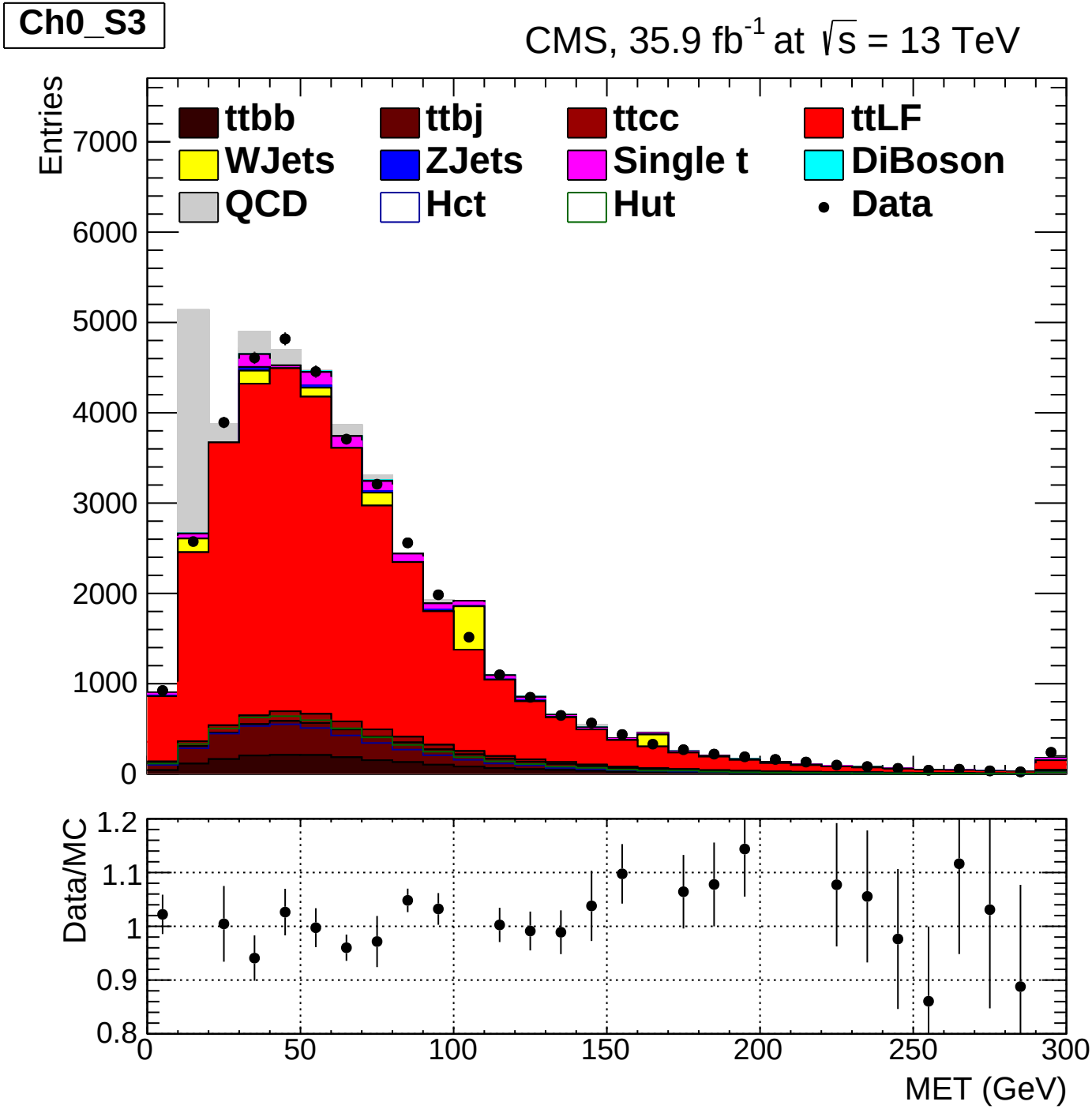

Ch0_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

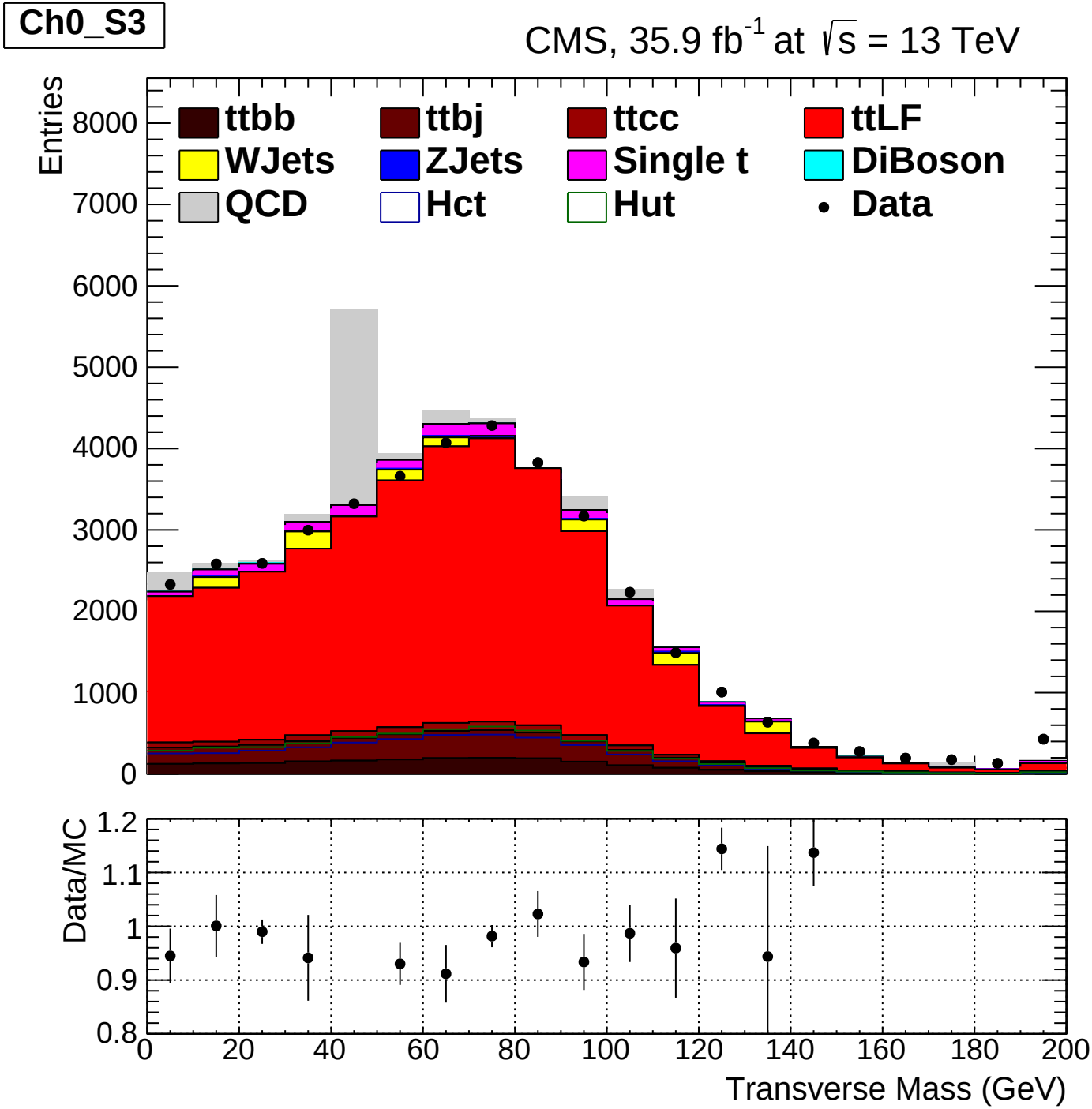

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

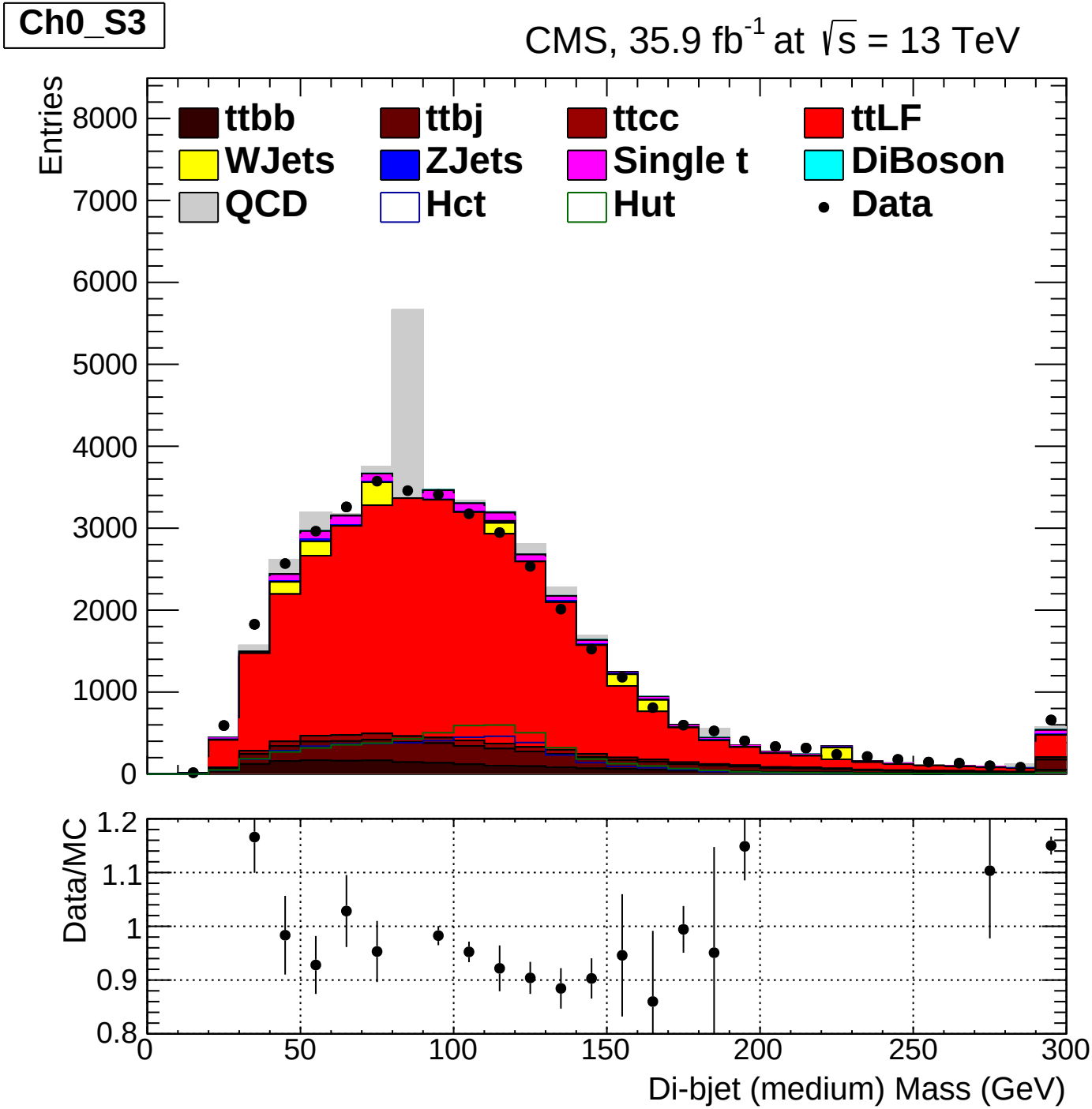

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

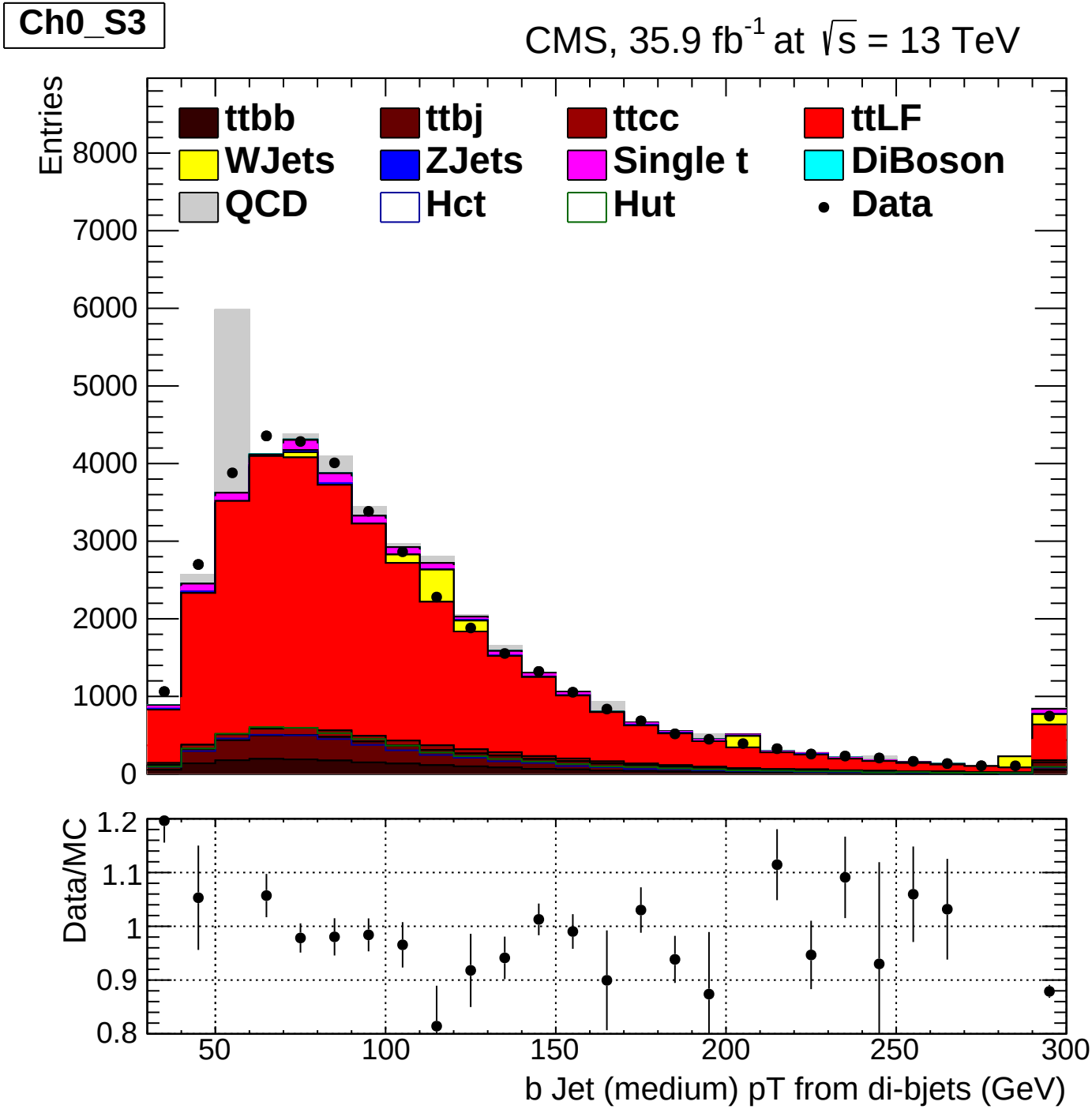

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

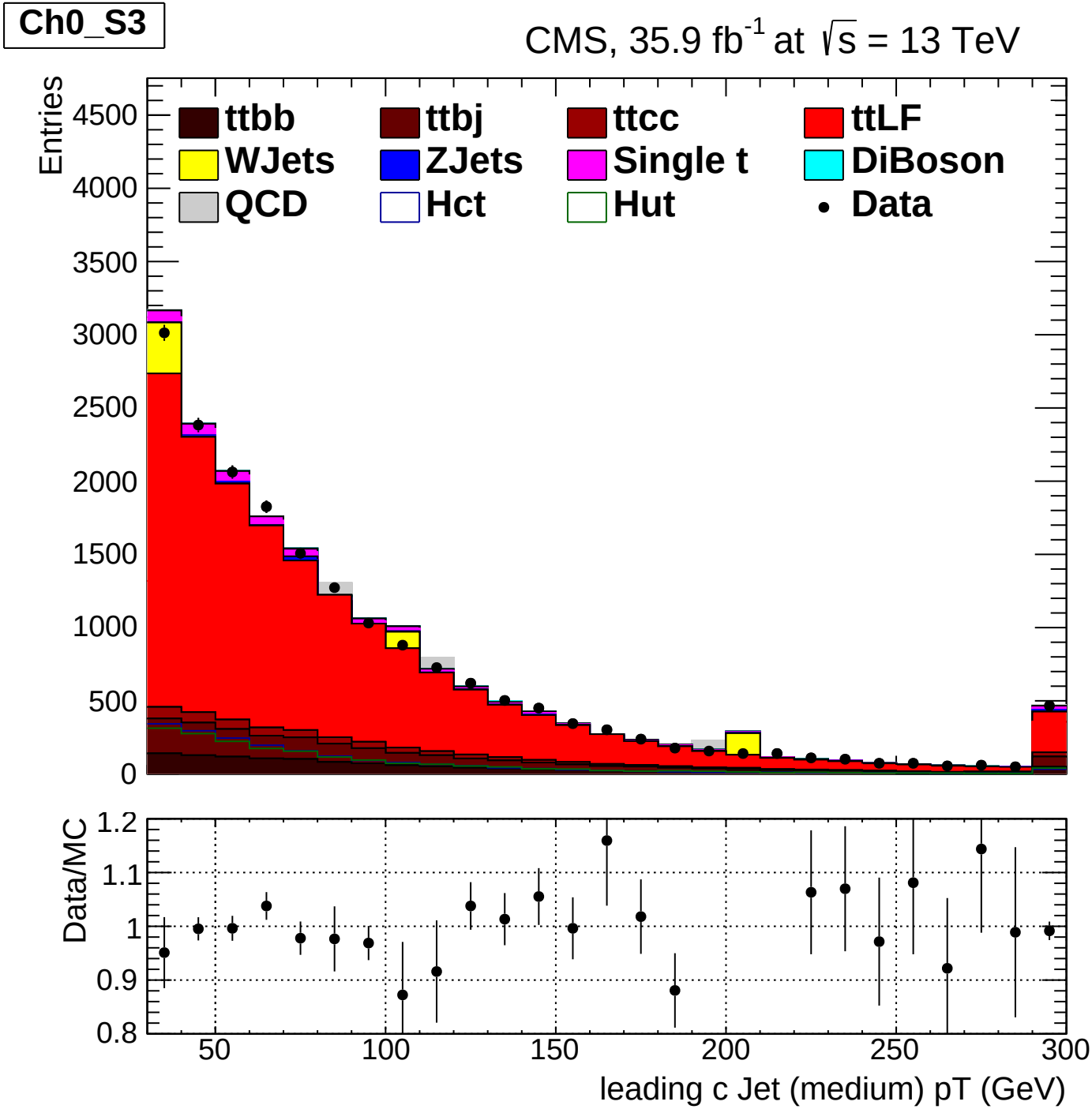

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

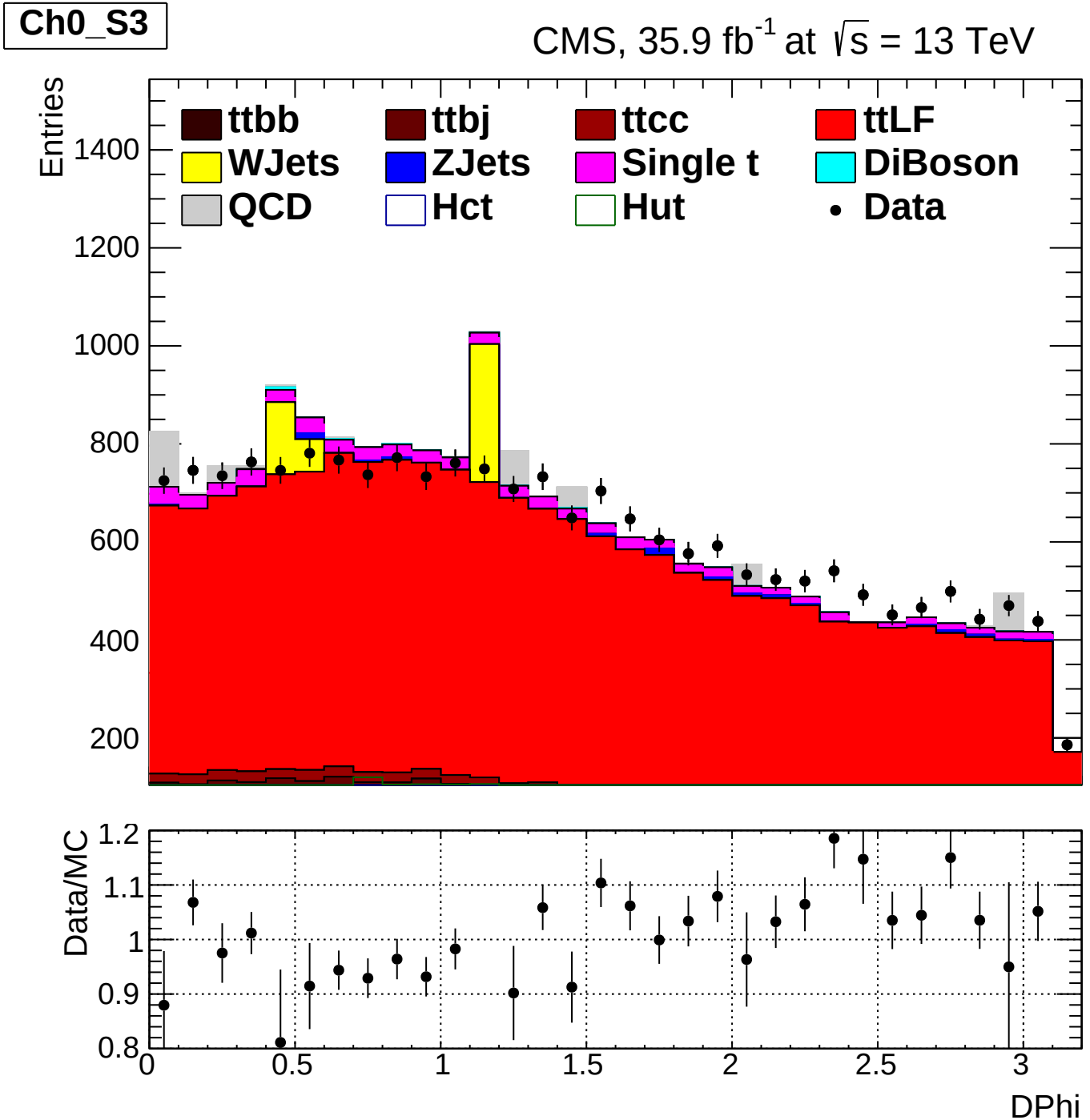

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

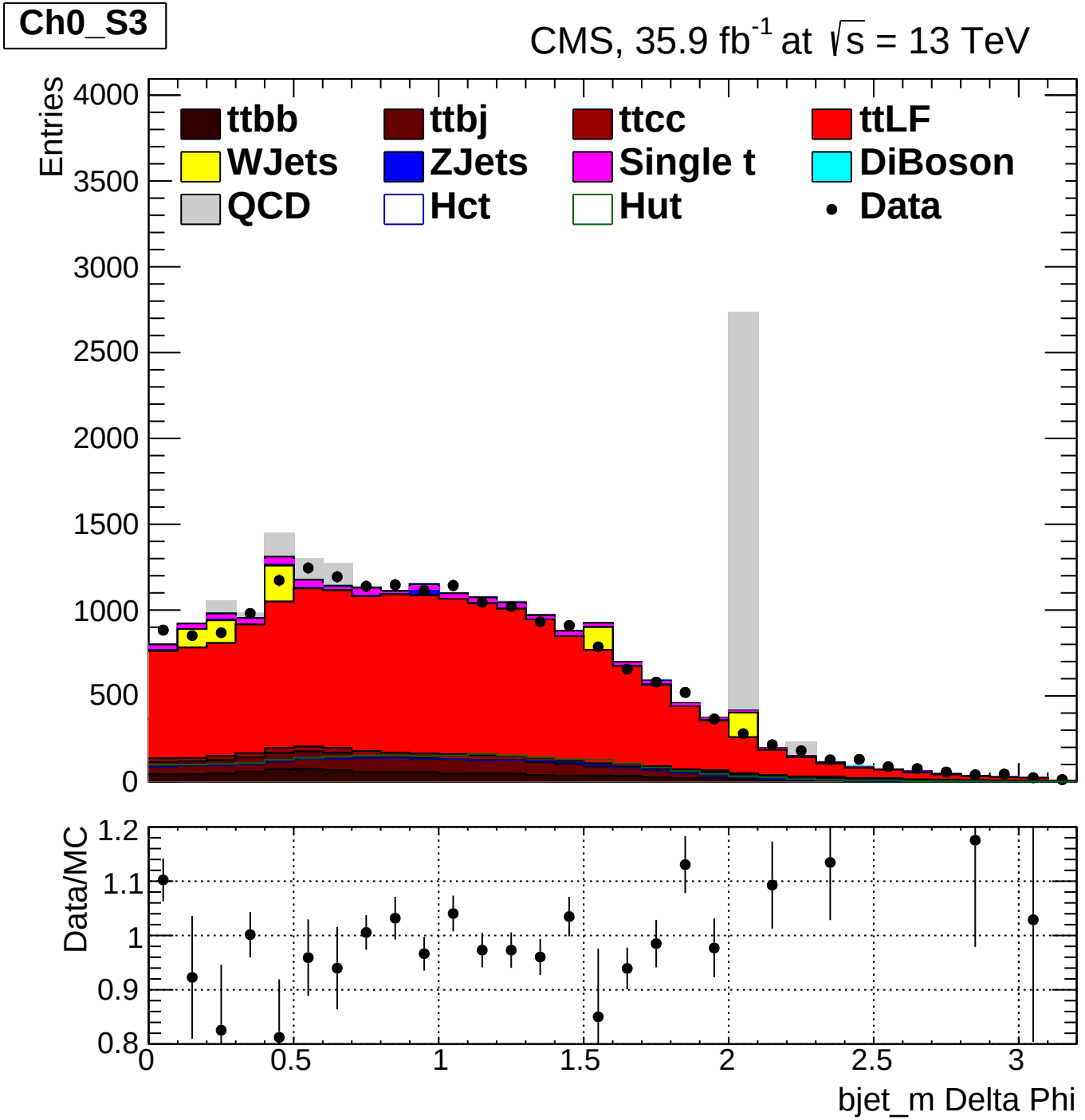

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

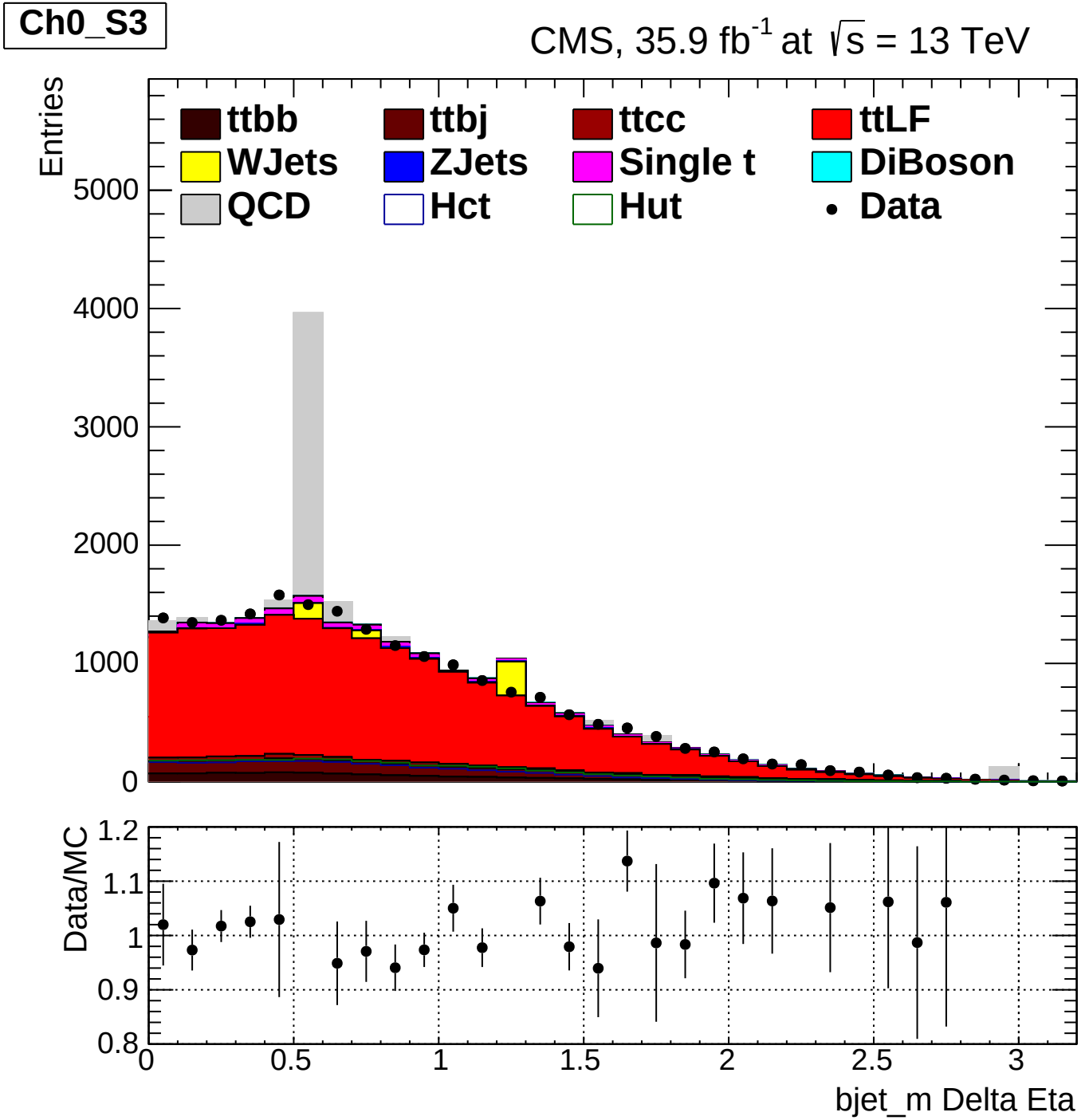

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

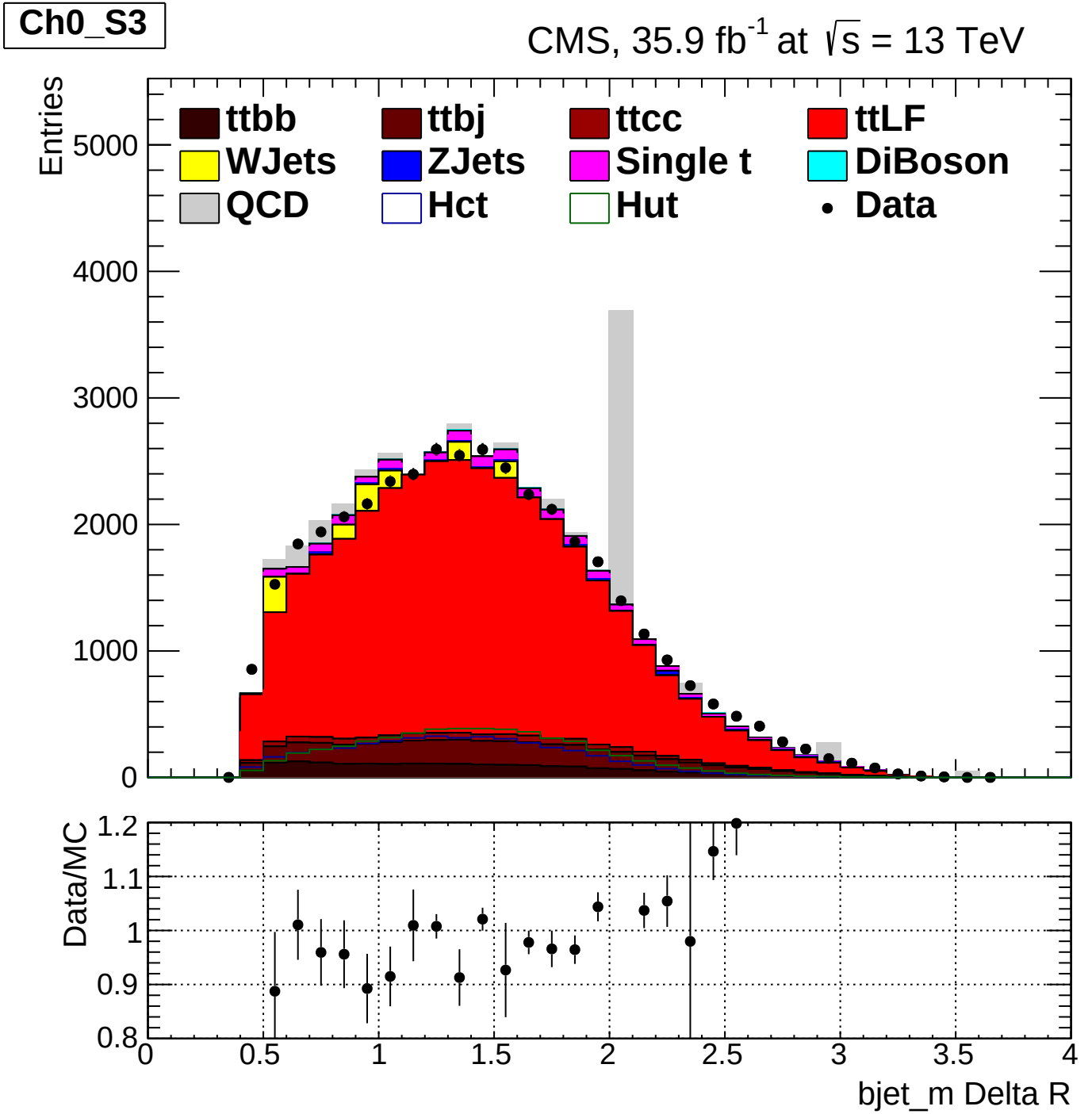

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

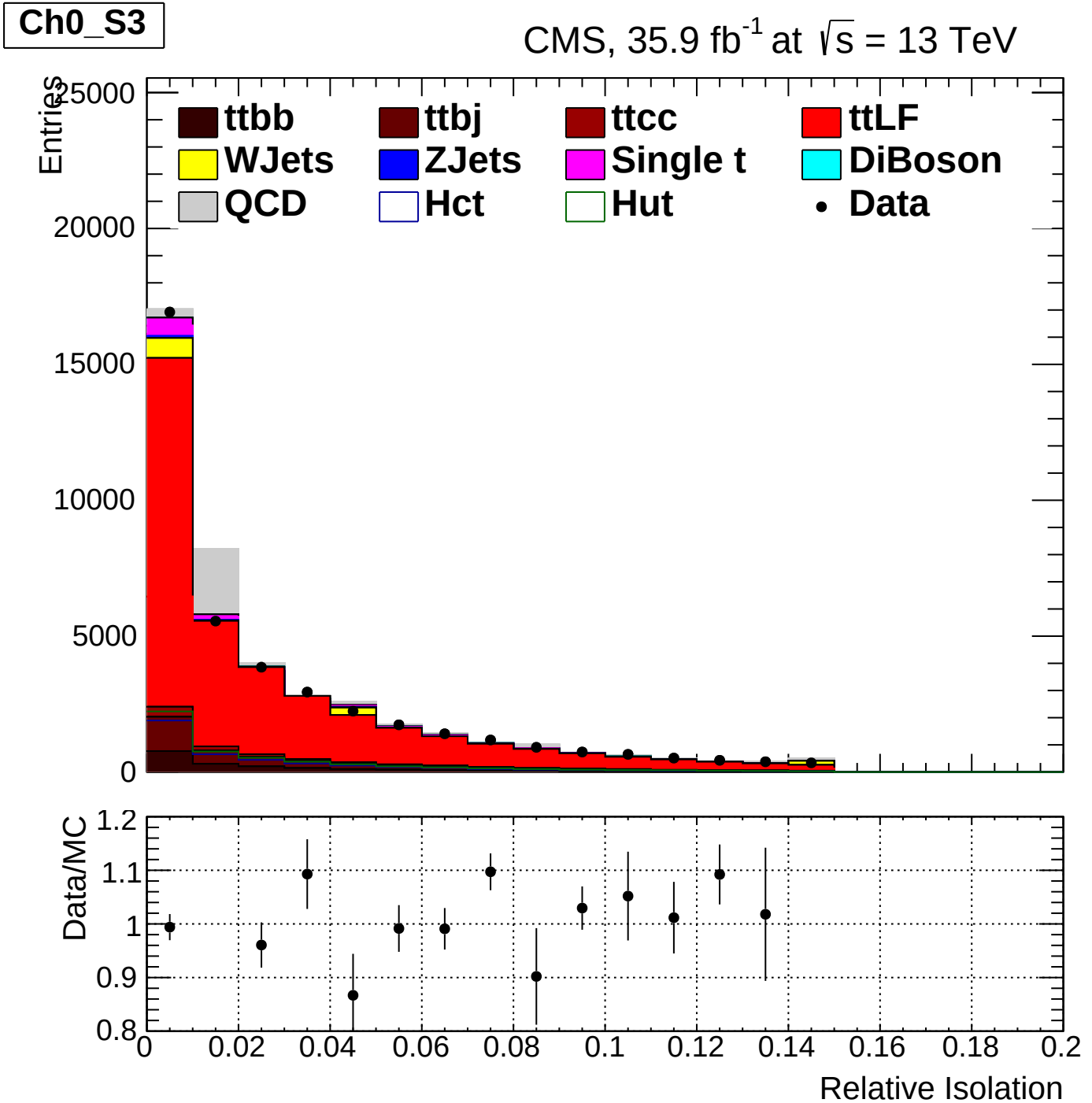

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

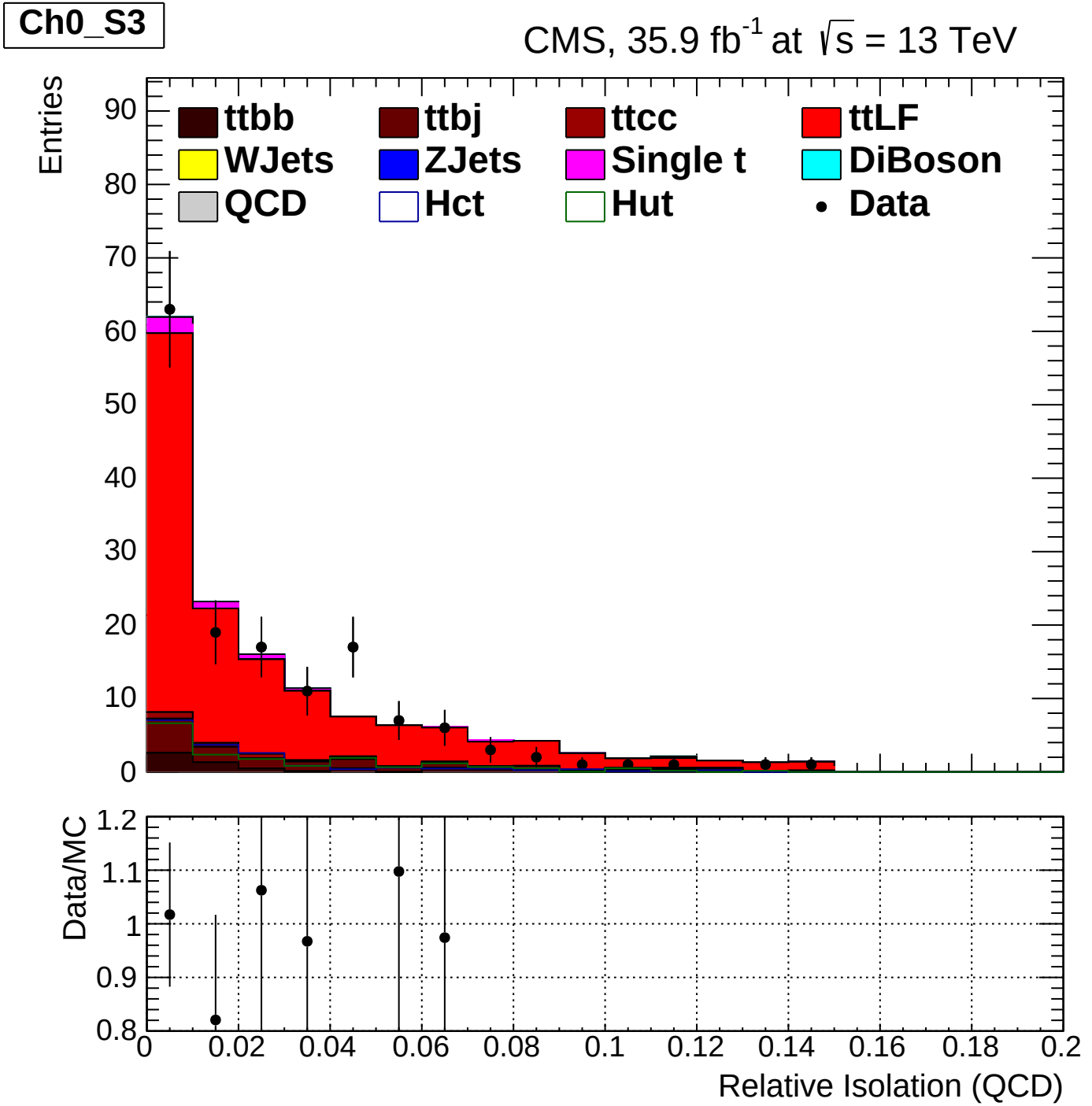

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1400
1200
1000
800
600
400
200
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

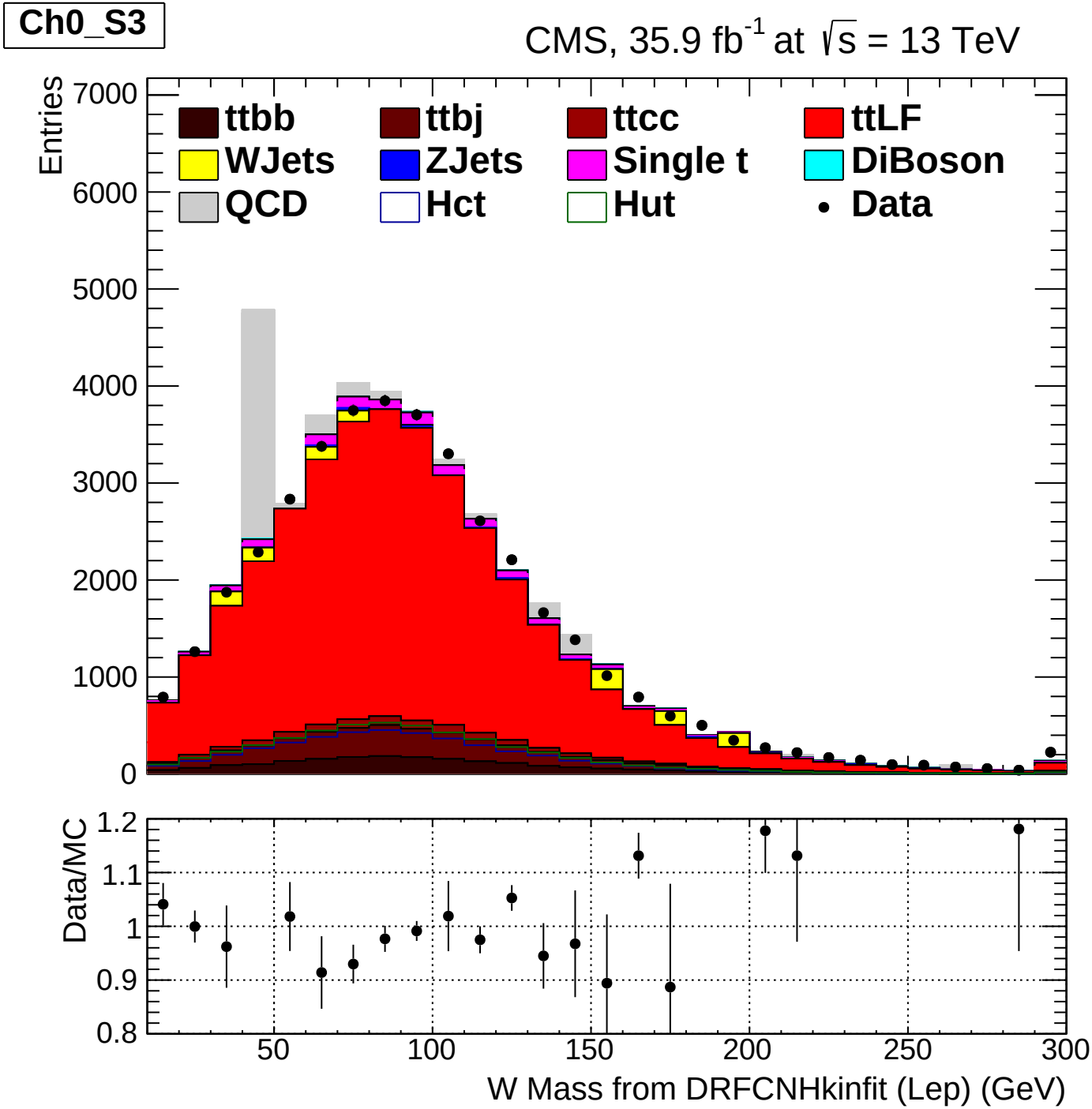

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

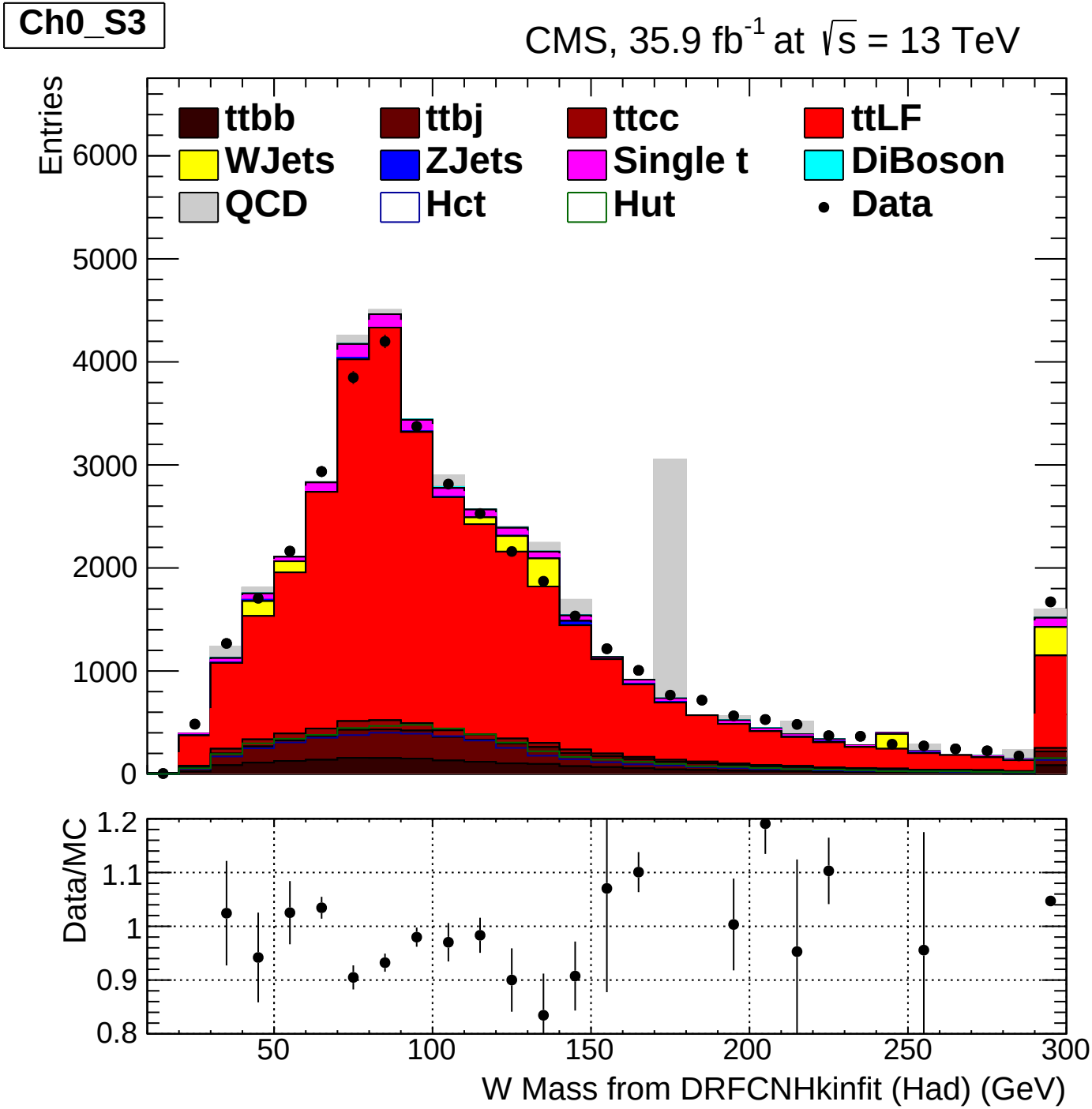

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
5000
4000
3000
2000
1000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

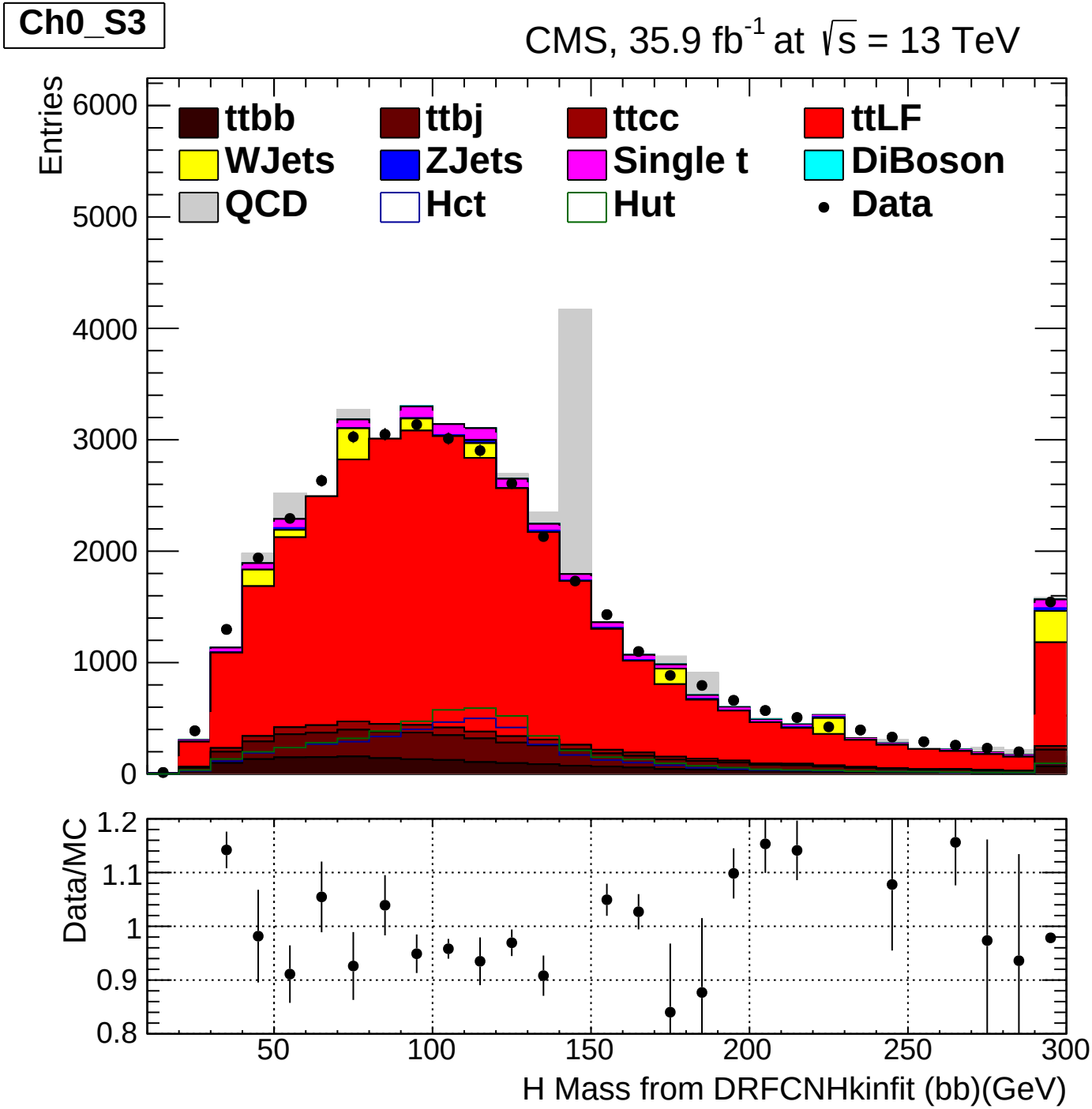

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

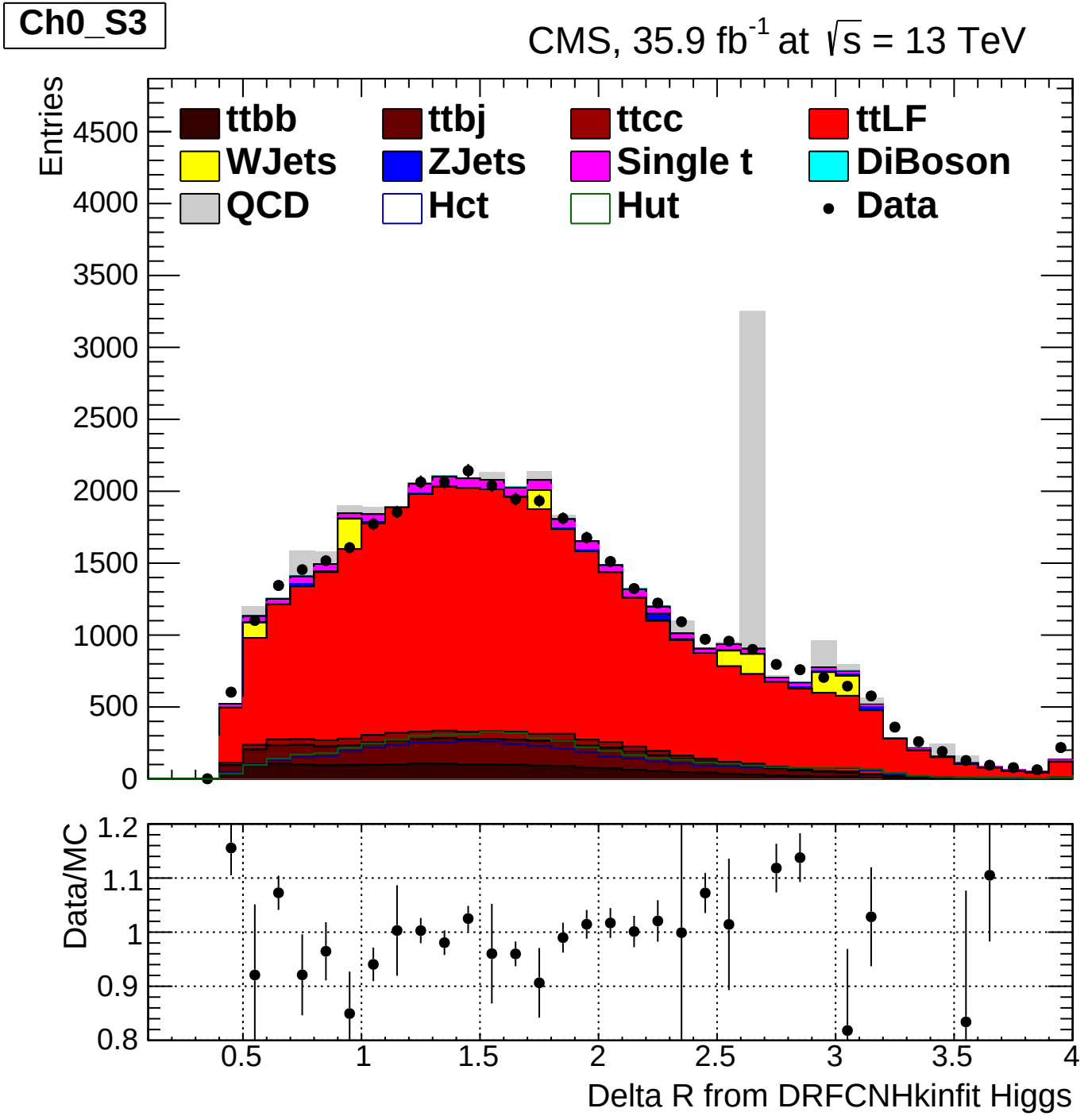

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

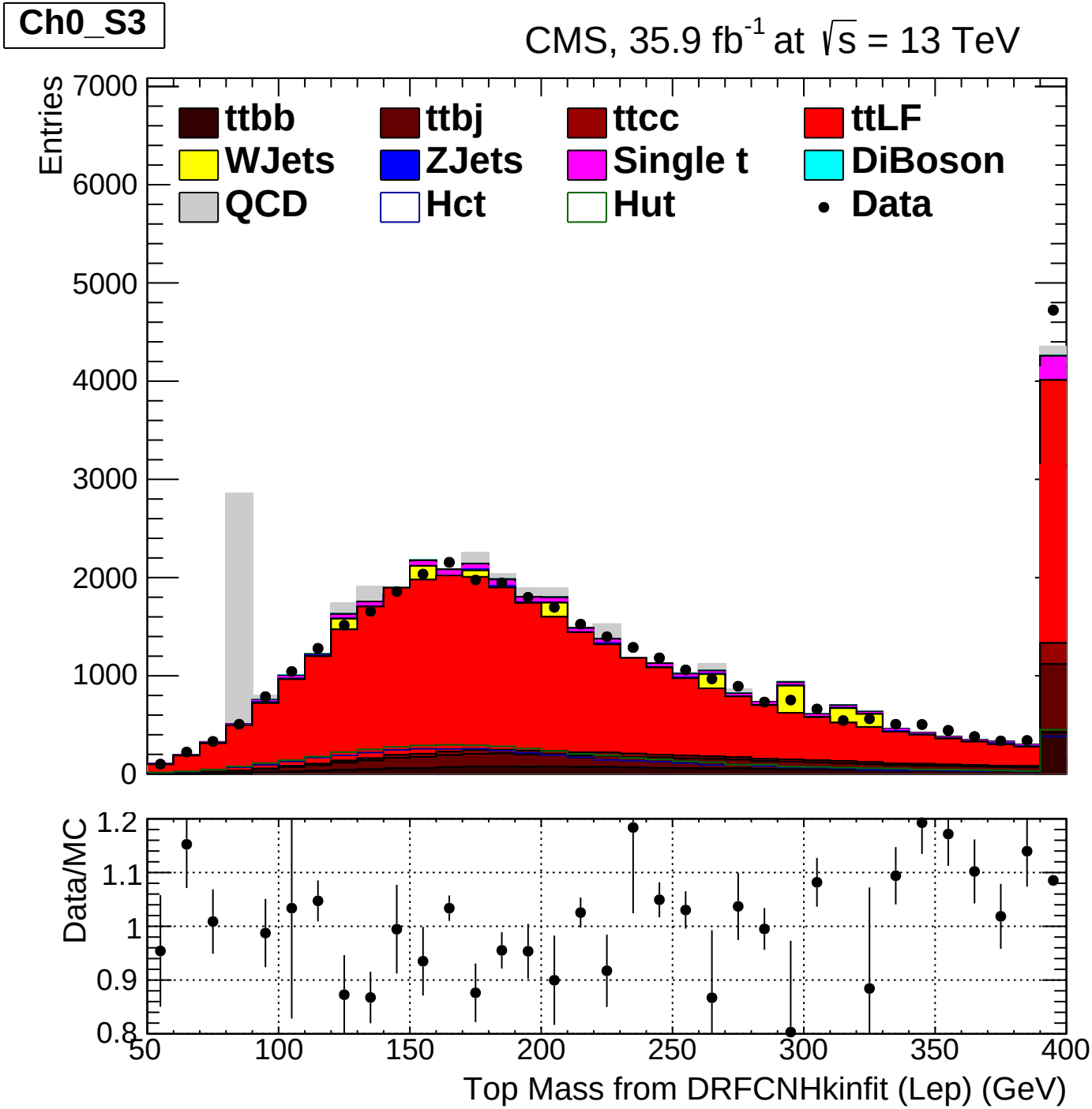

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

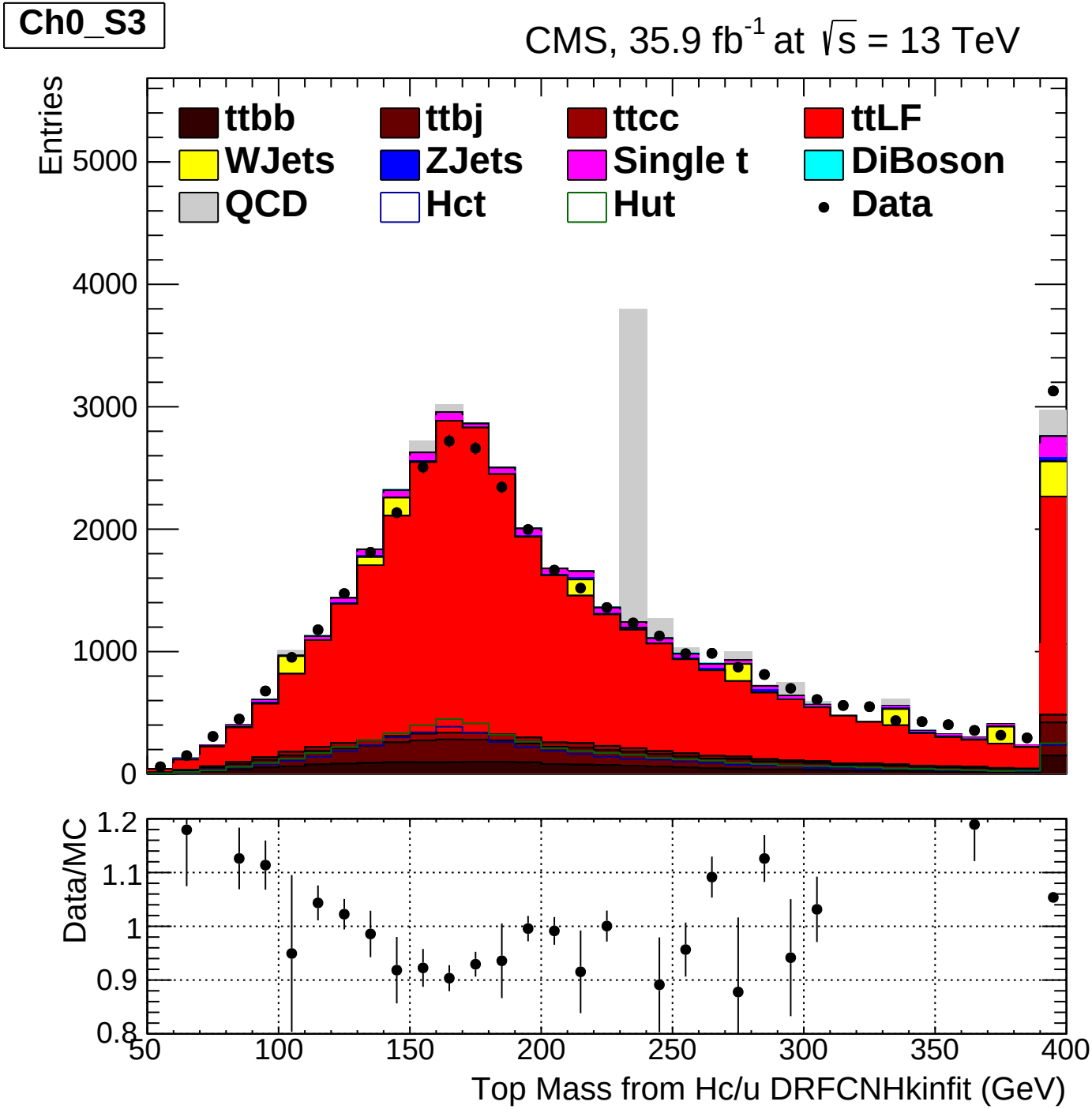

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

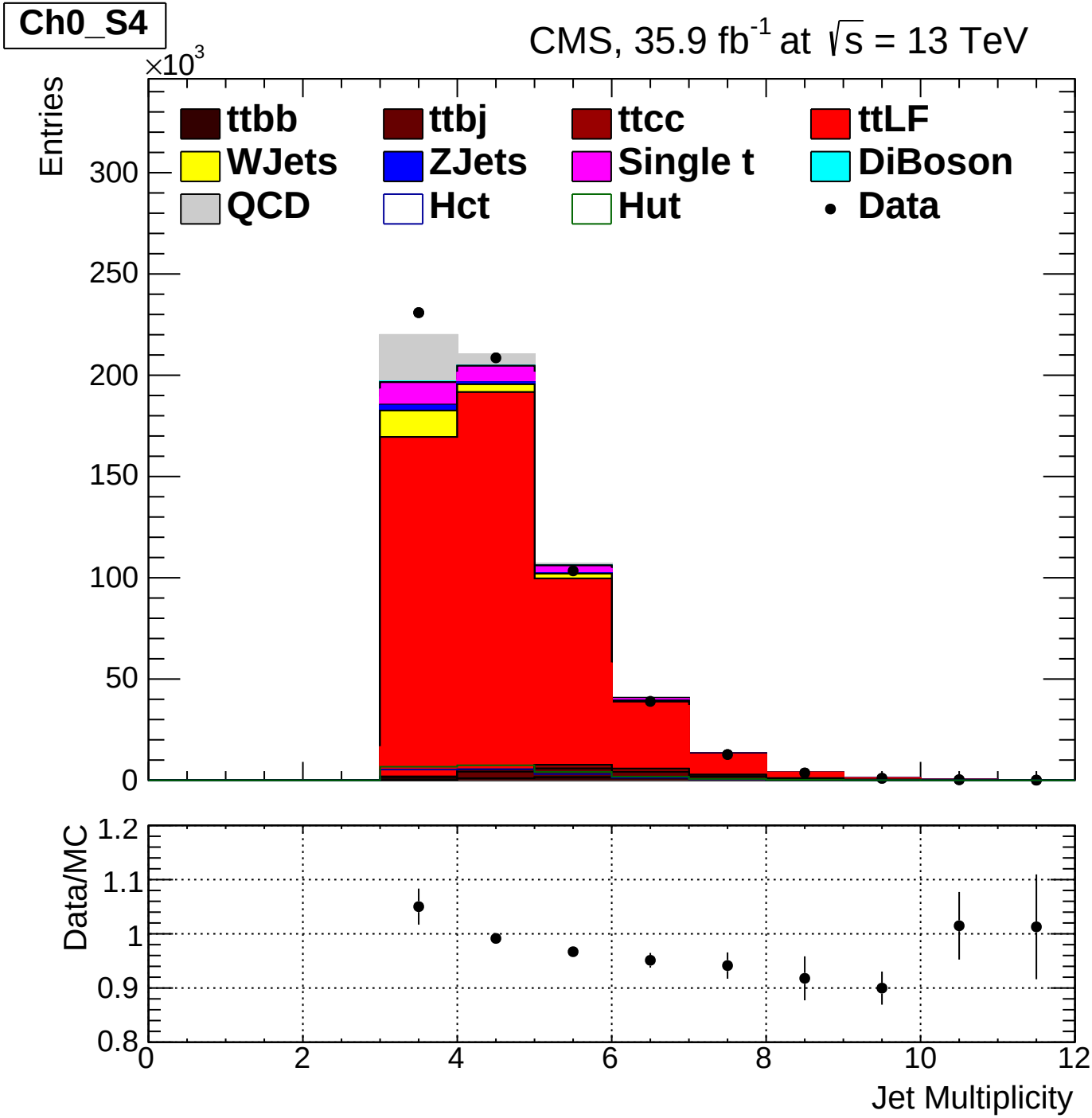

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
6000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

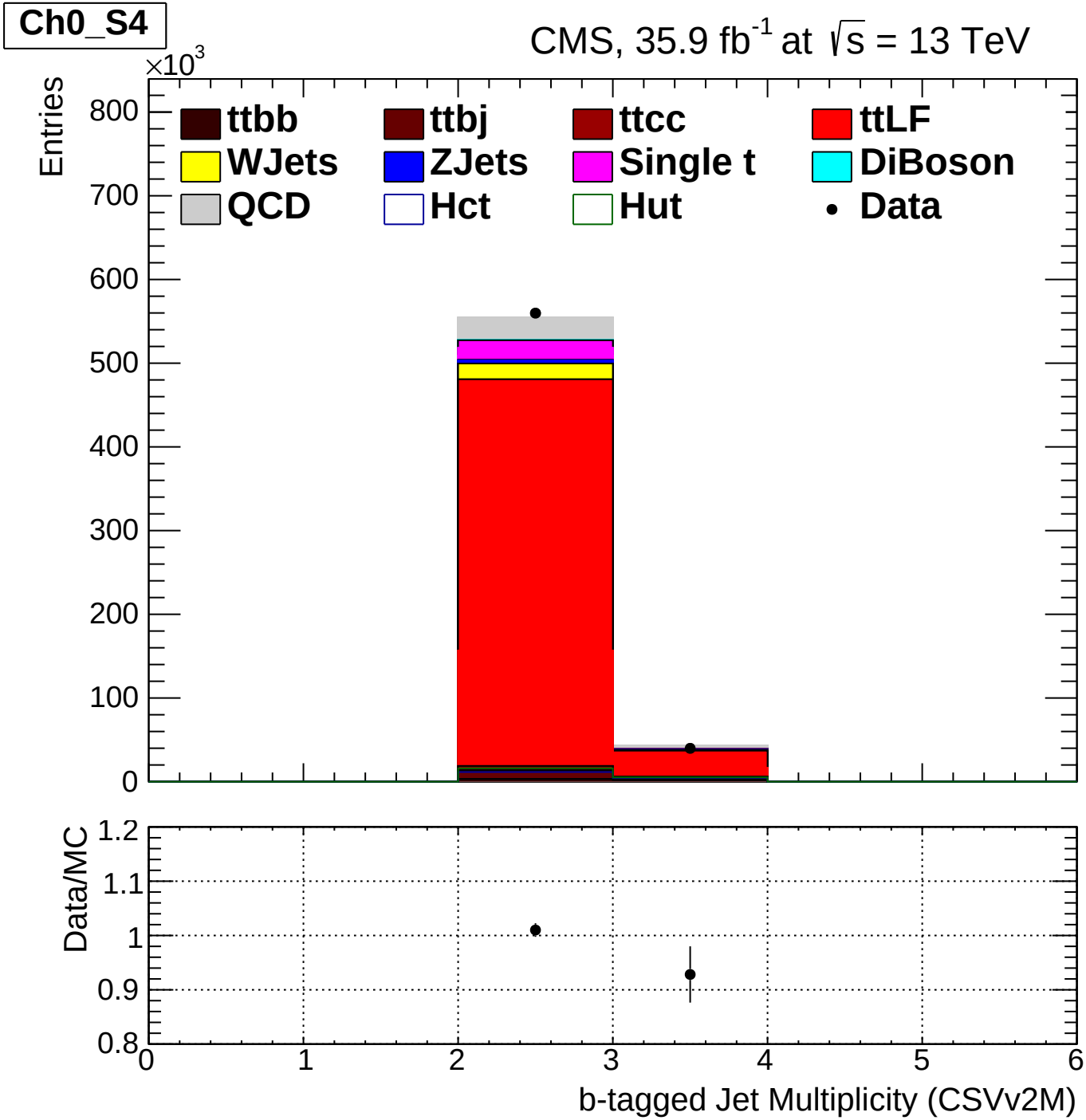

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

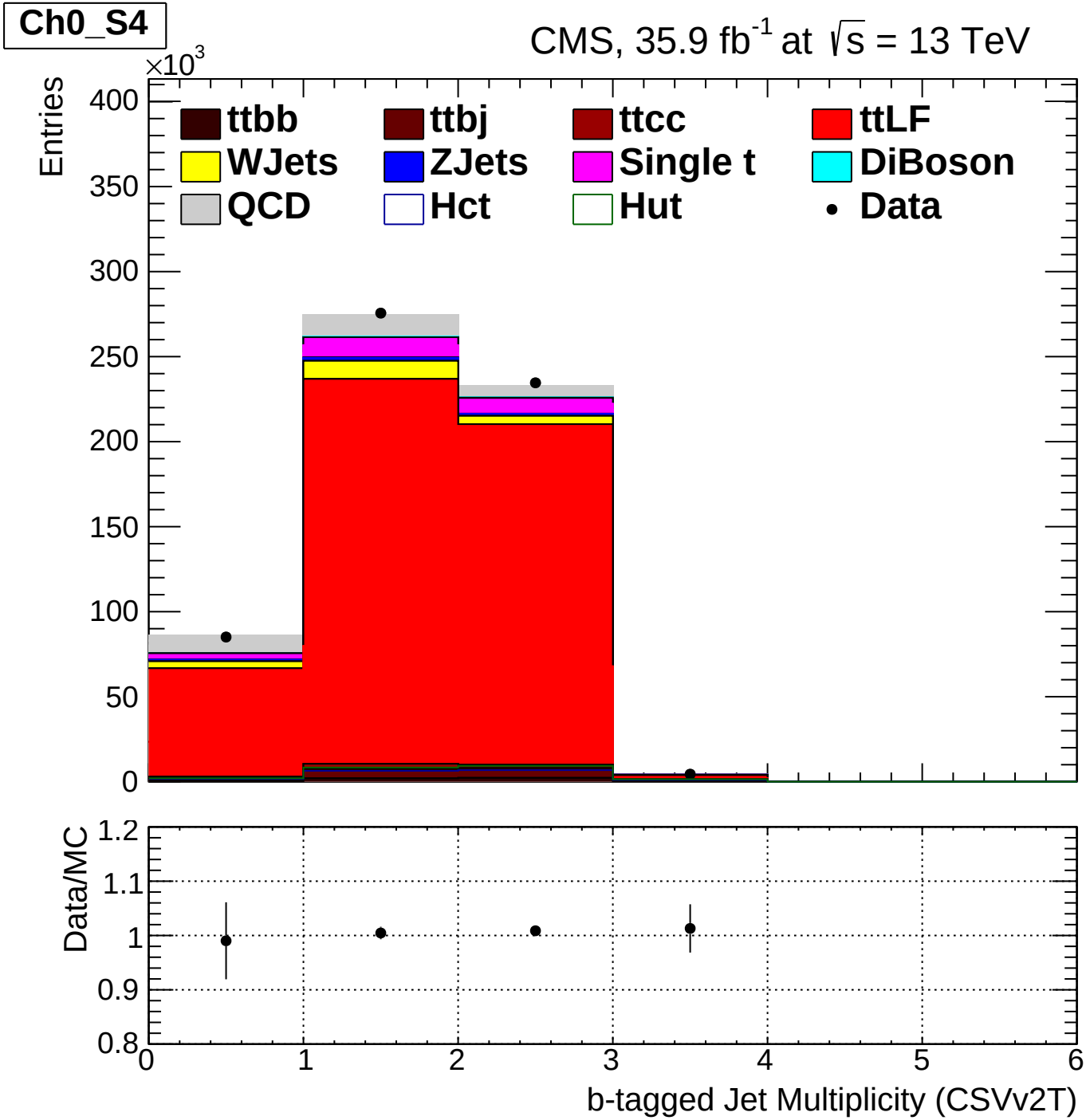

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

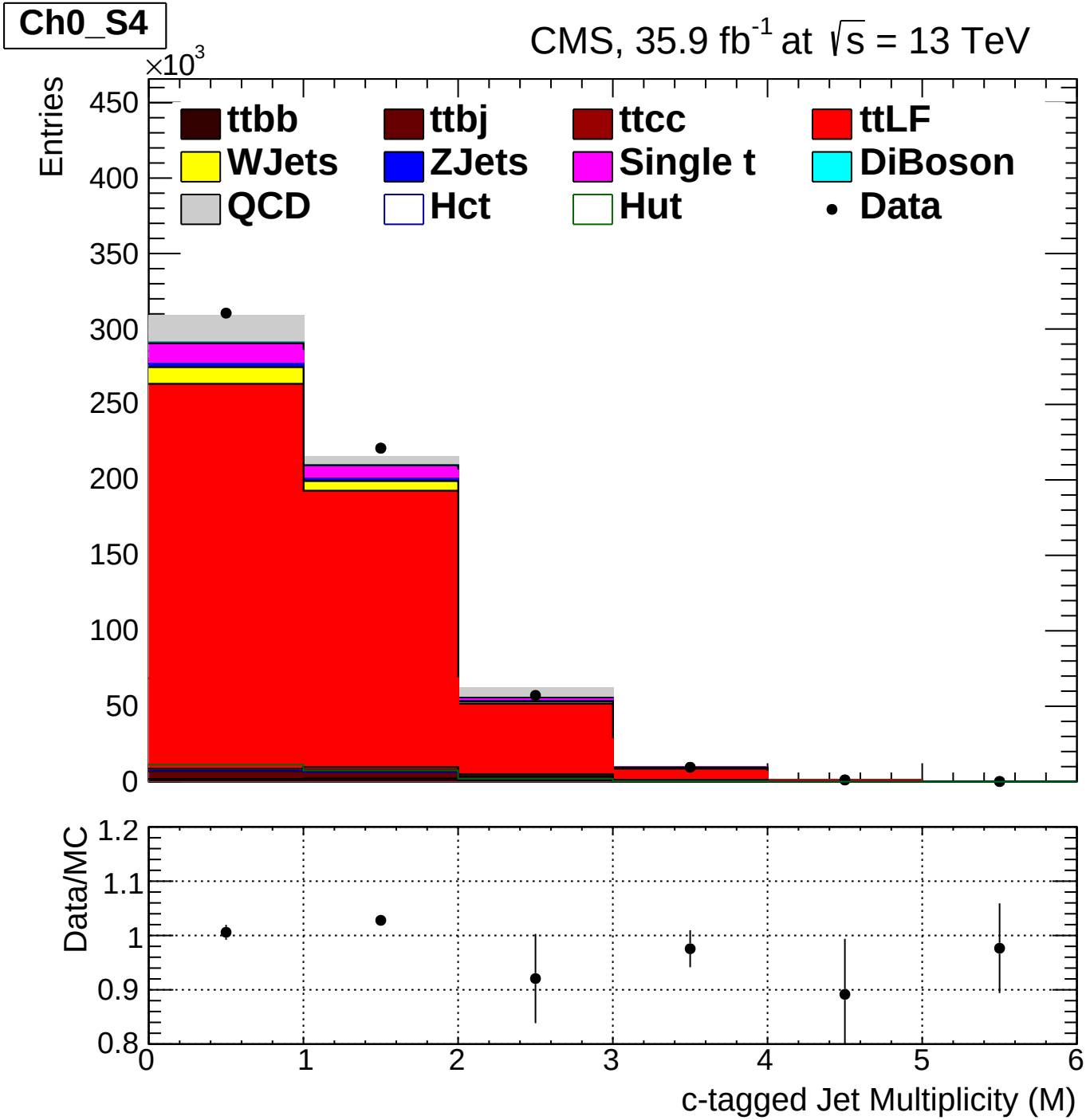

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

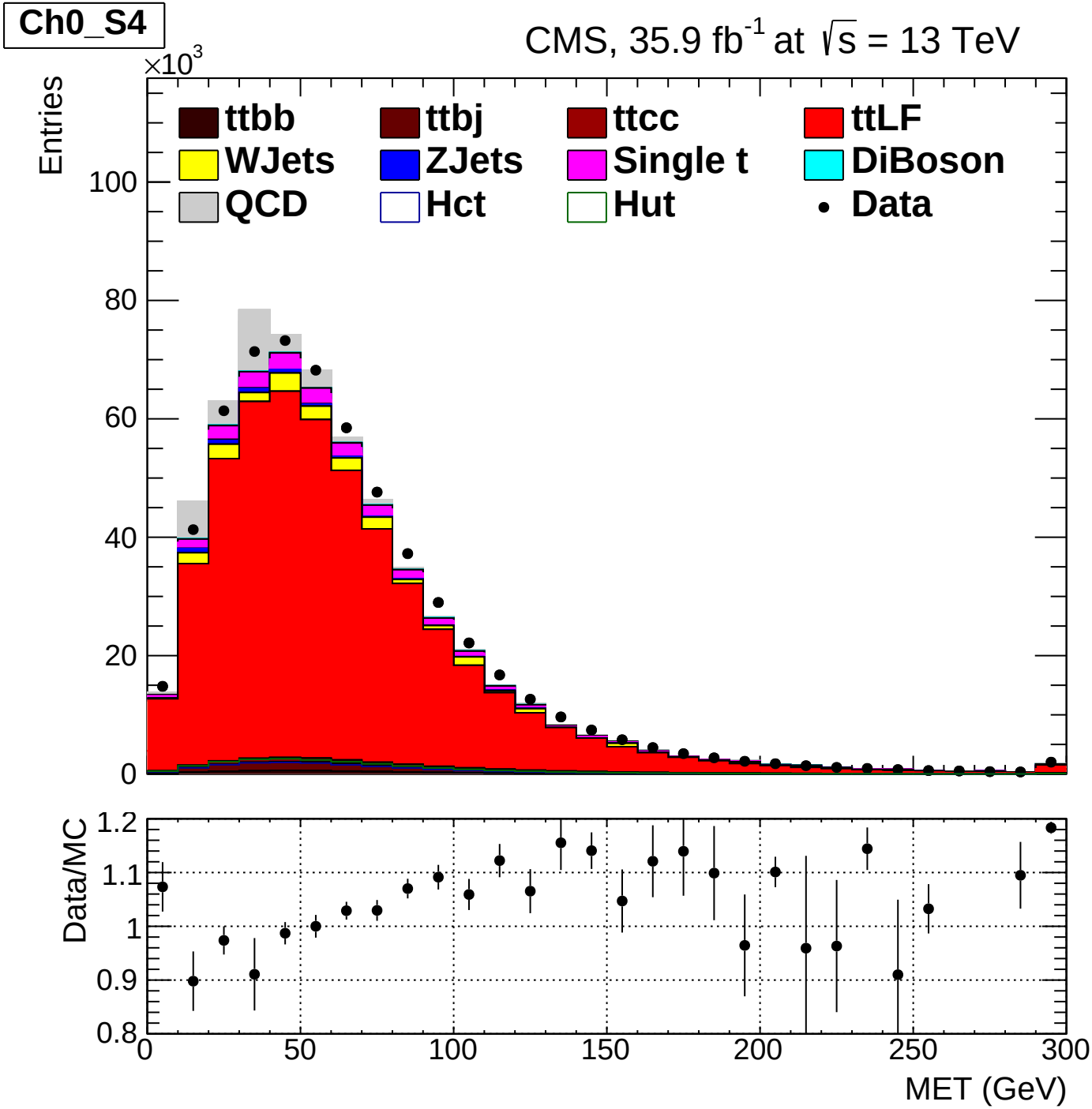

Ch0_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

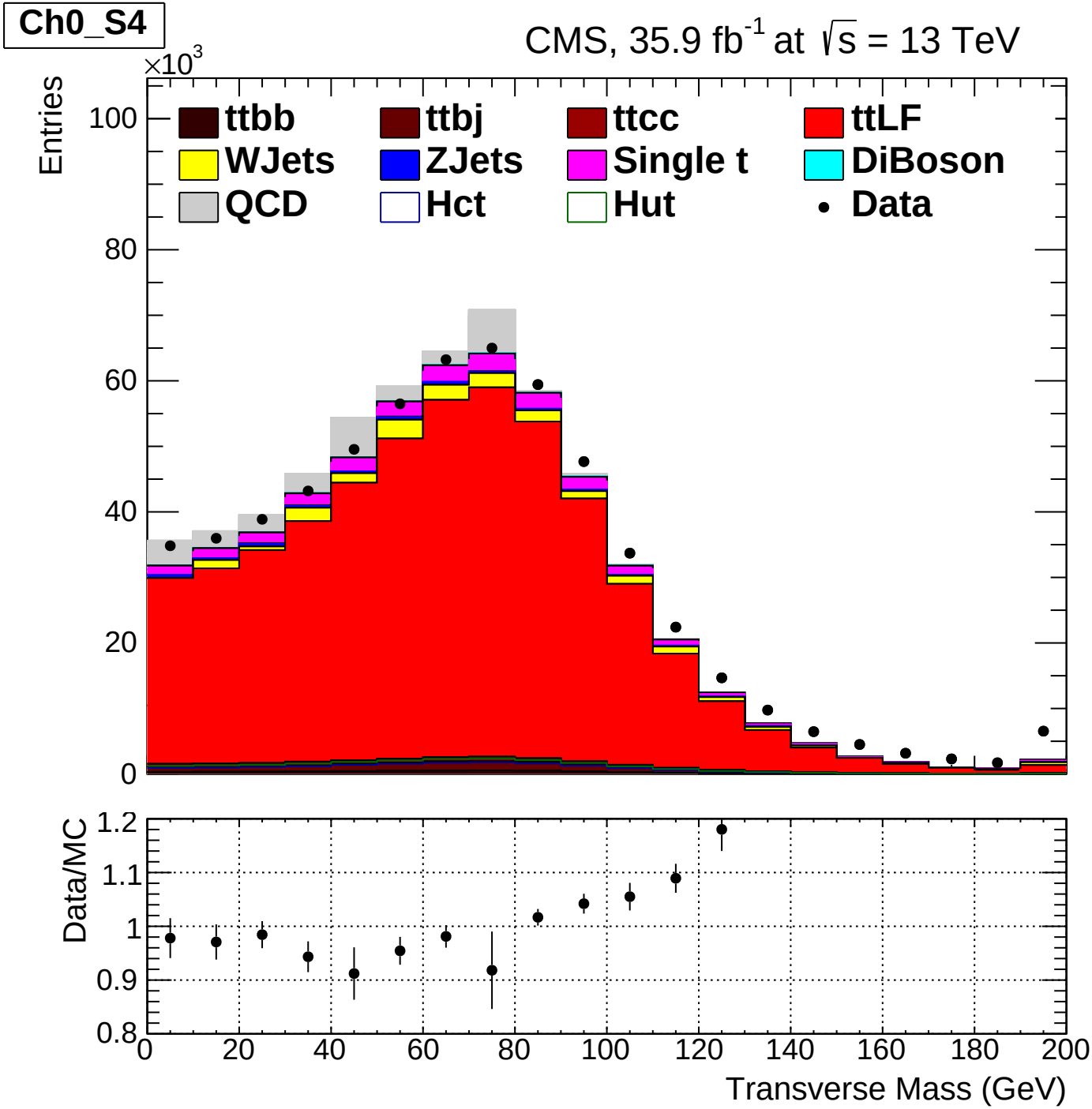

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

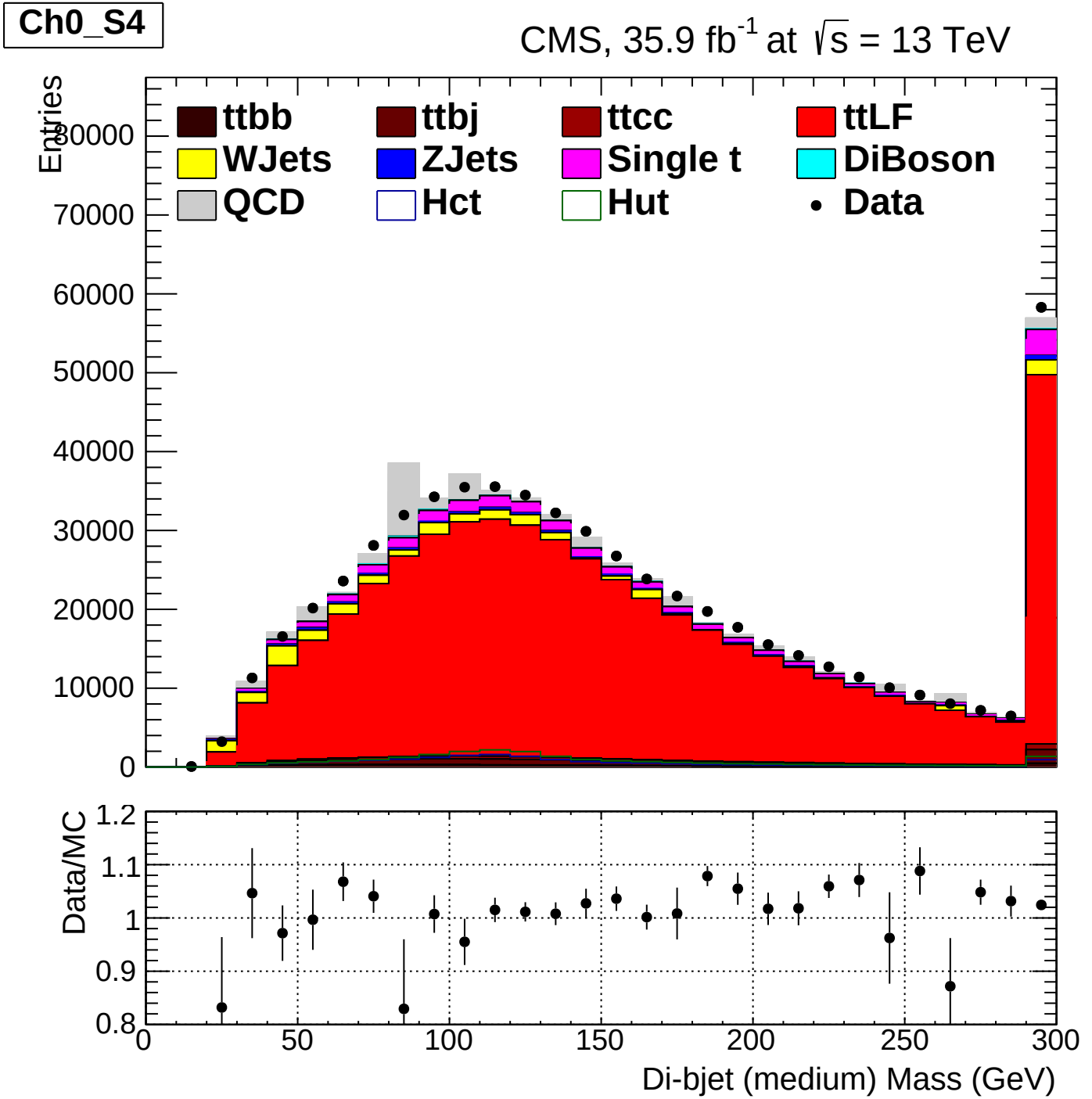

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

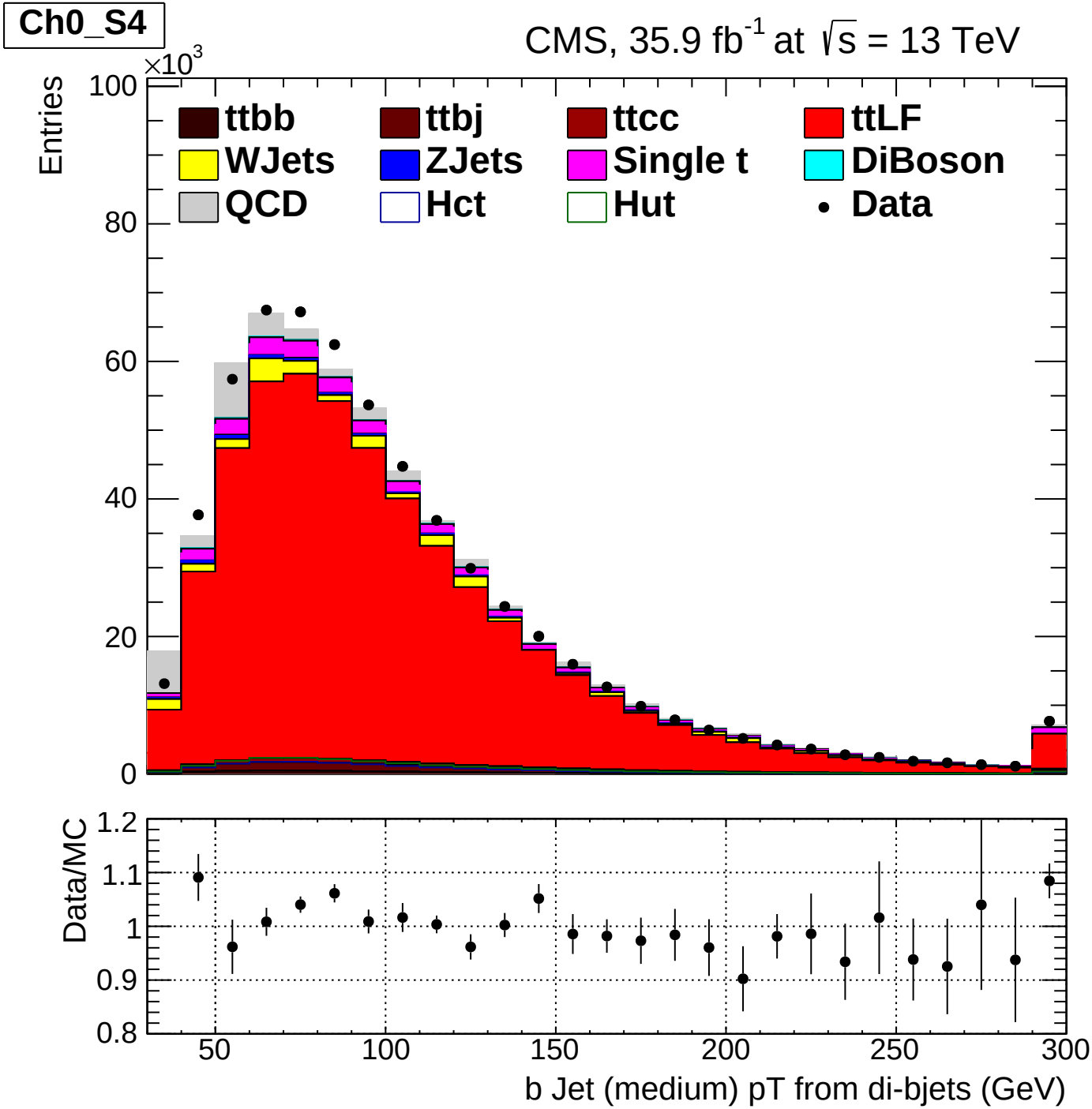

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

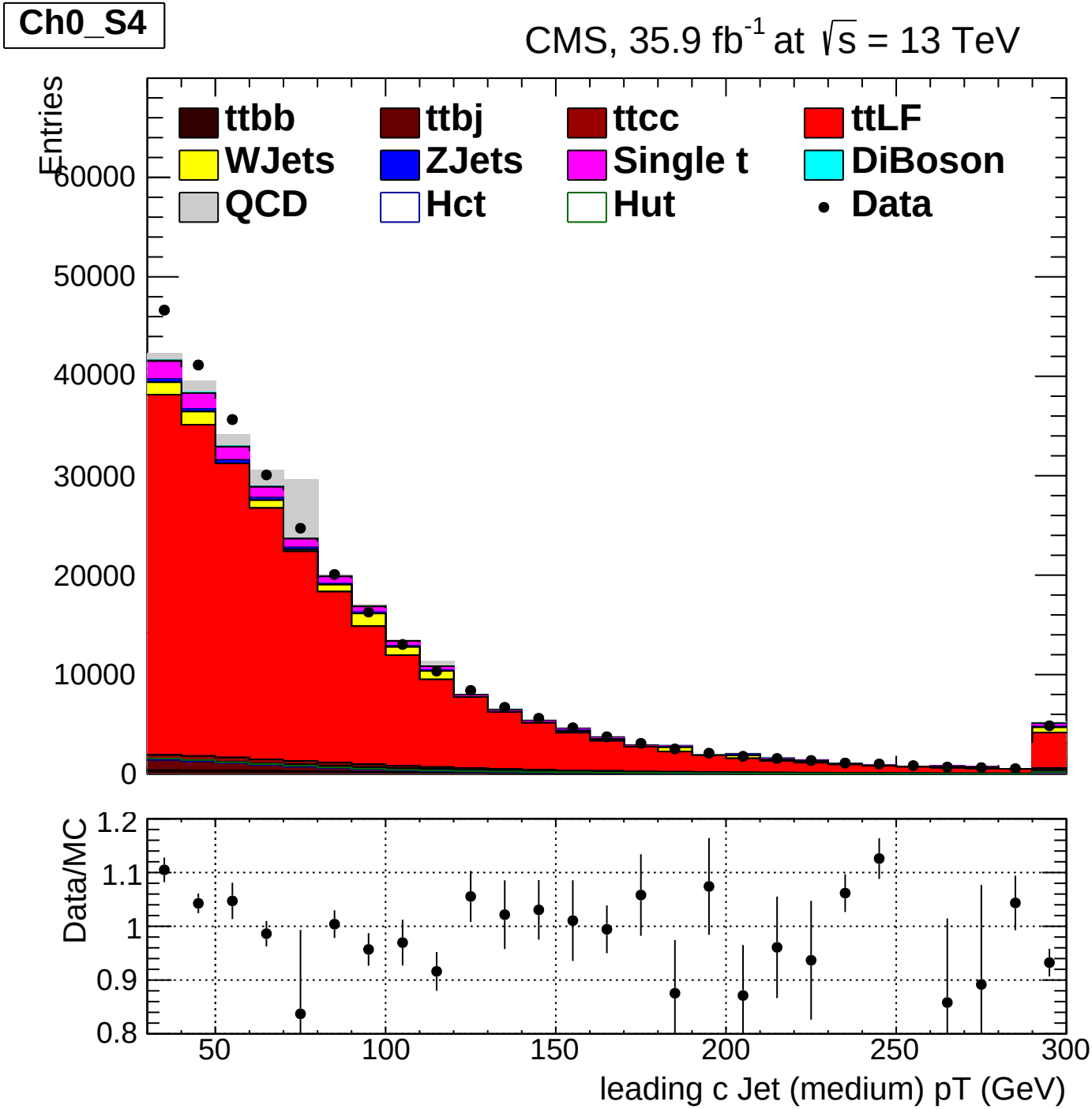

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

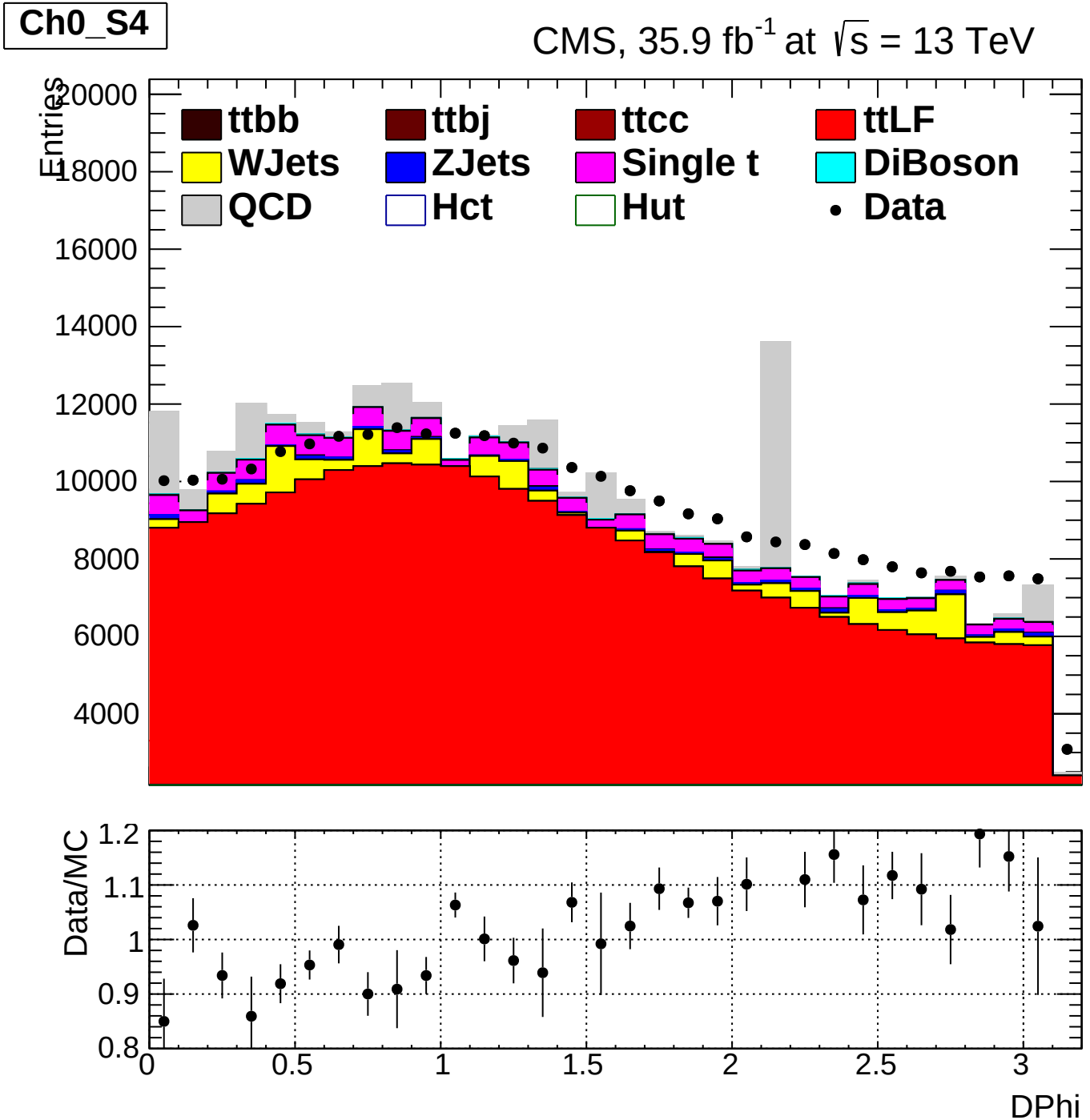

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

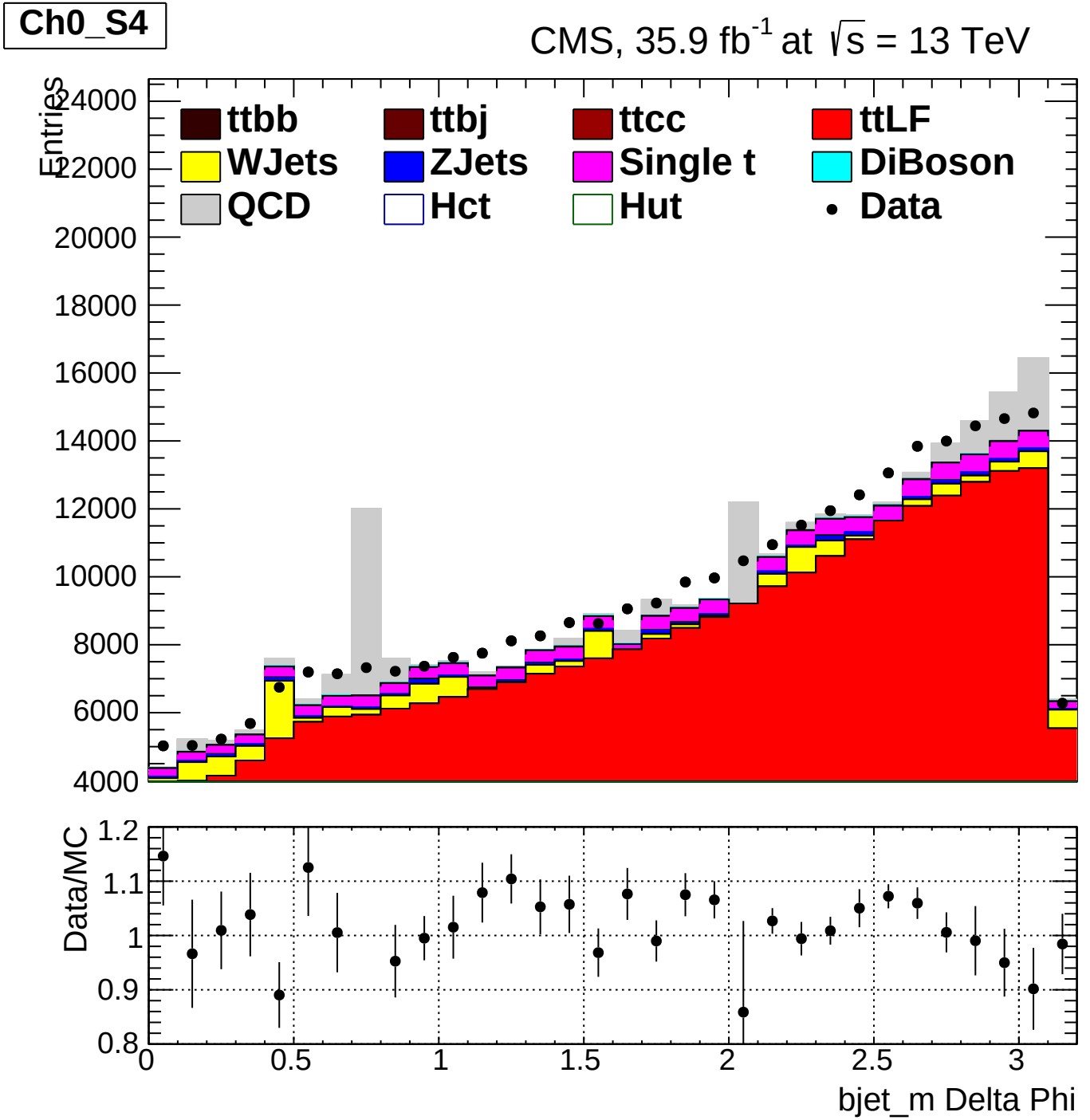

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

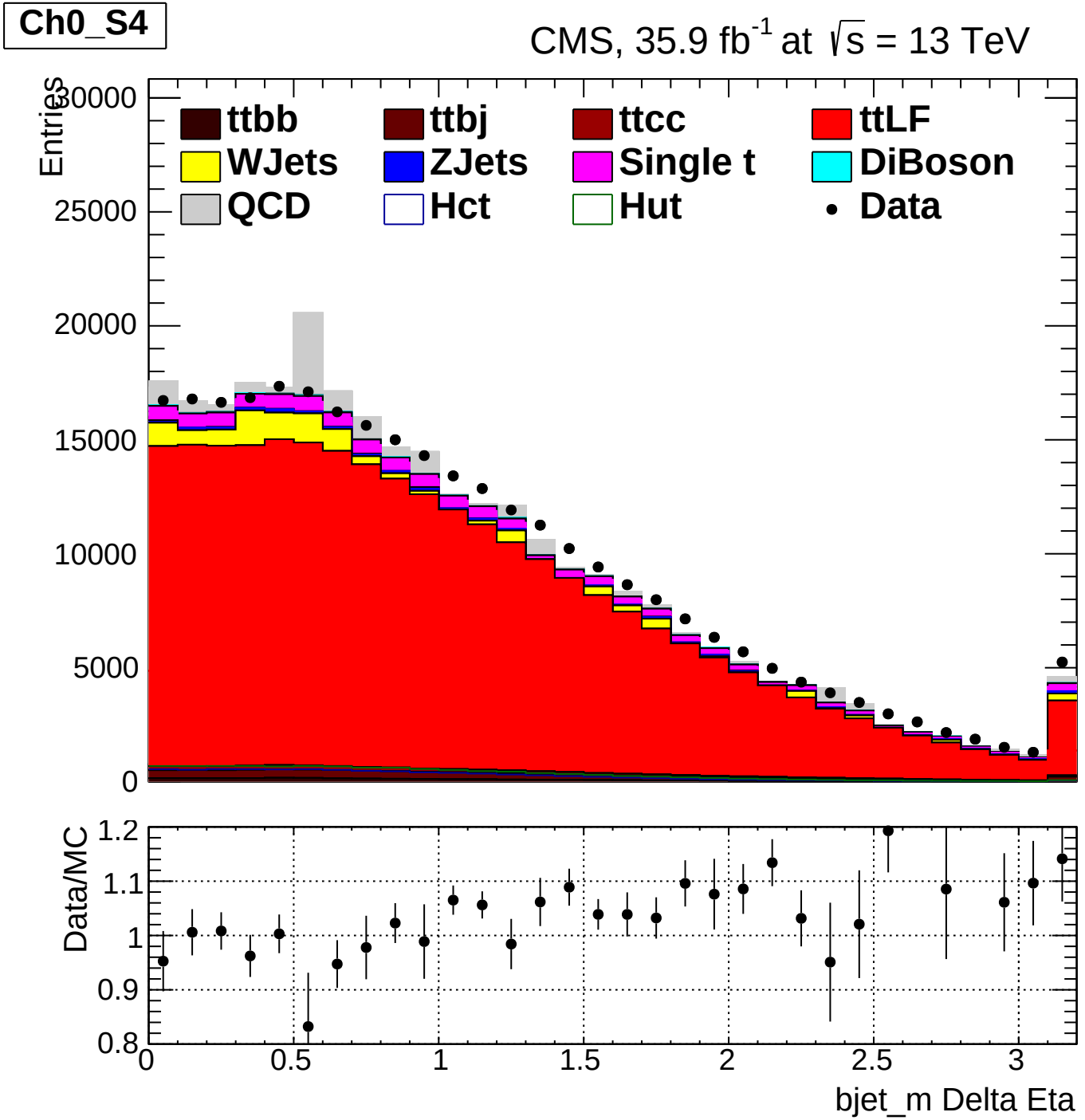

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
20000
18000
16000
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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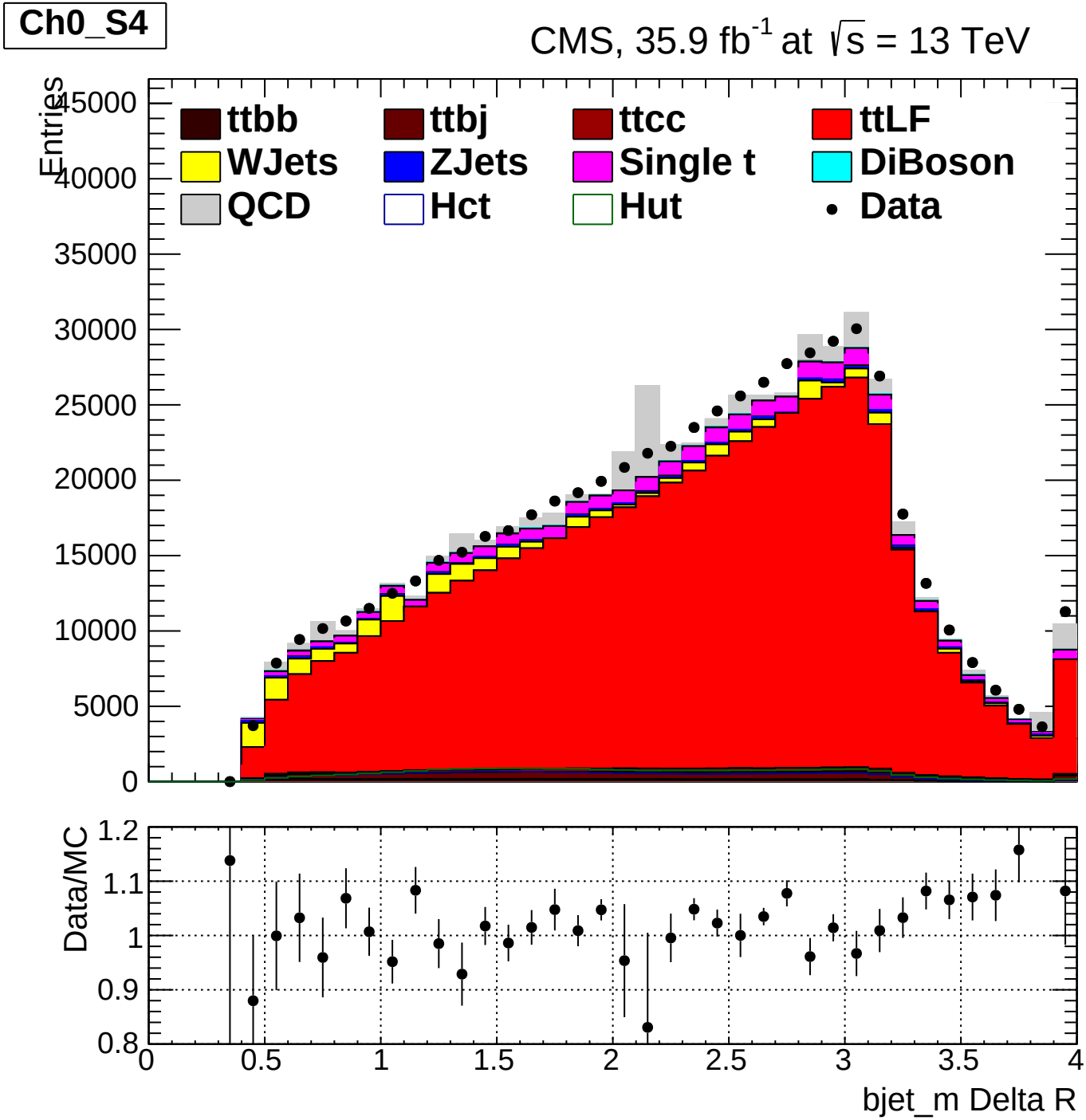
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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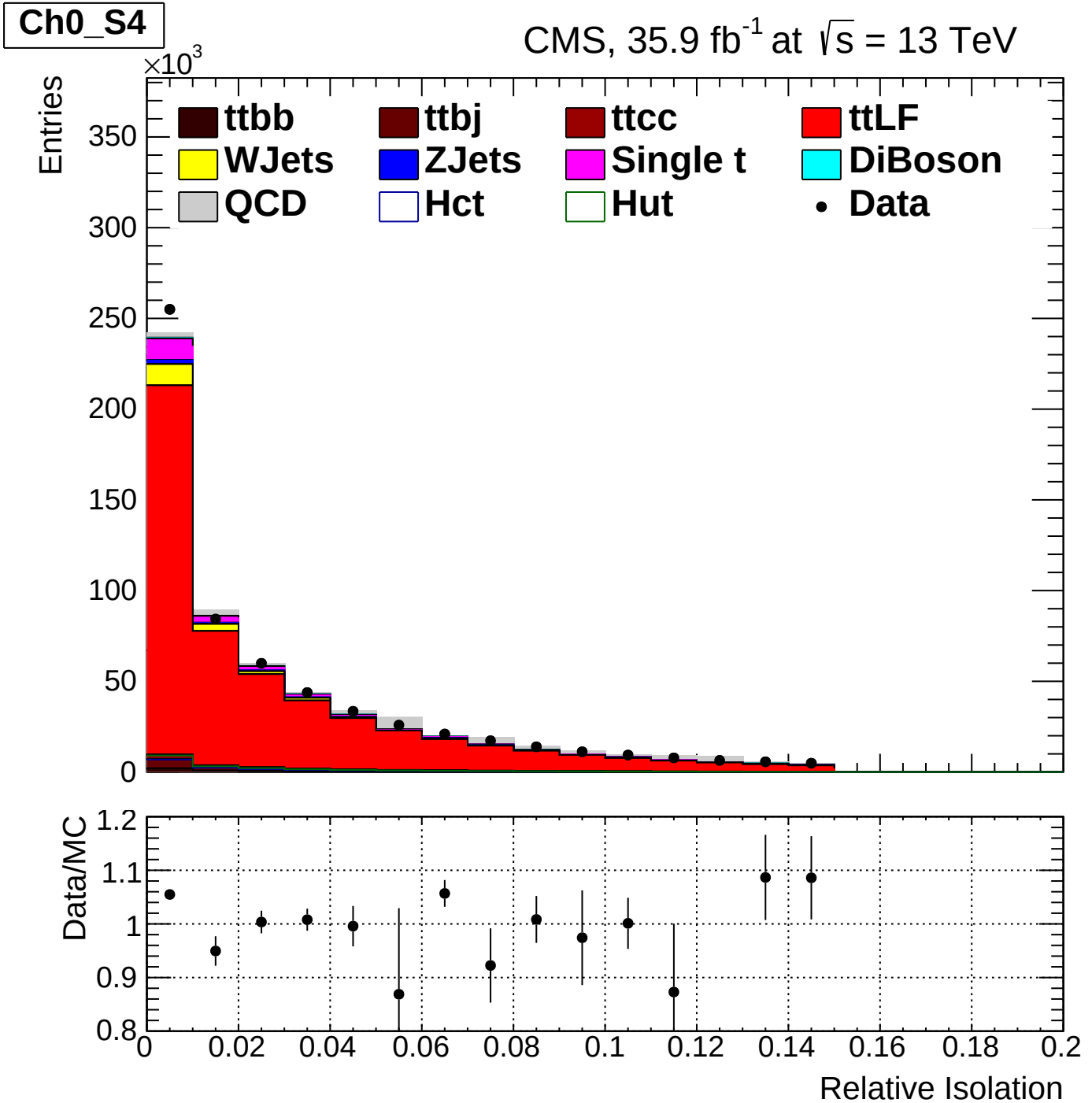
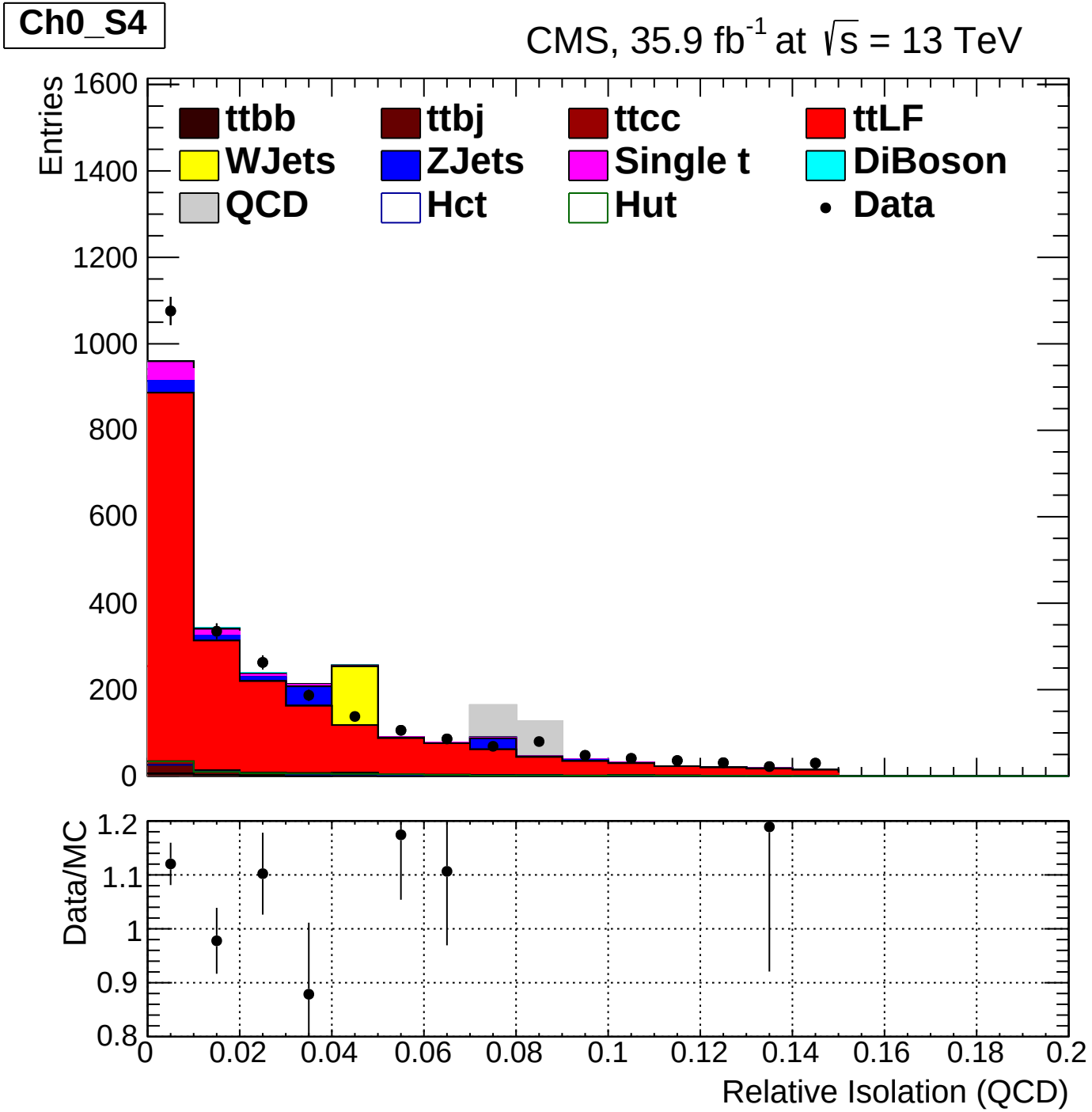
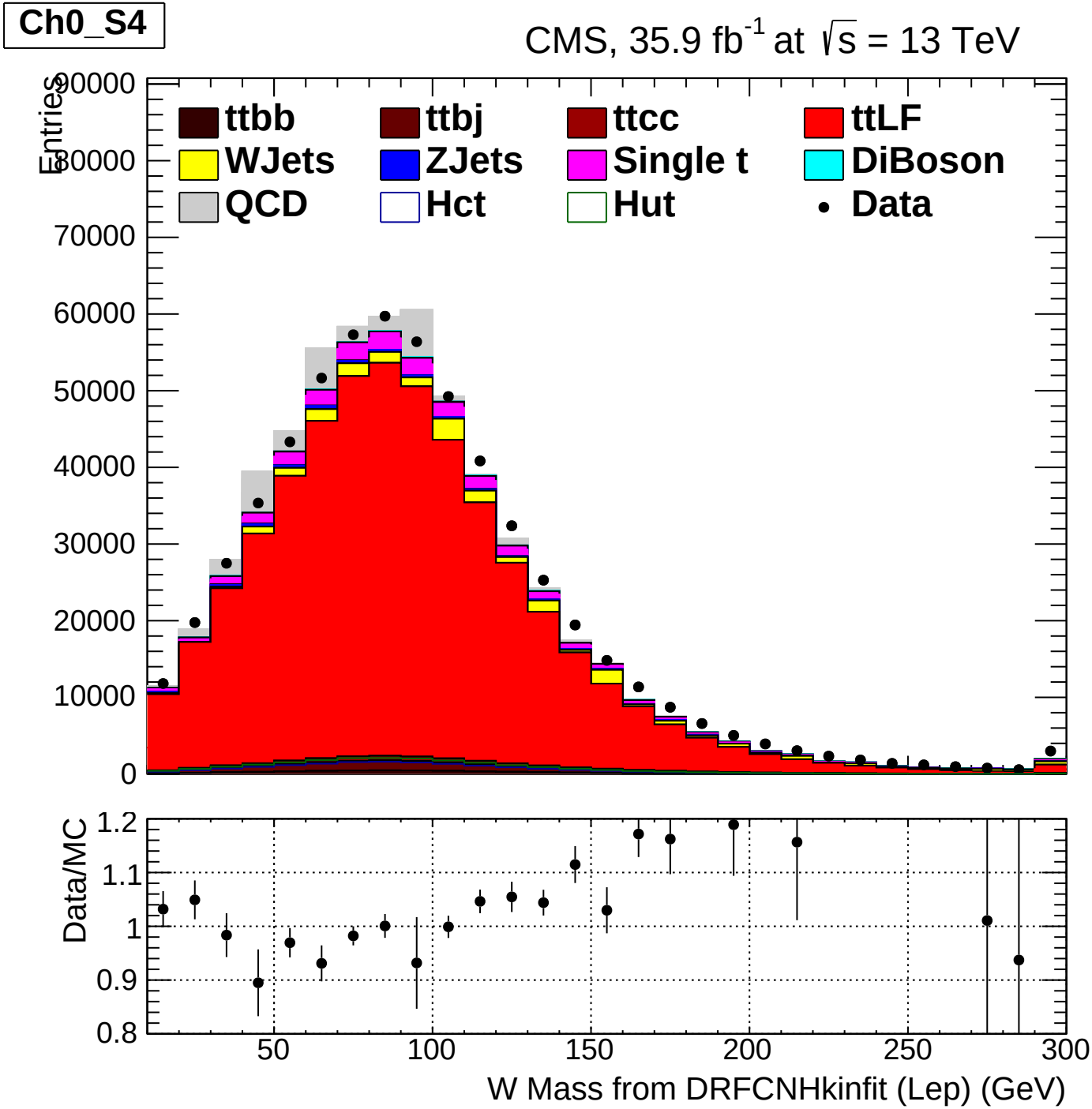
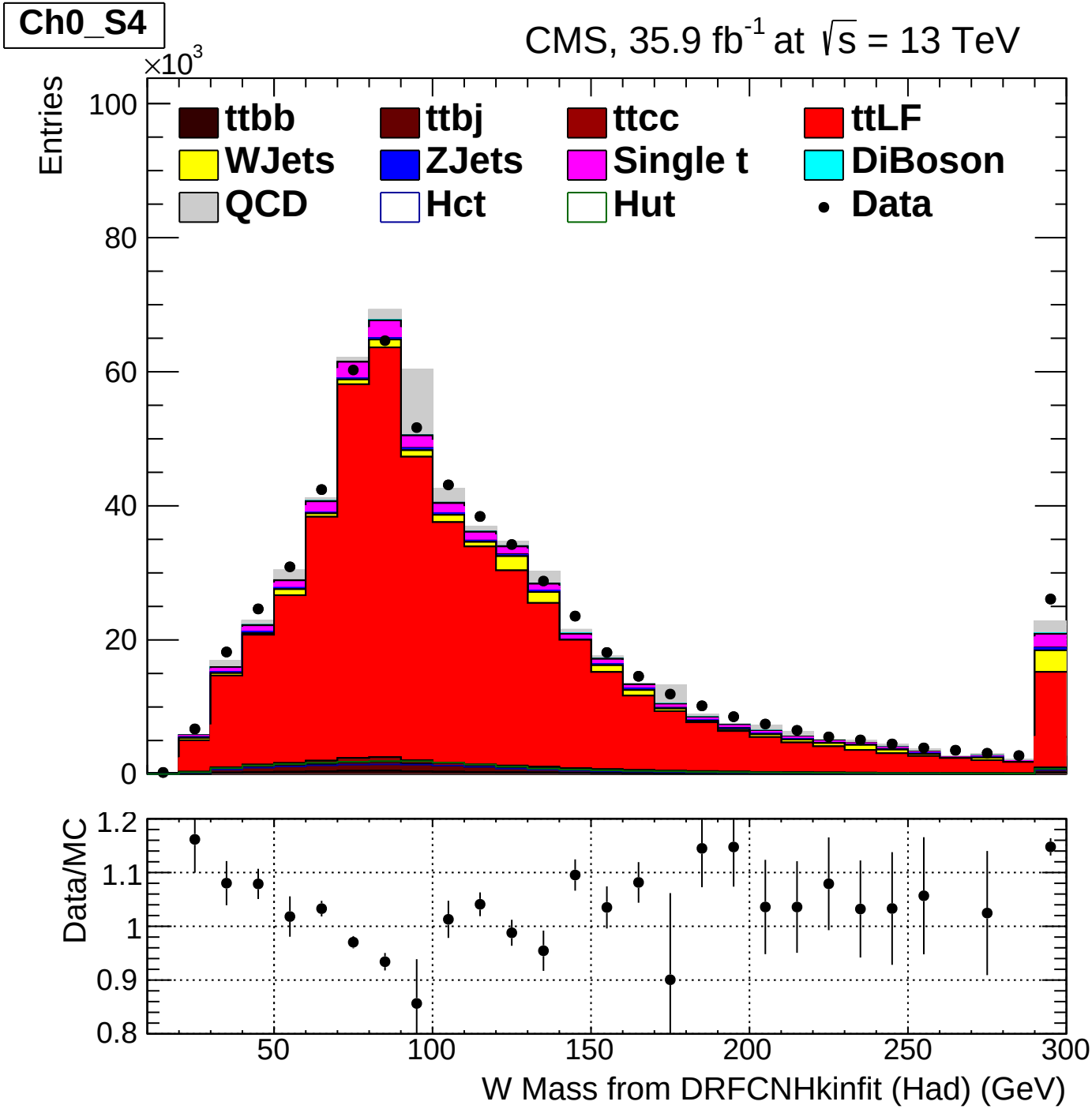
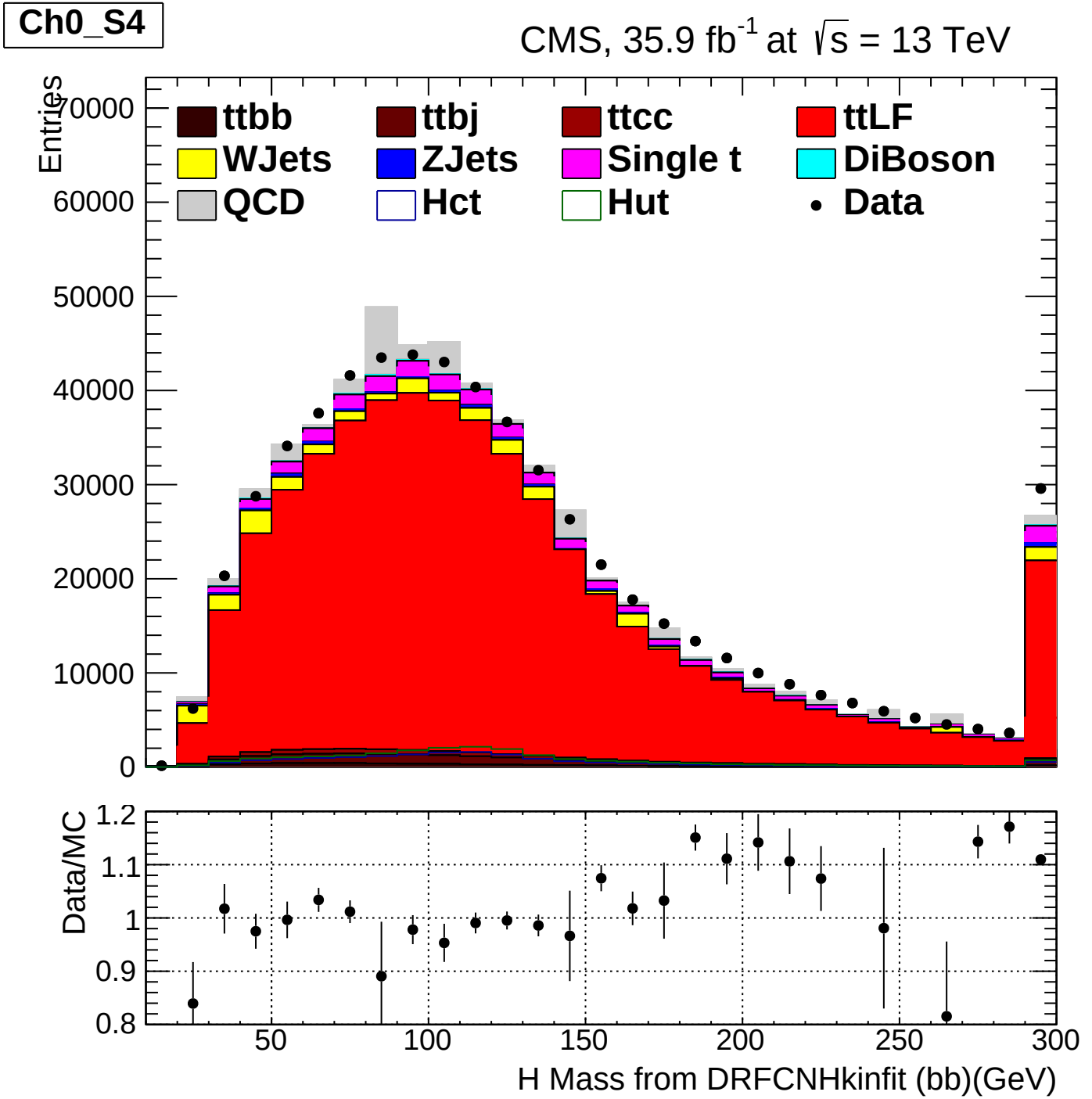
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

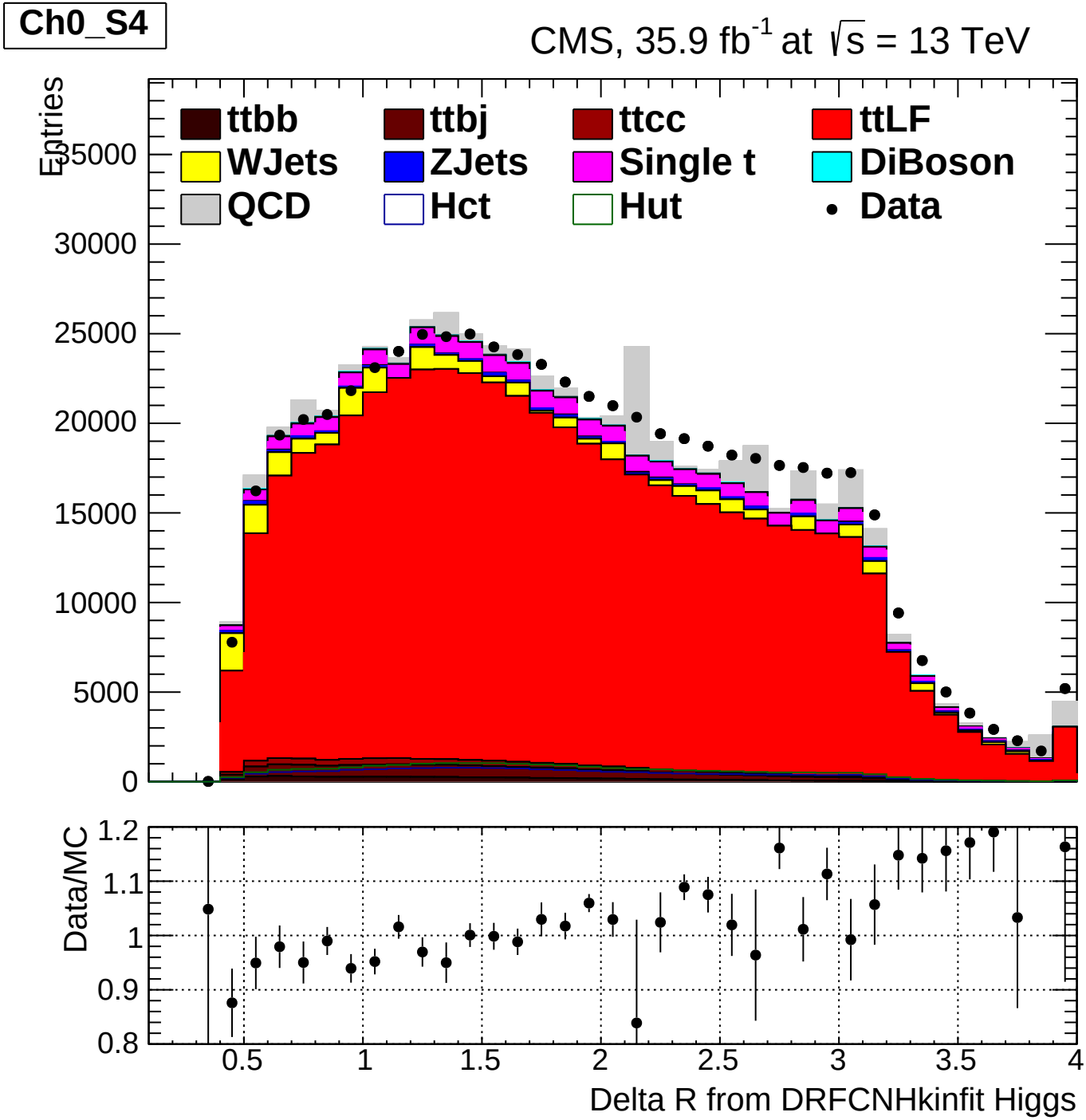

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

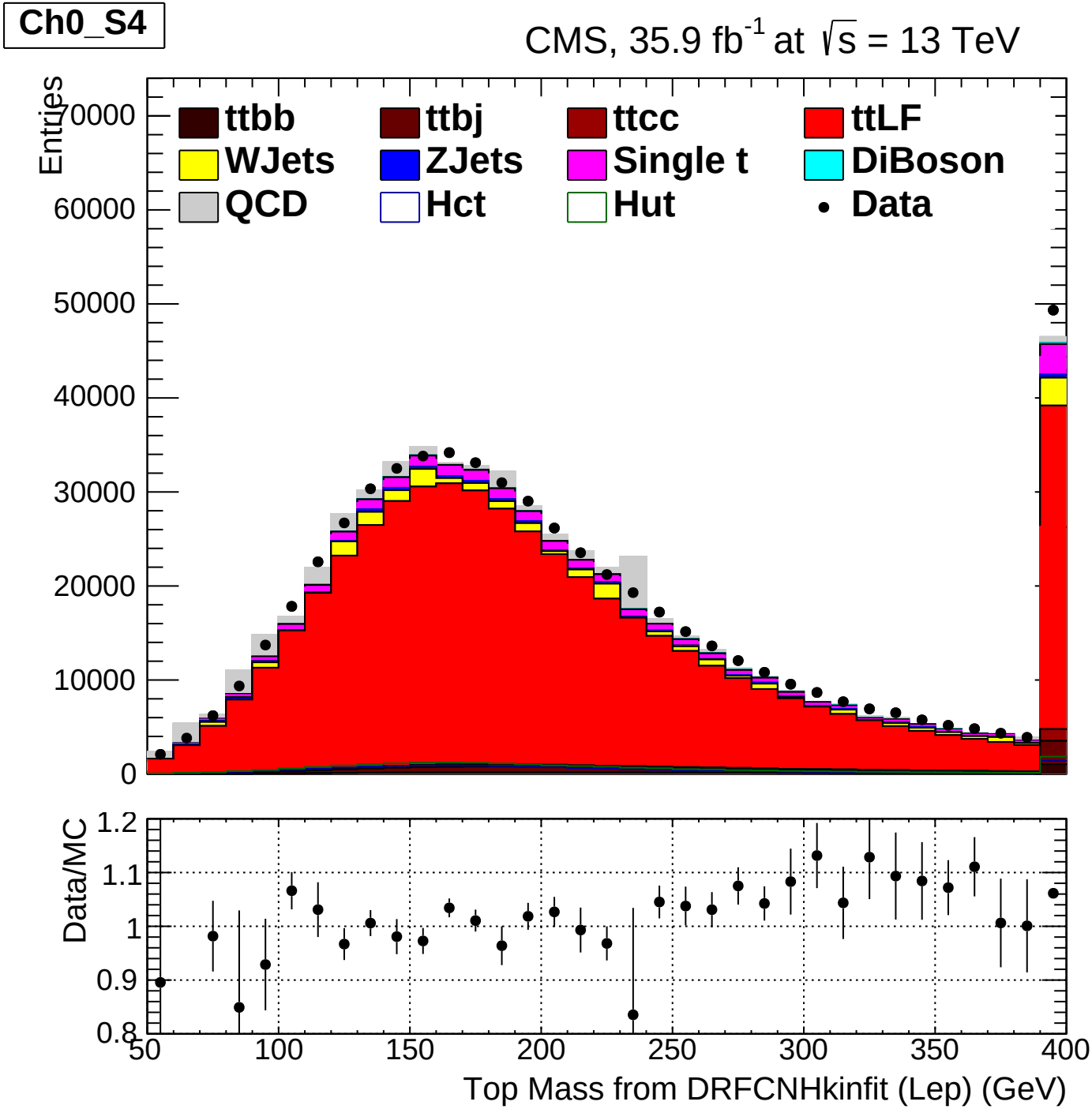

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

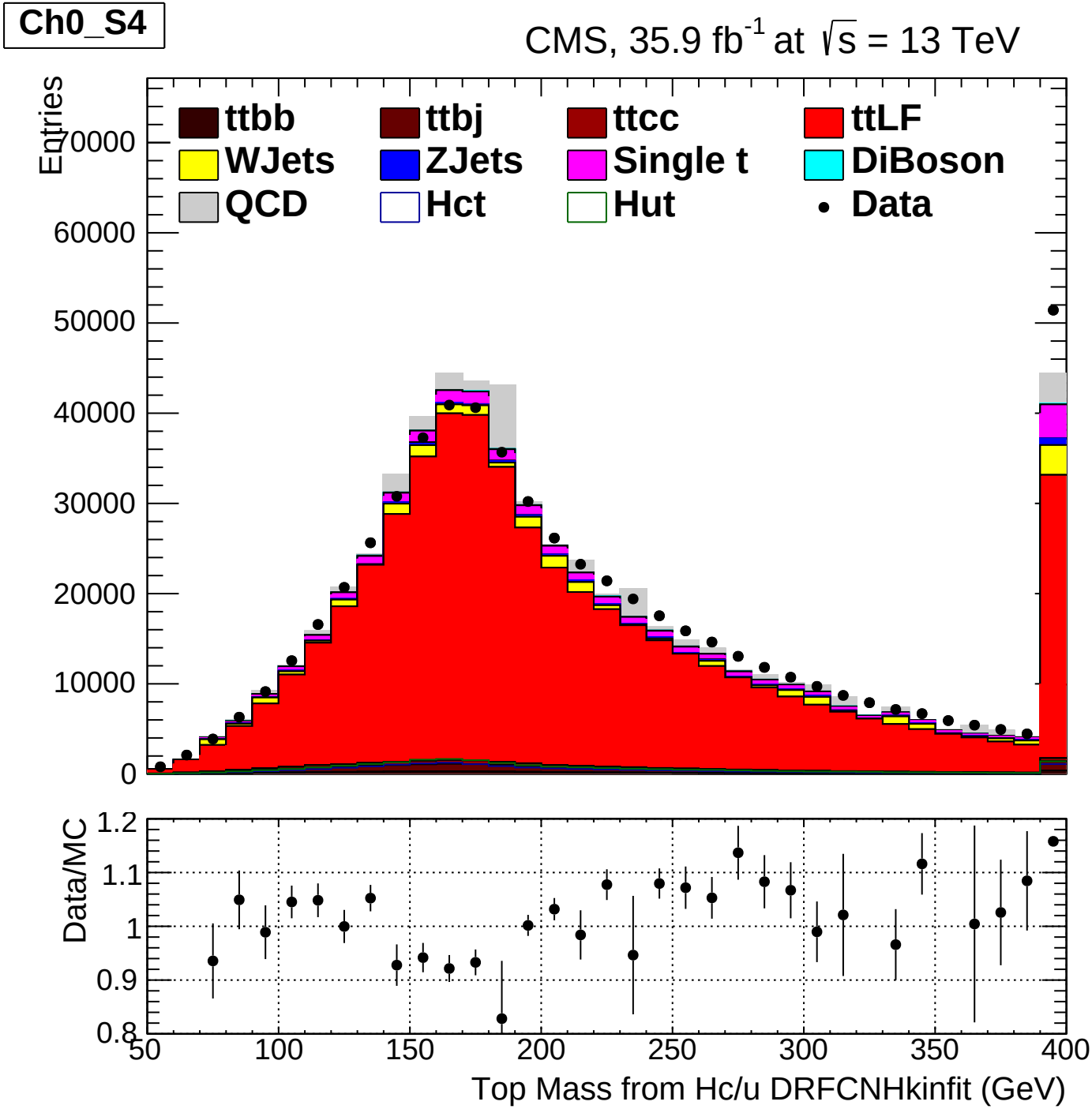

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

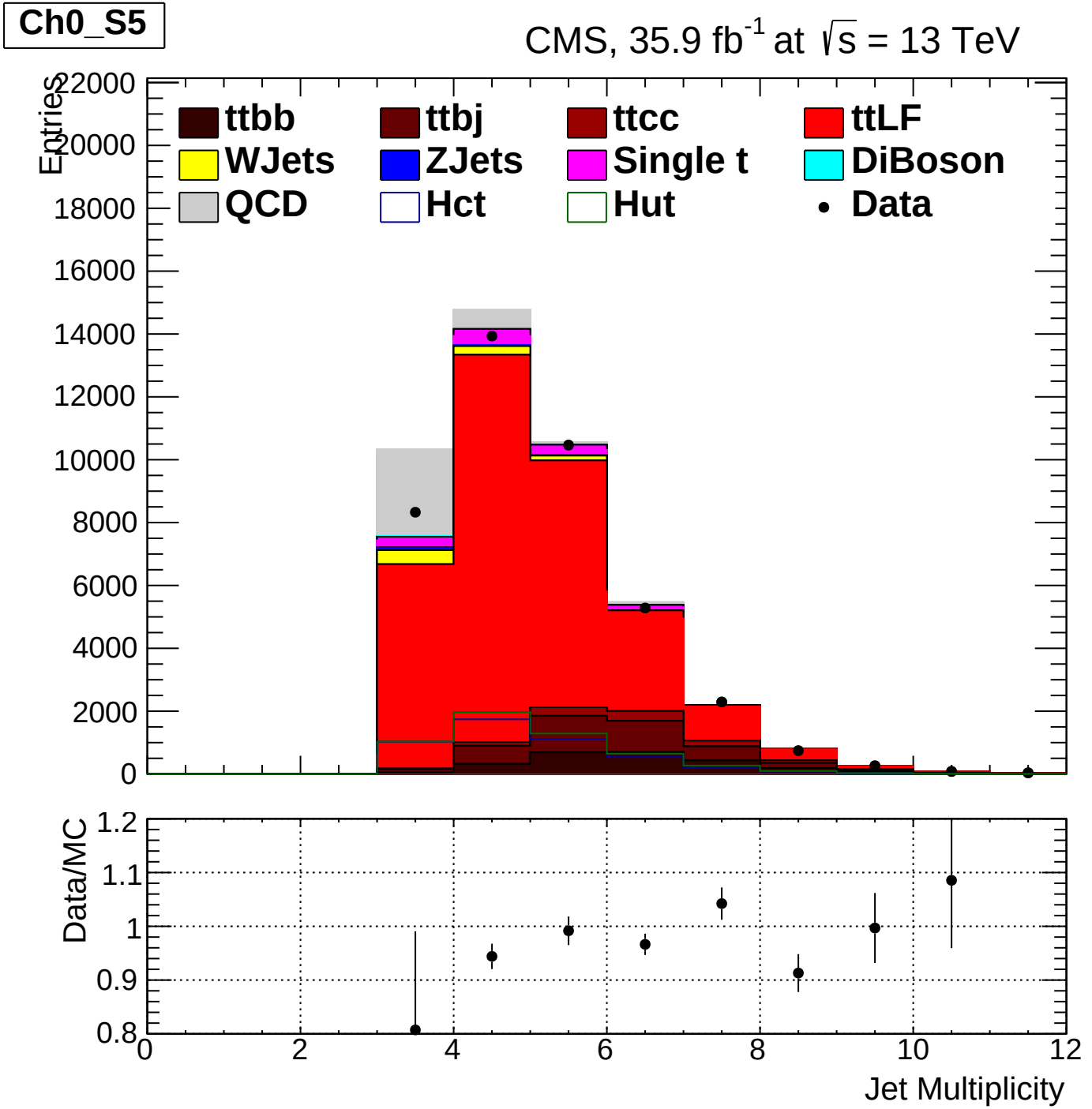

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

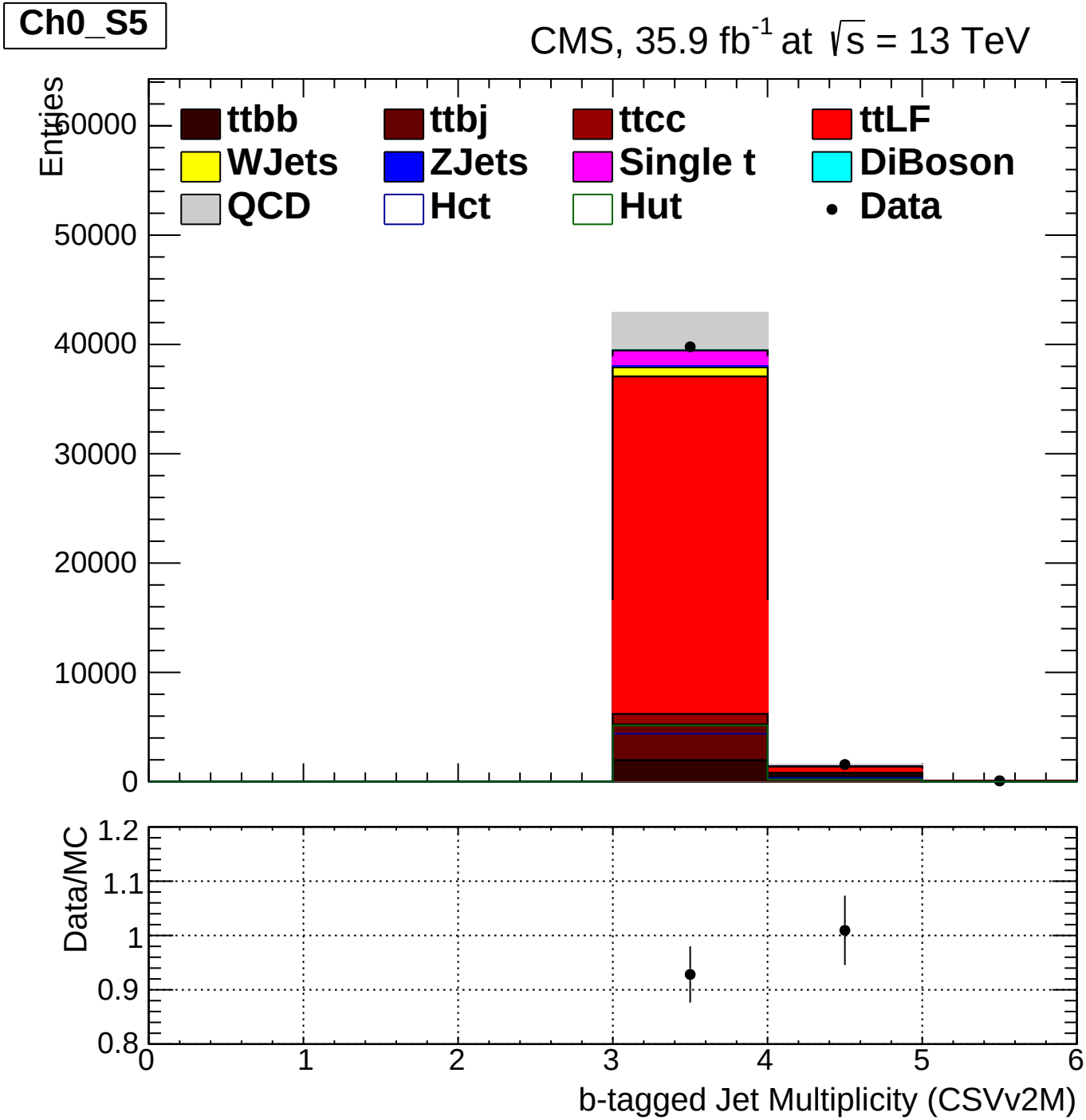

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

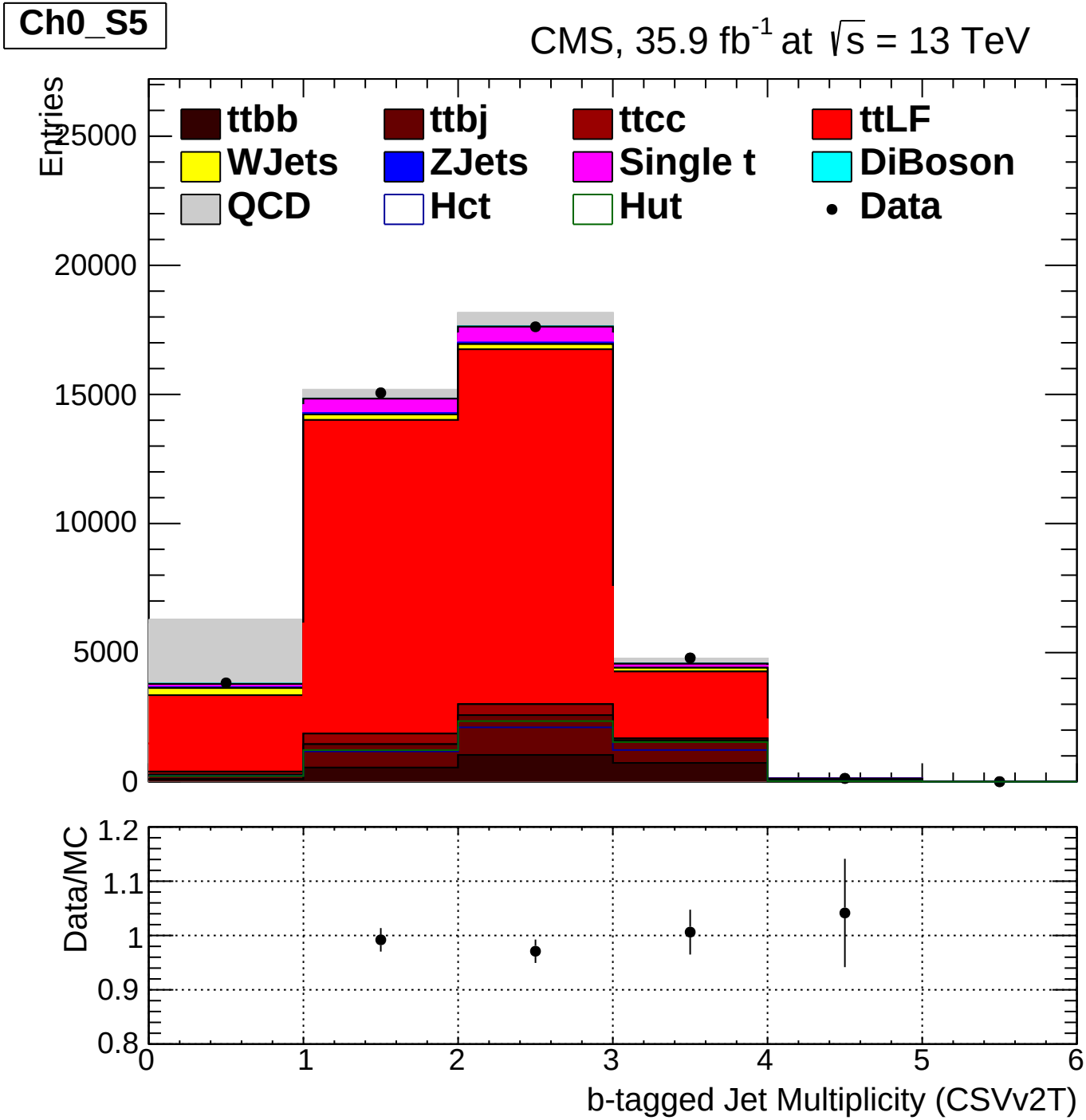

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

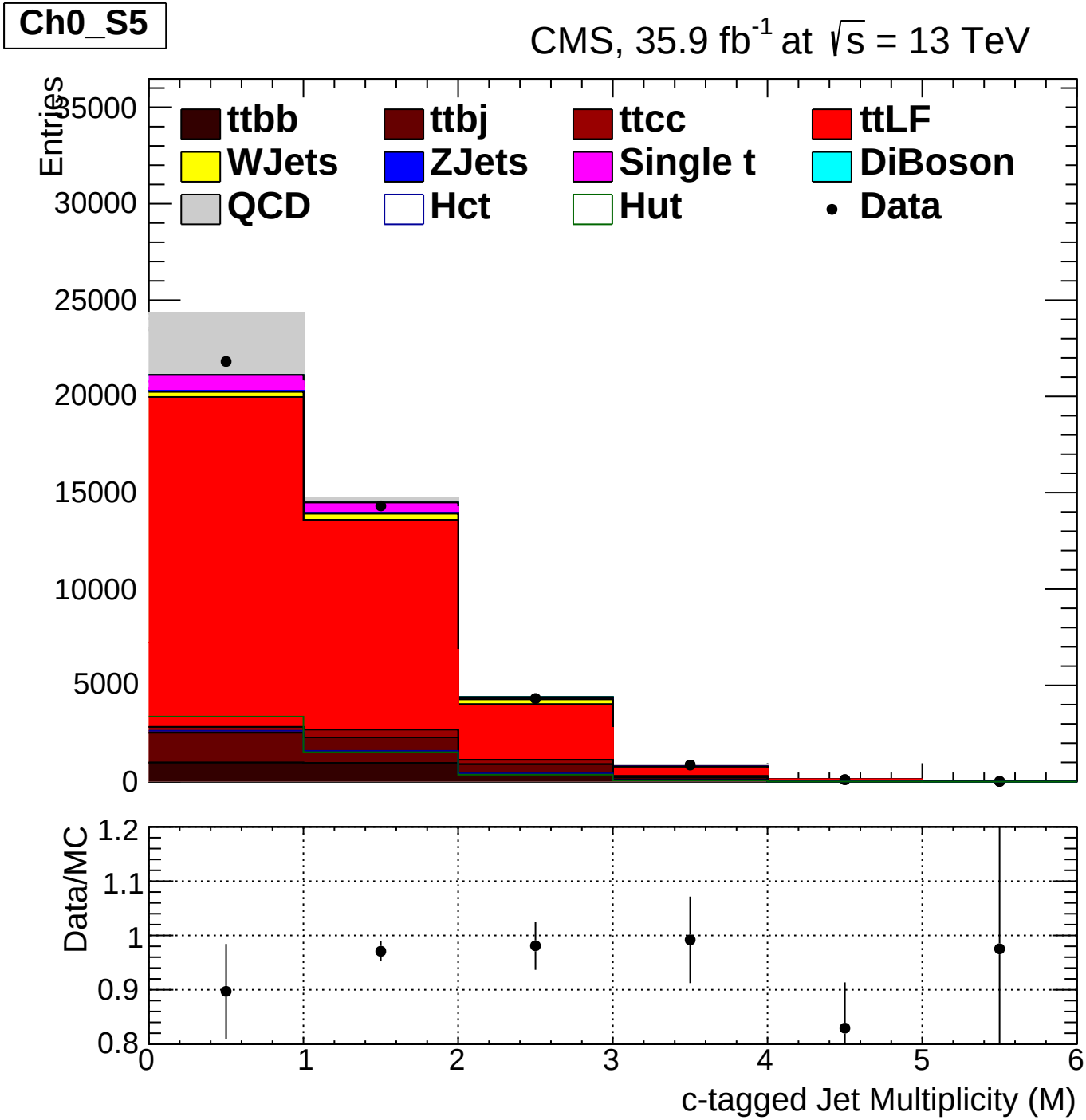

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

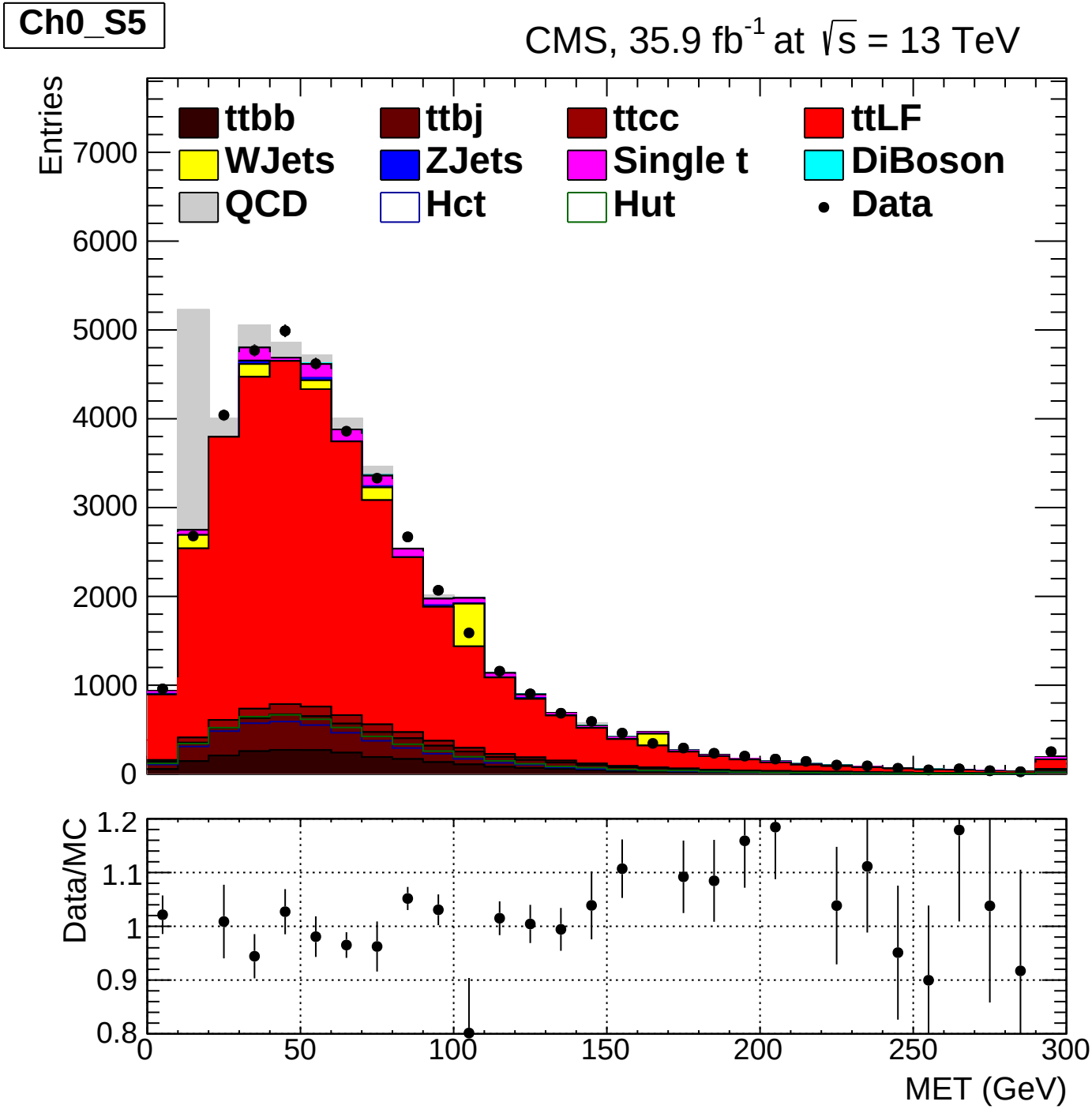

Ch0_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

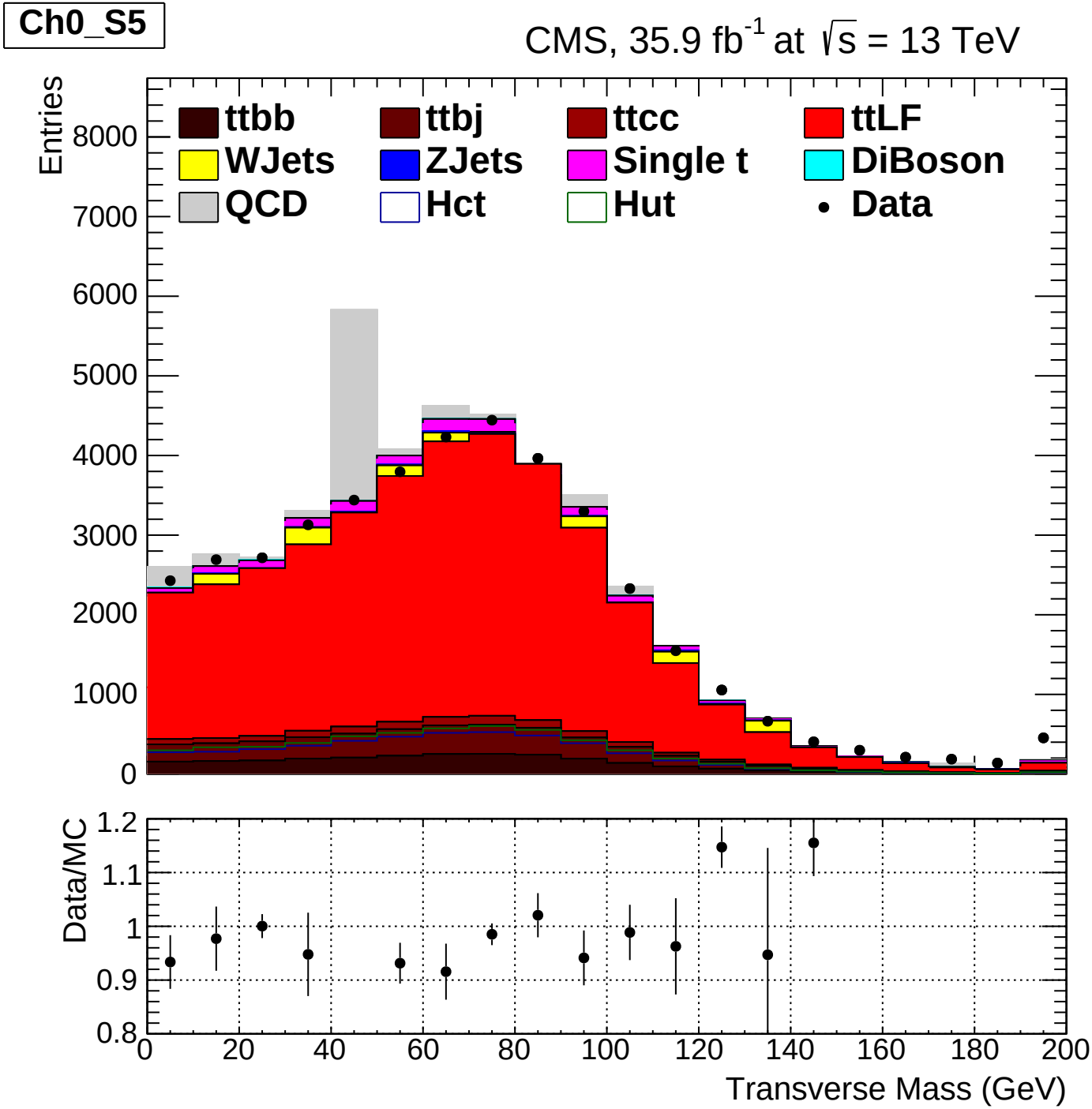

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

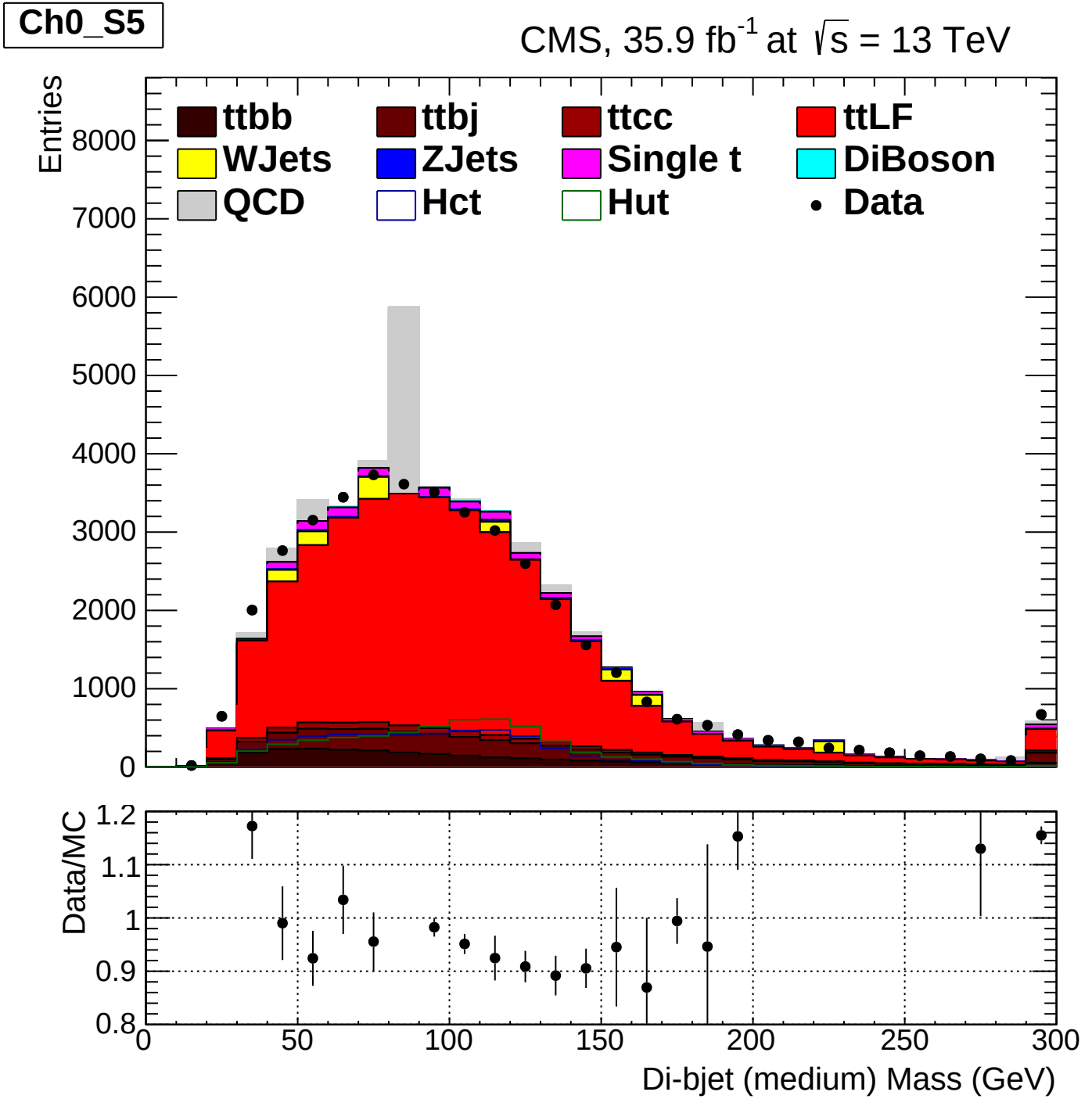

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

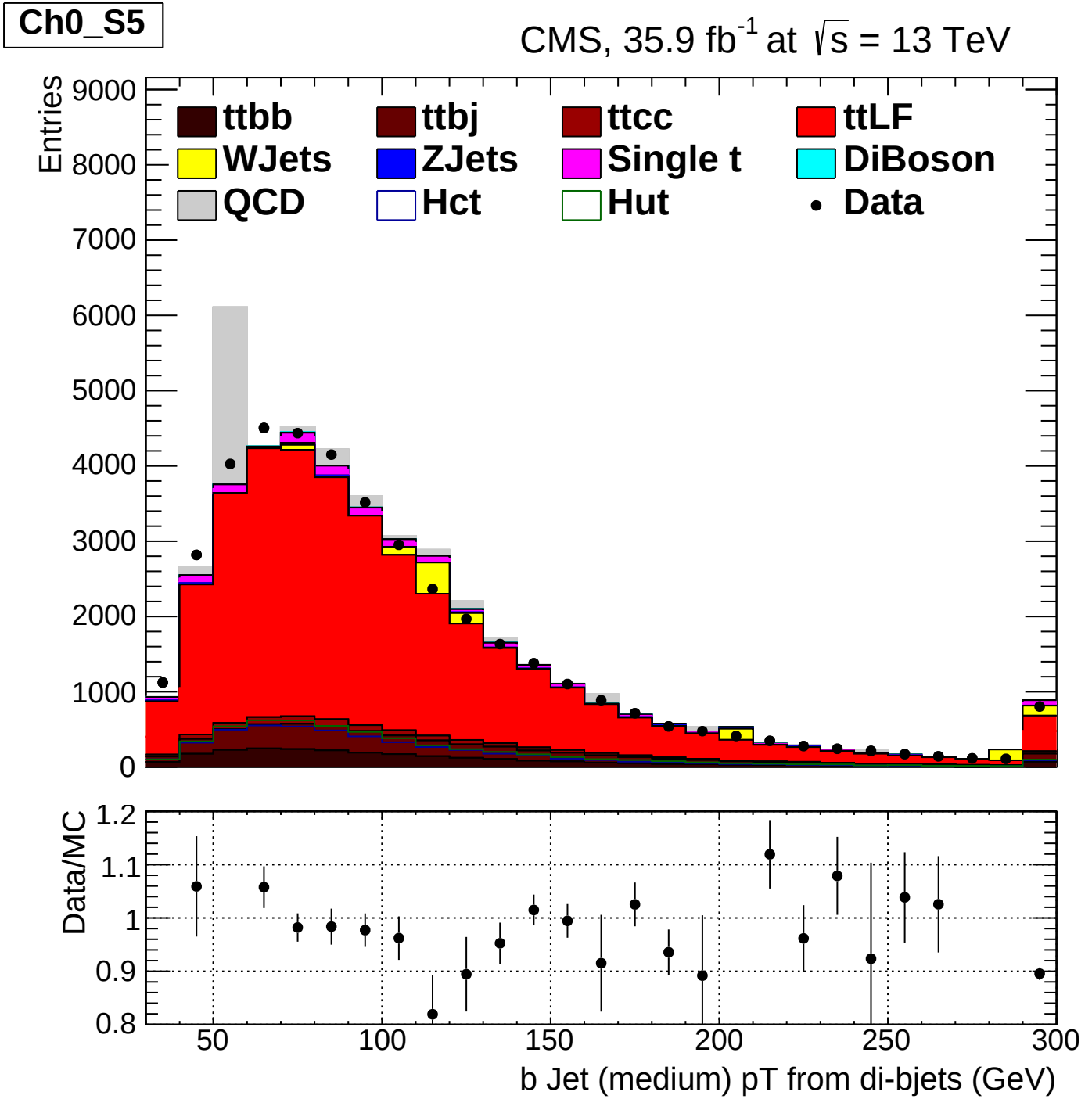

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

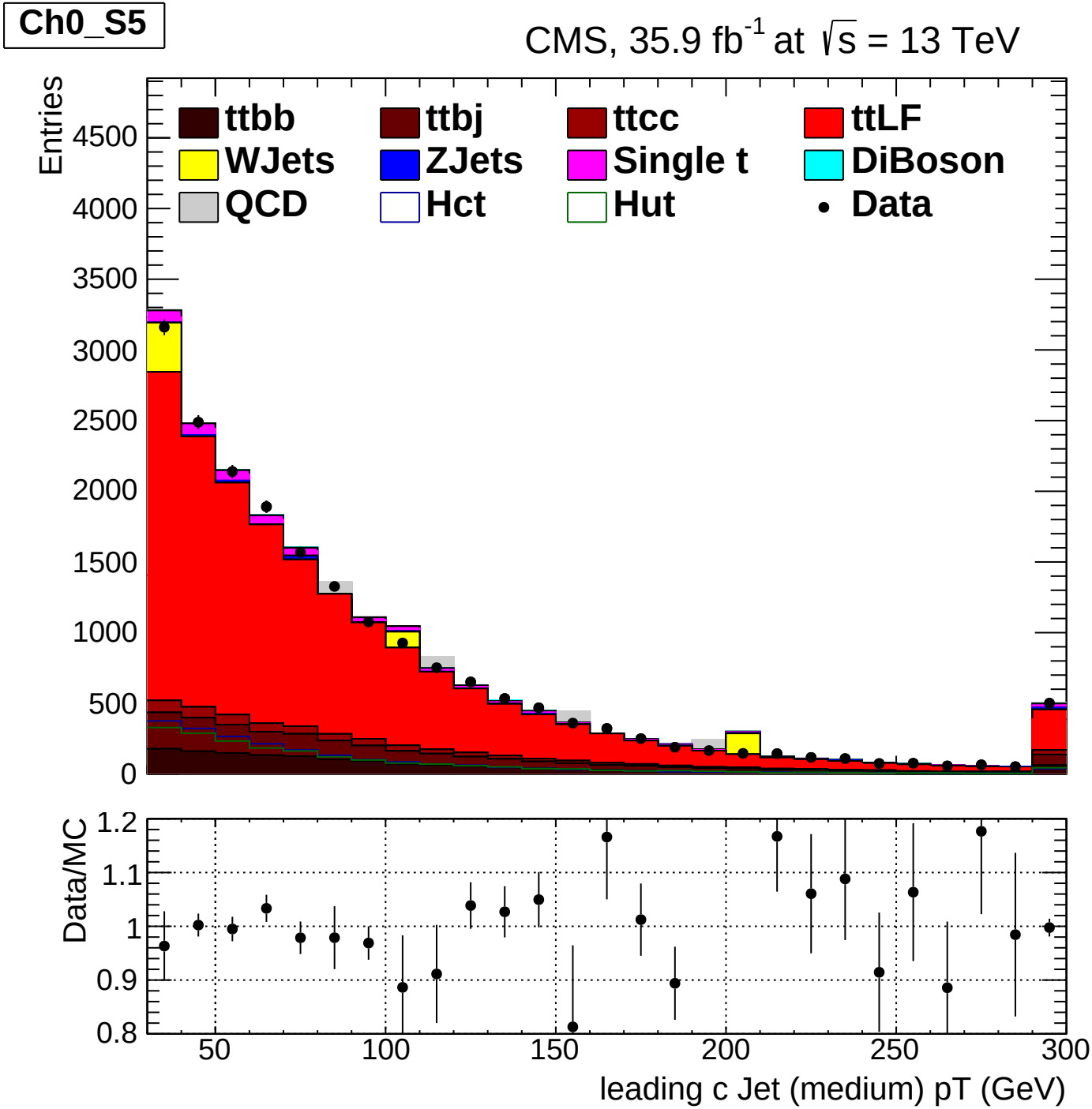

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

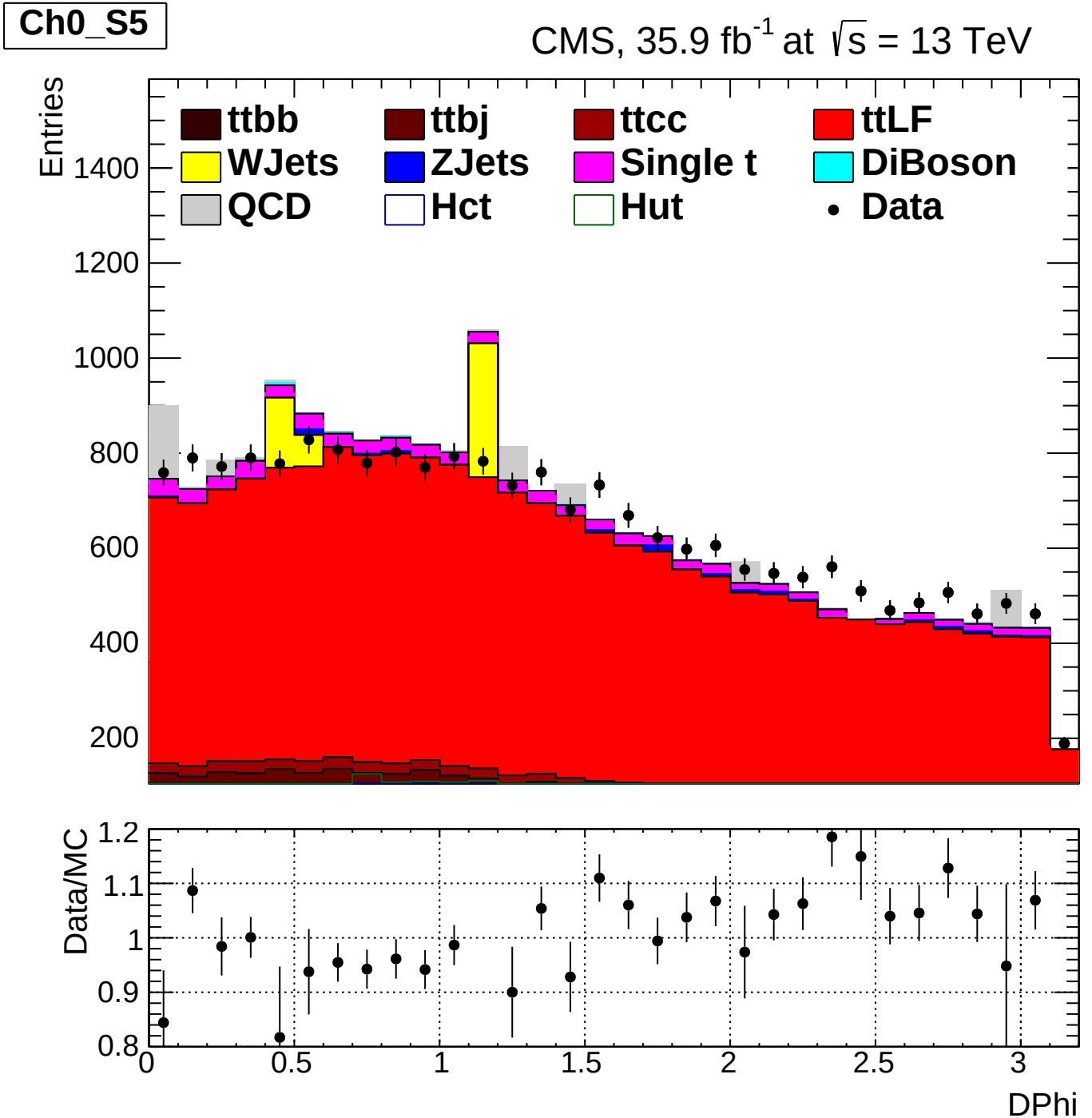

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
6000
7000
Data/MC
0.8
0.9
1
1.1
1.2
0
50
100
150
200
250
300
MET (GeV)


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1400
1200
1000
800
600
400
200
Data/MC
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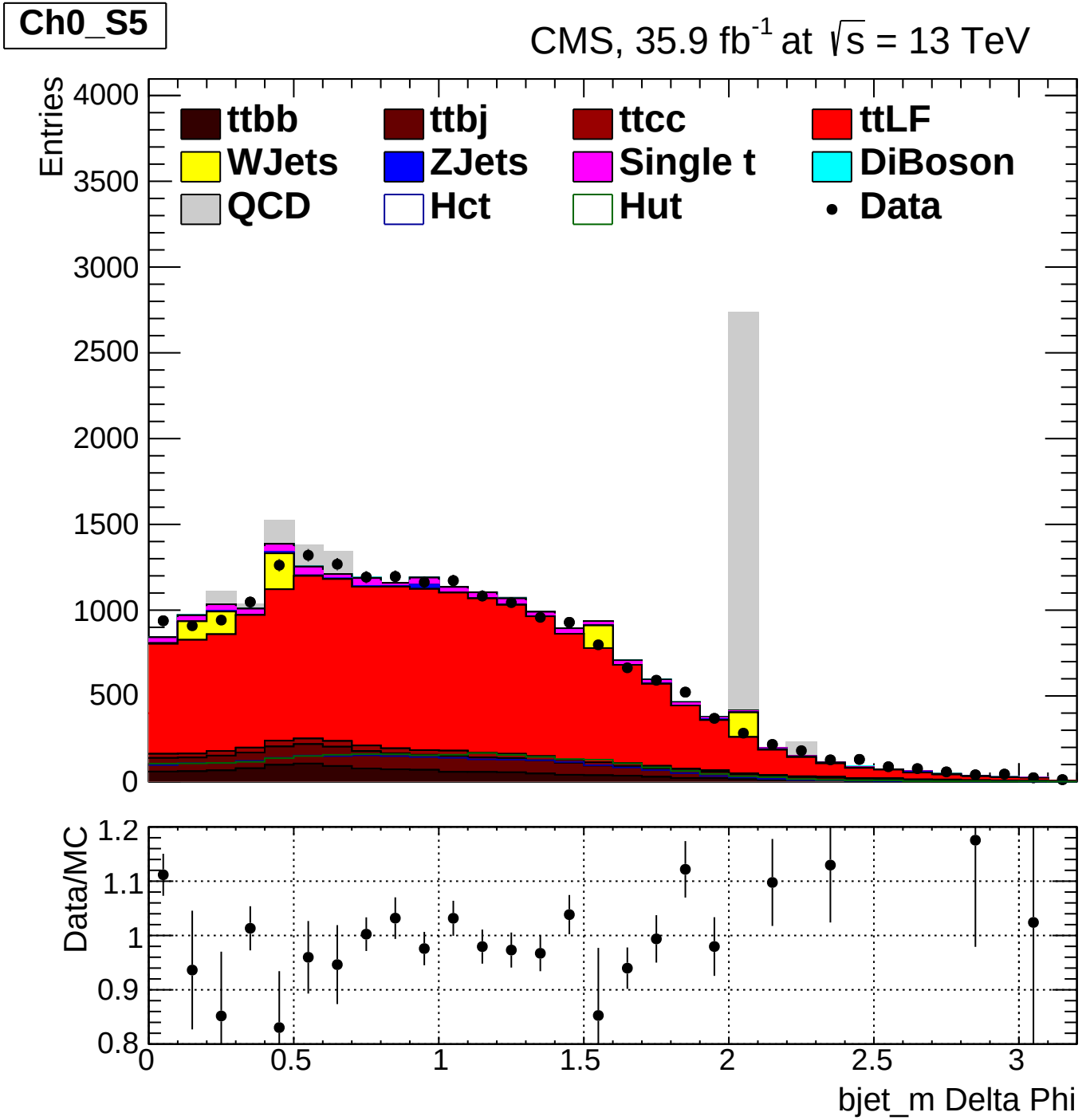
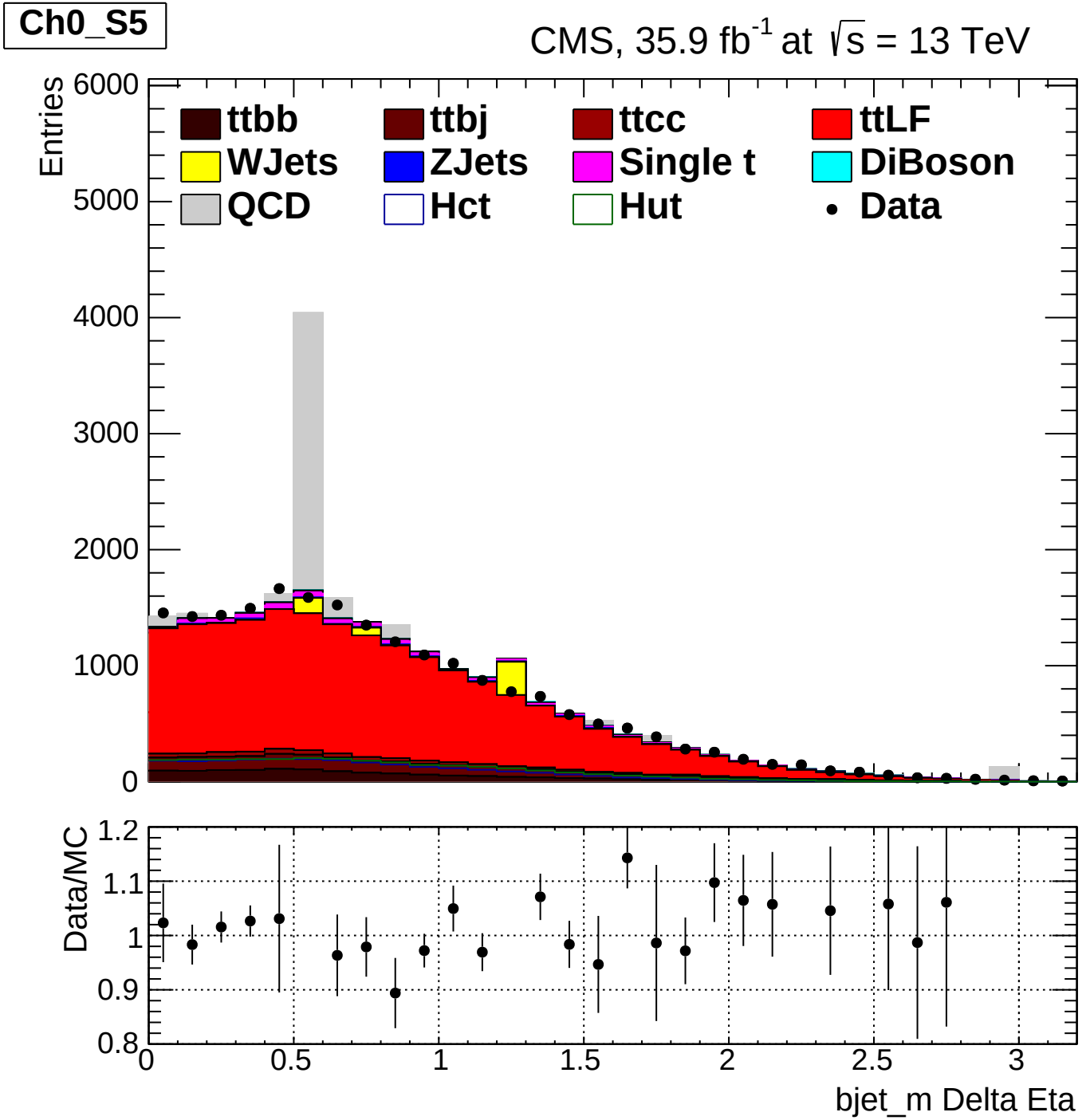
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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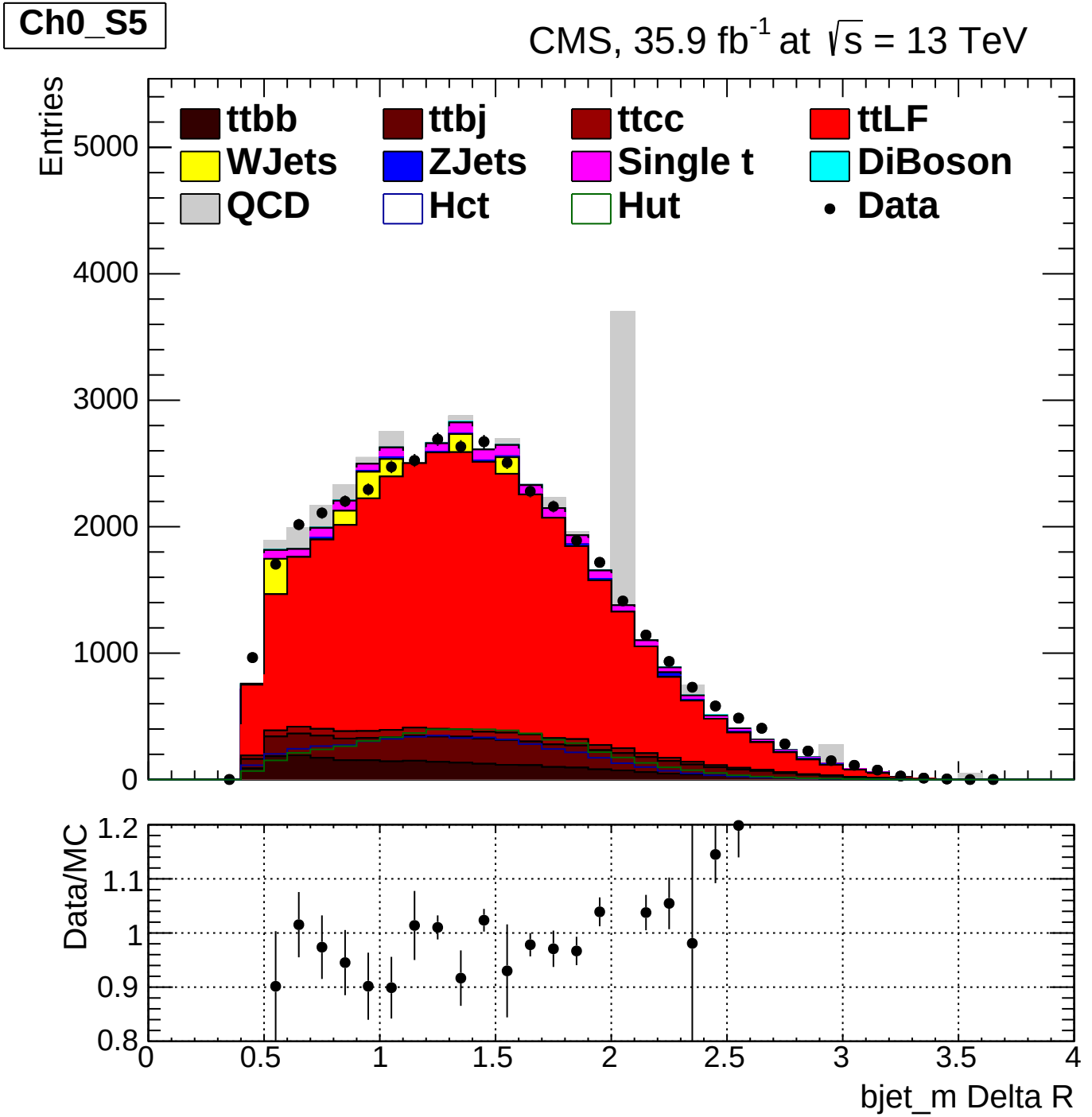
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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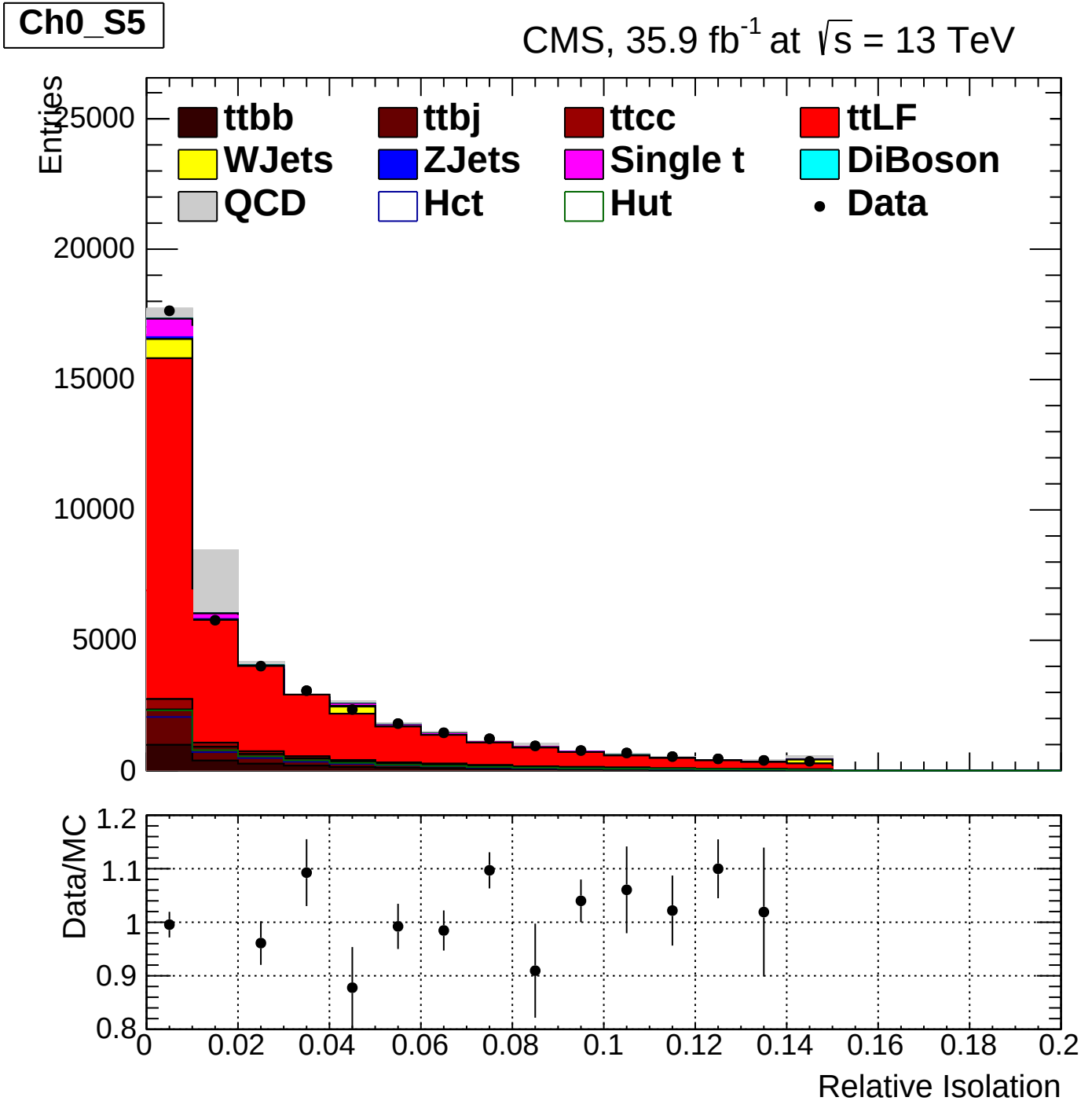
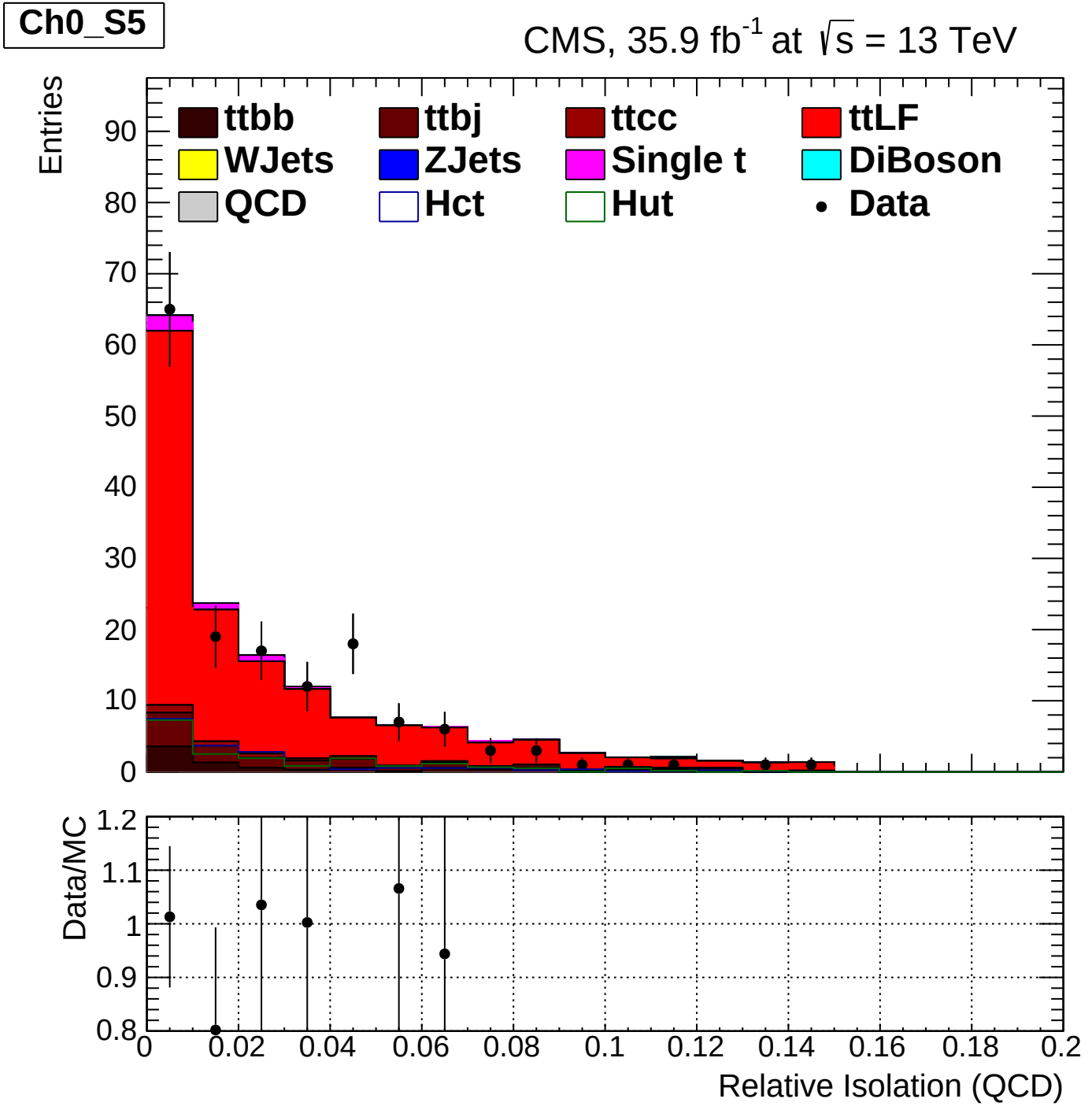
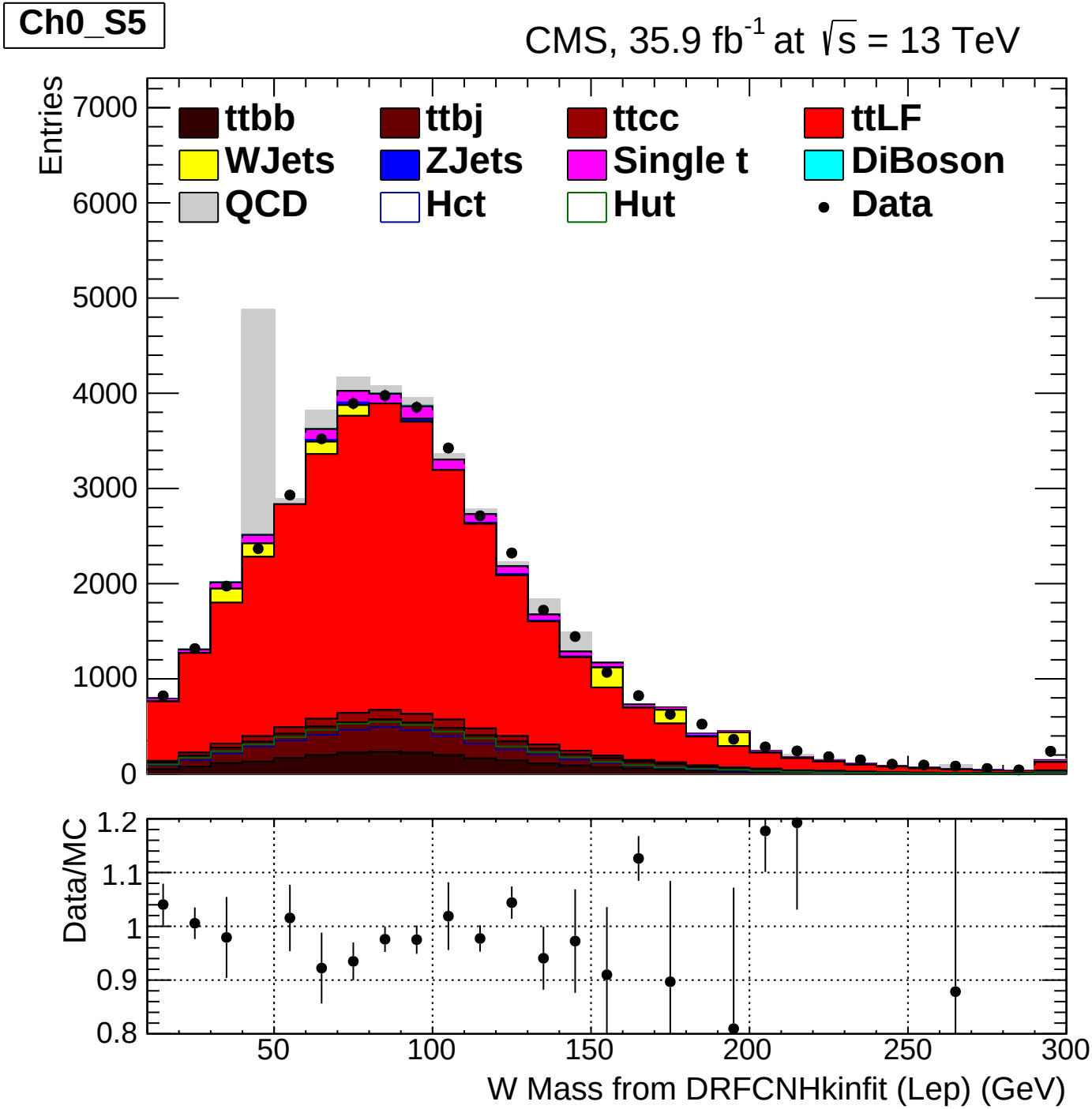
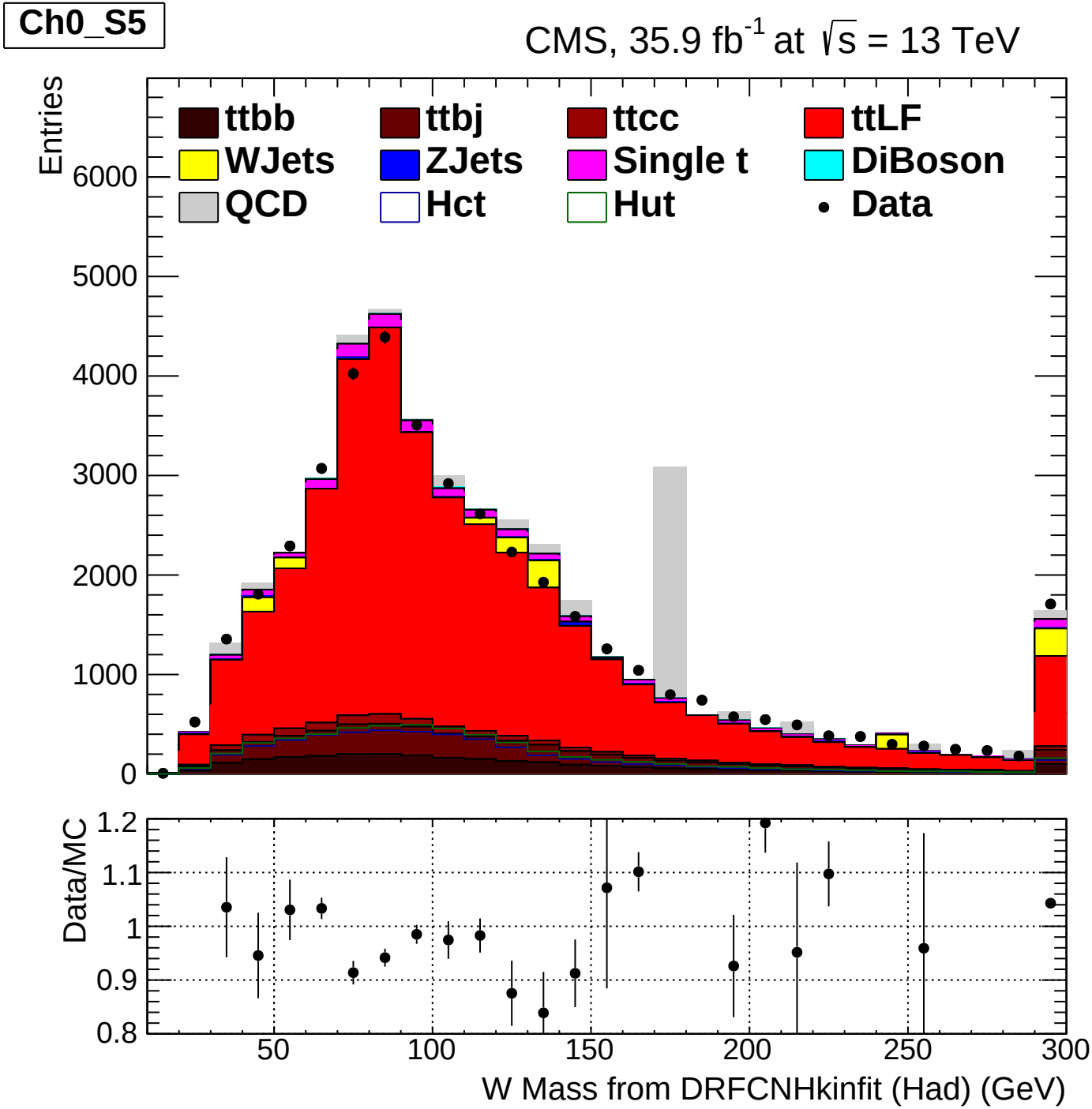
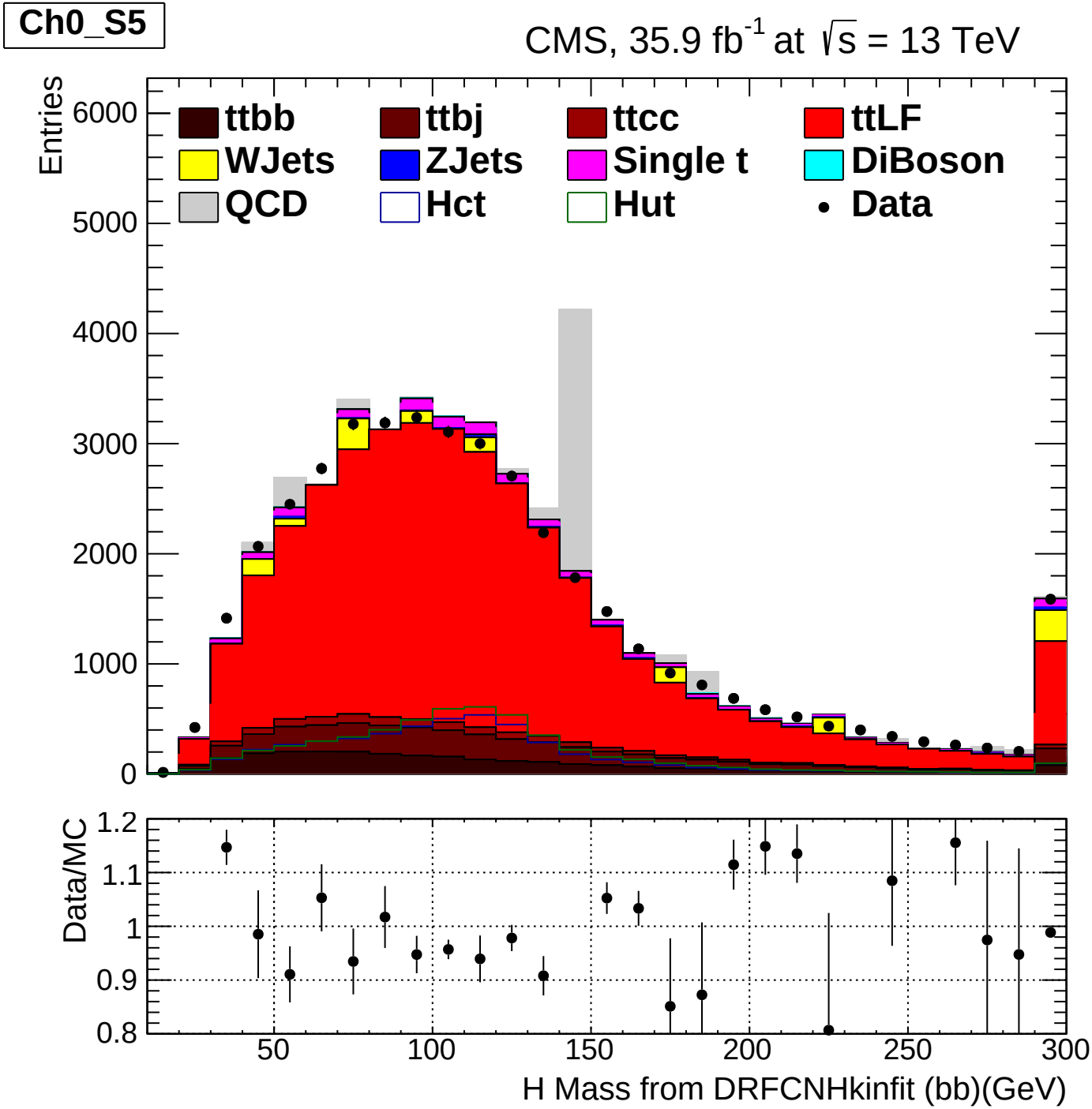
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

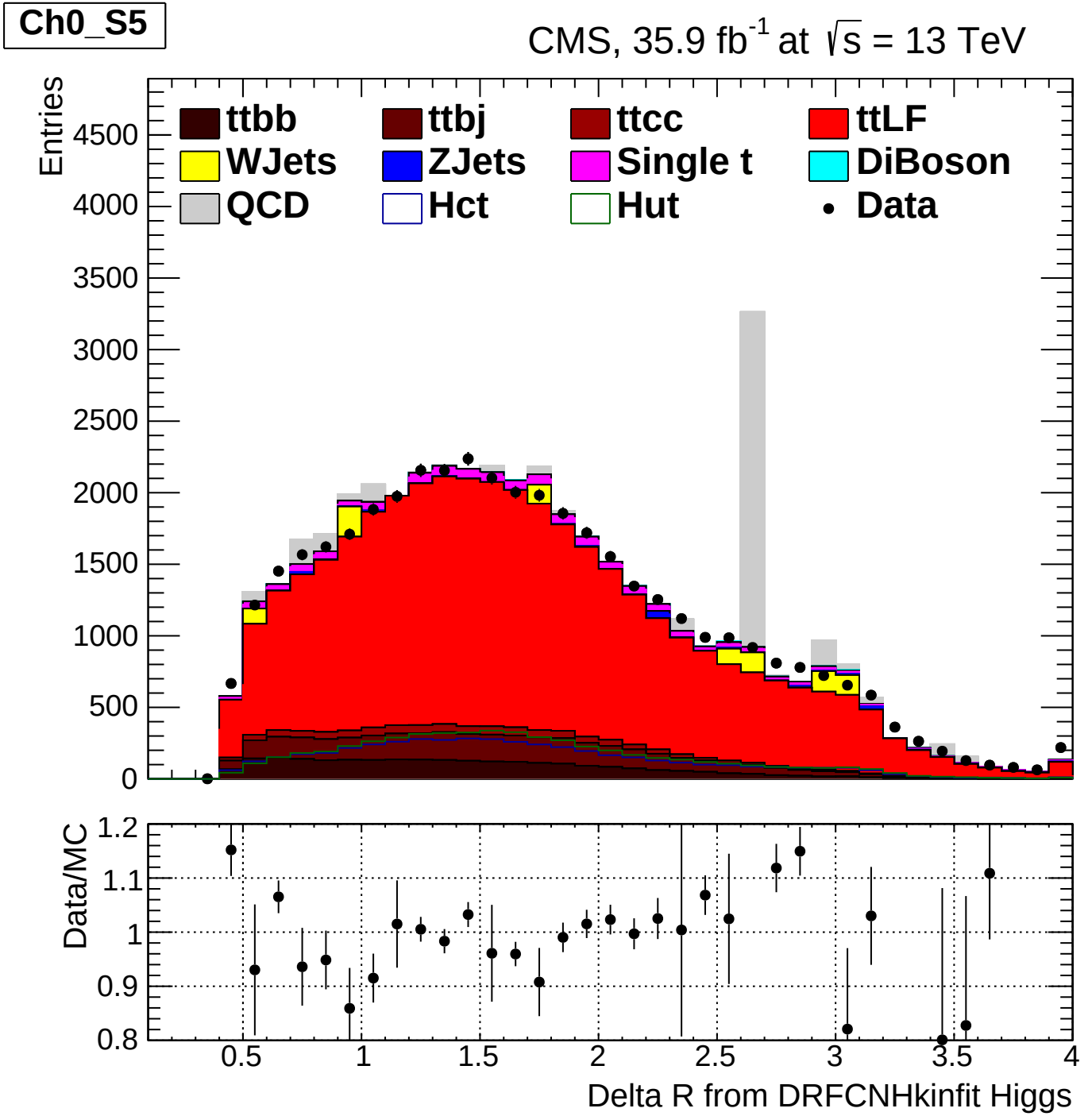

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

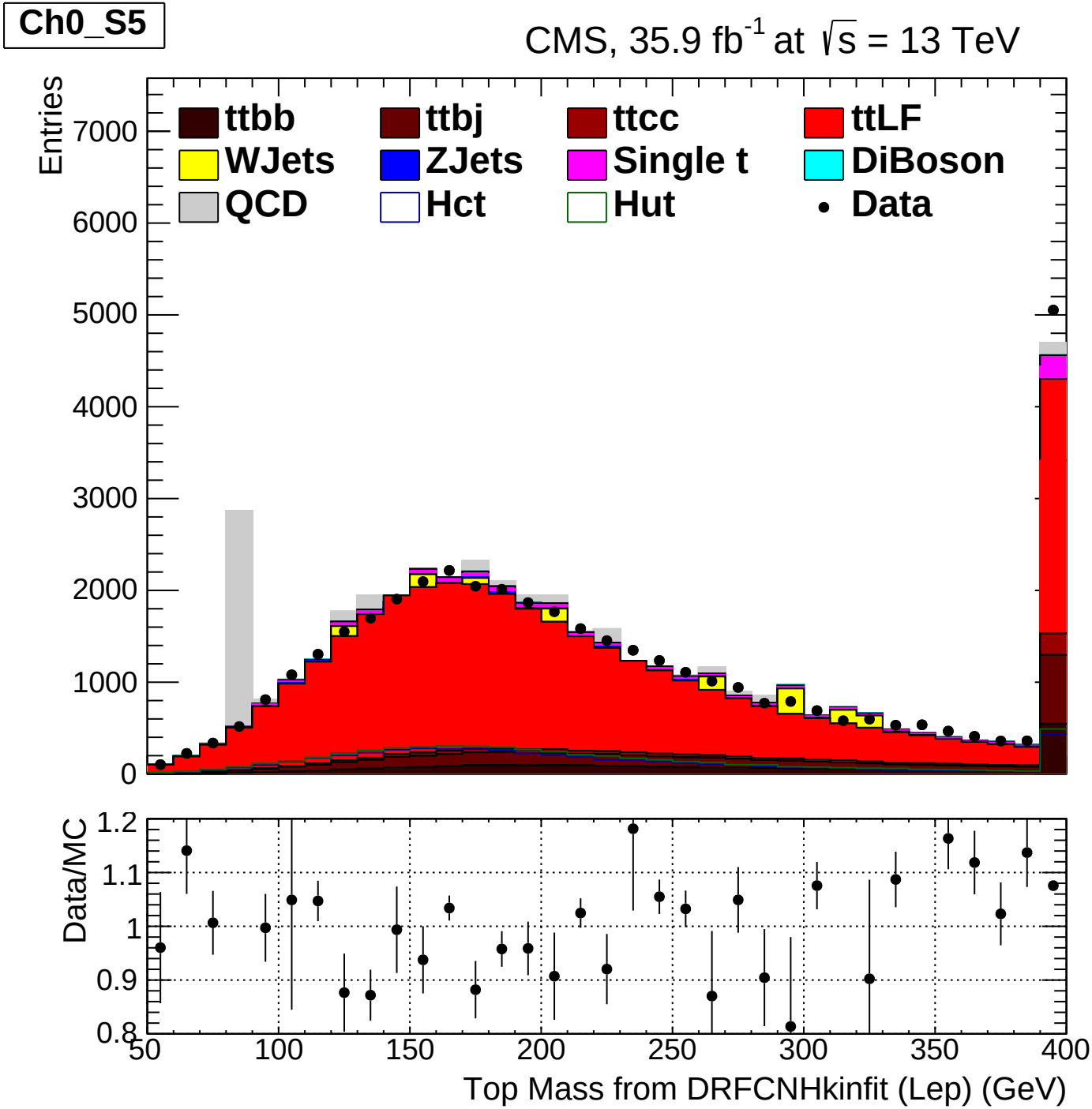

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

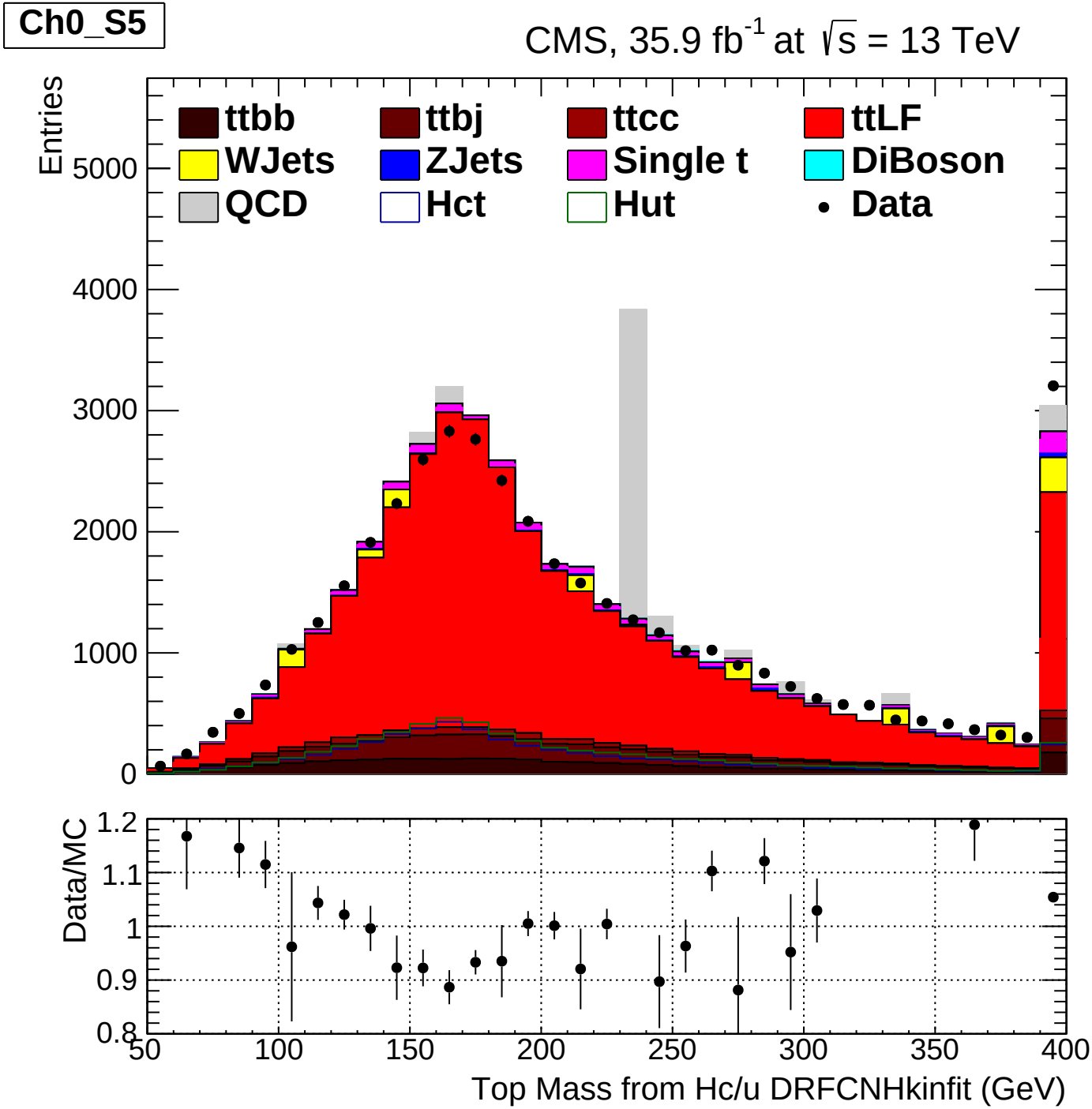

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

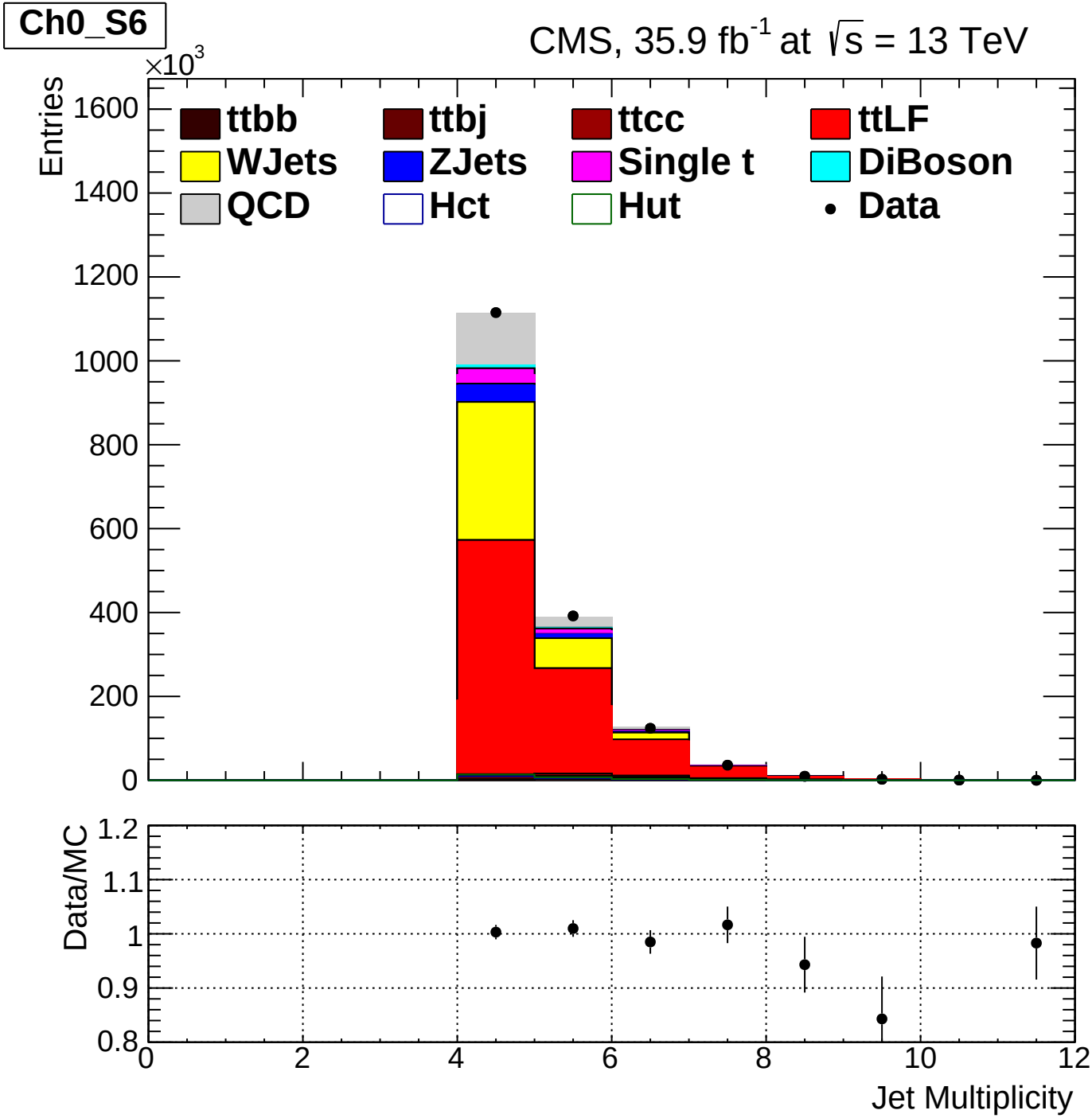

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
6000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

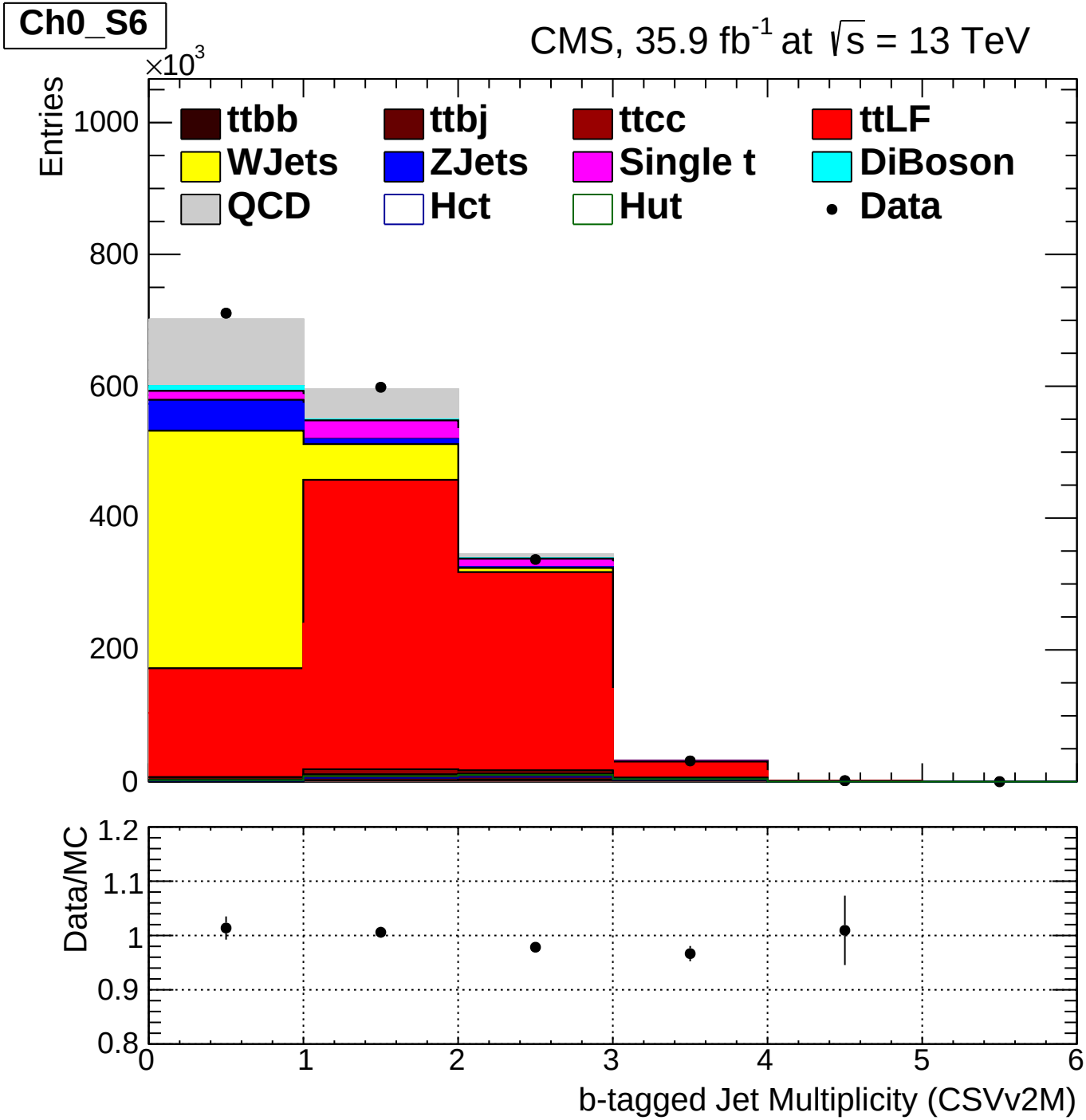

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

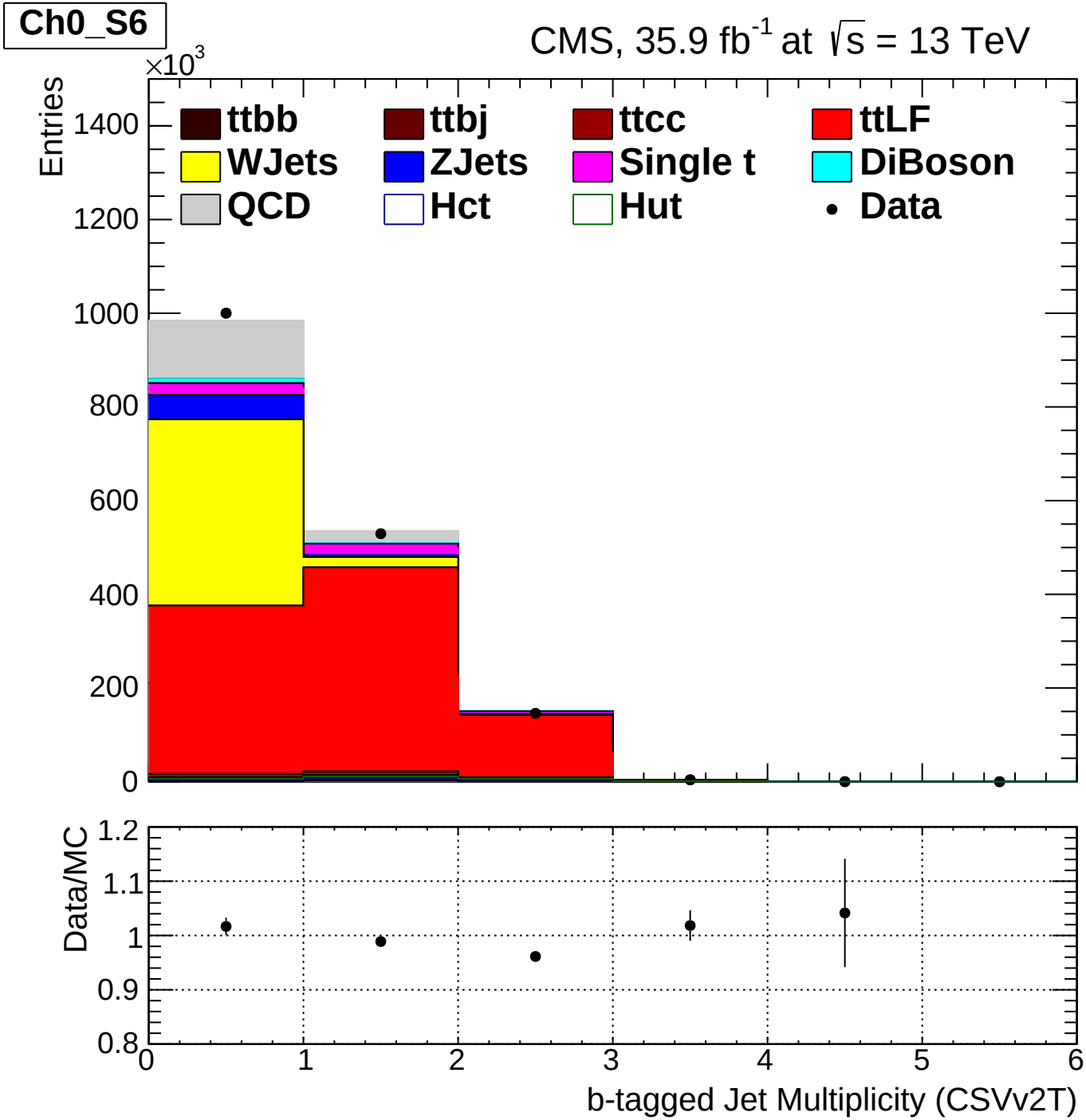

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

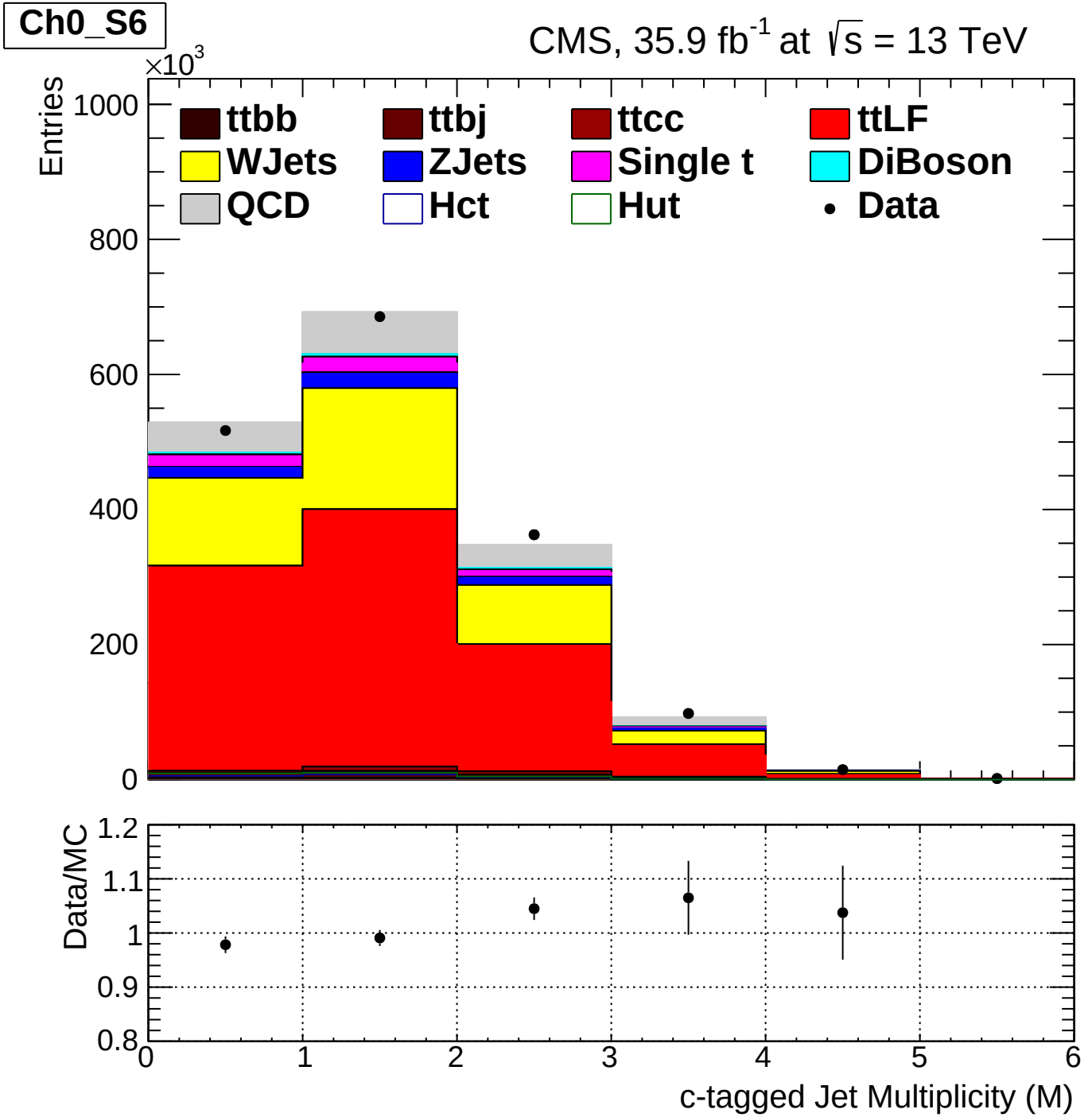

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

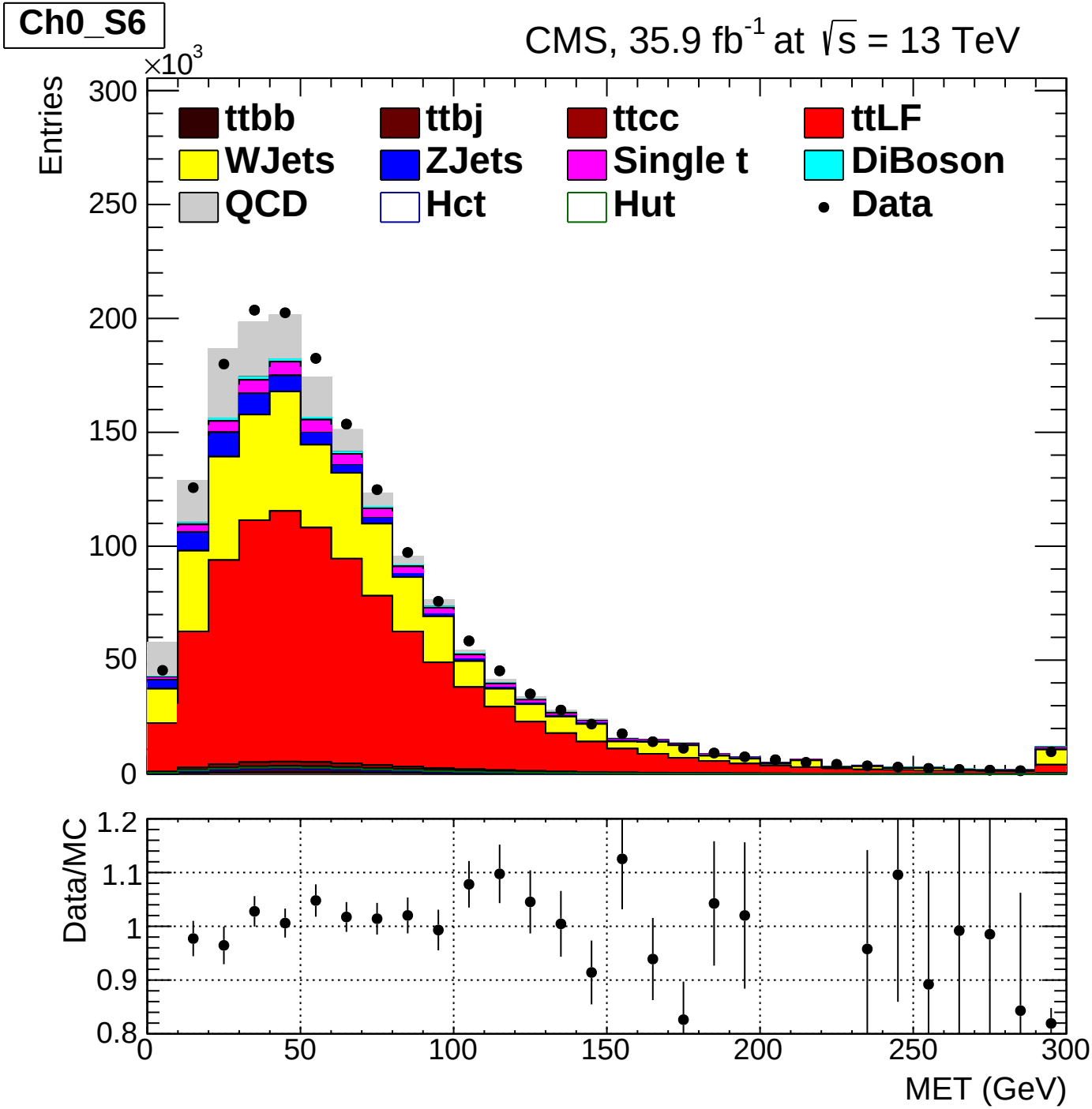

Ch0_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

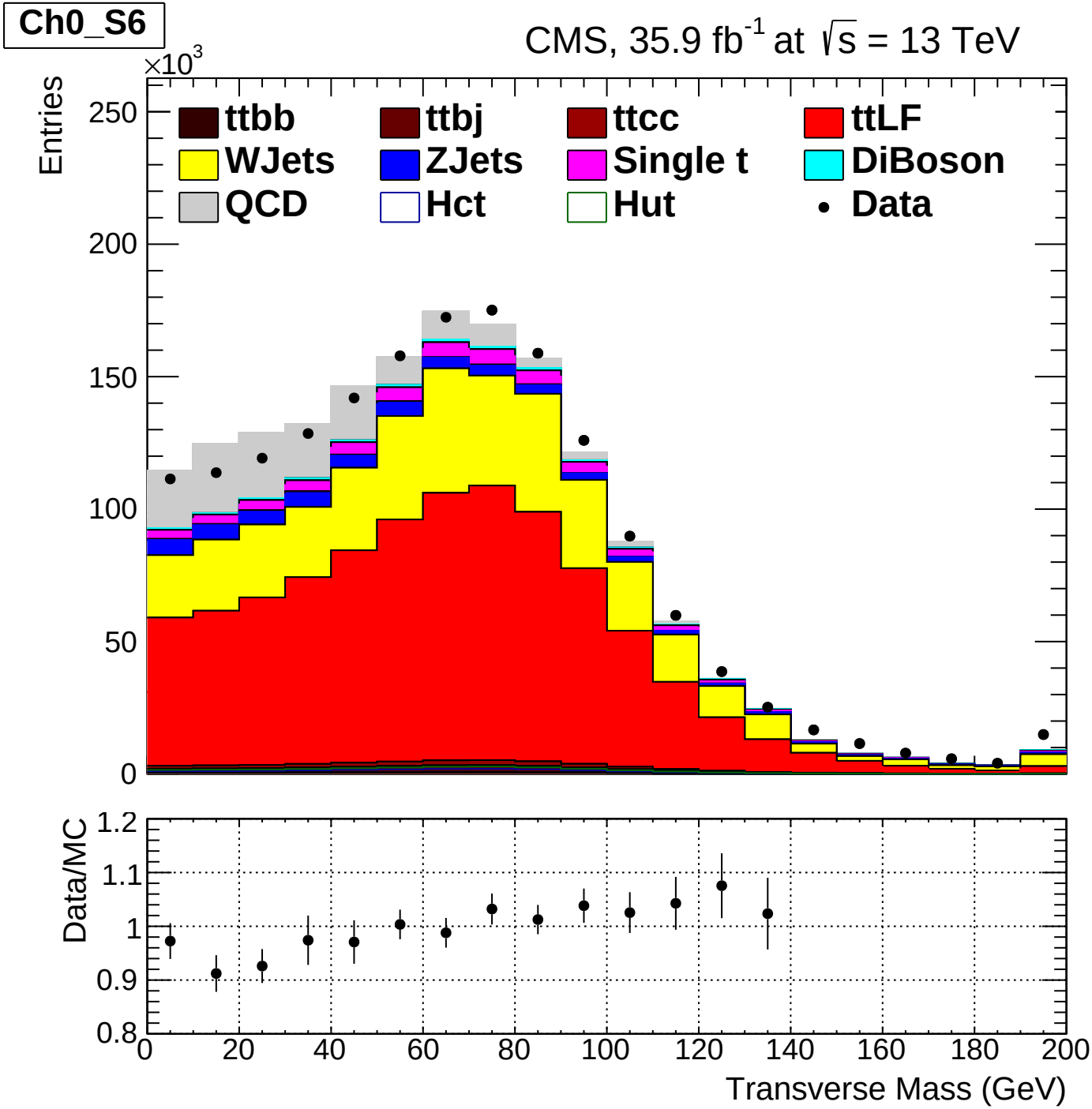

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

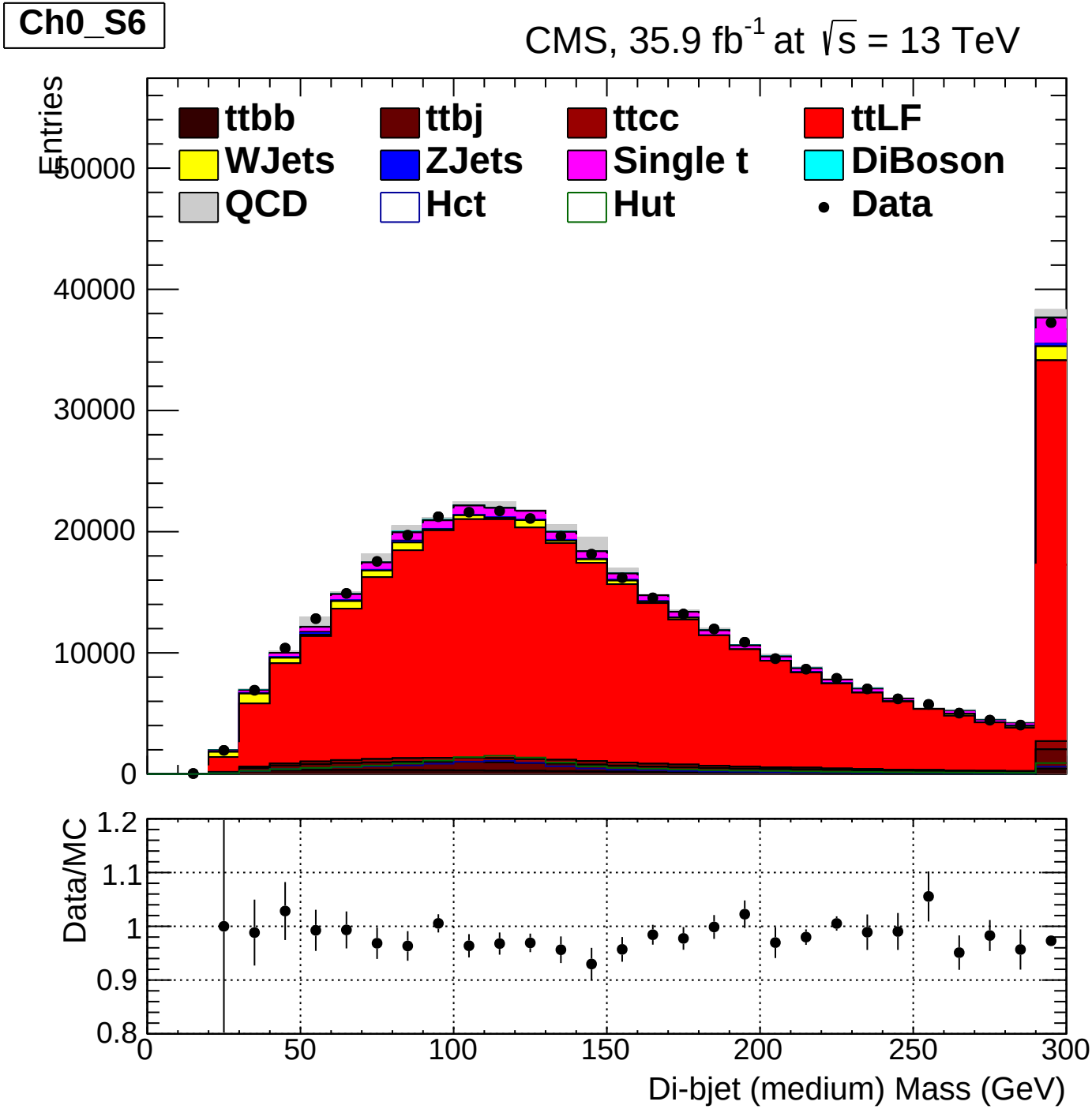

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

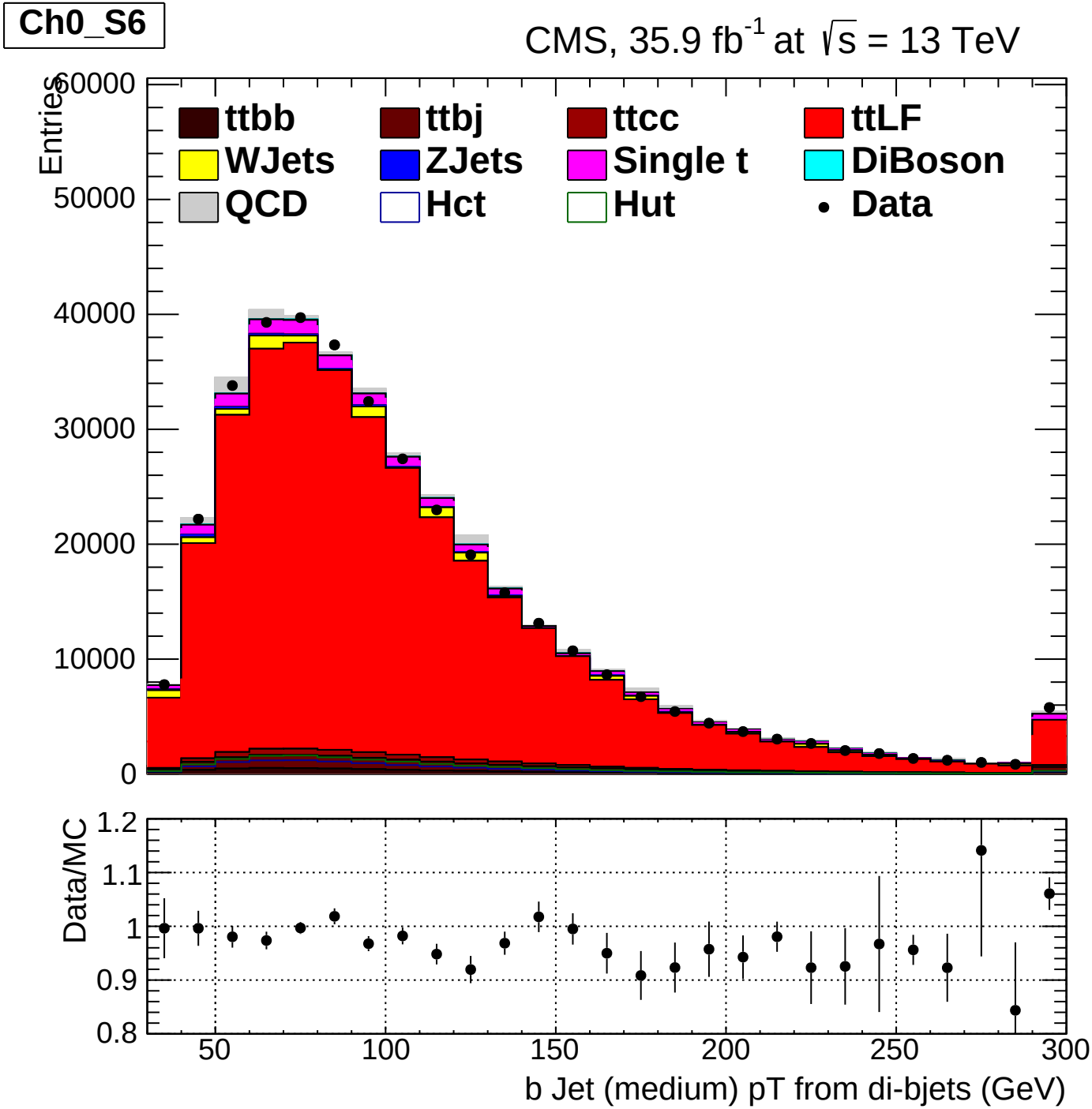

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

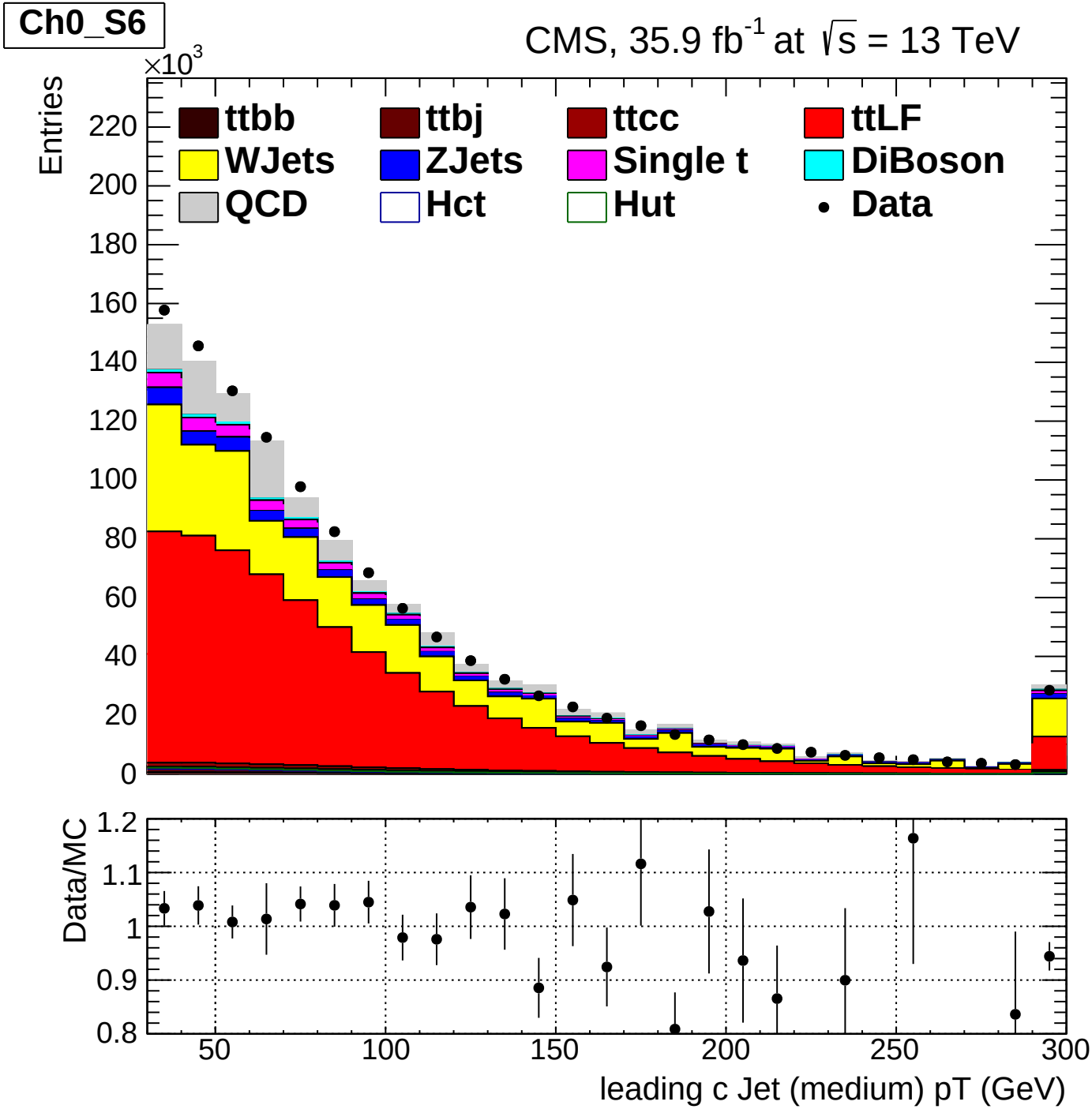

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

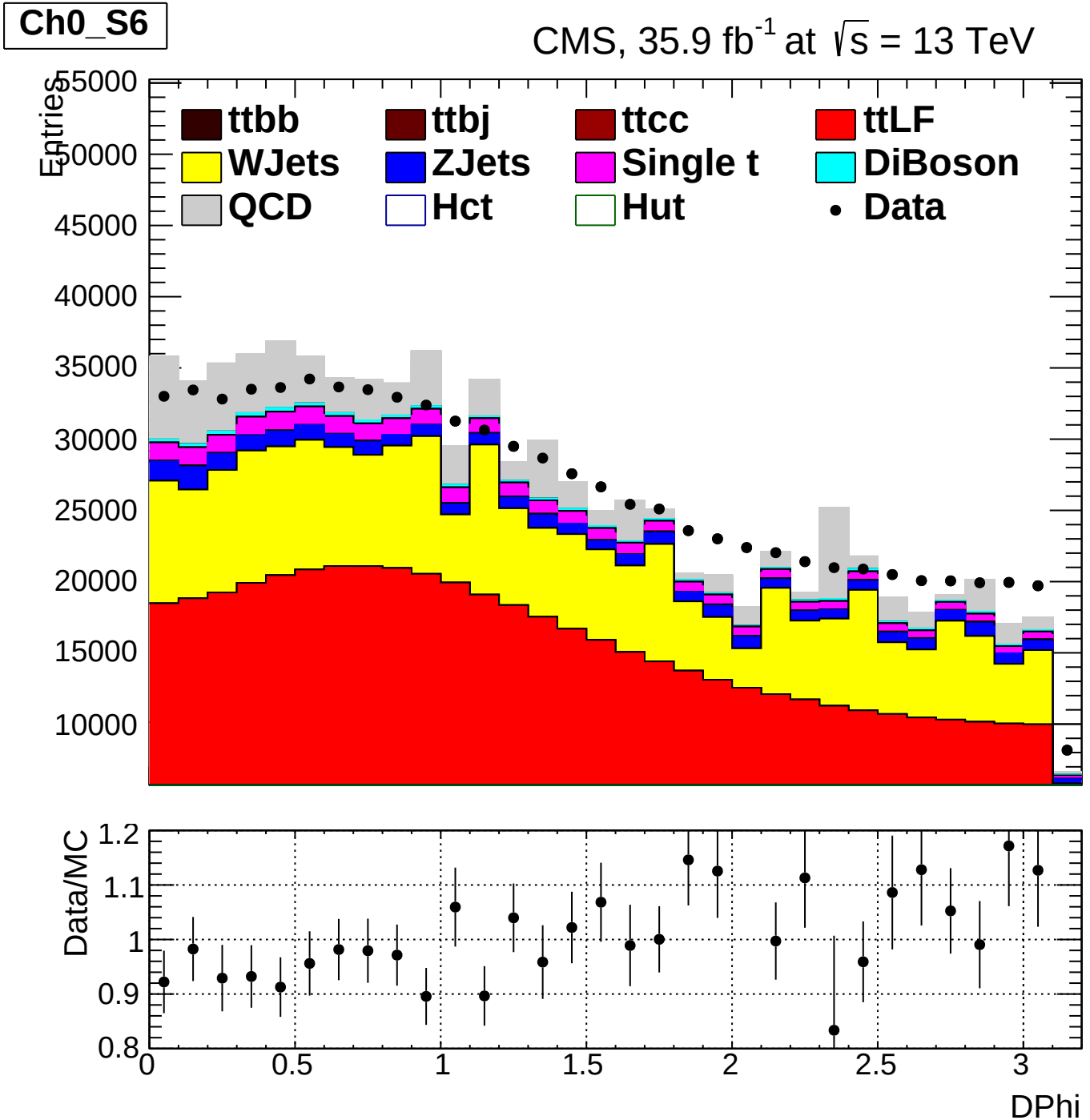

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

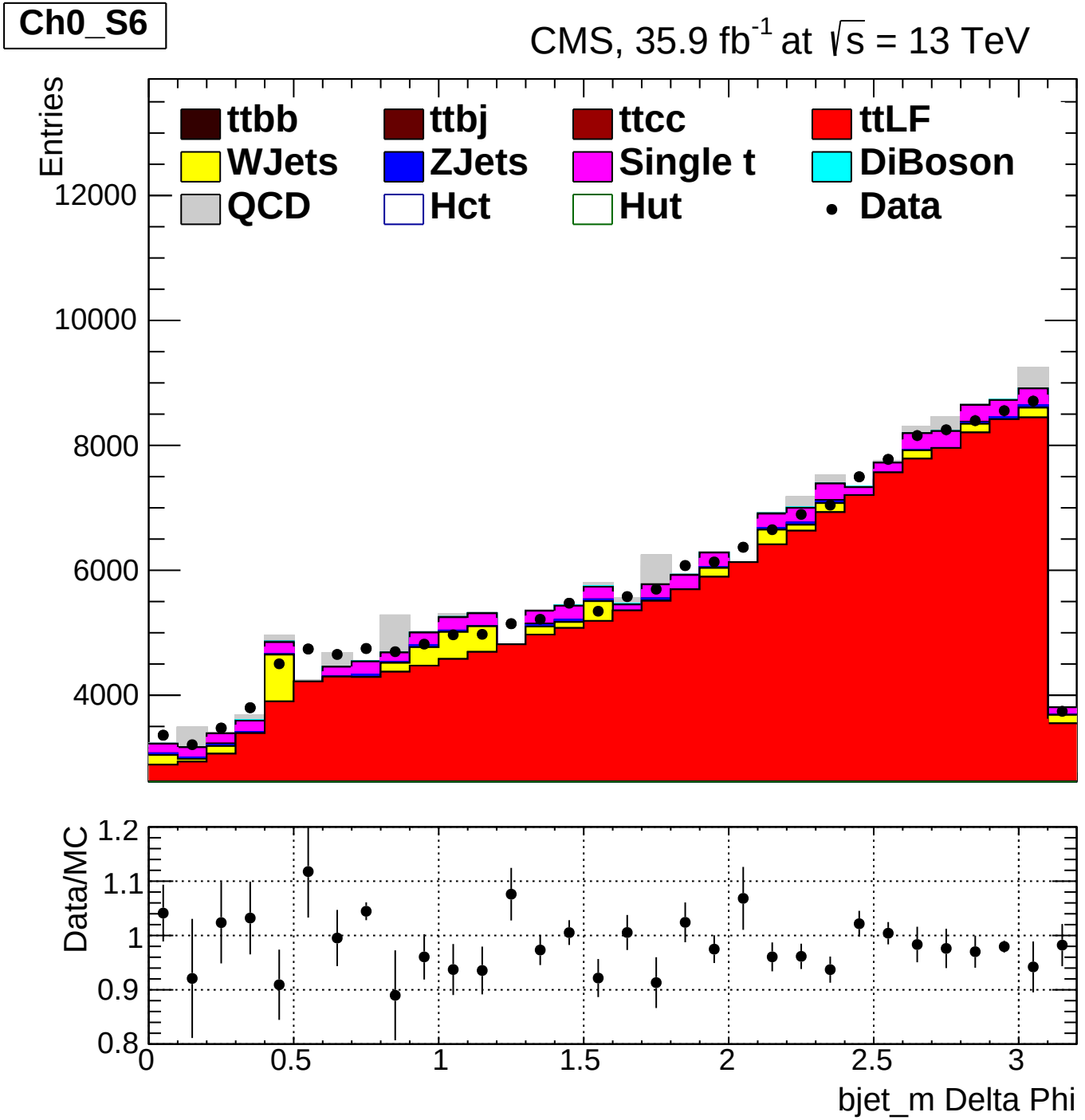

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

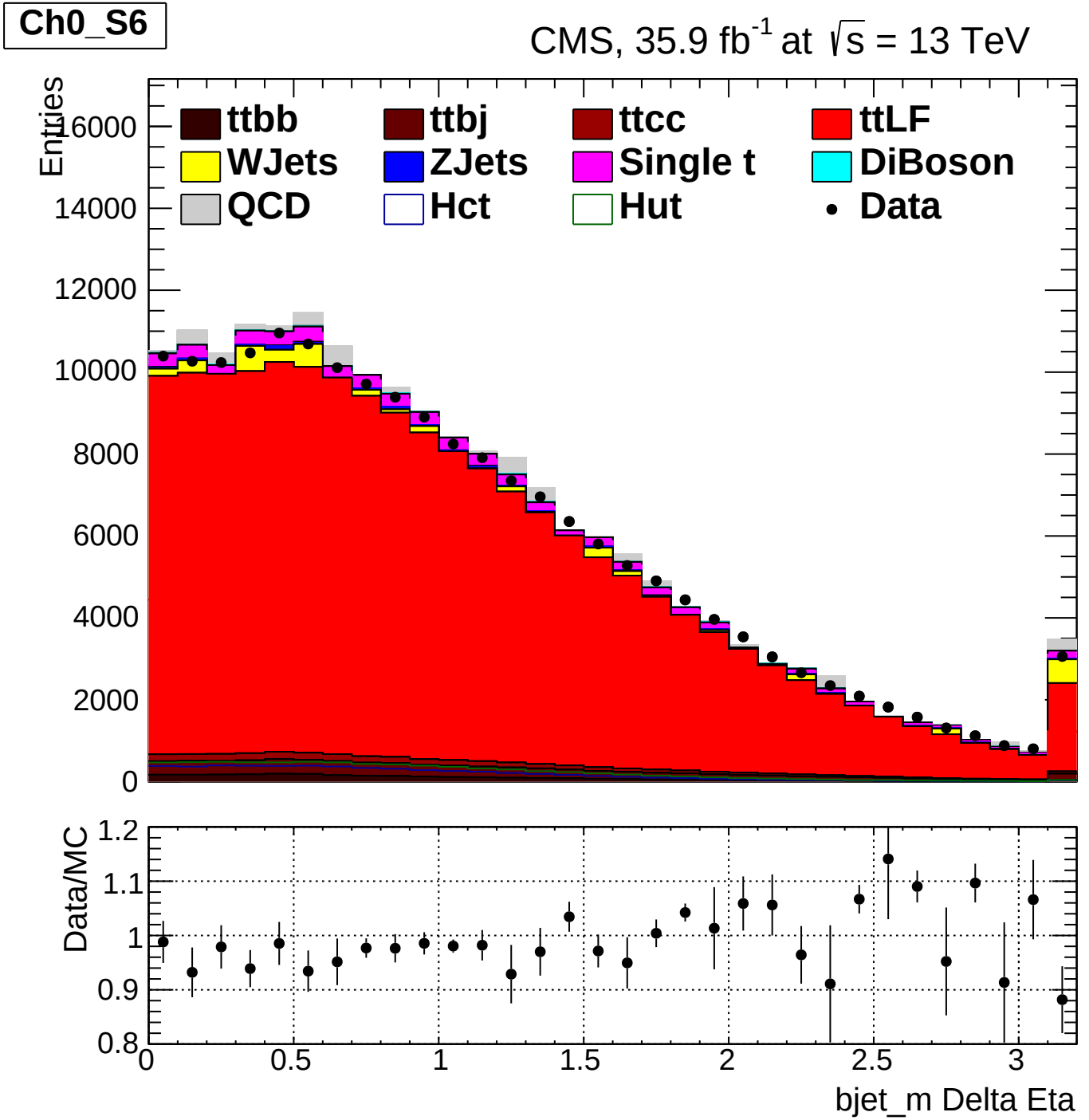

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)

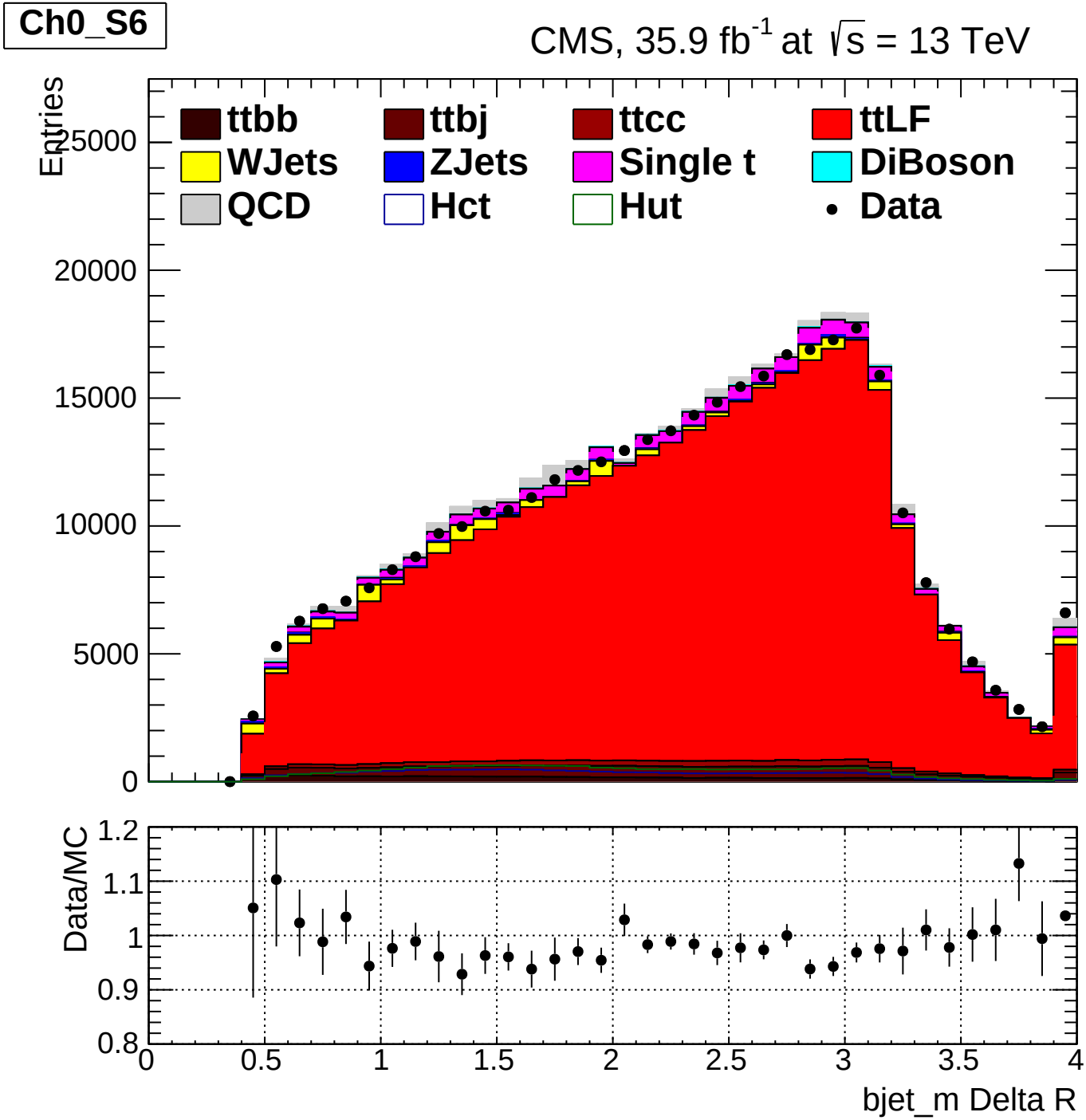

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

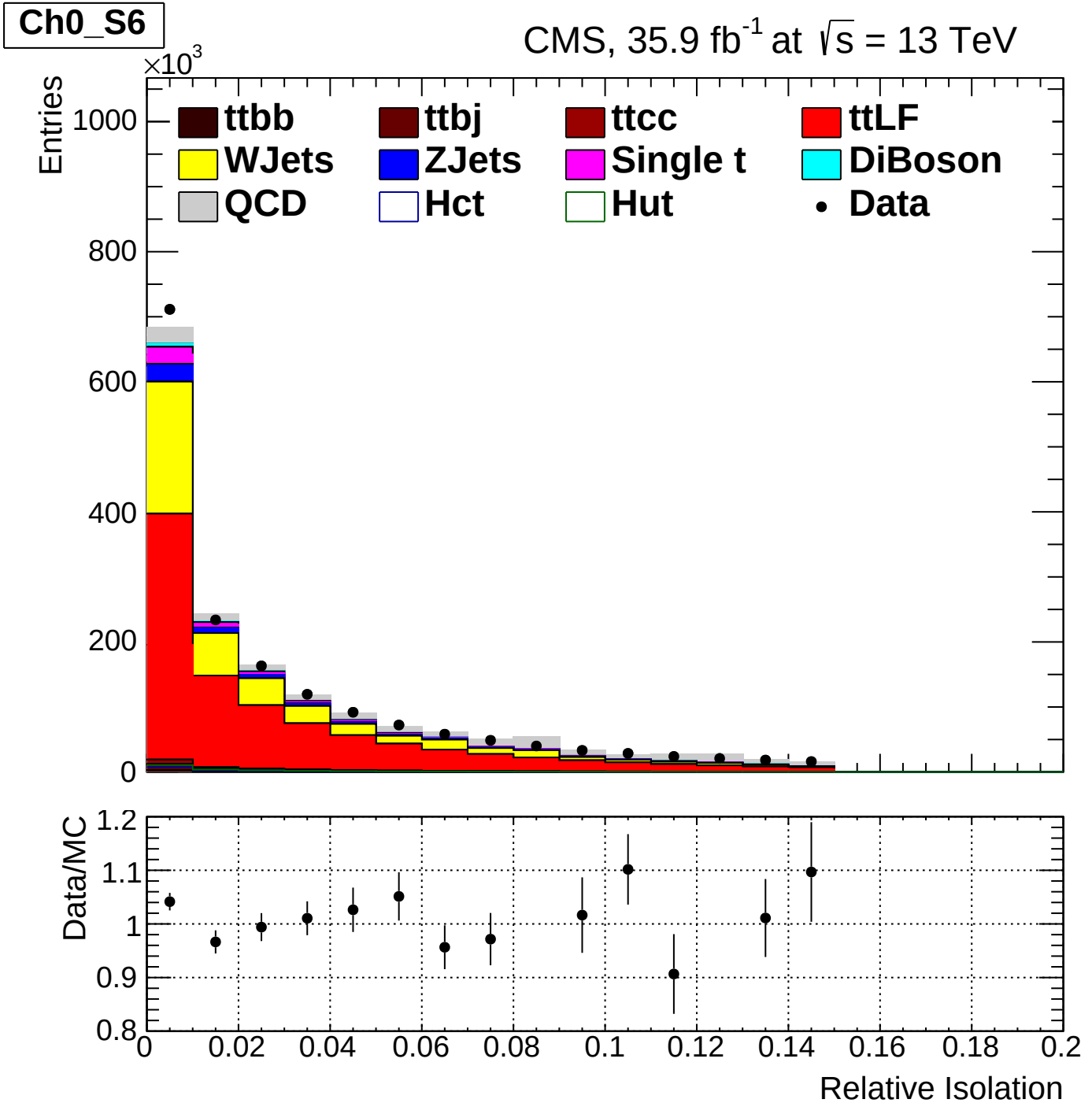

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

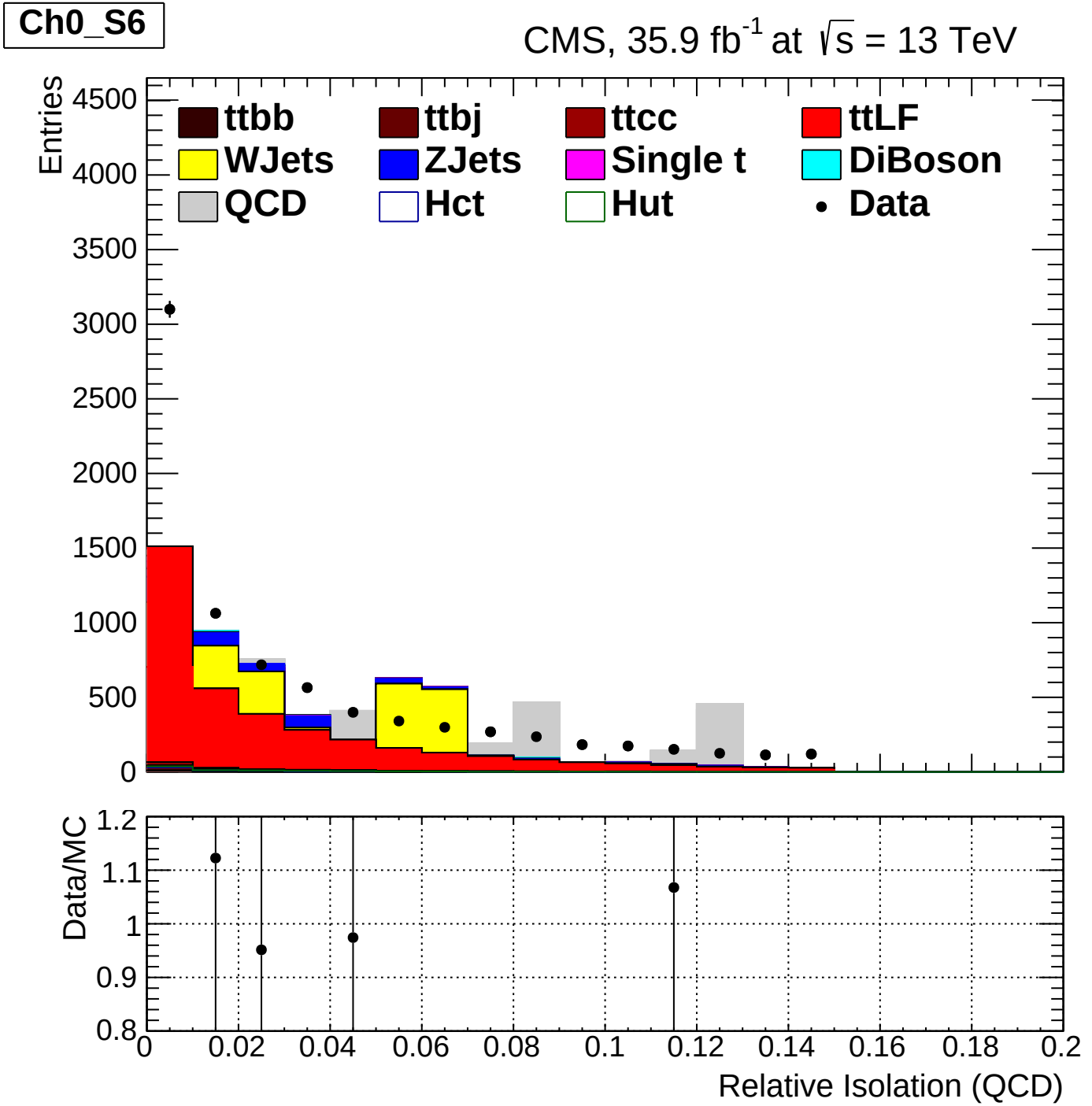

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

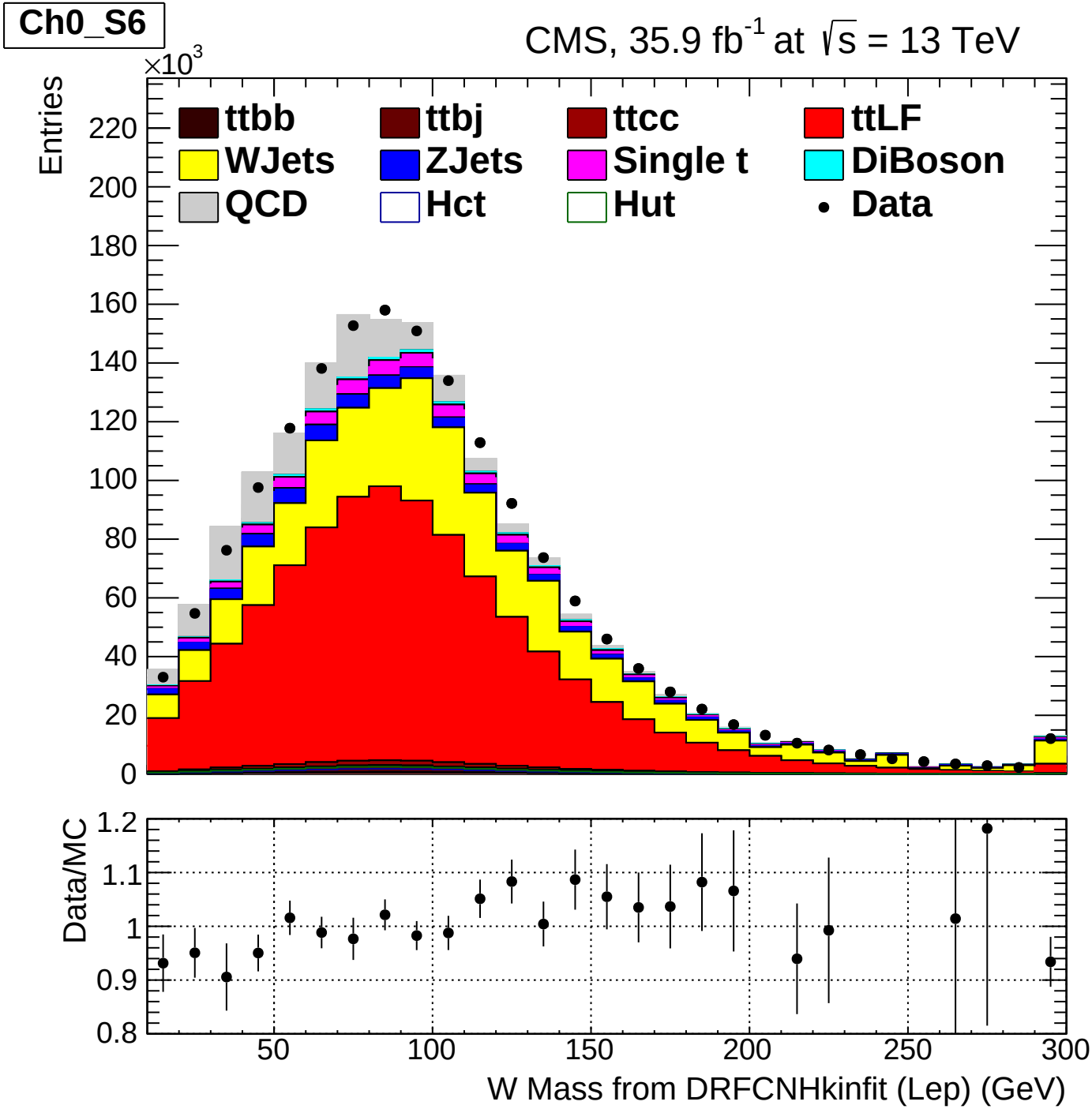

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

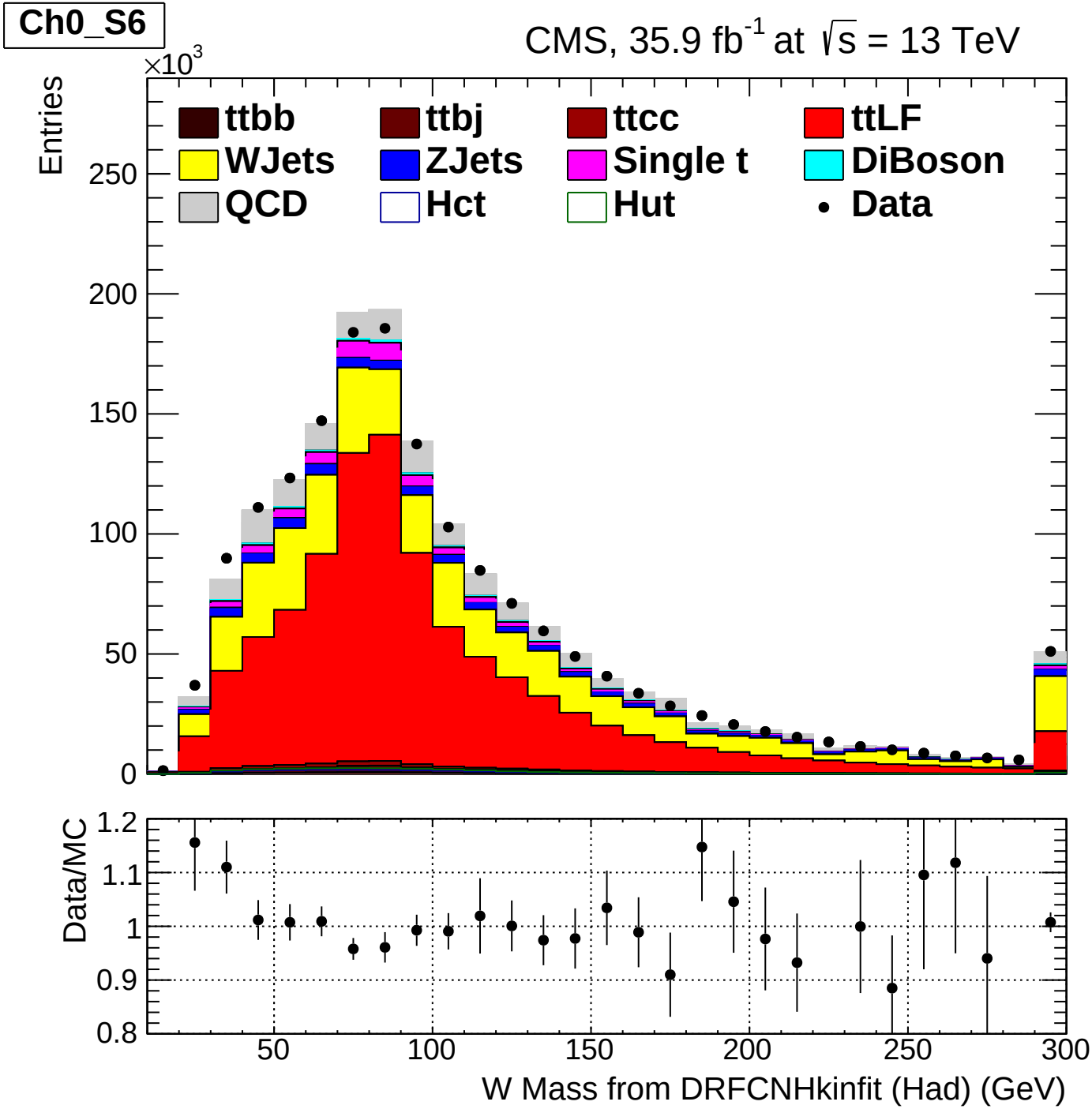

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

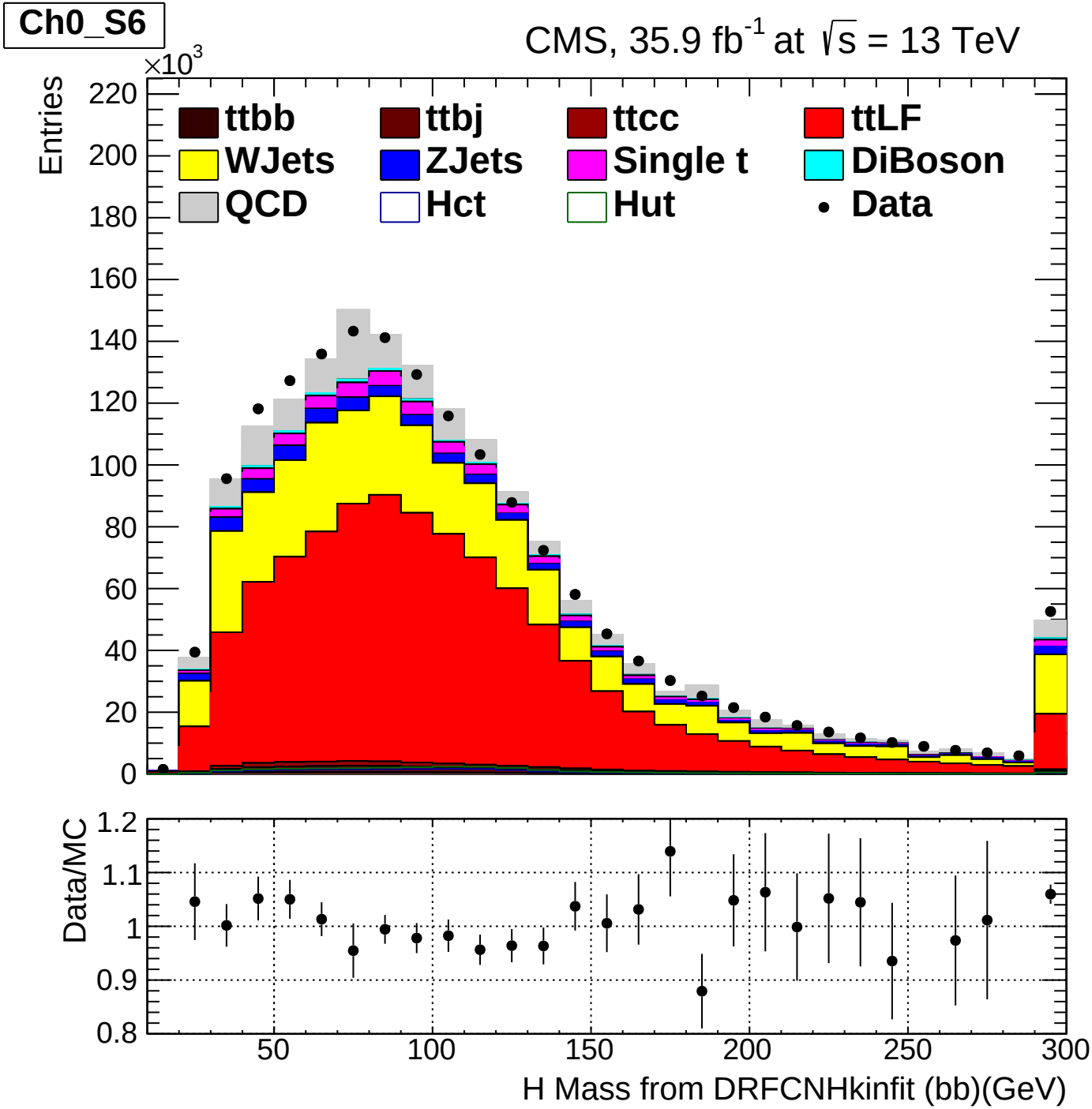

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R

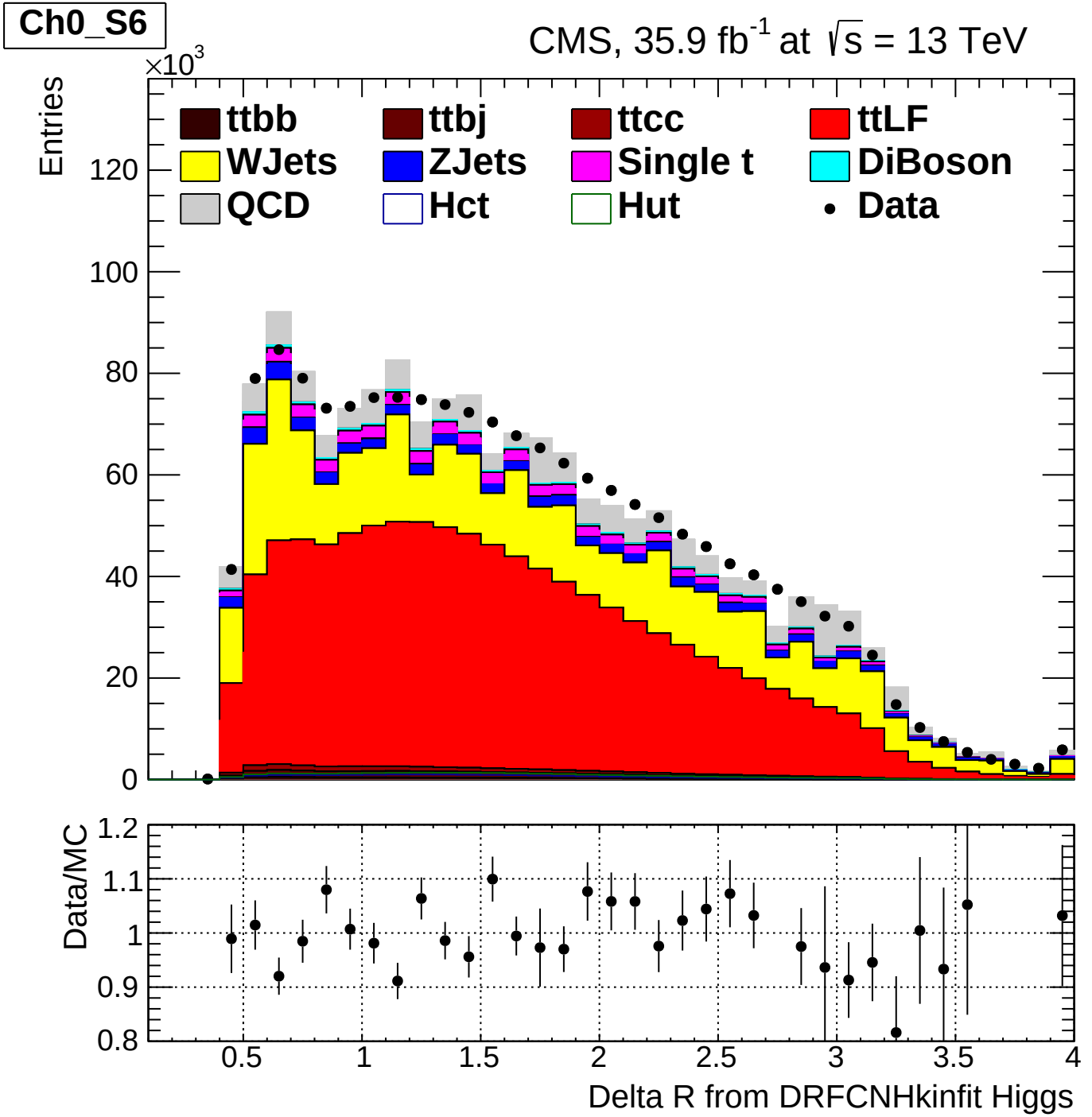

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

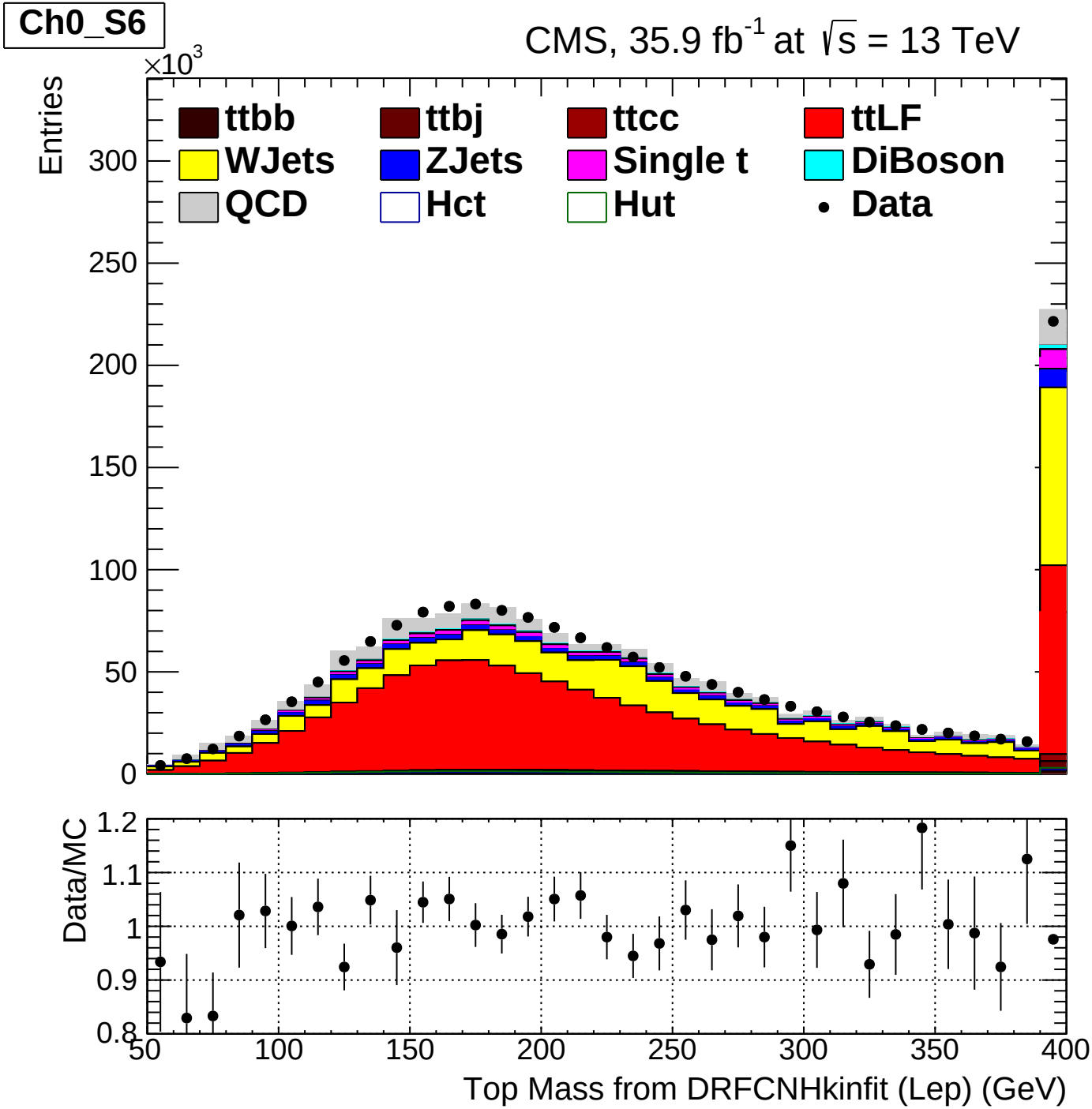

Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
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ttcc
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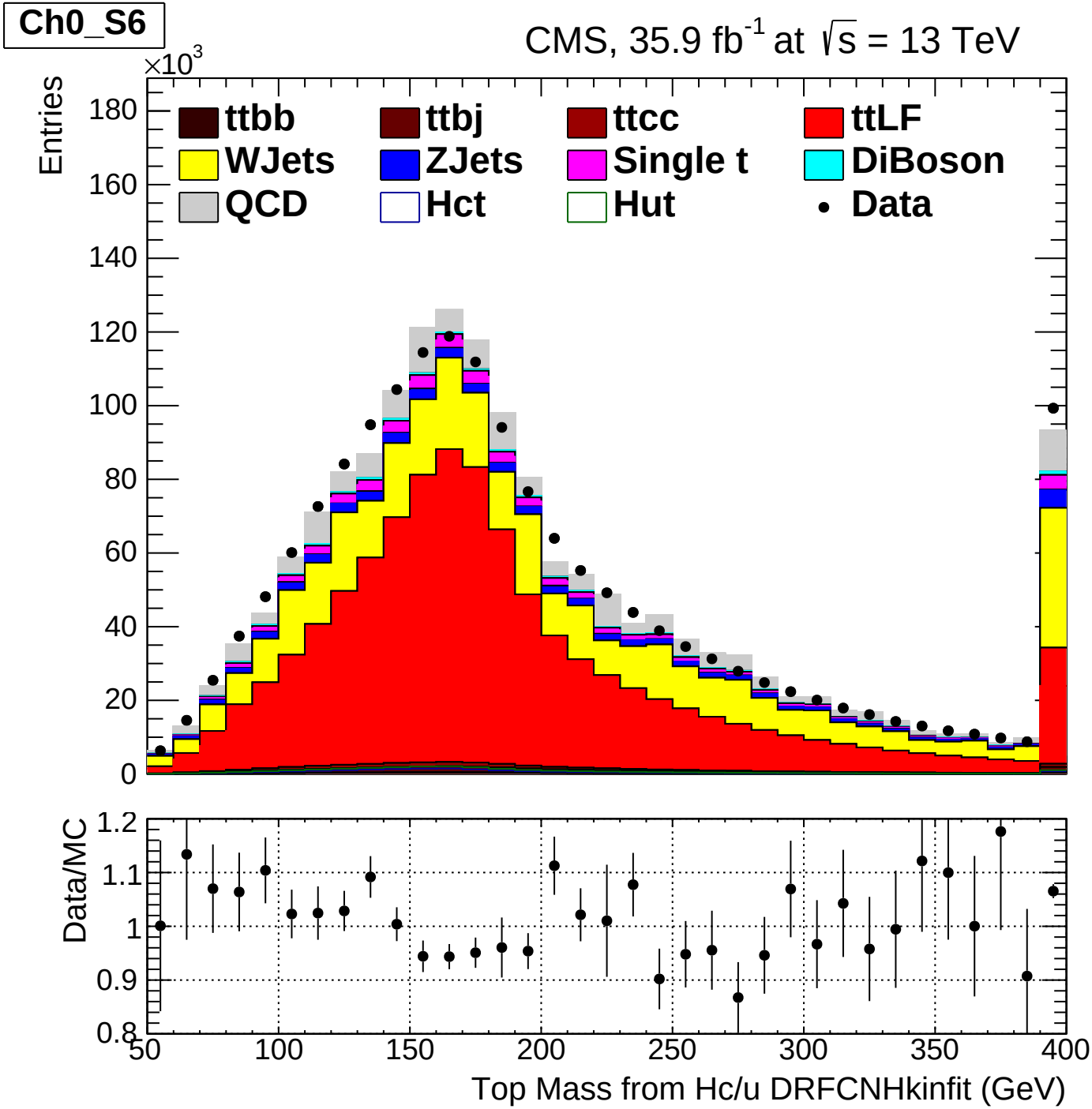
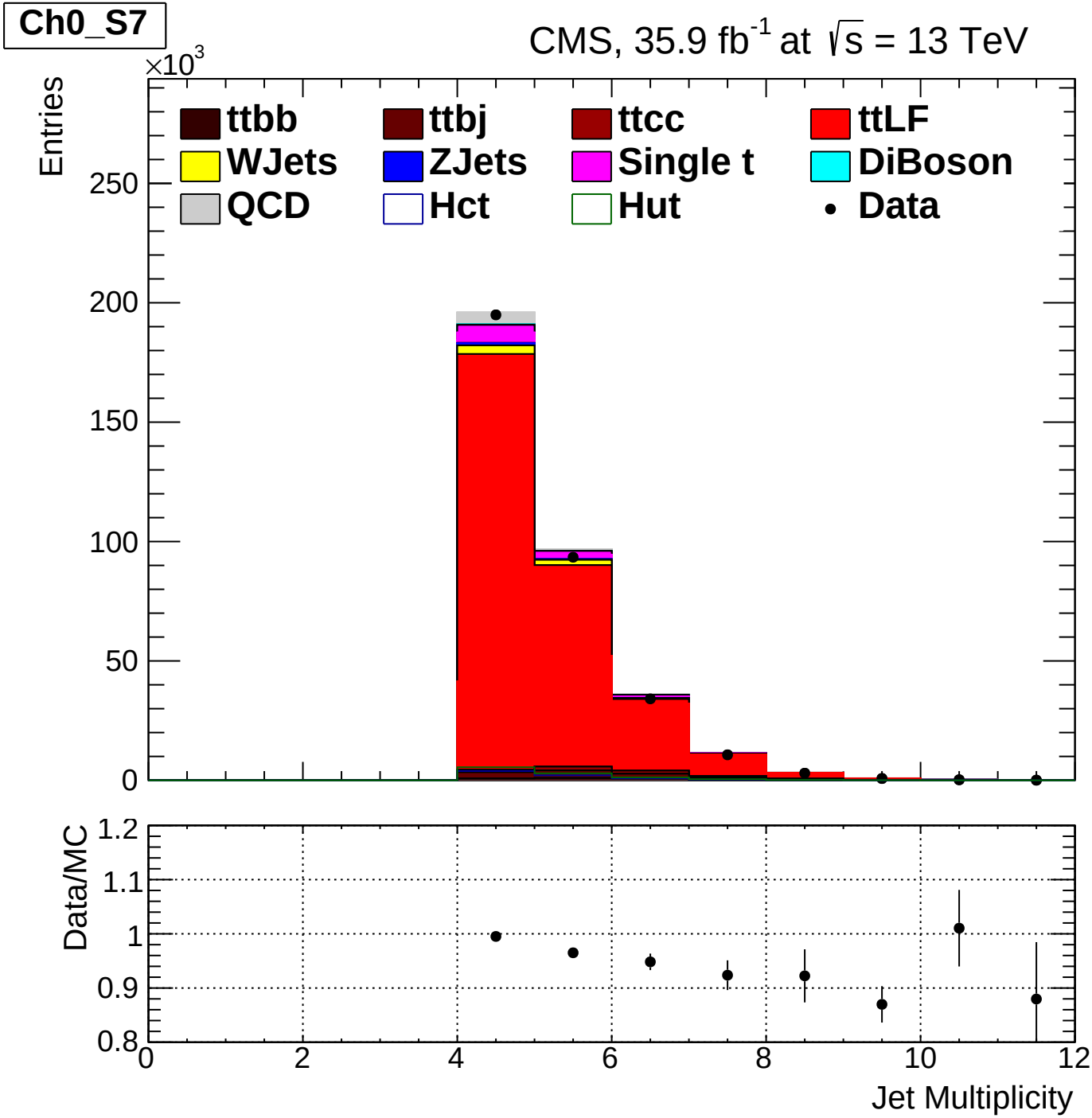
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
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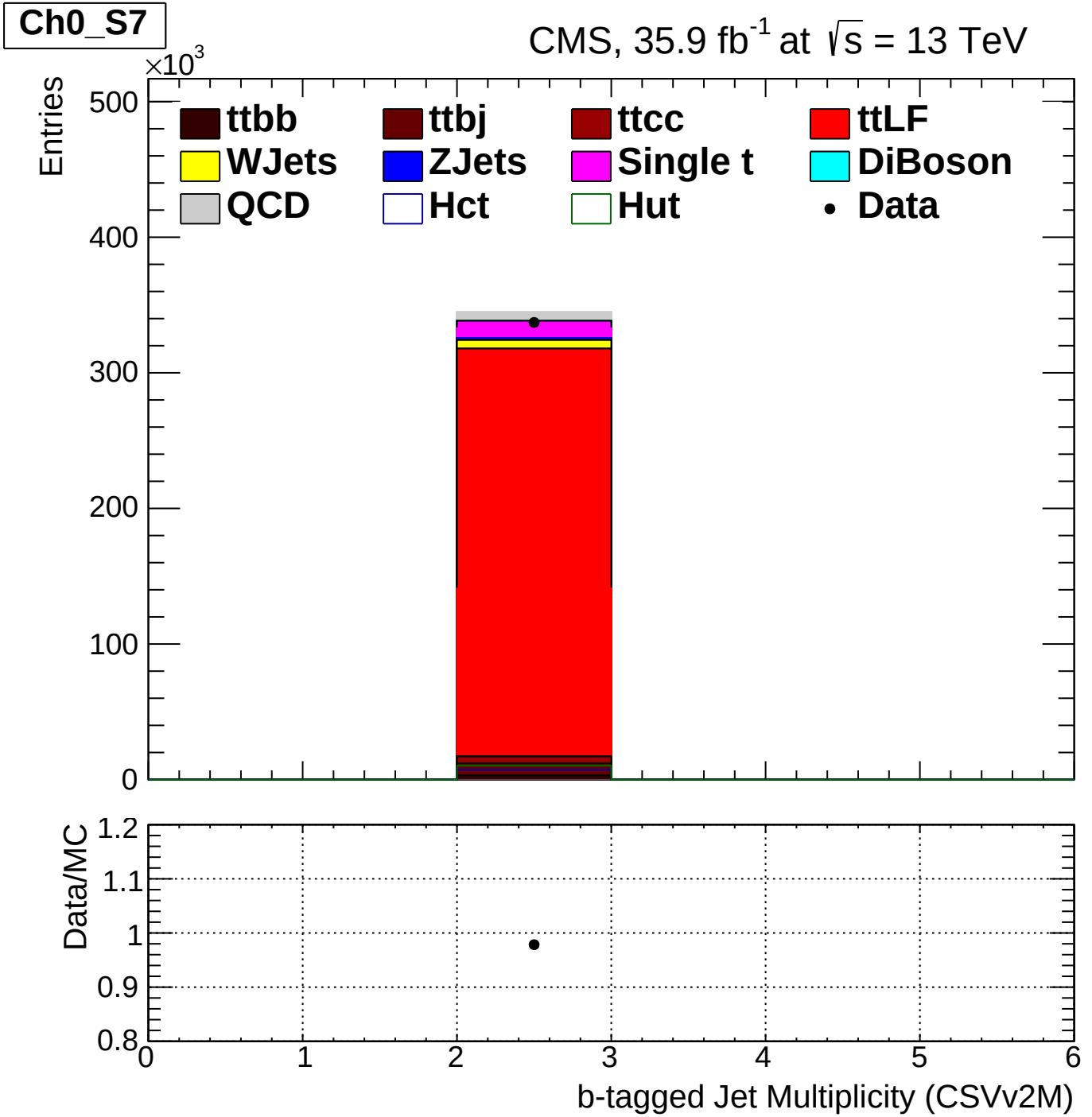
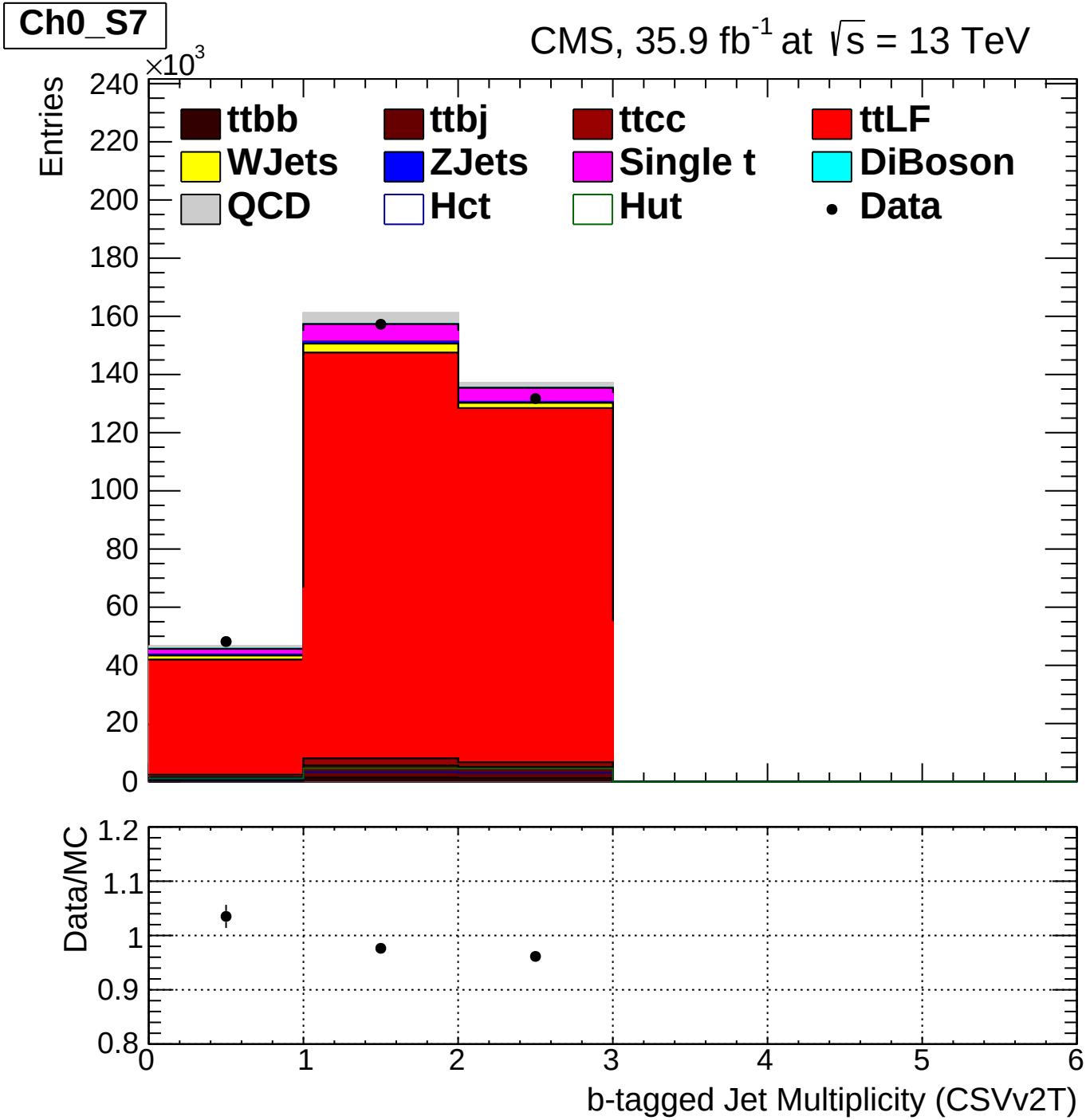
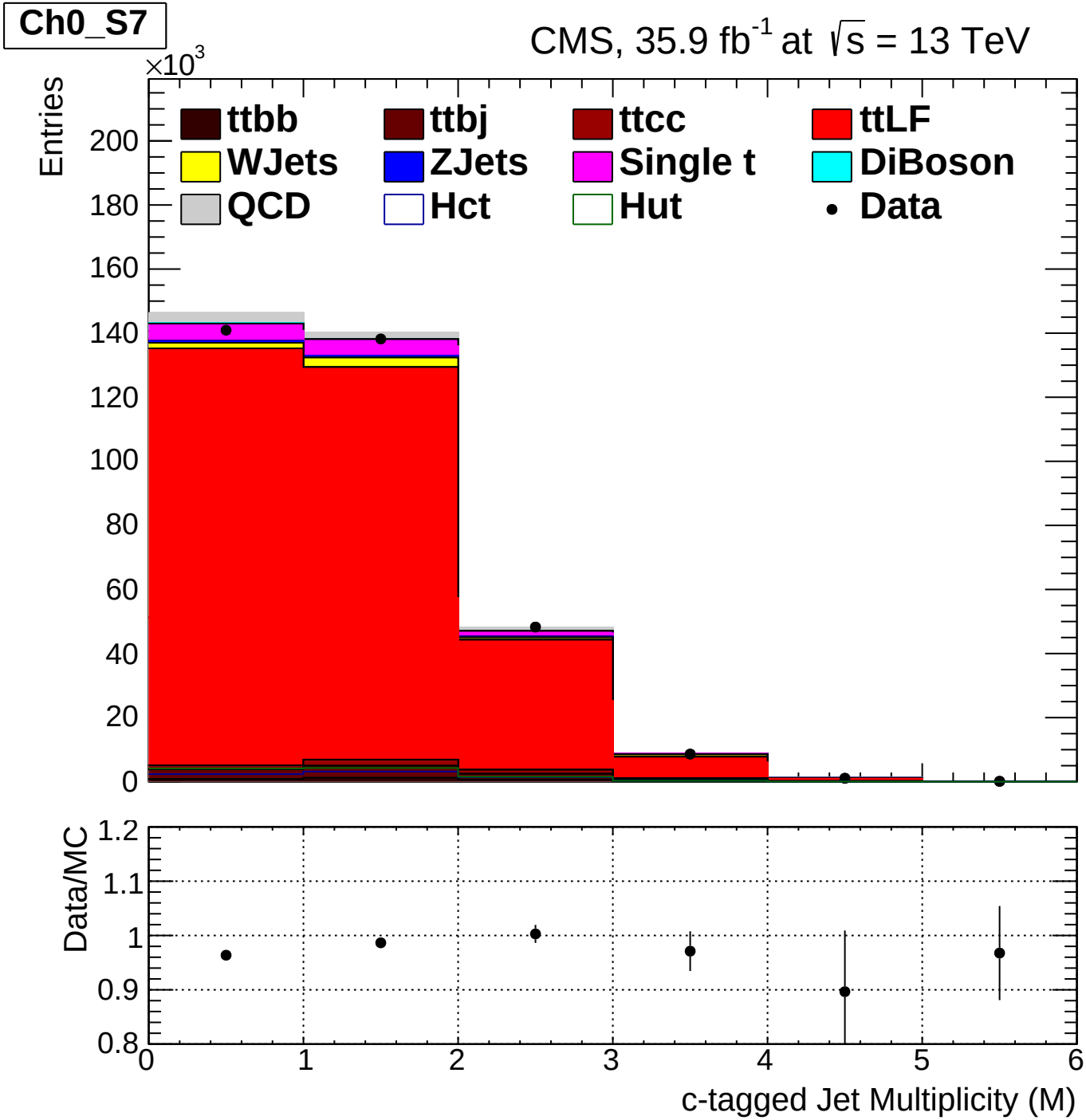
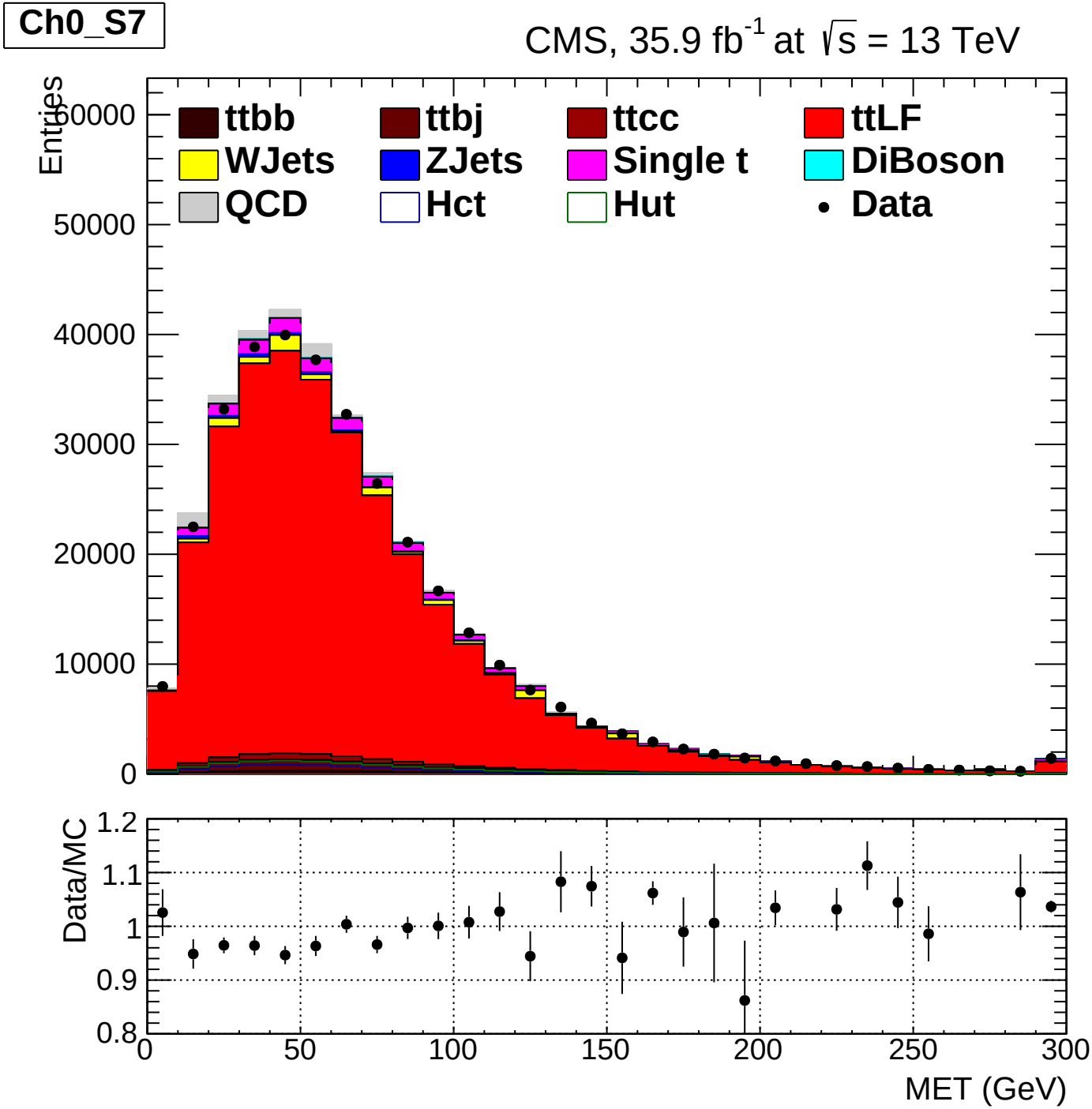
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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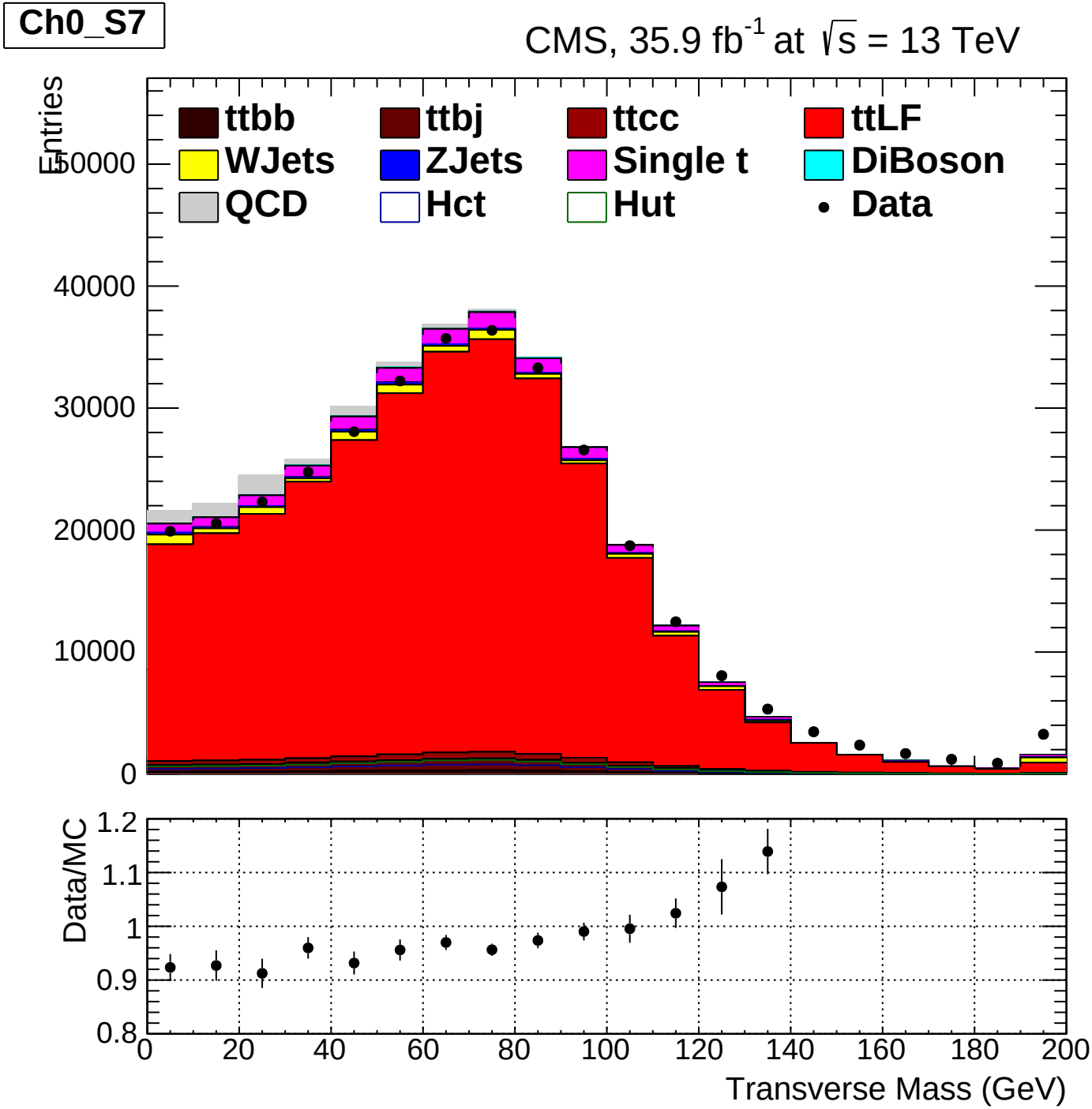
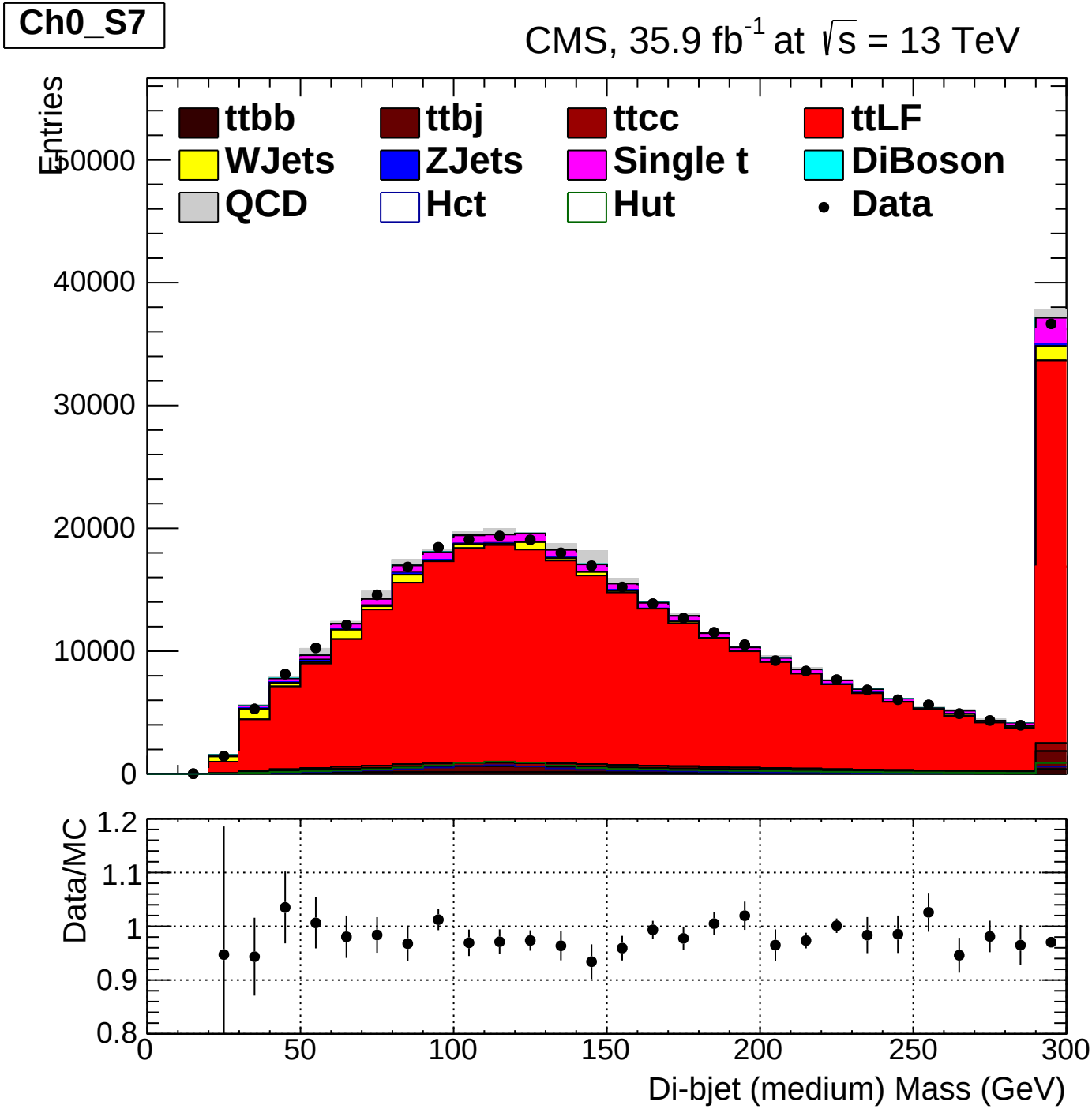
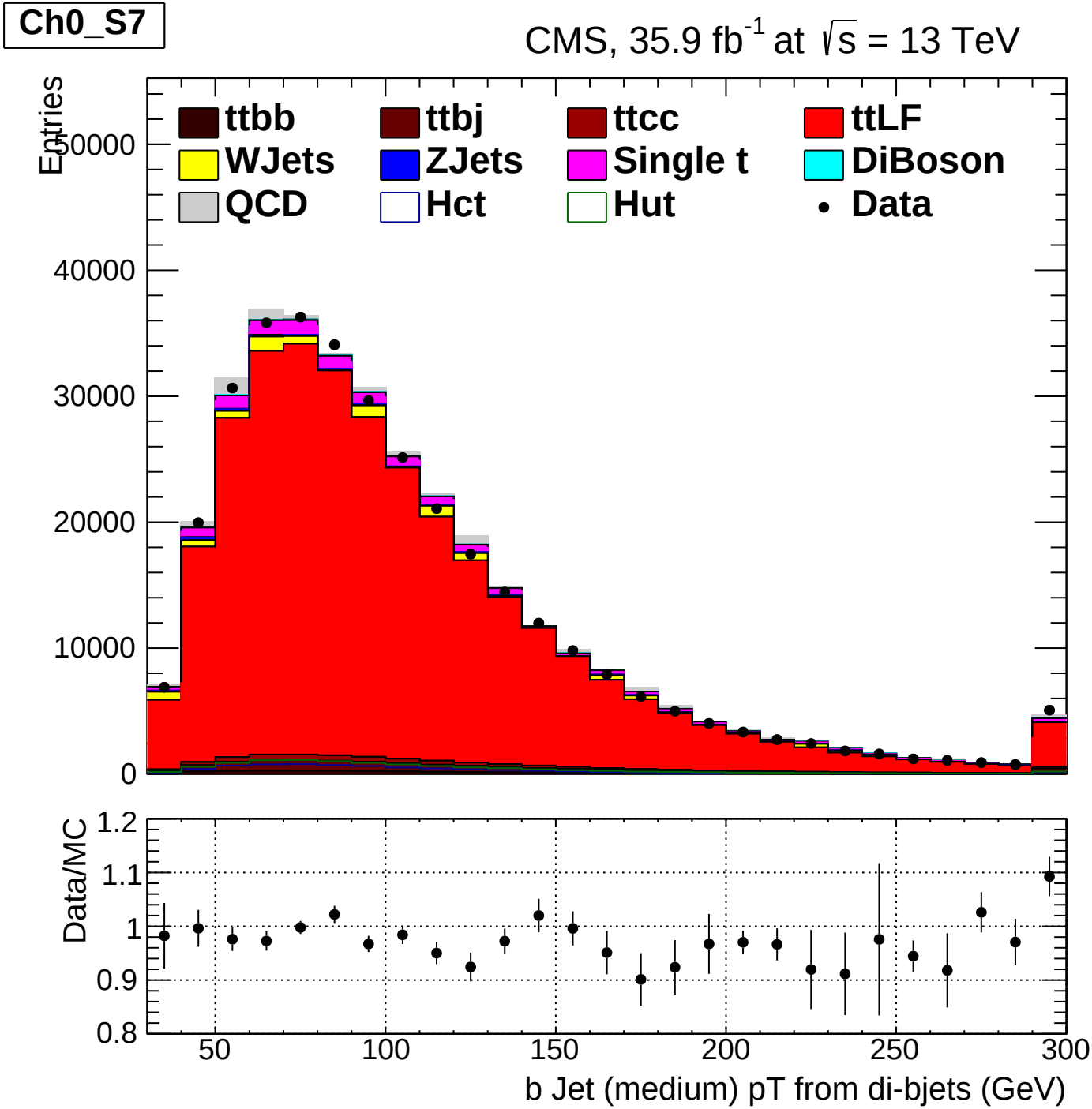
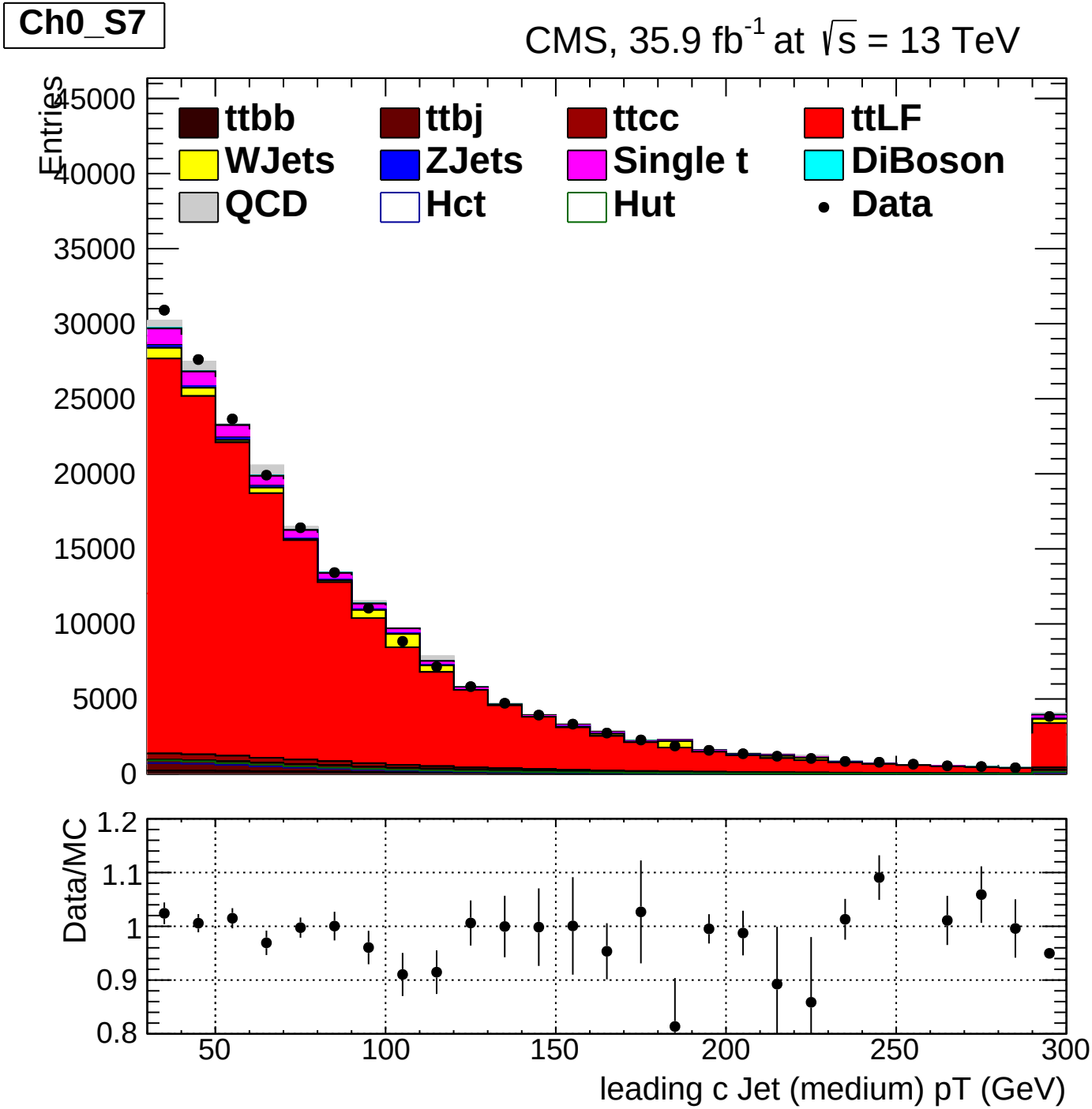
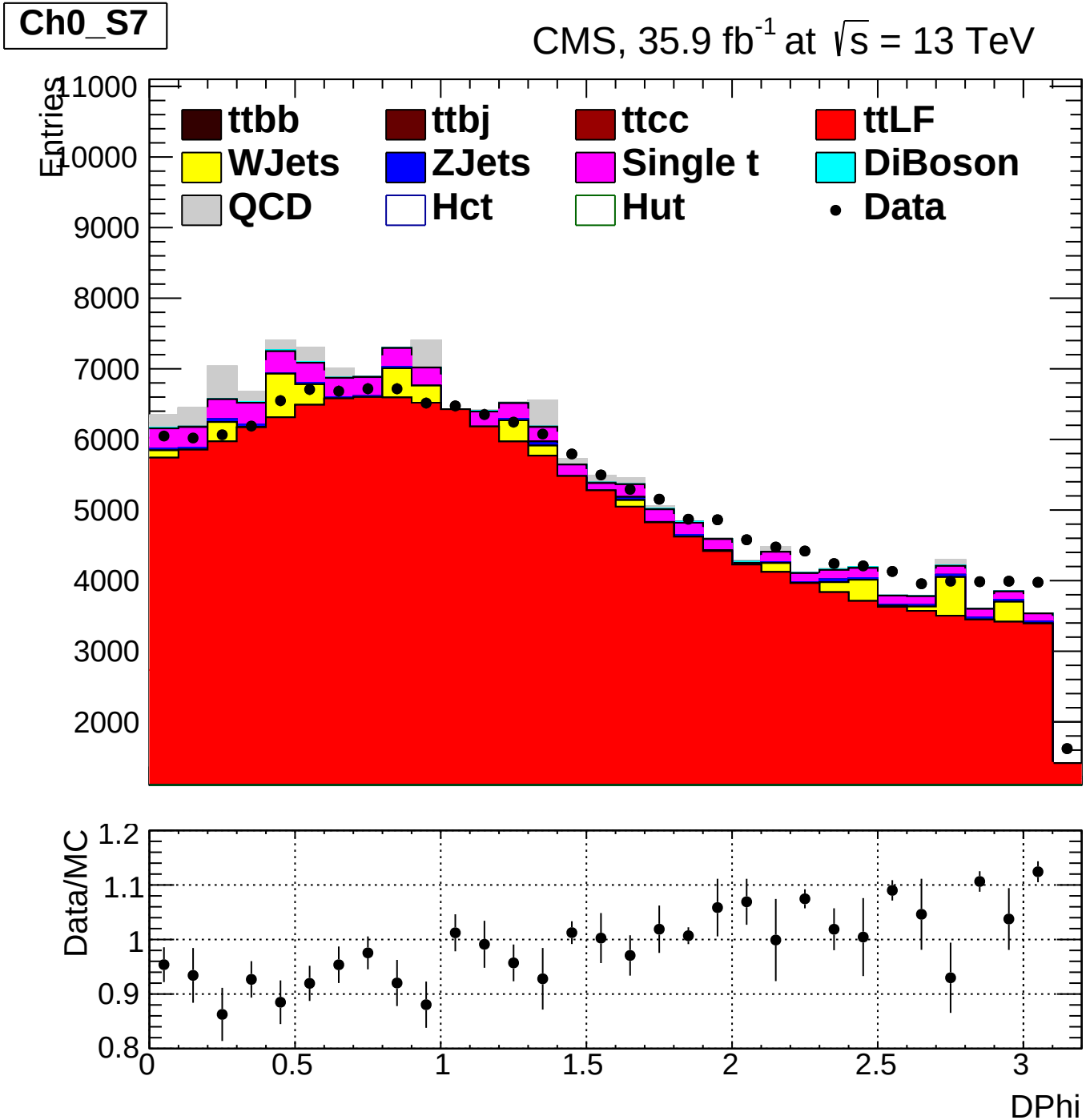
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

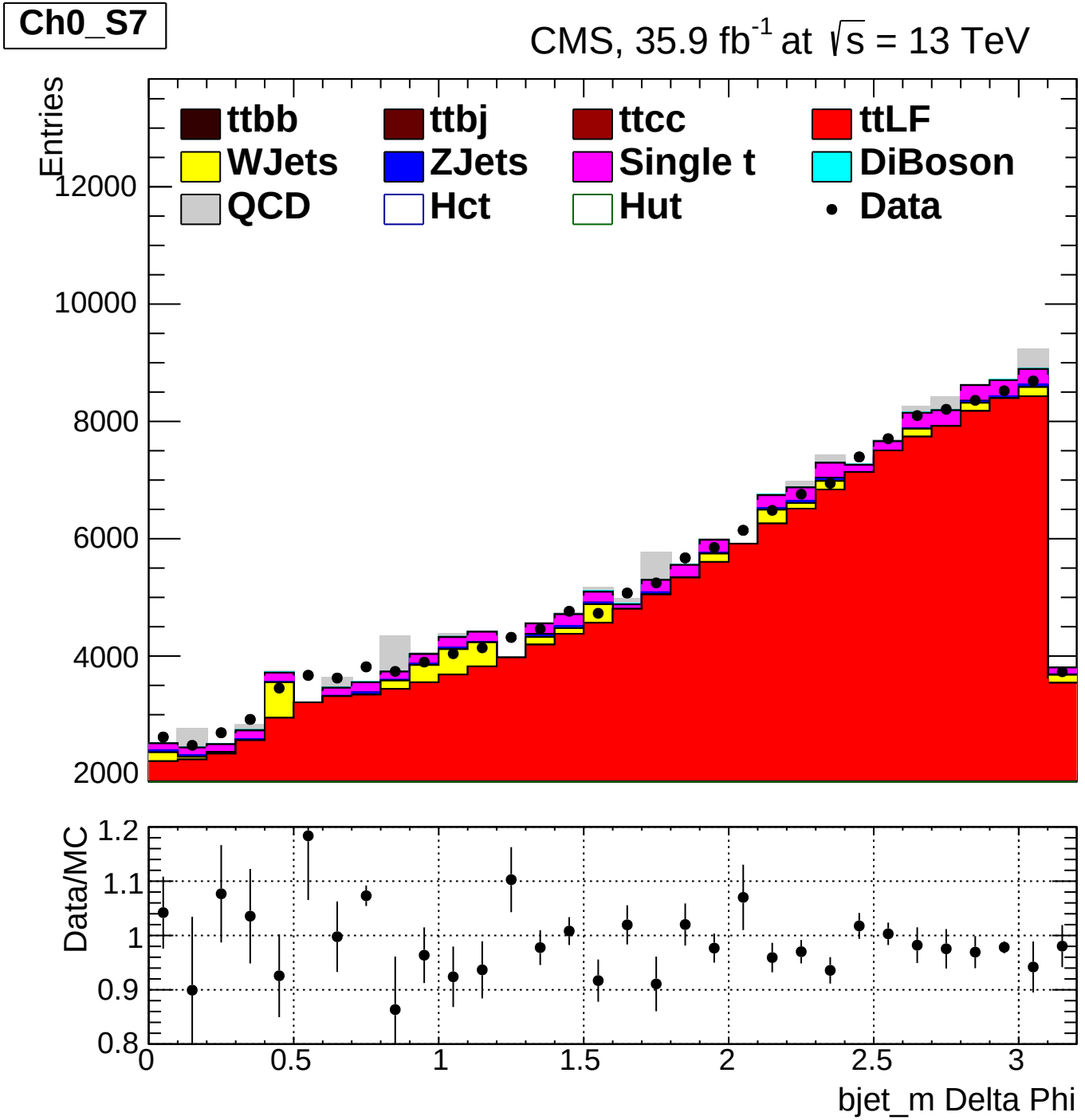

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
20
40
60
80
100
120
140
160
180
200
Transverse Mass (GeV)

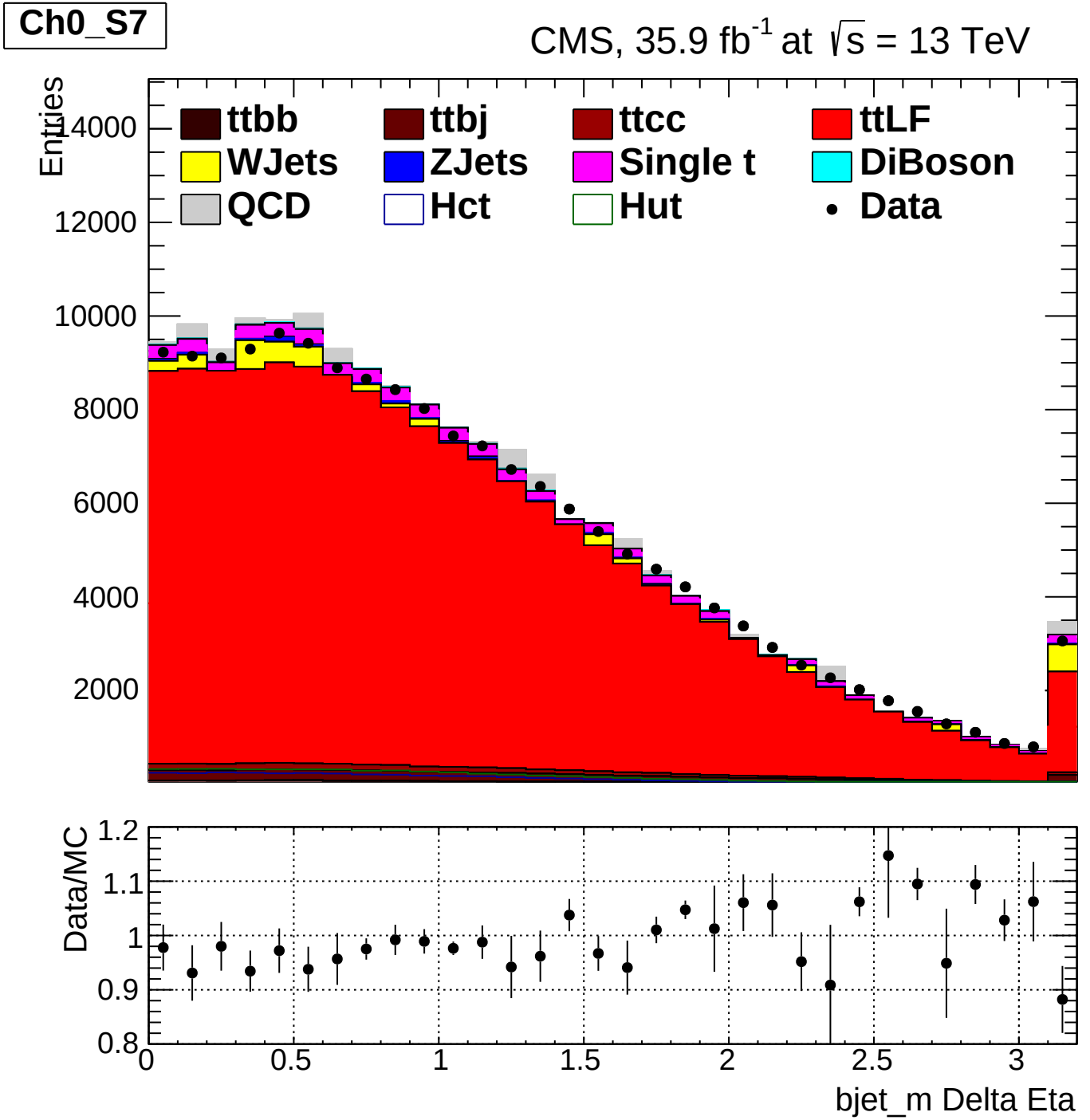

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)

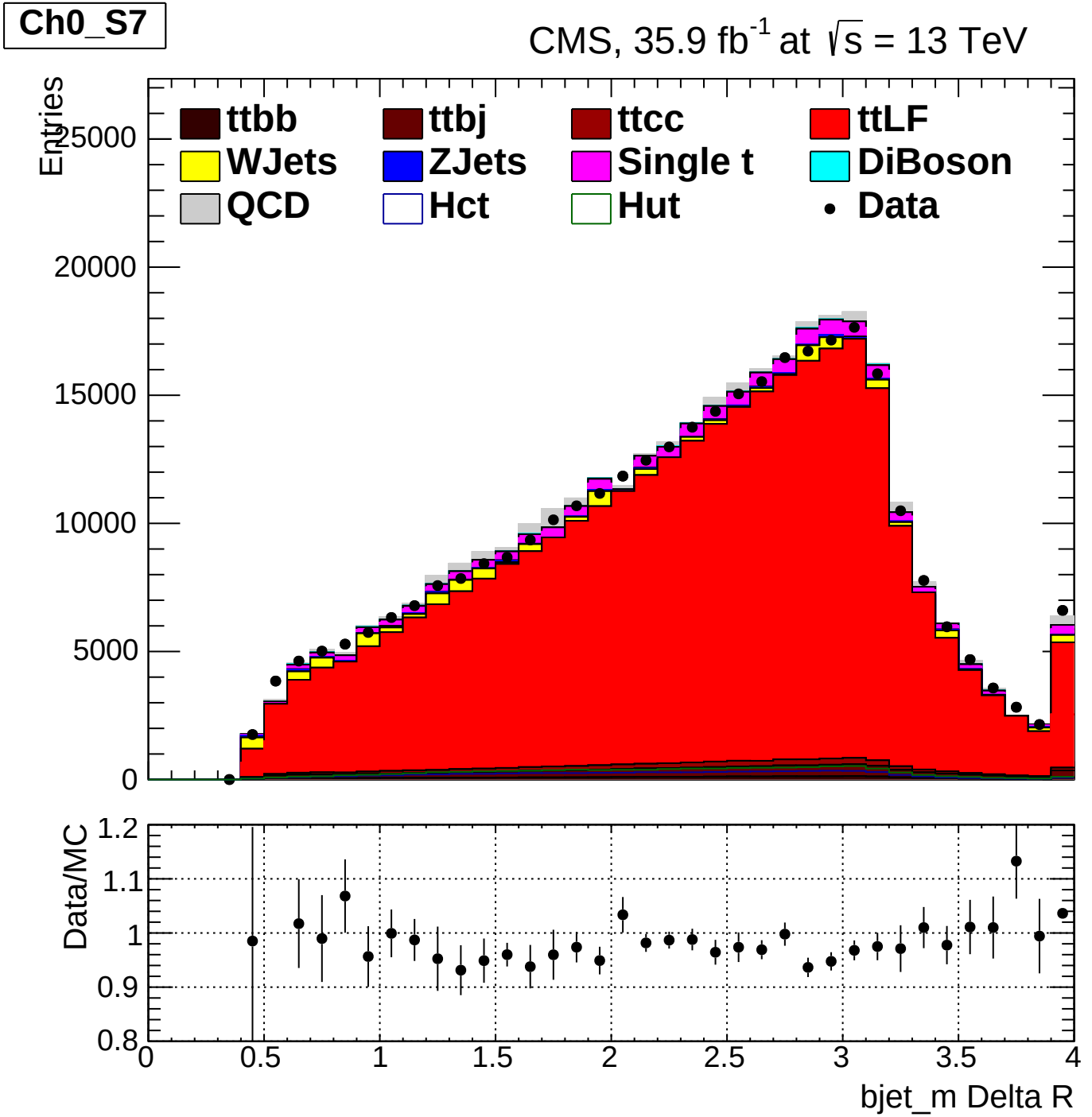

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)

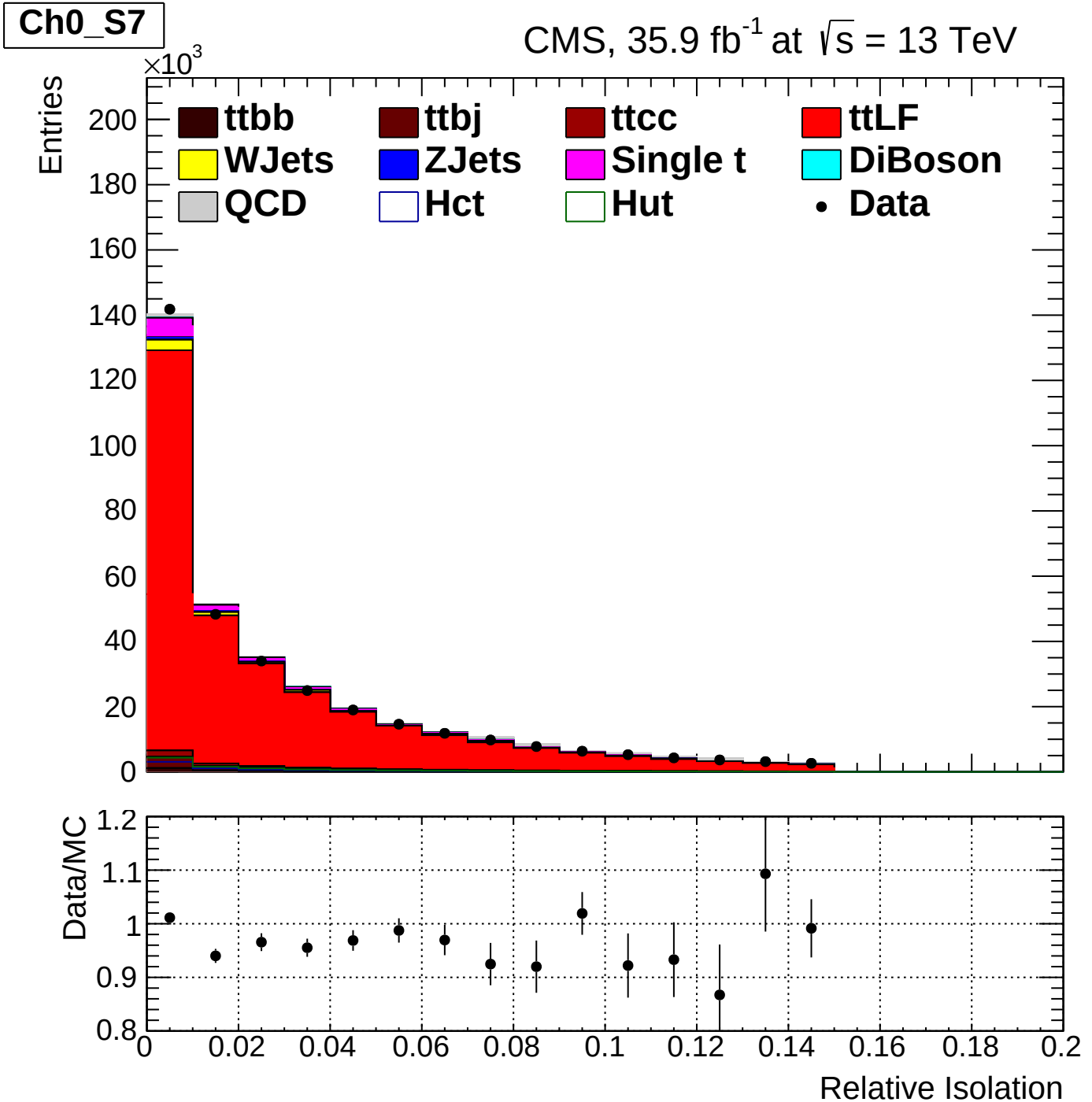

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
14000
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
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ttbj
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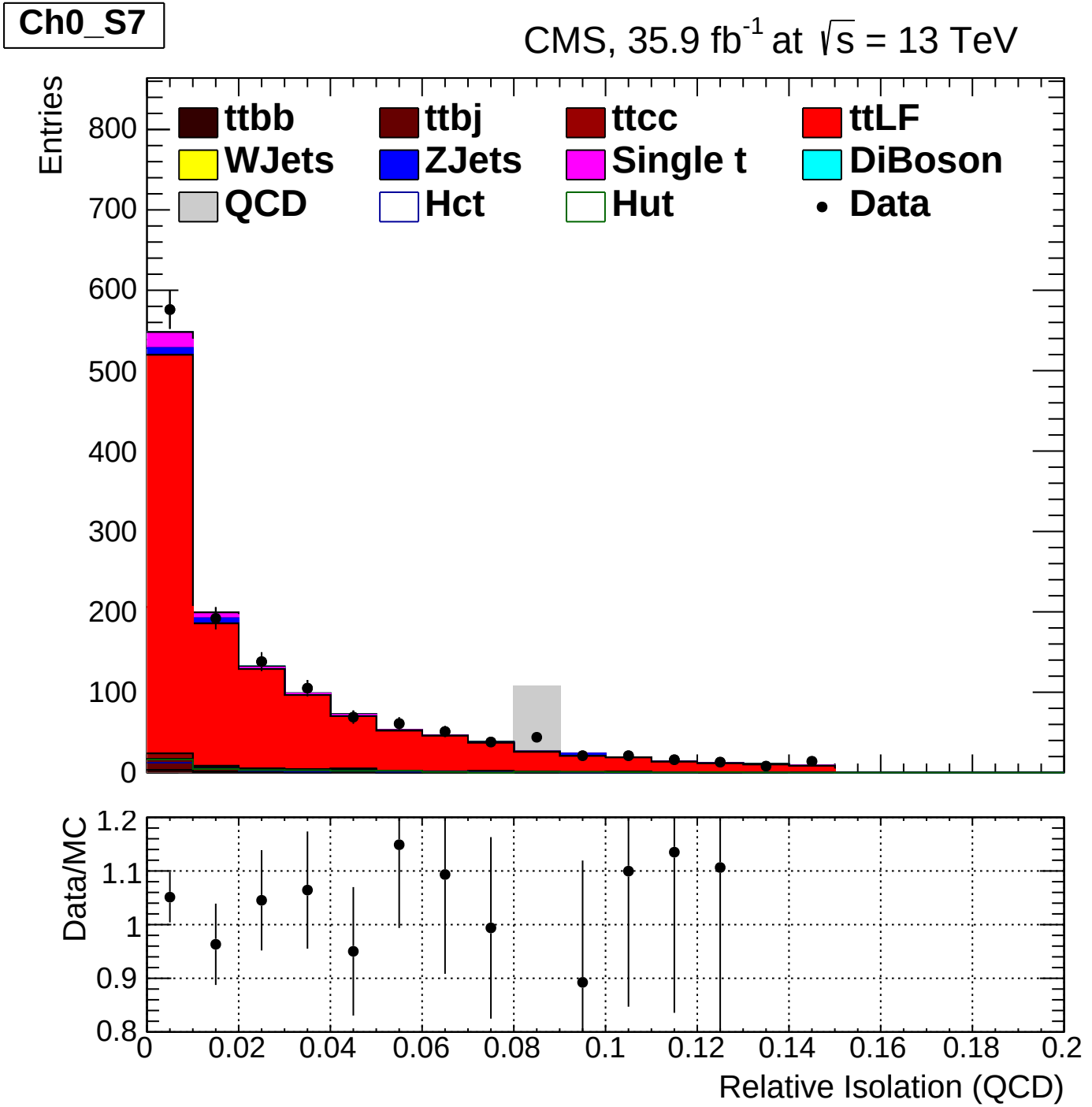
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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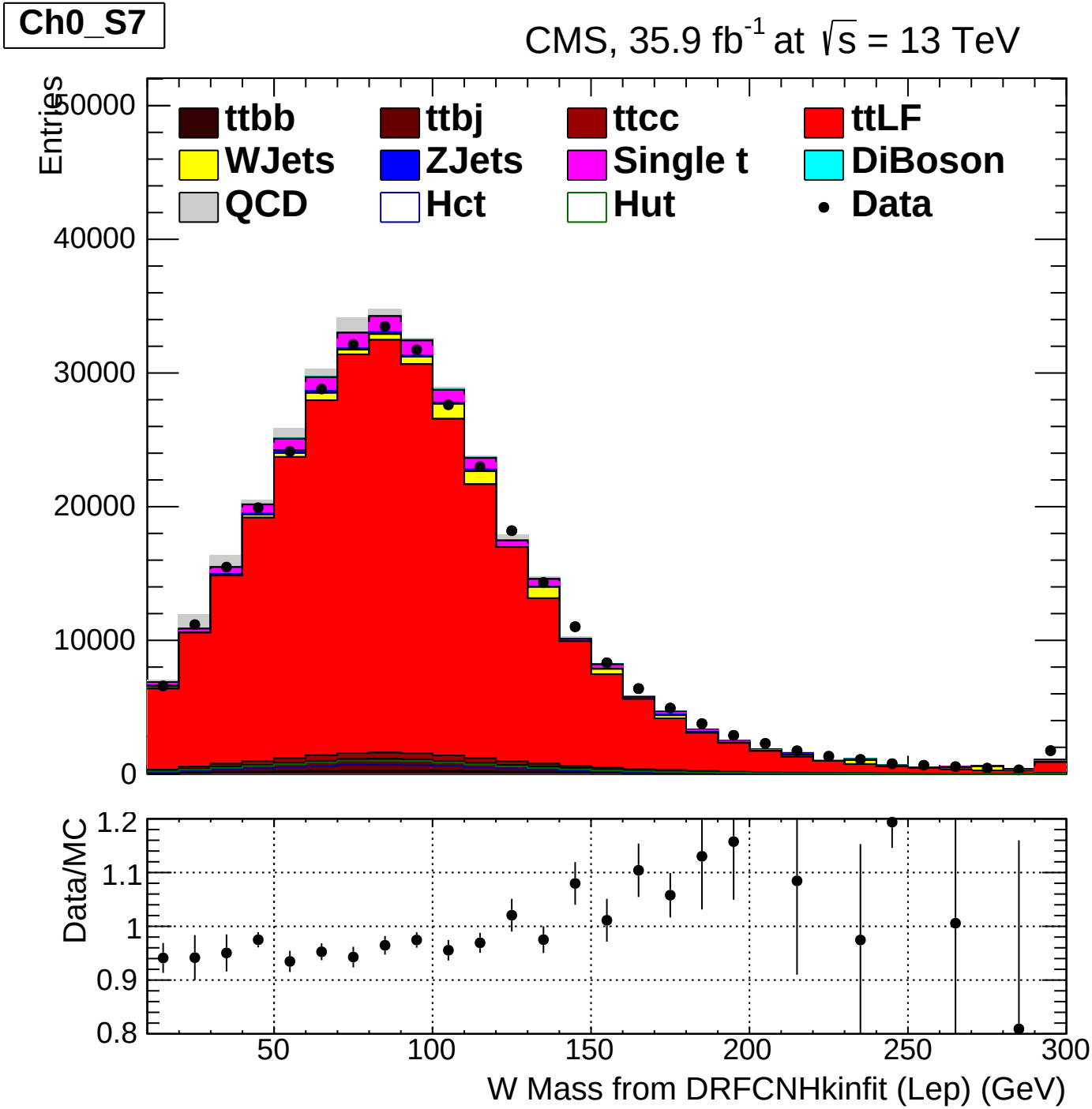
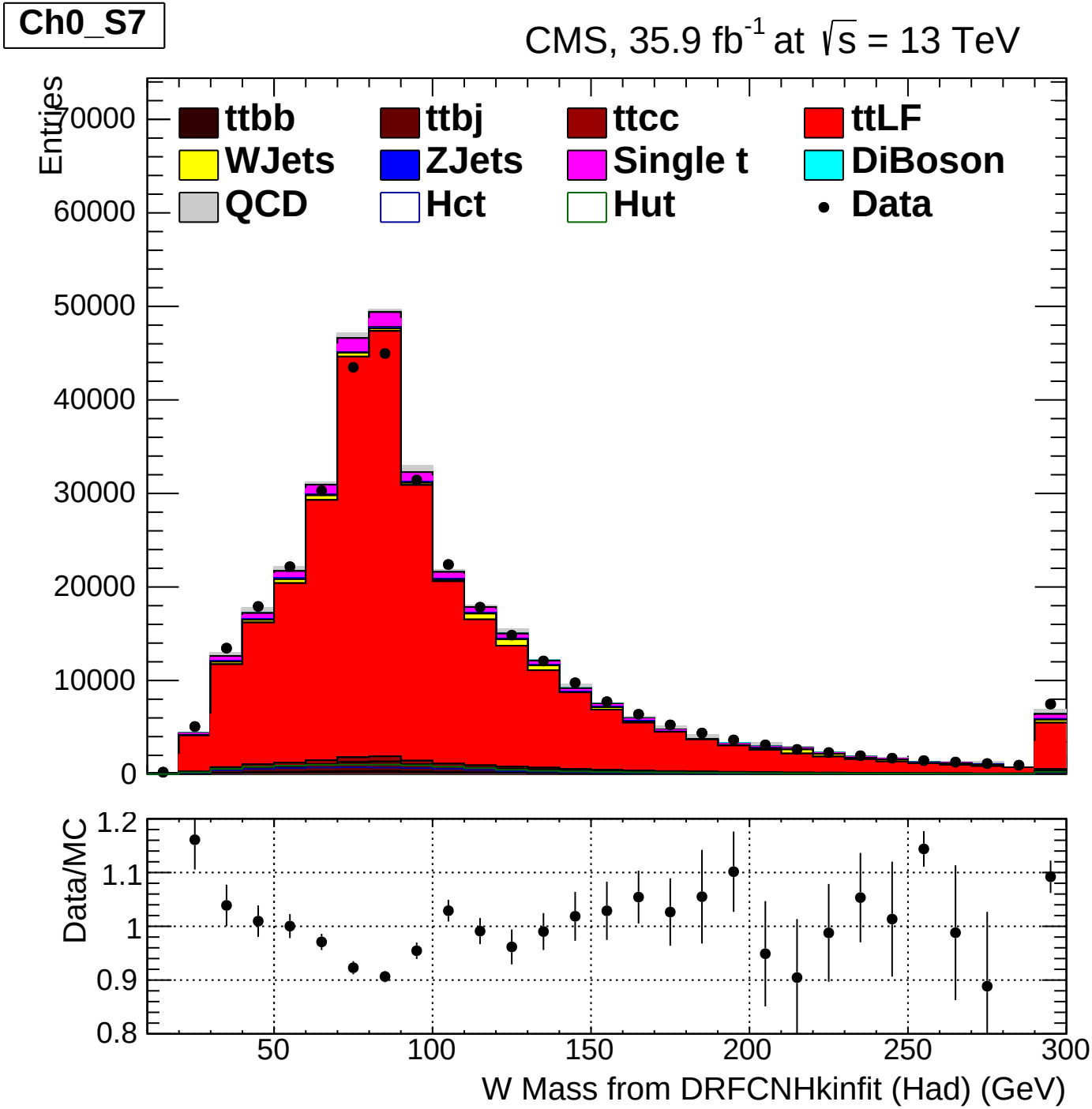
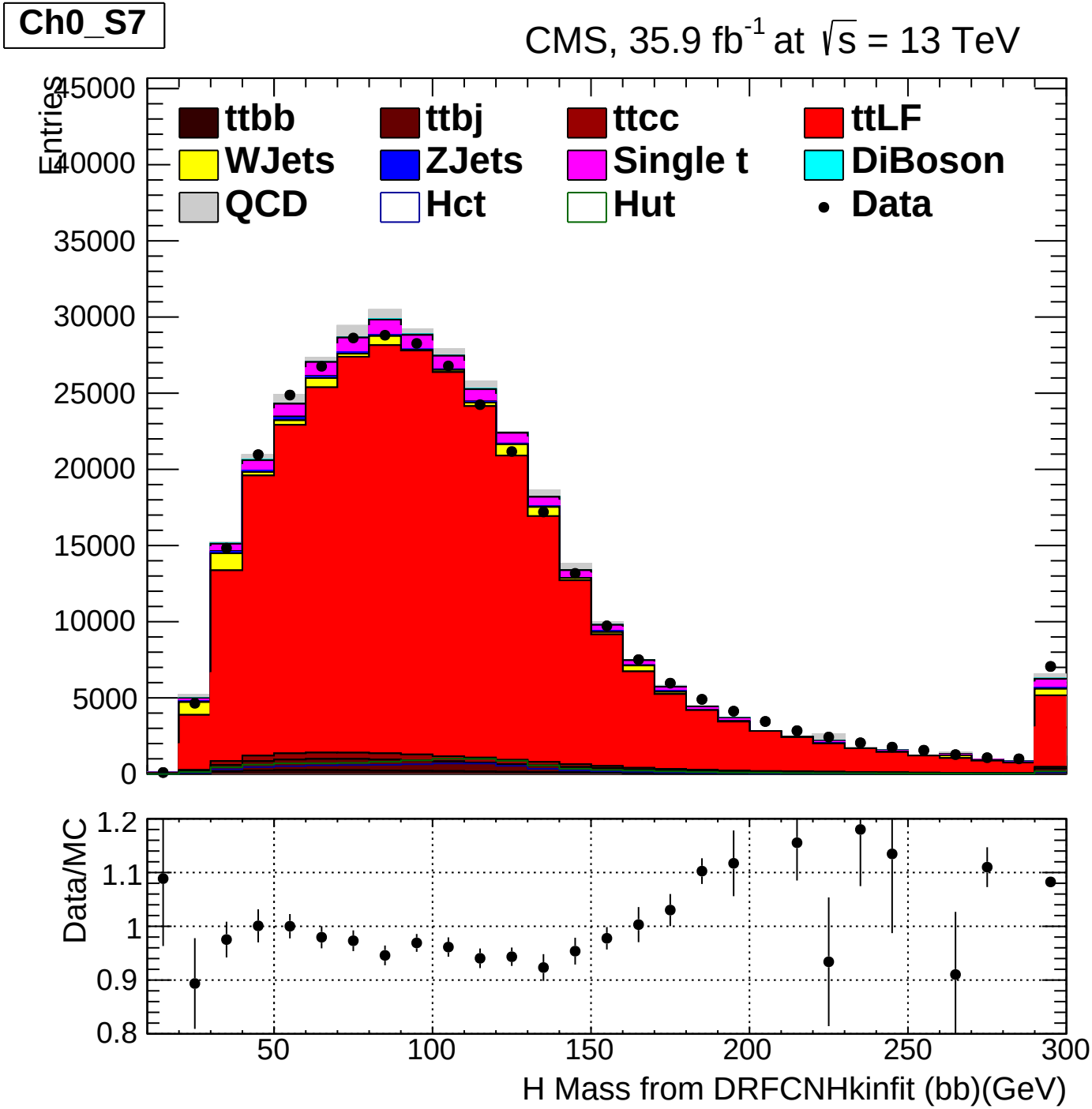
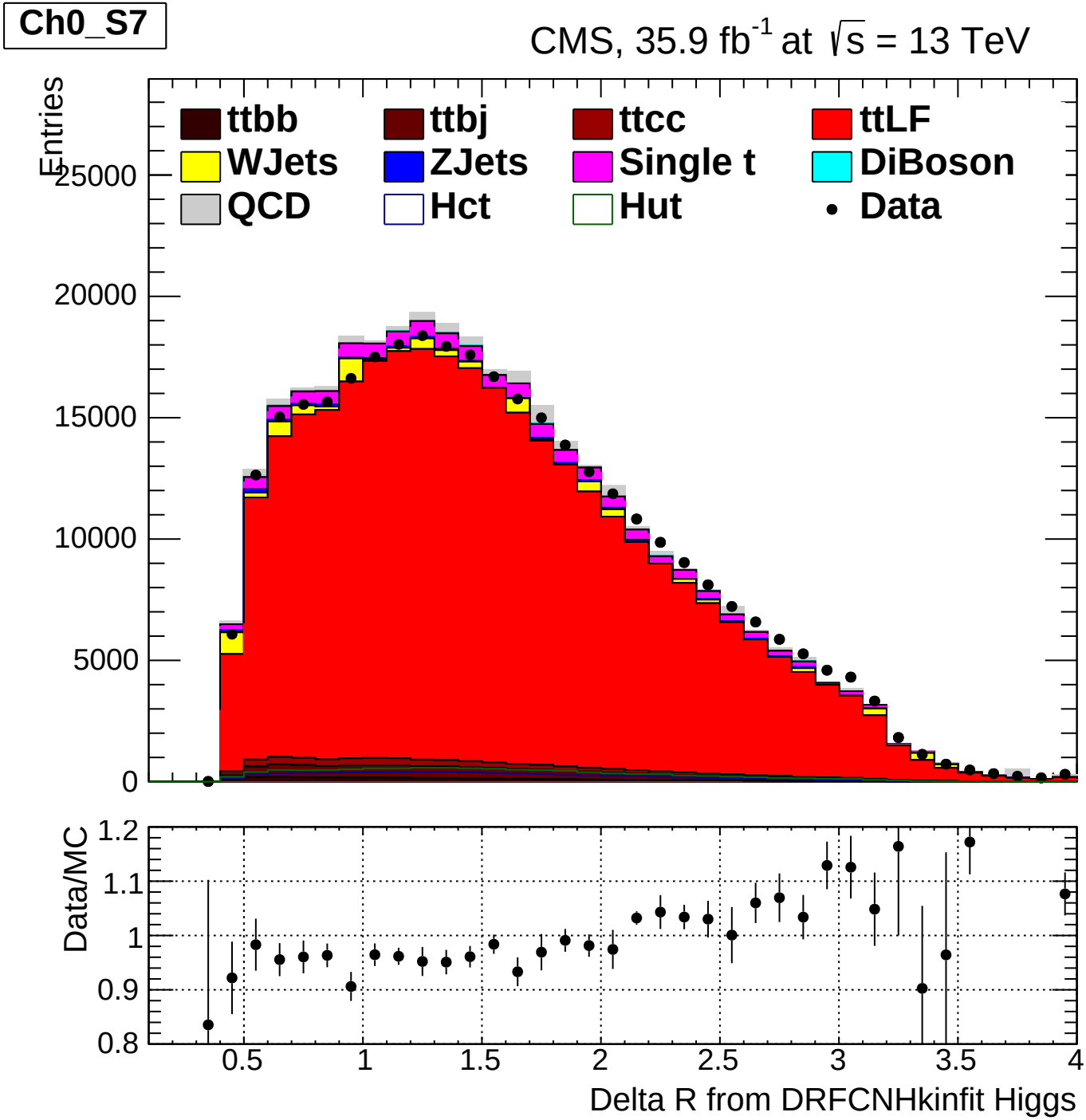
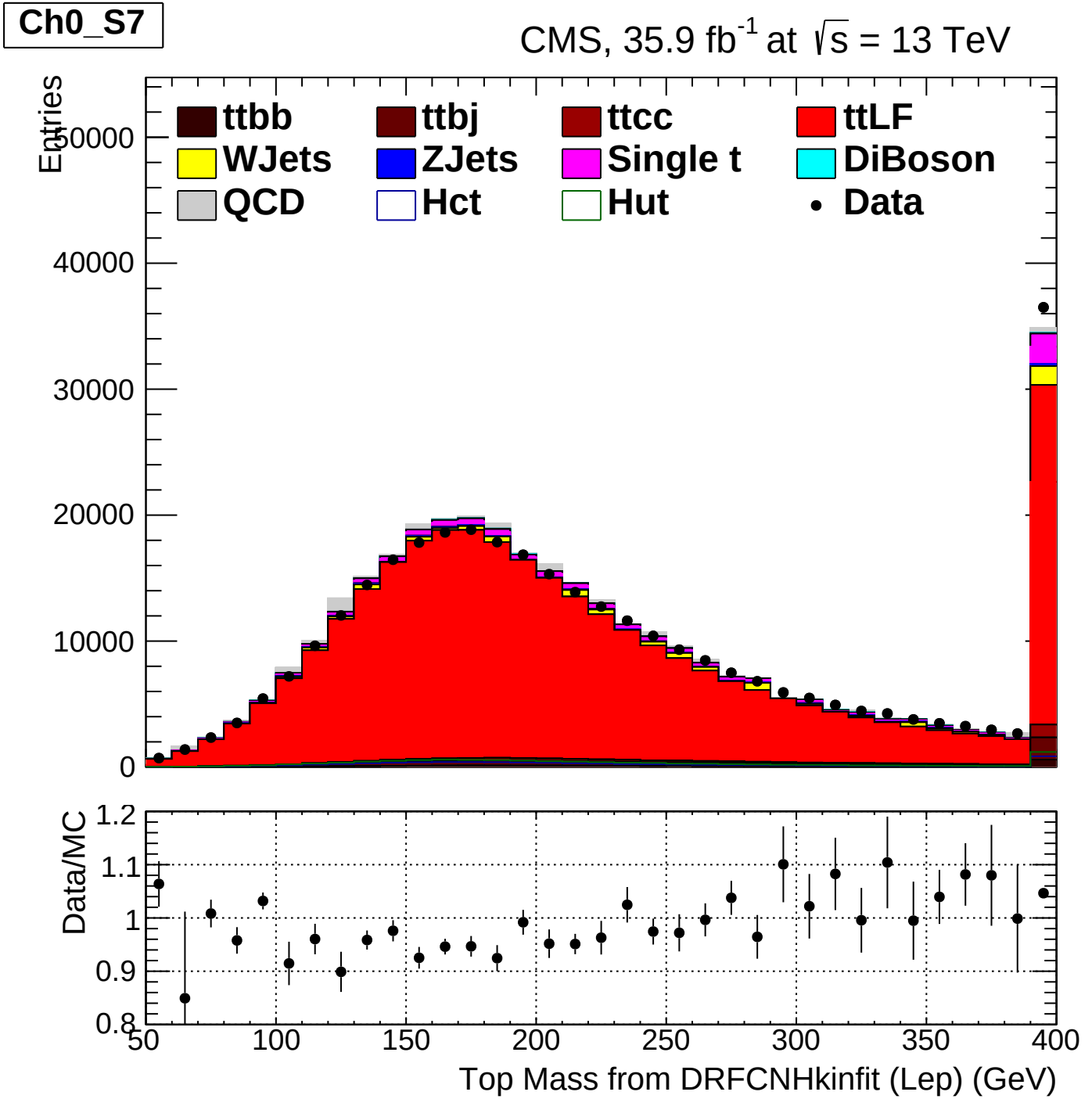
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

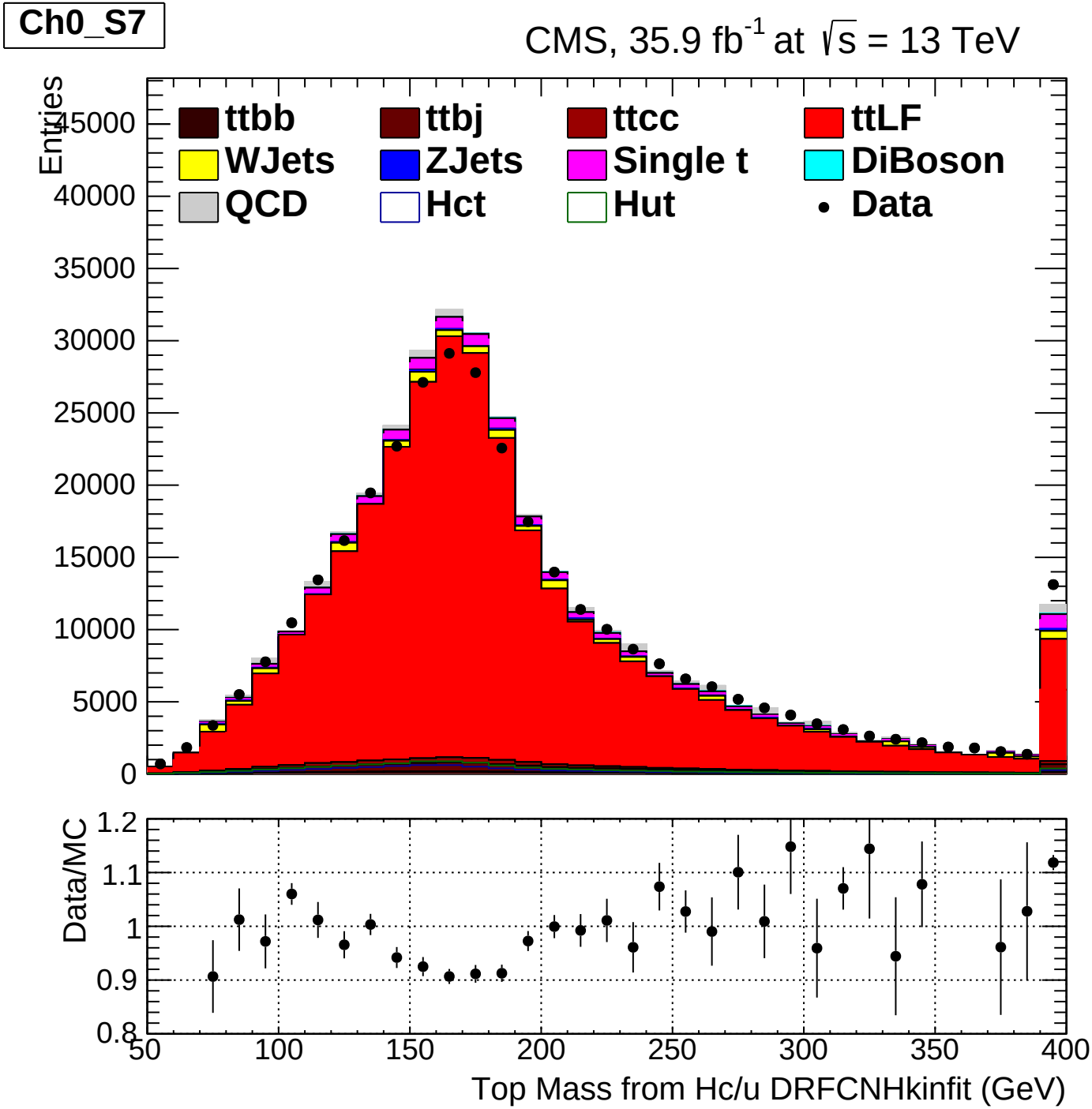

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)

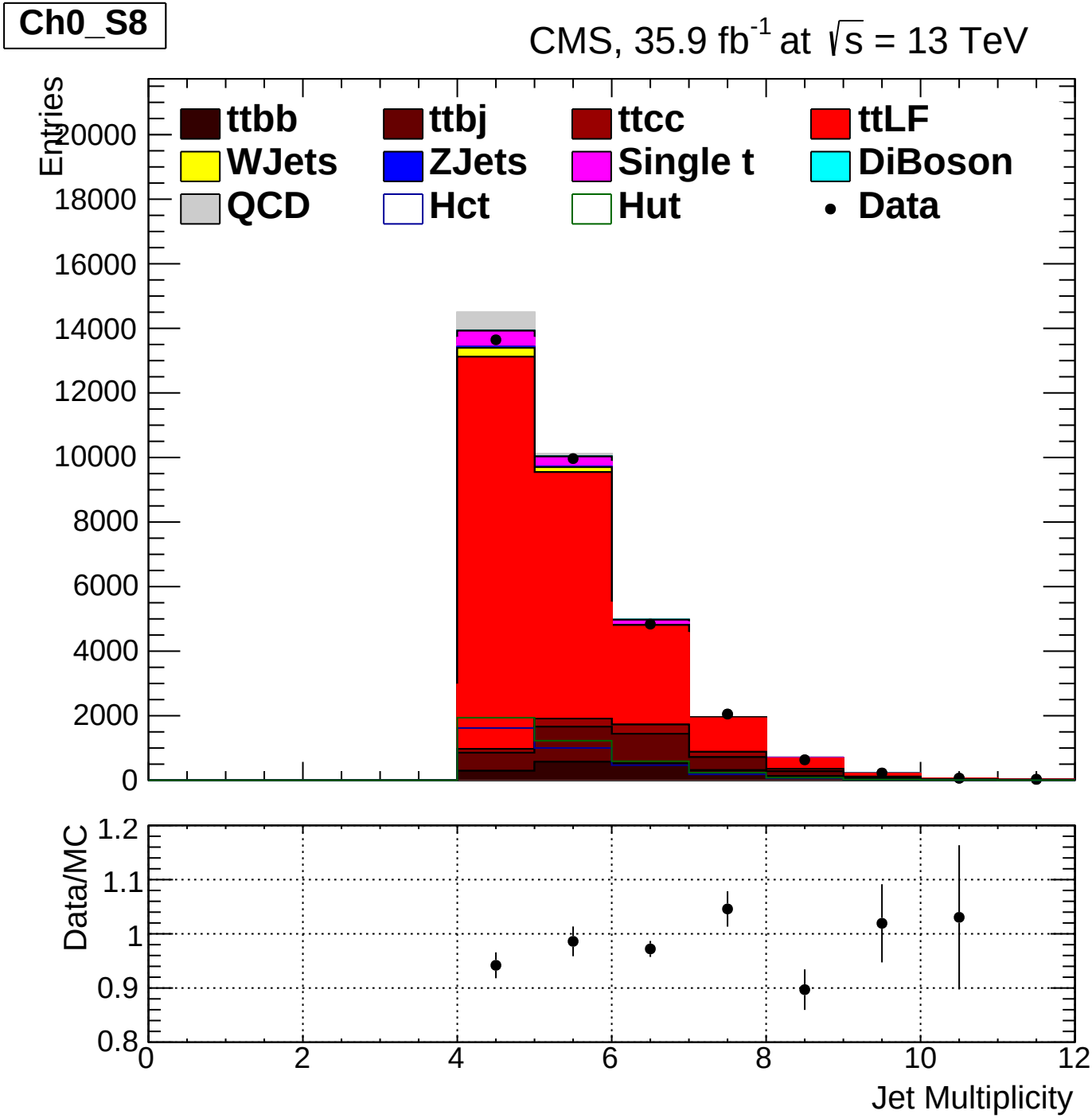

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

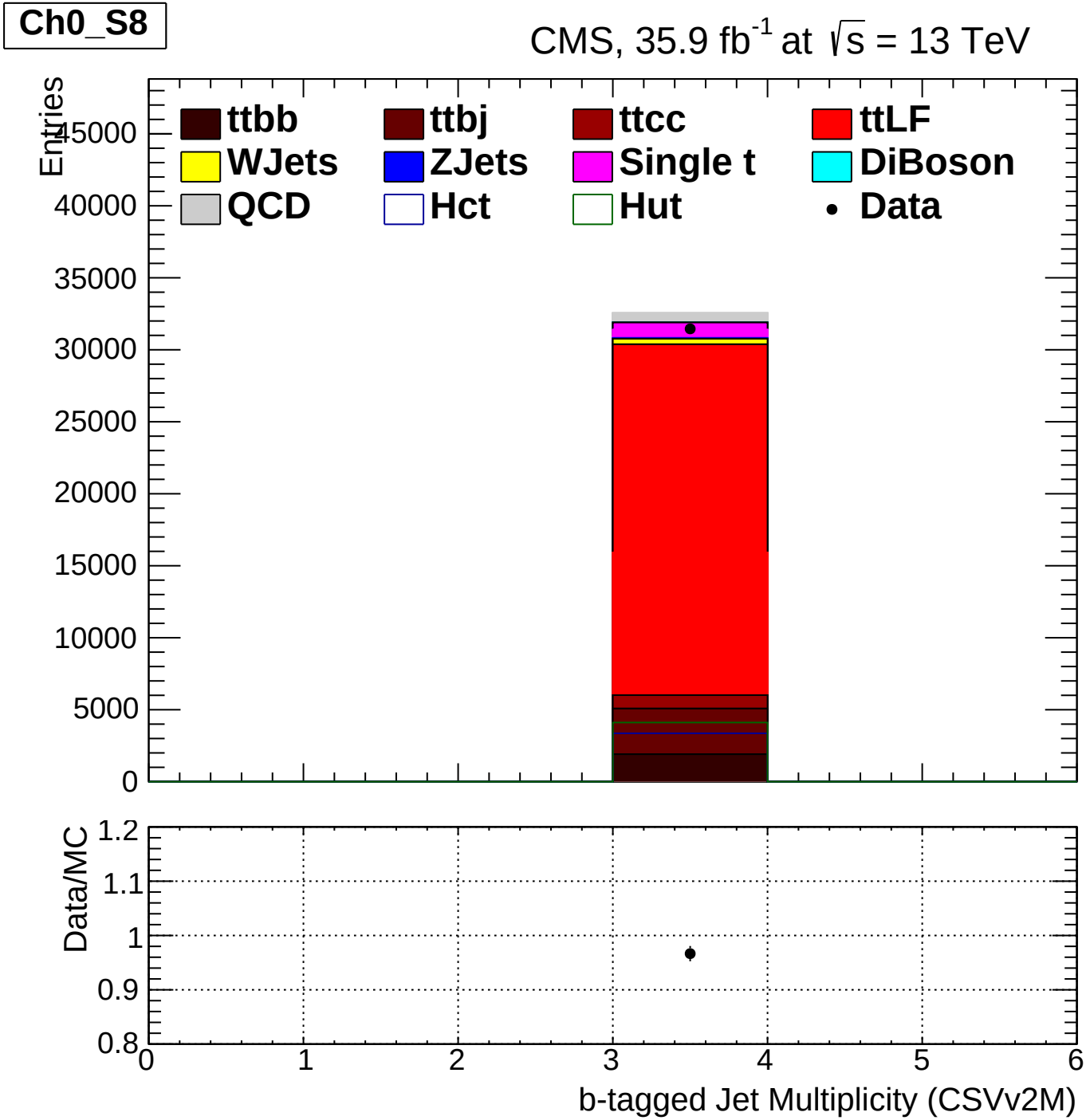

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

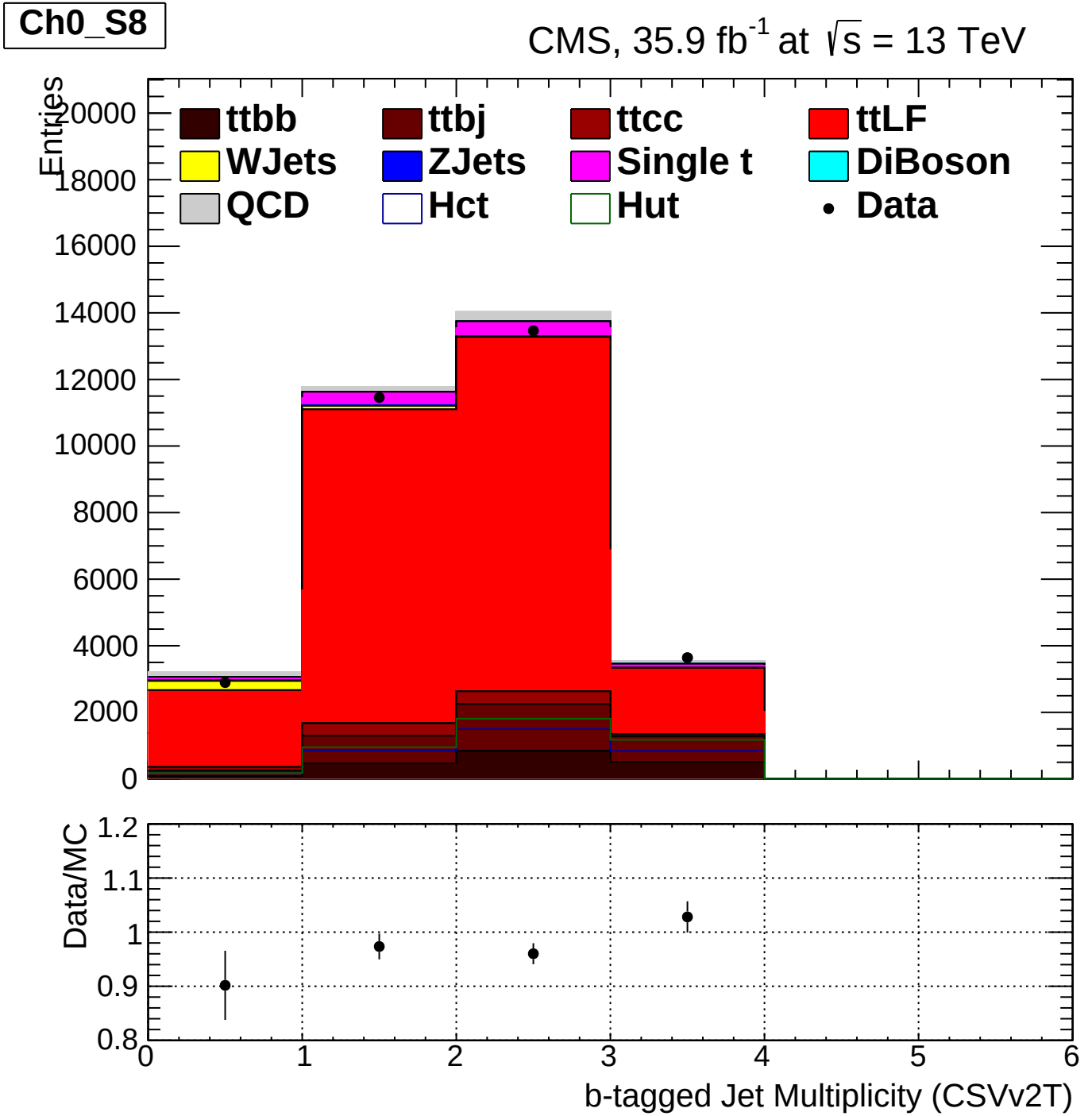

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

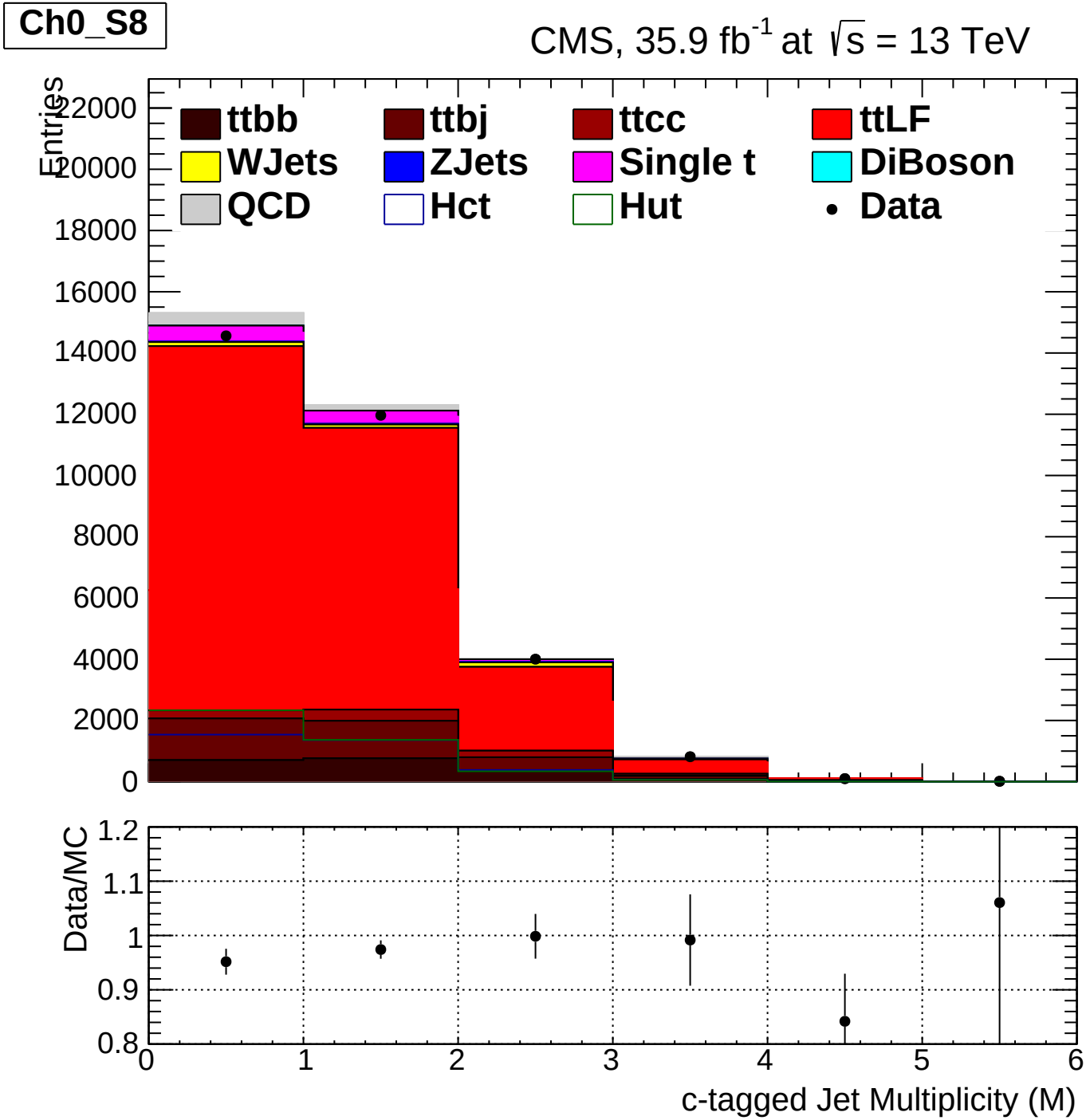

Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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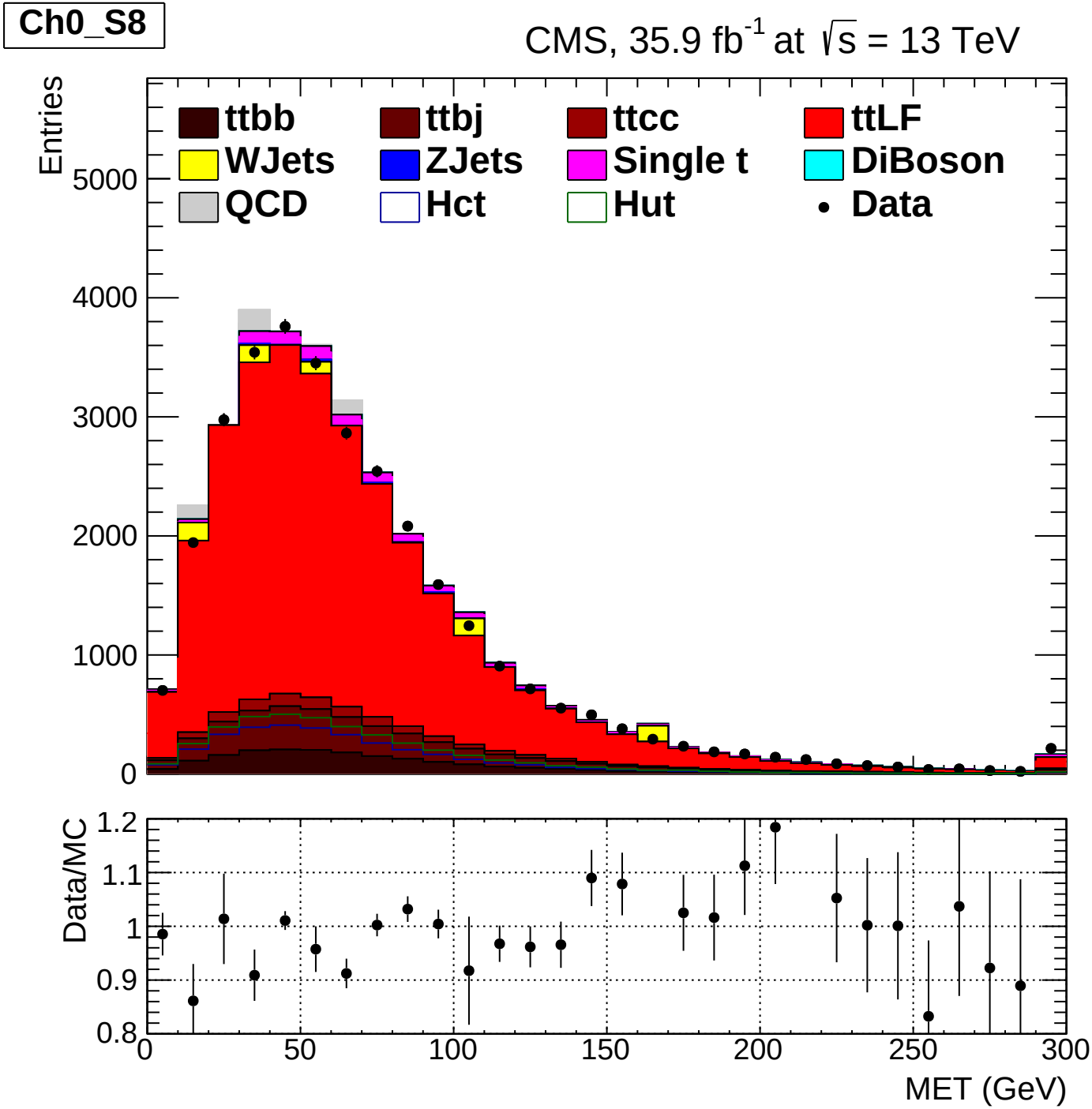
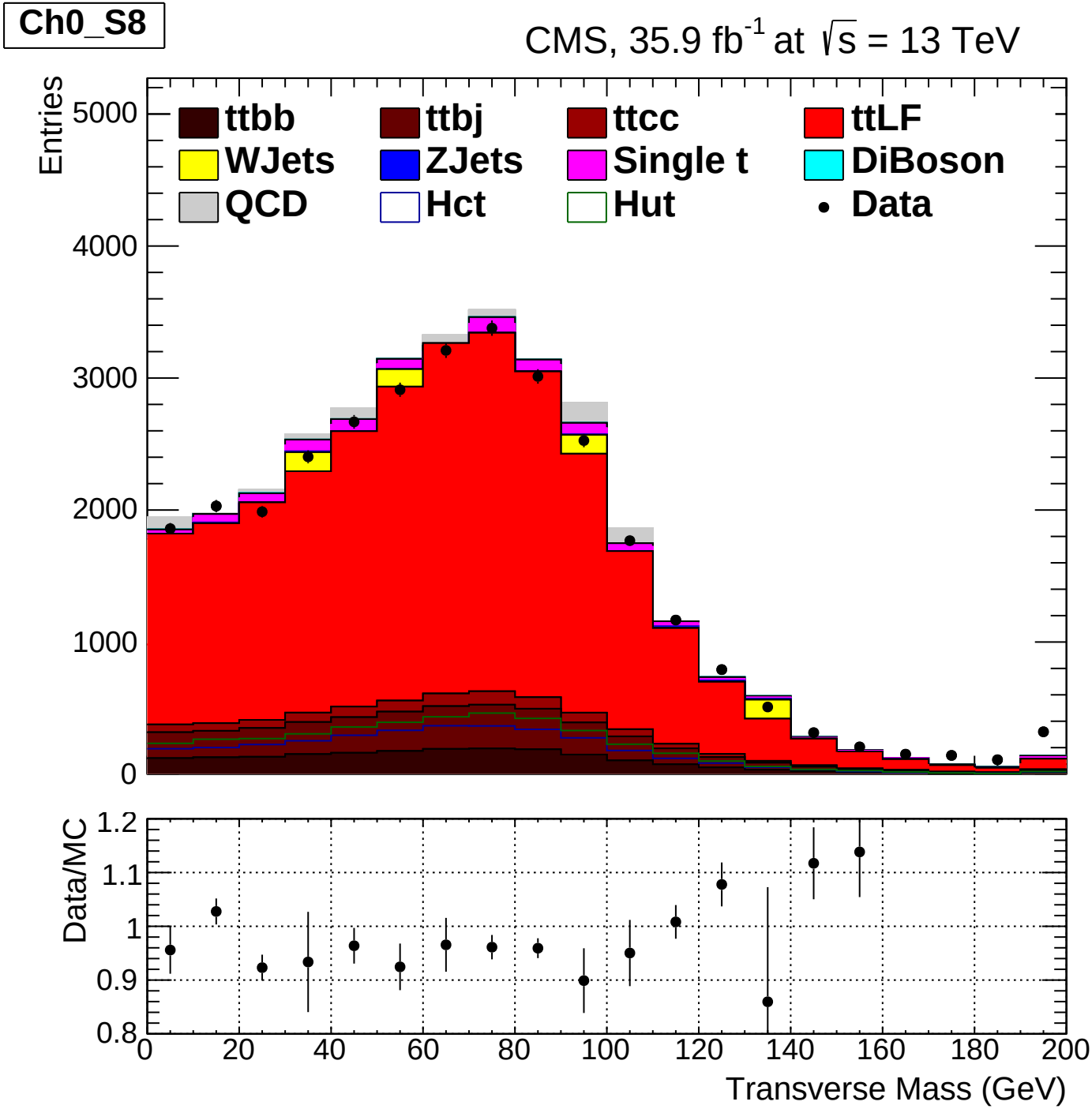
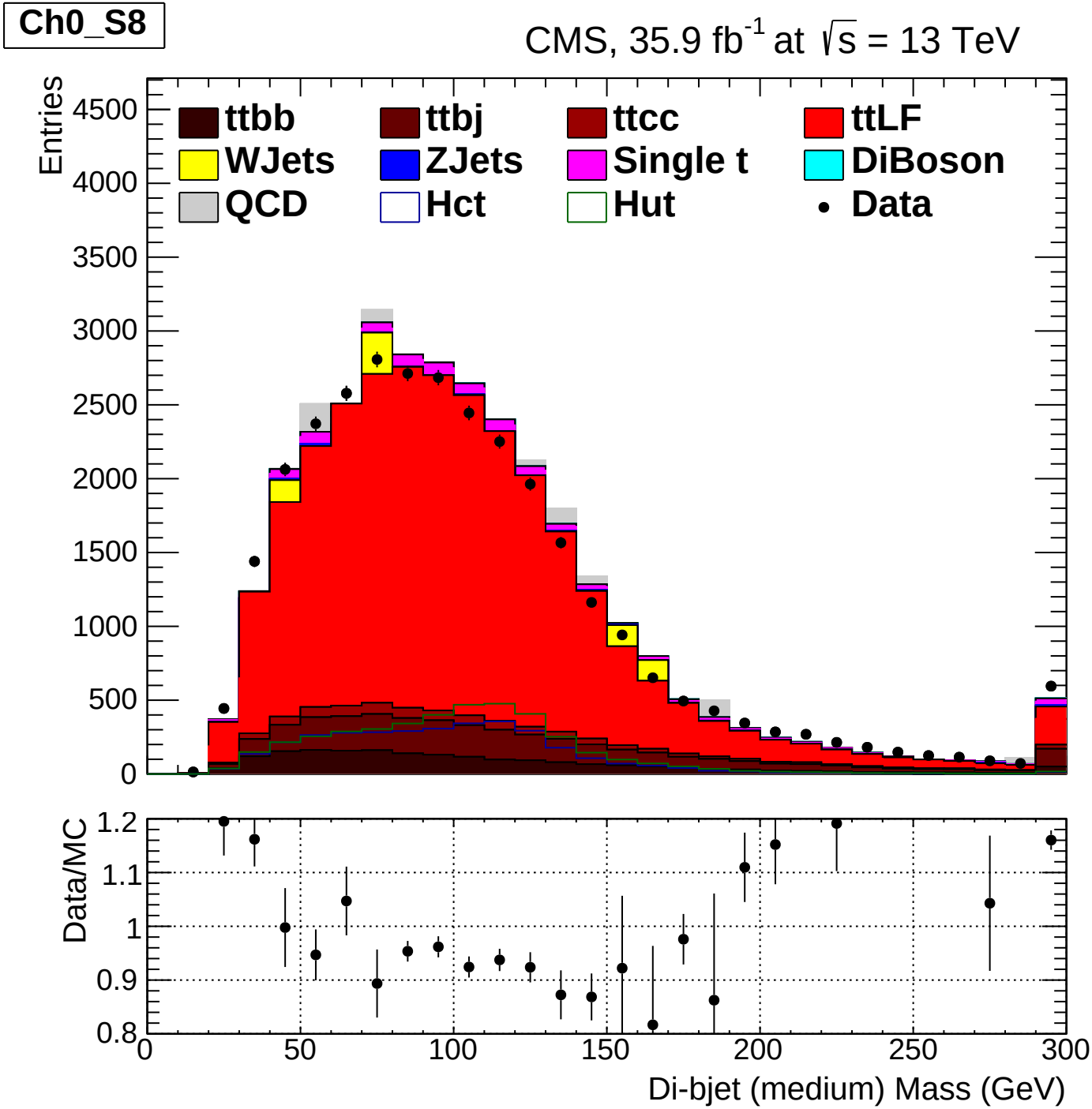
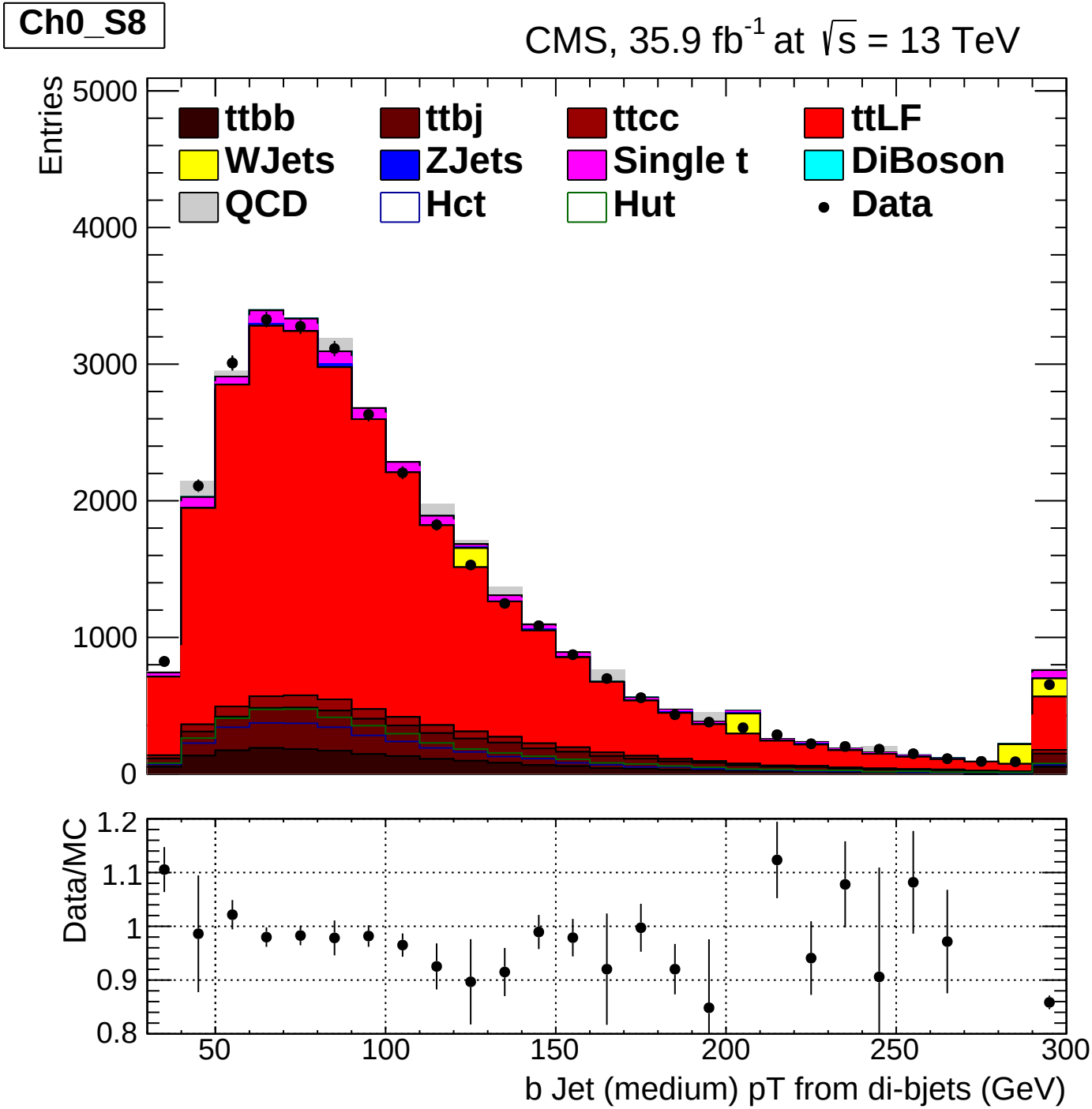
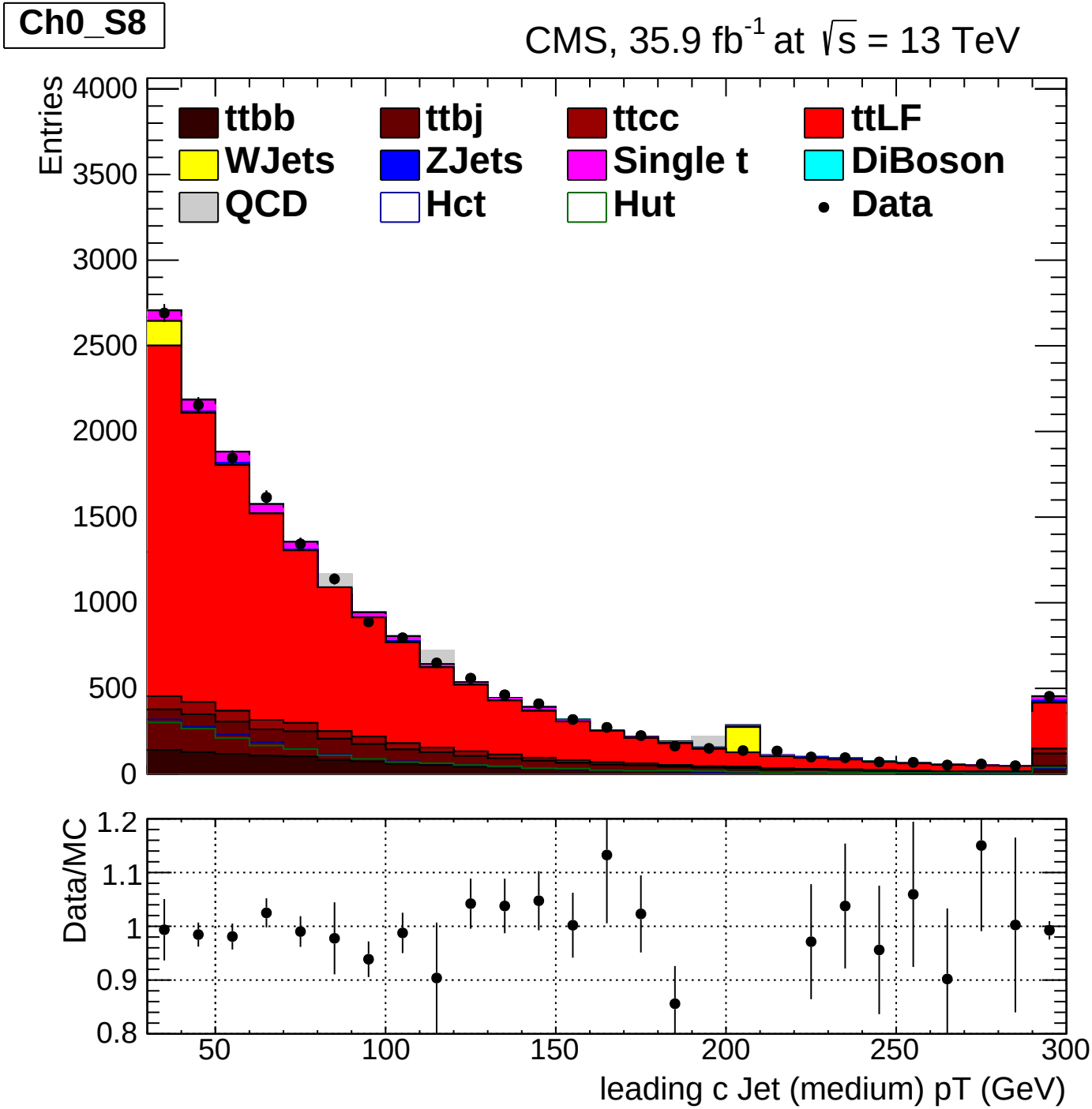
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

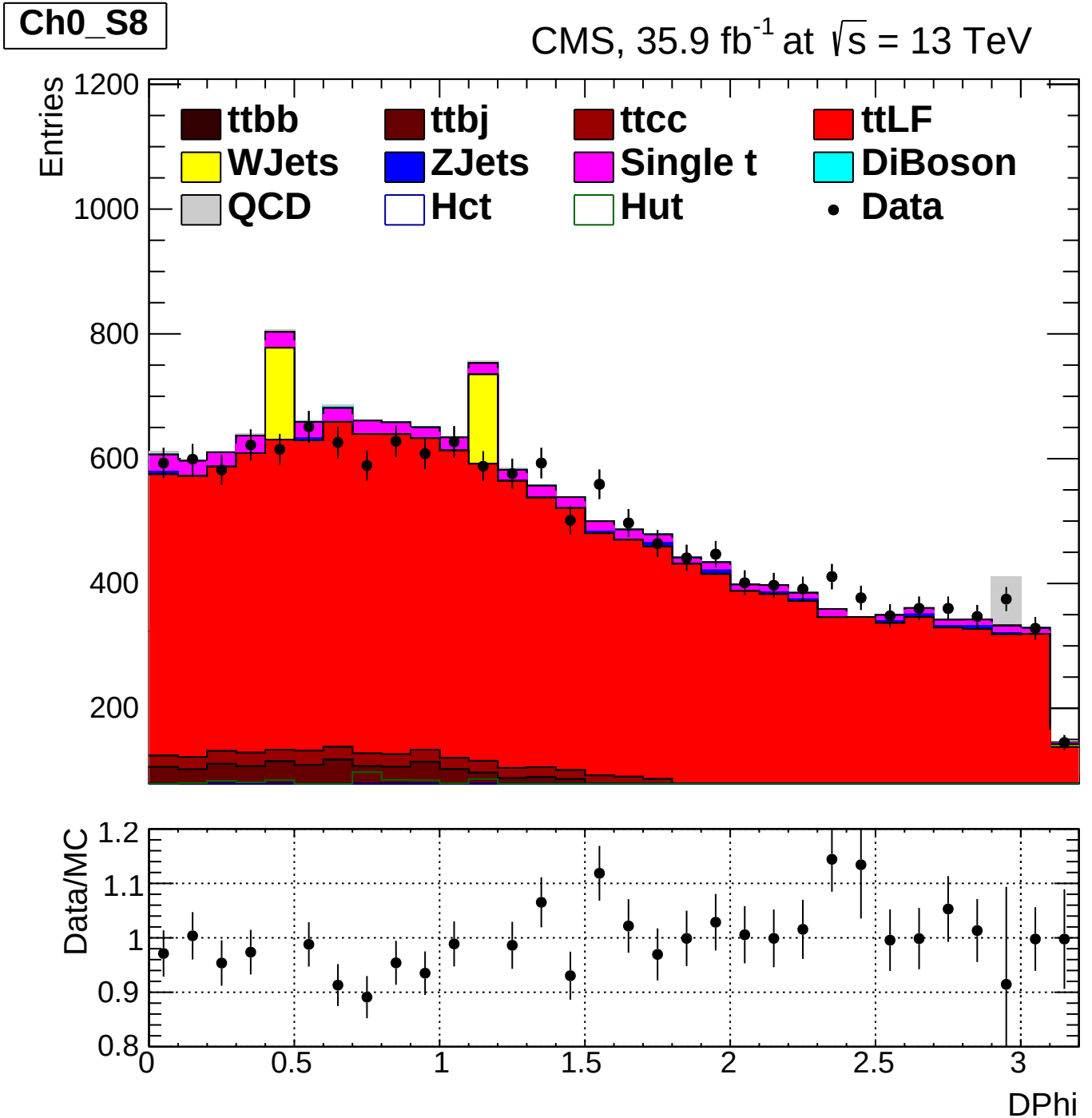

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
0
50
100
150
200
250
300
MET (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1200
1000
800
600
400
200
Data/MC
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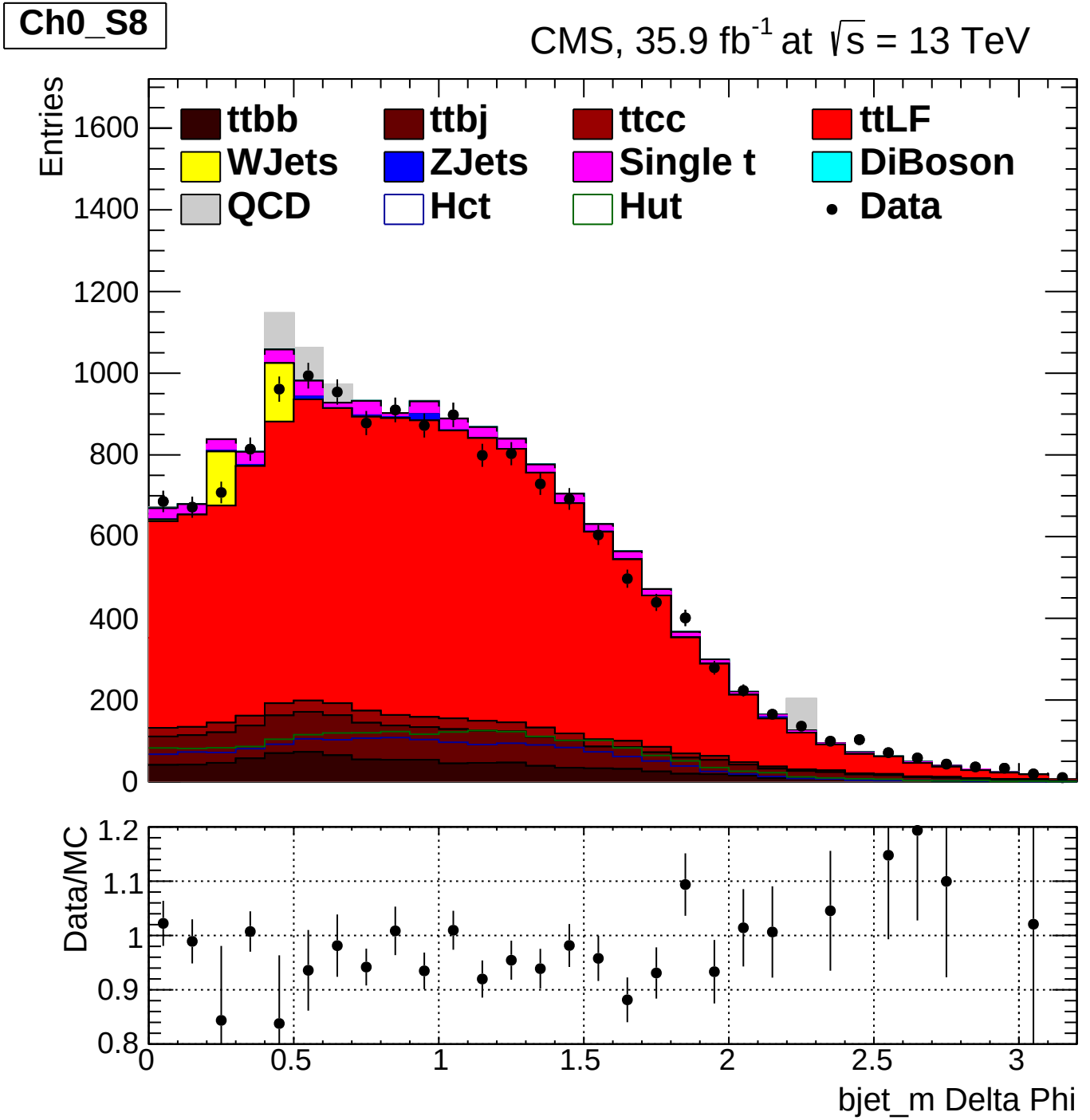
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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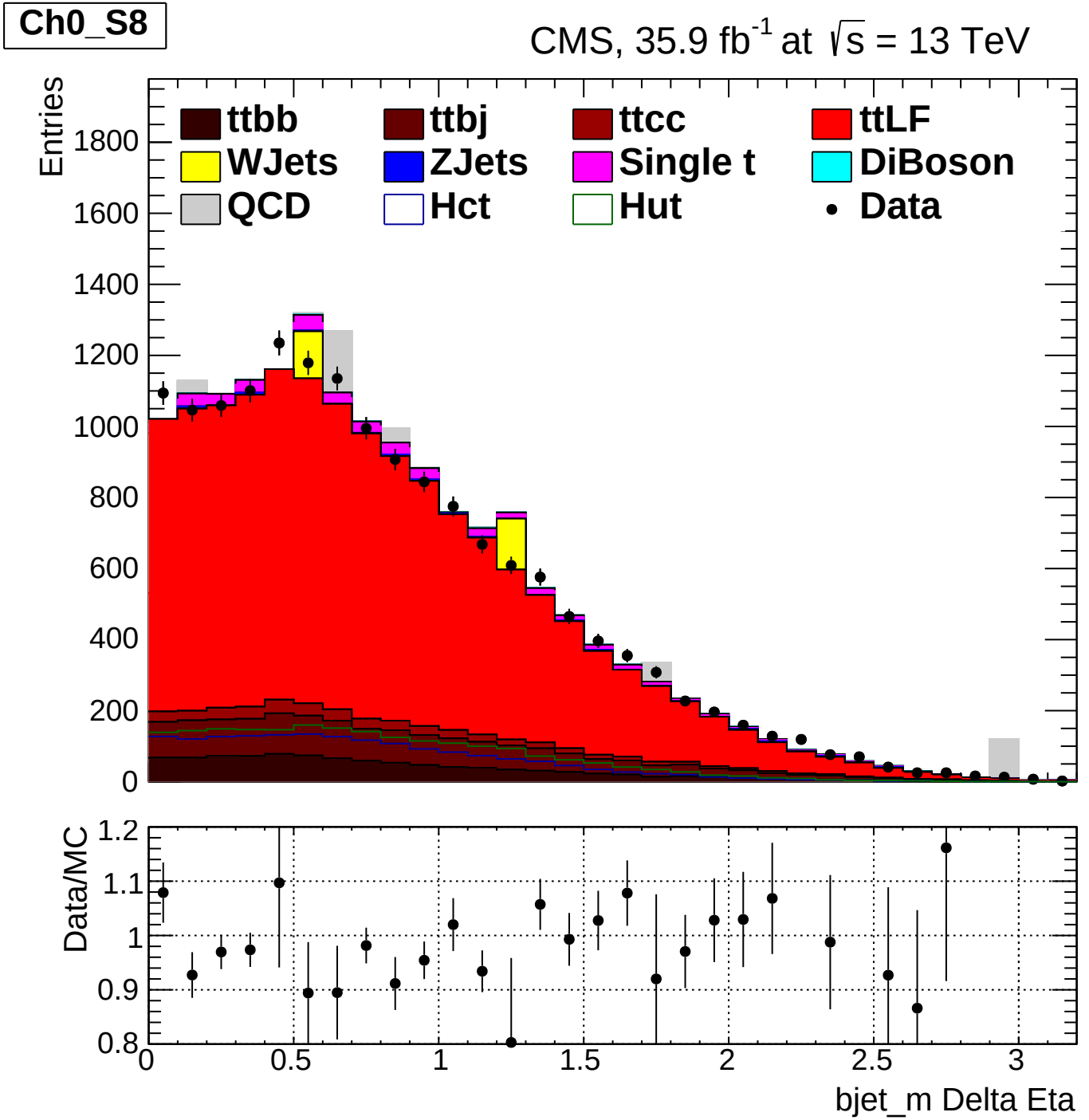
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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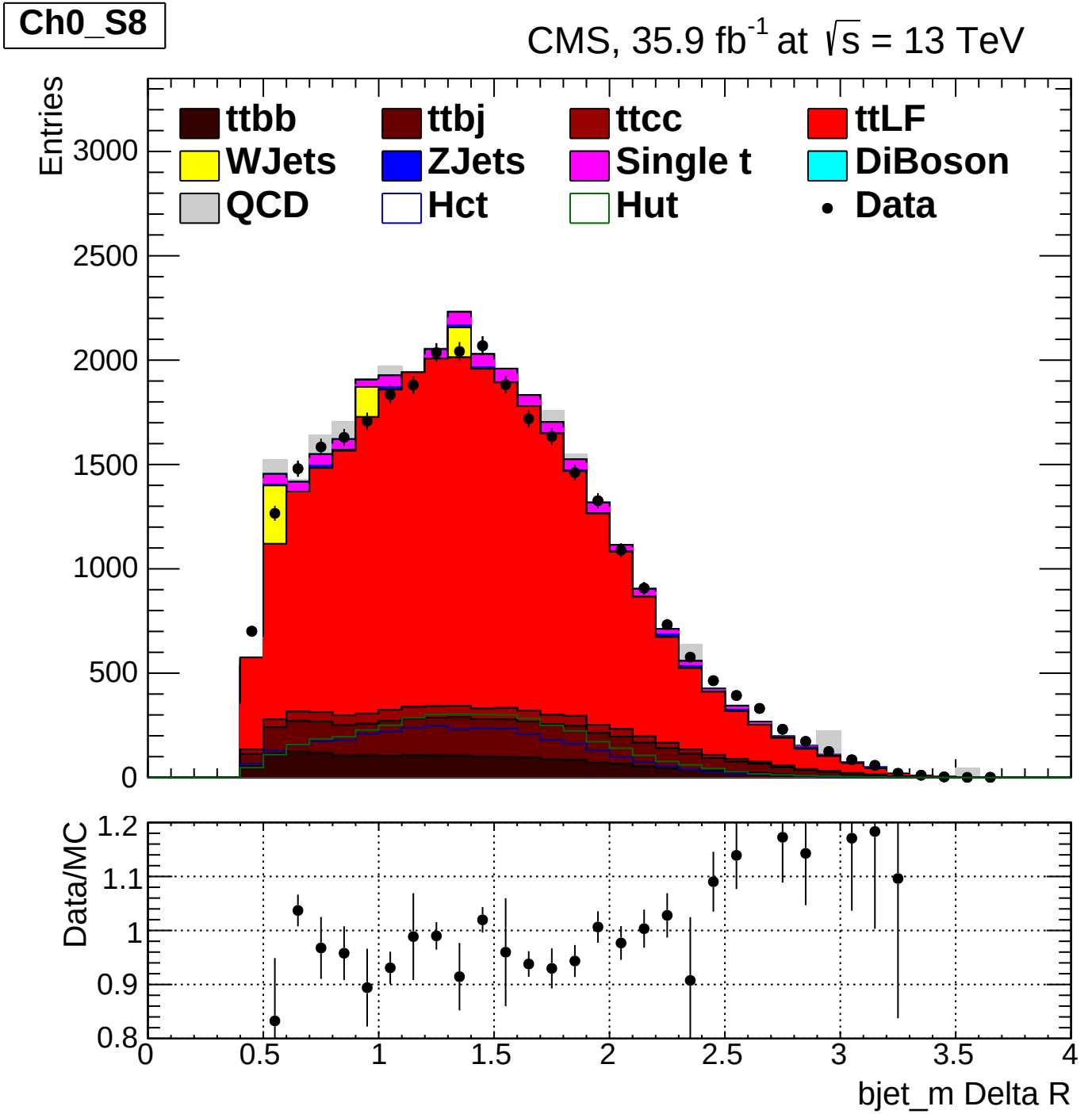
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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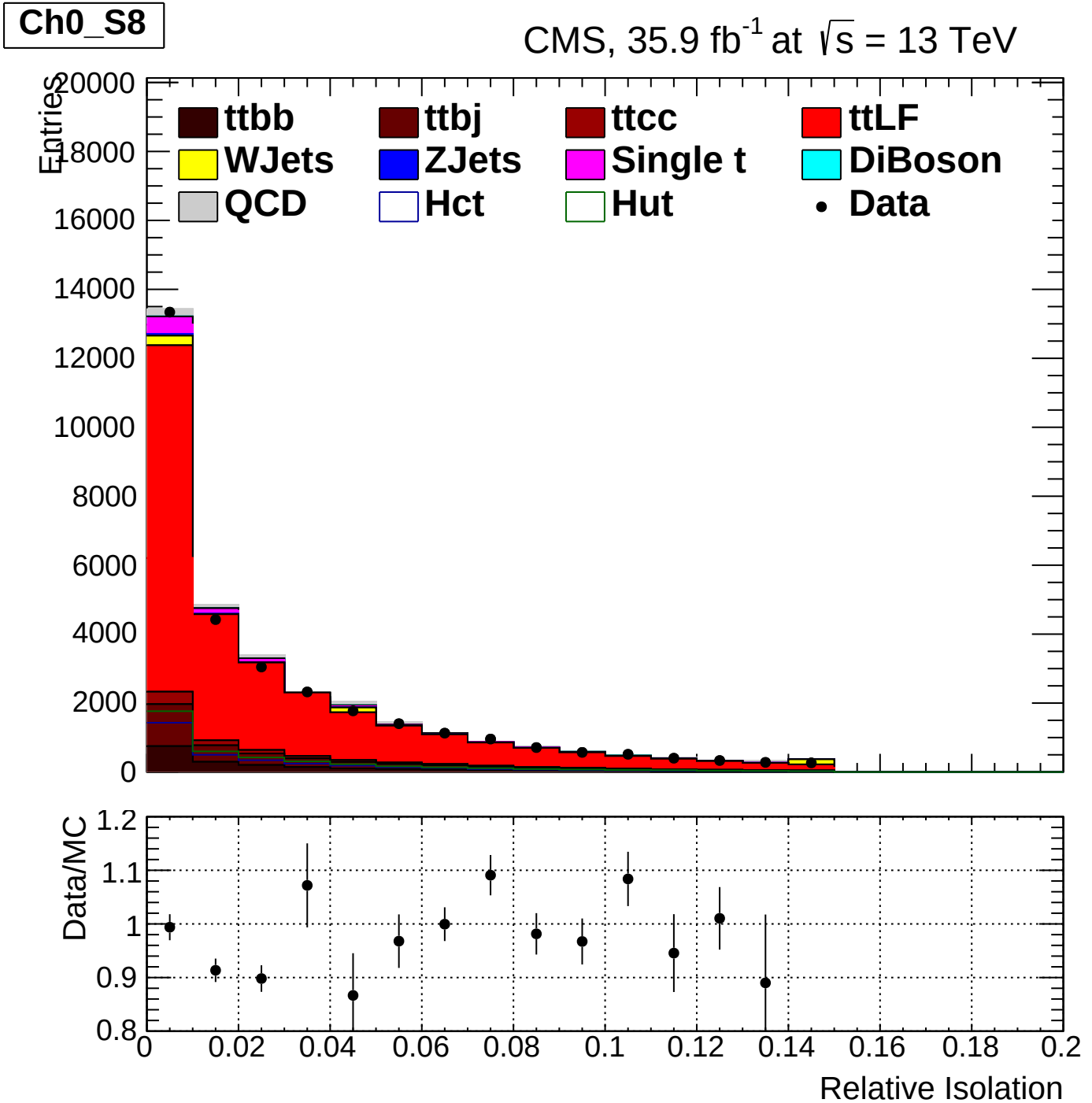
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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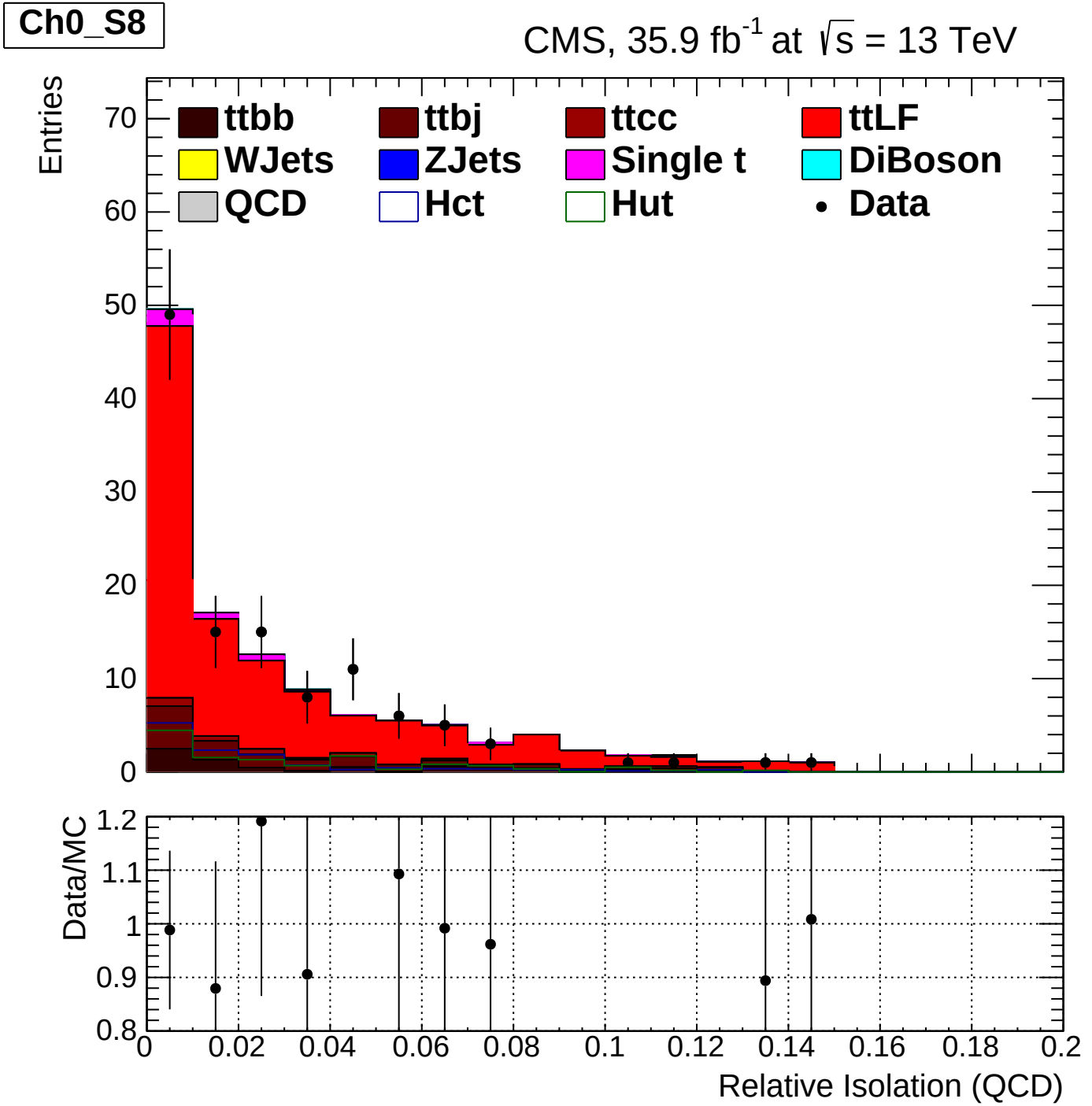
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation


Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttcc
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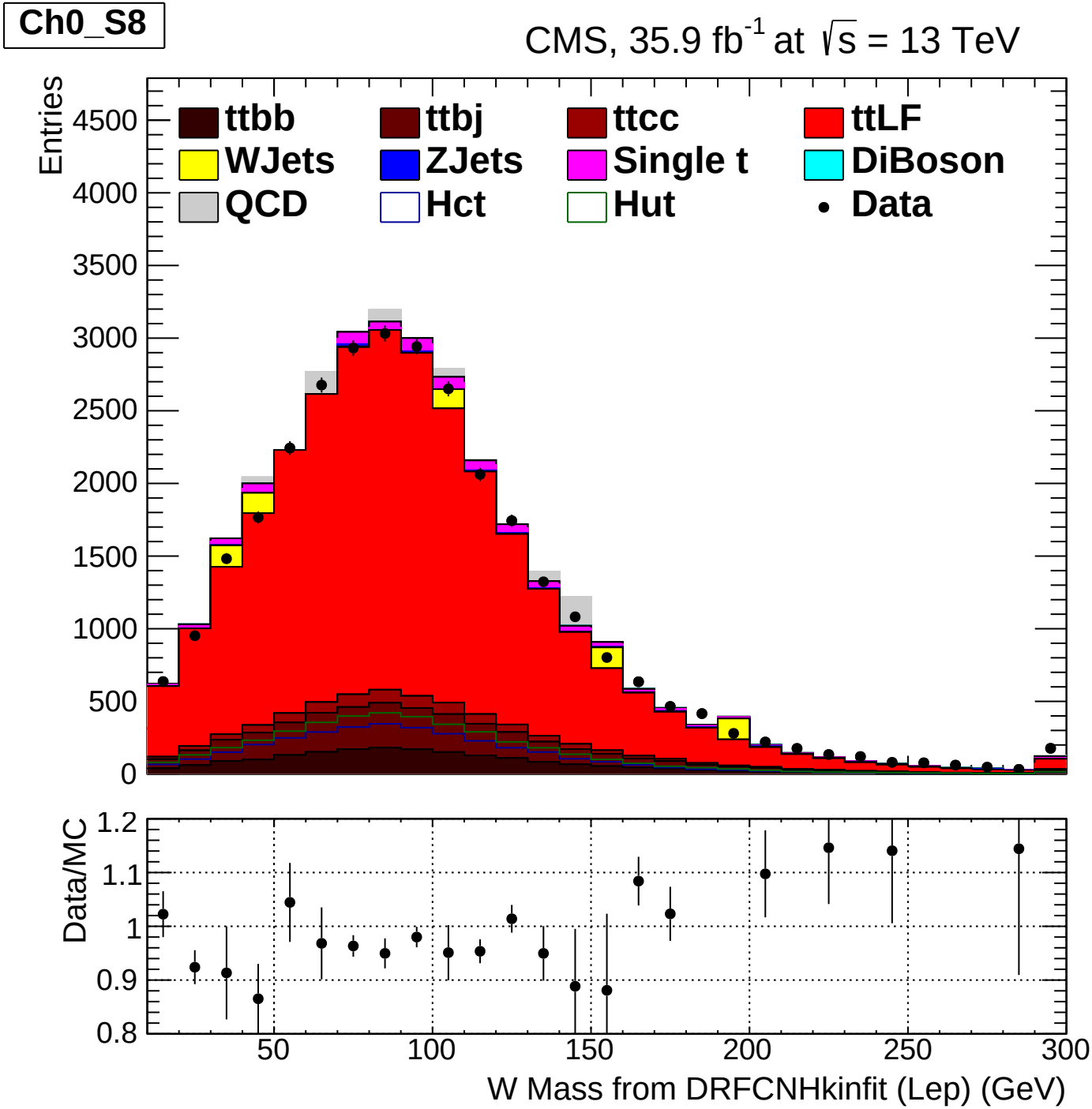
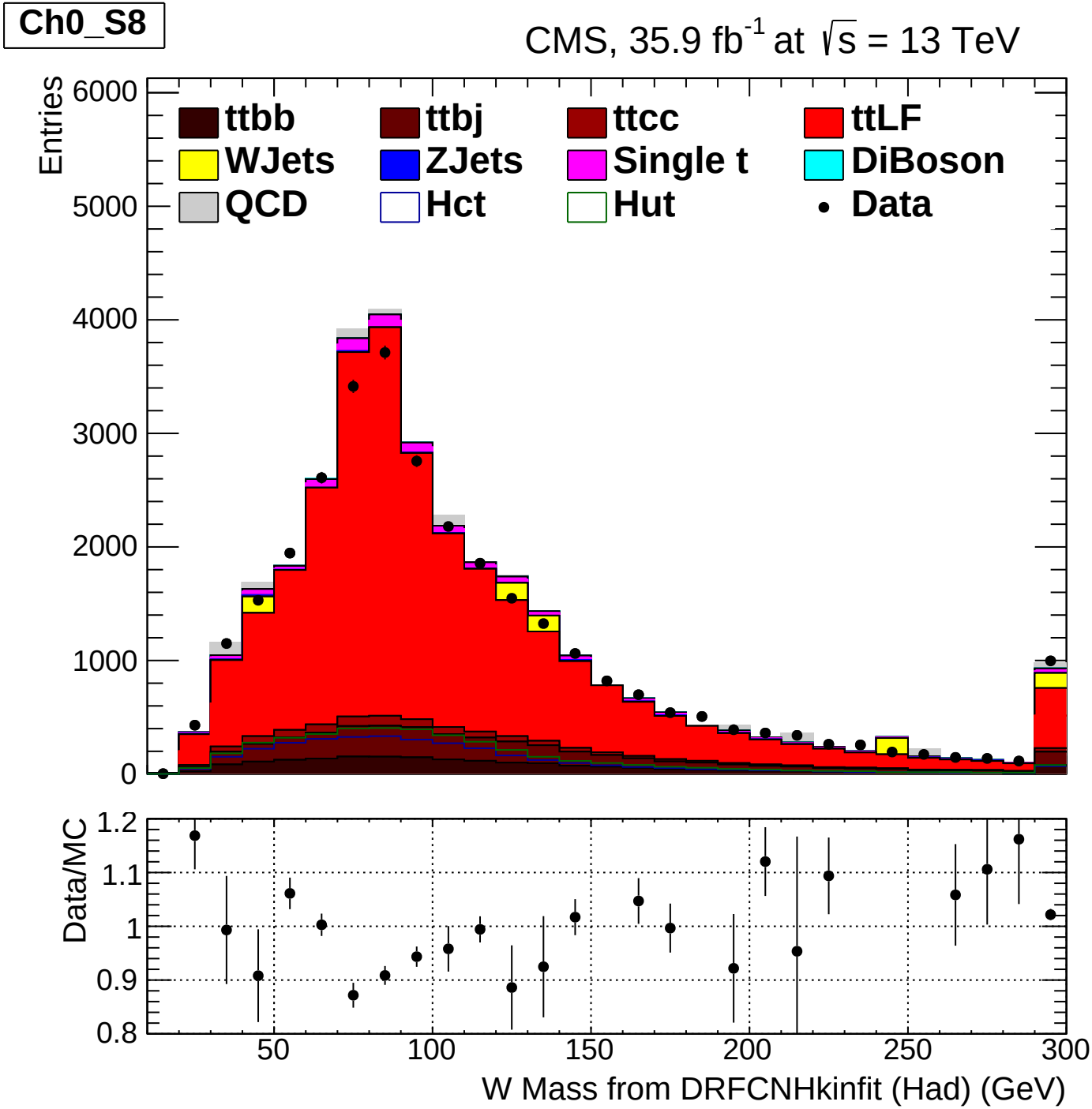
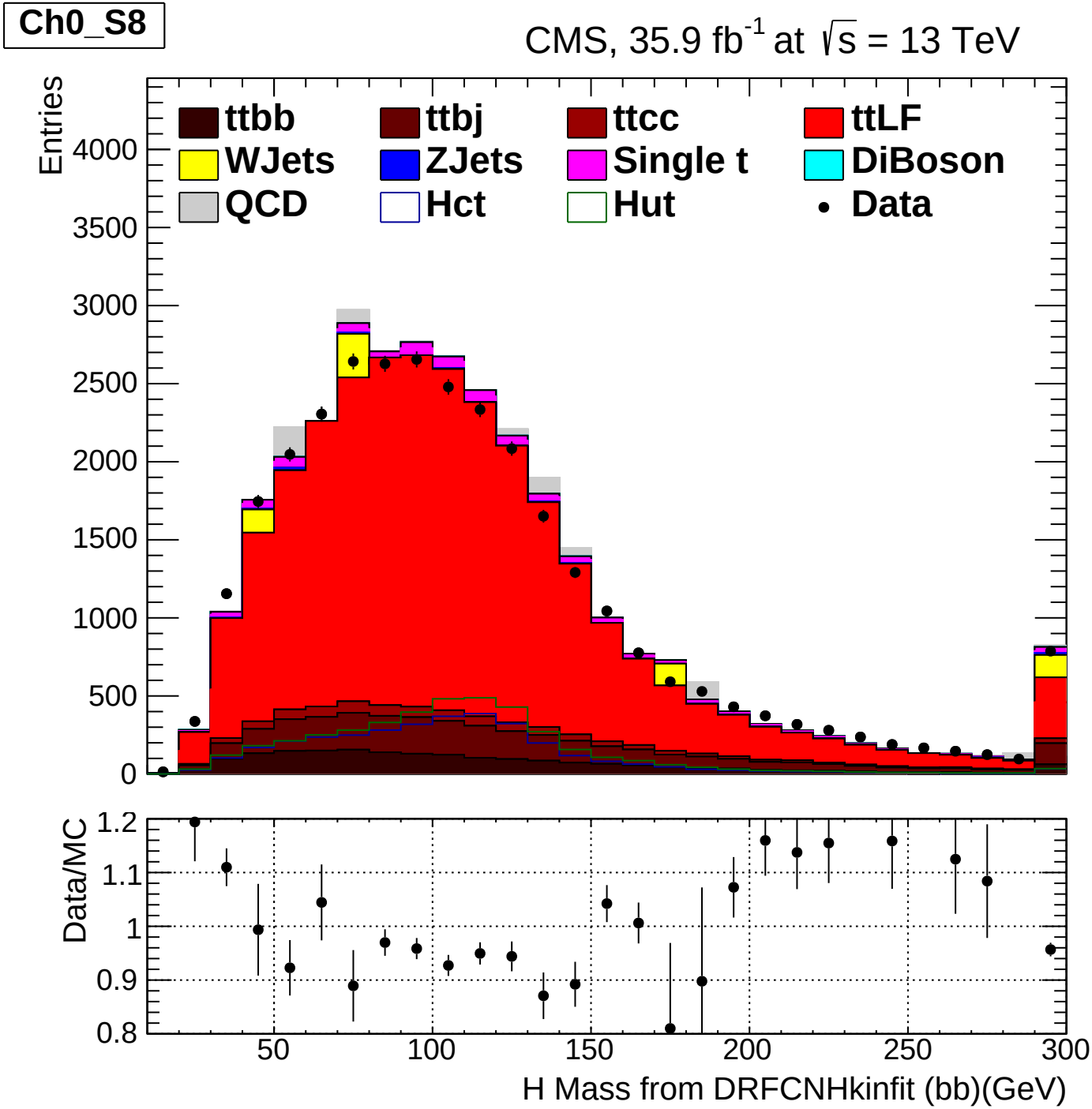
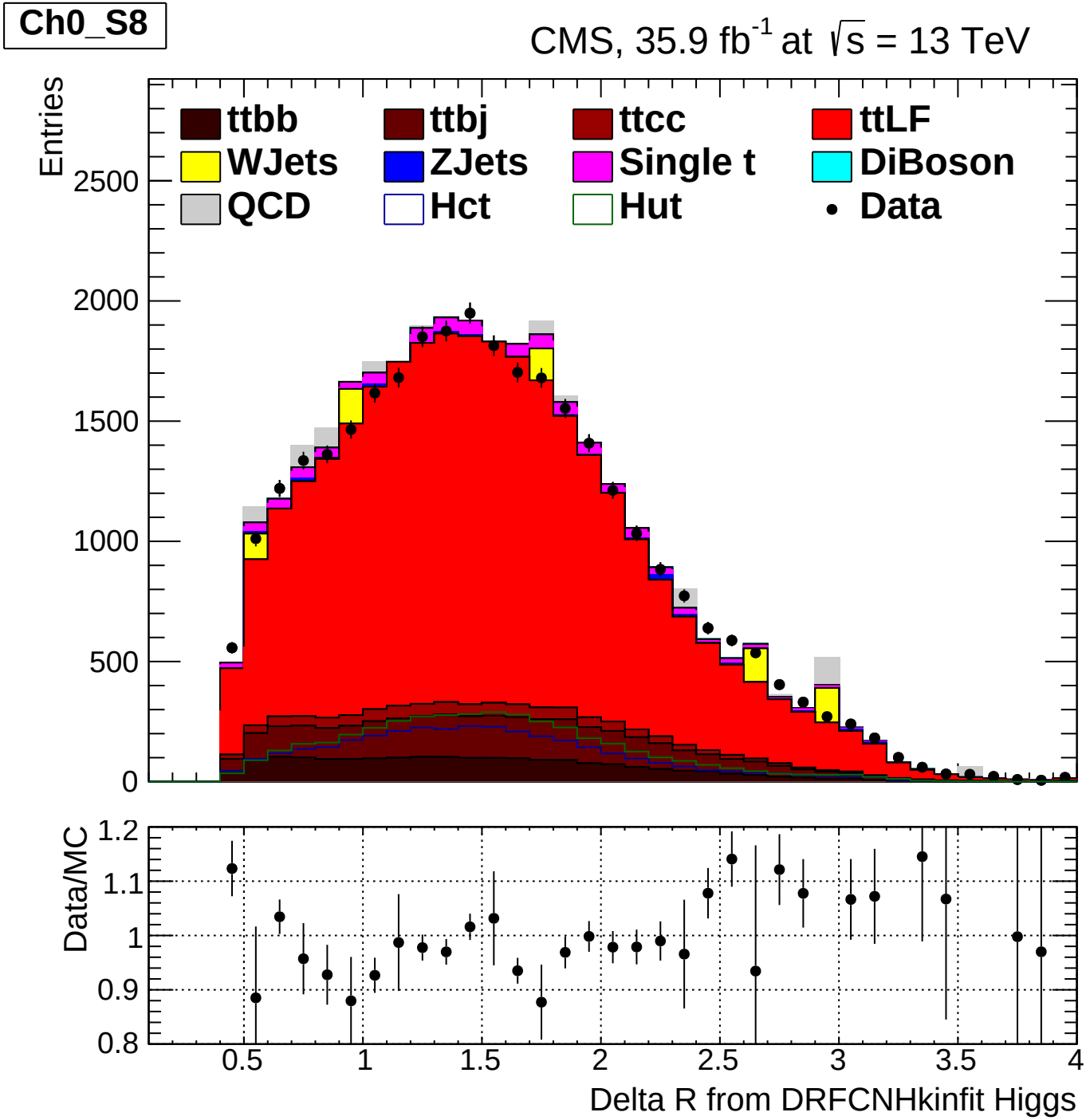
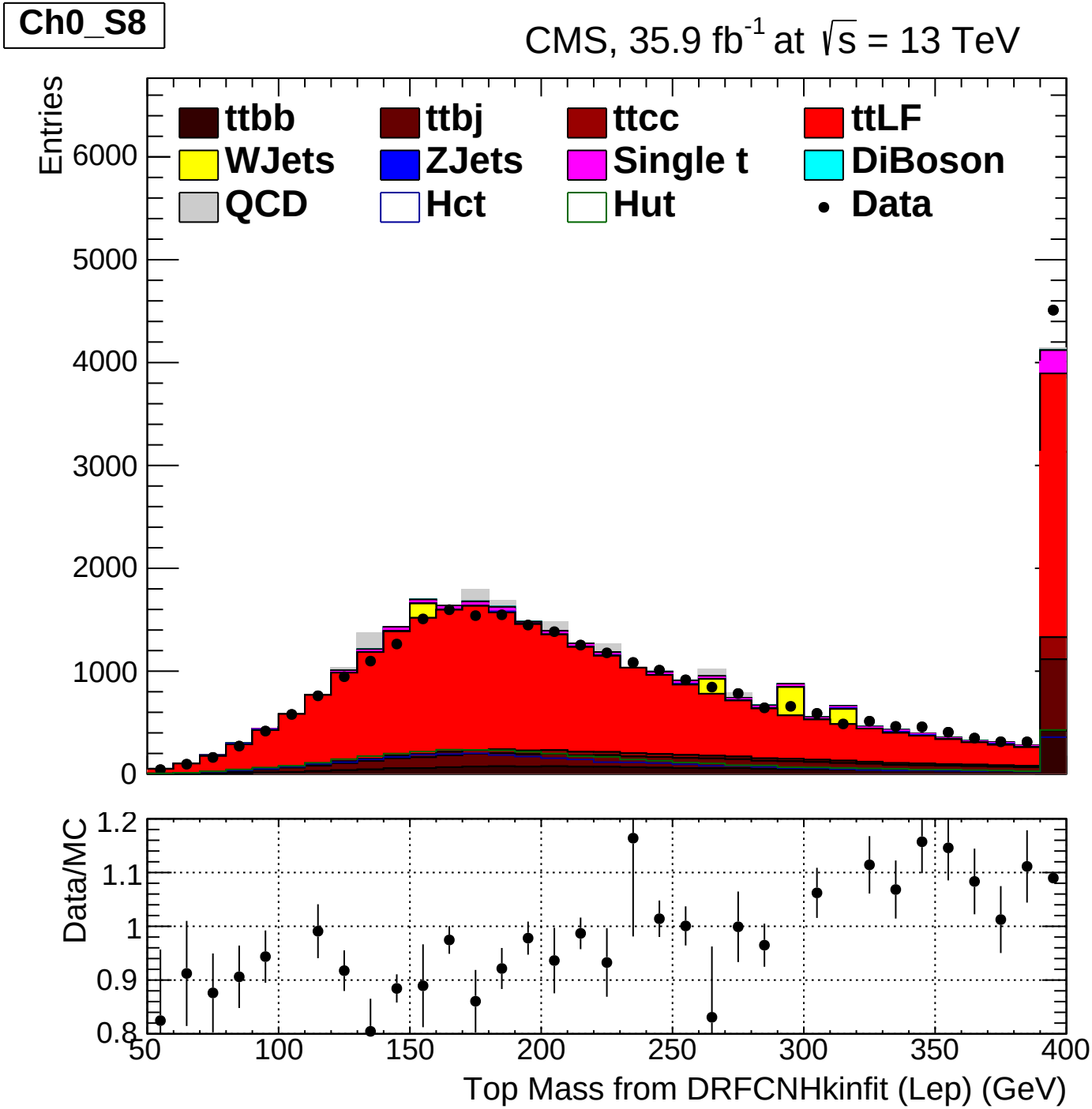
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

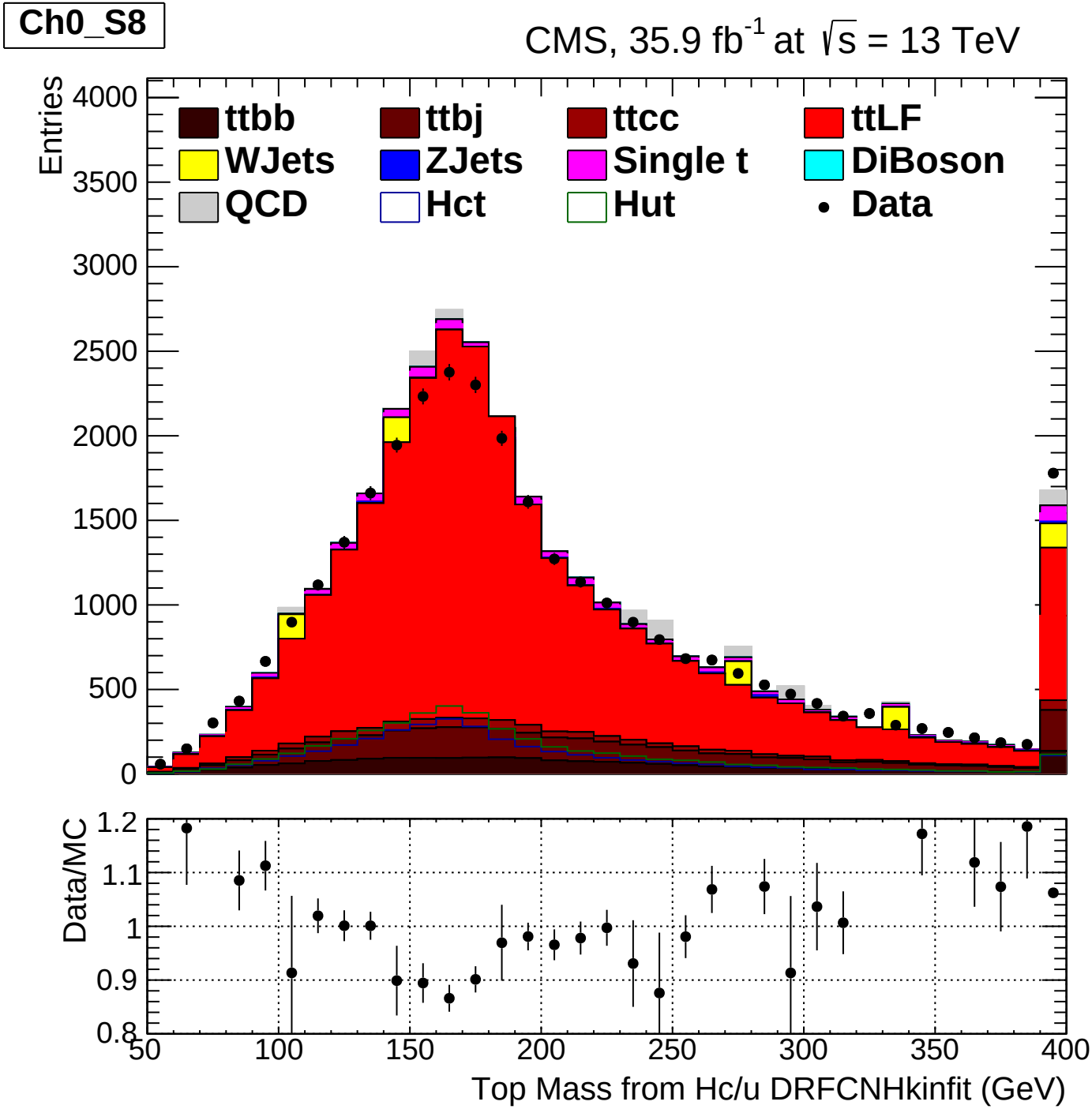

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

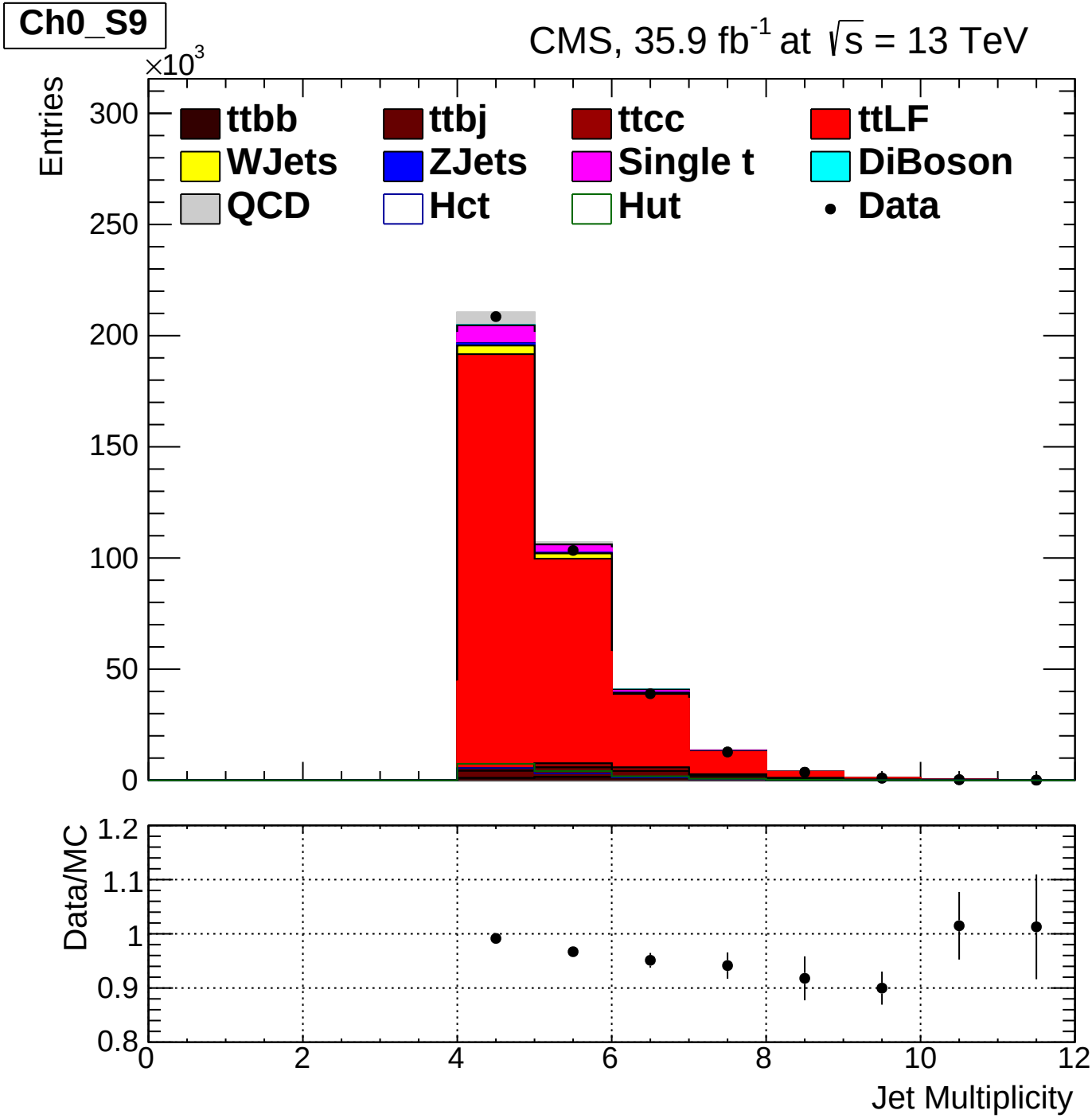

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

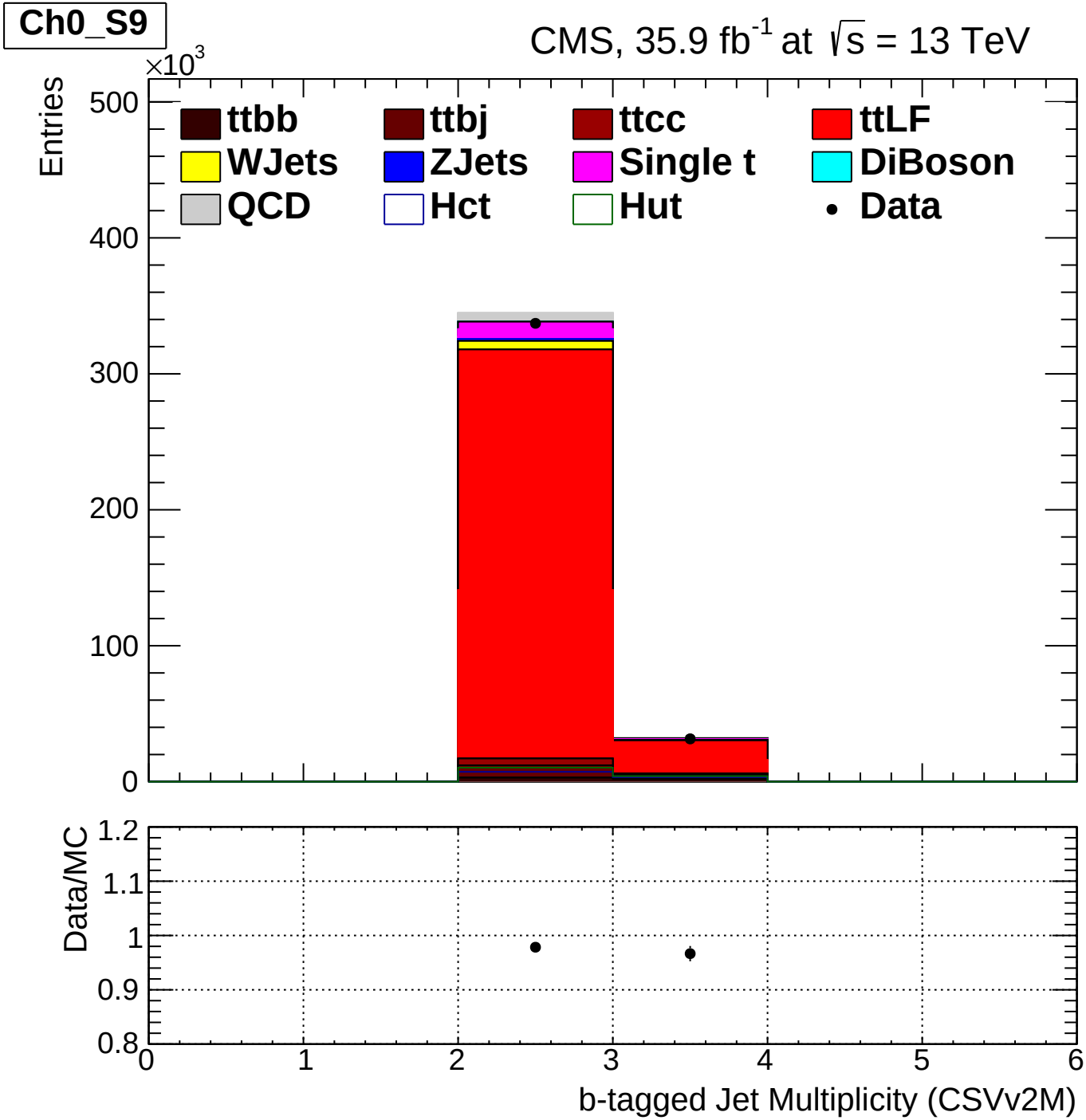

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

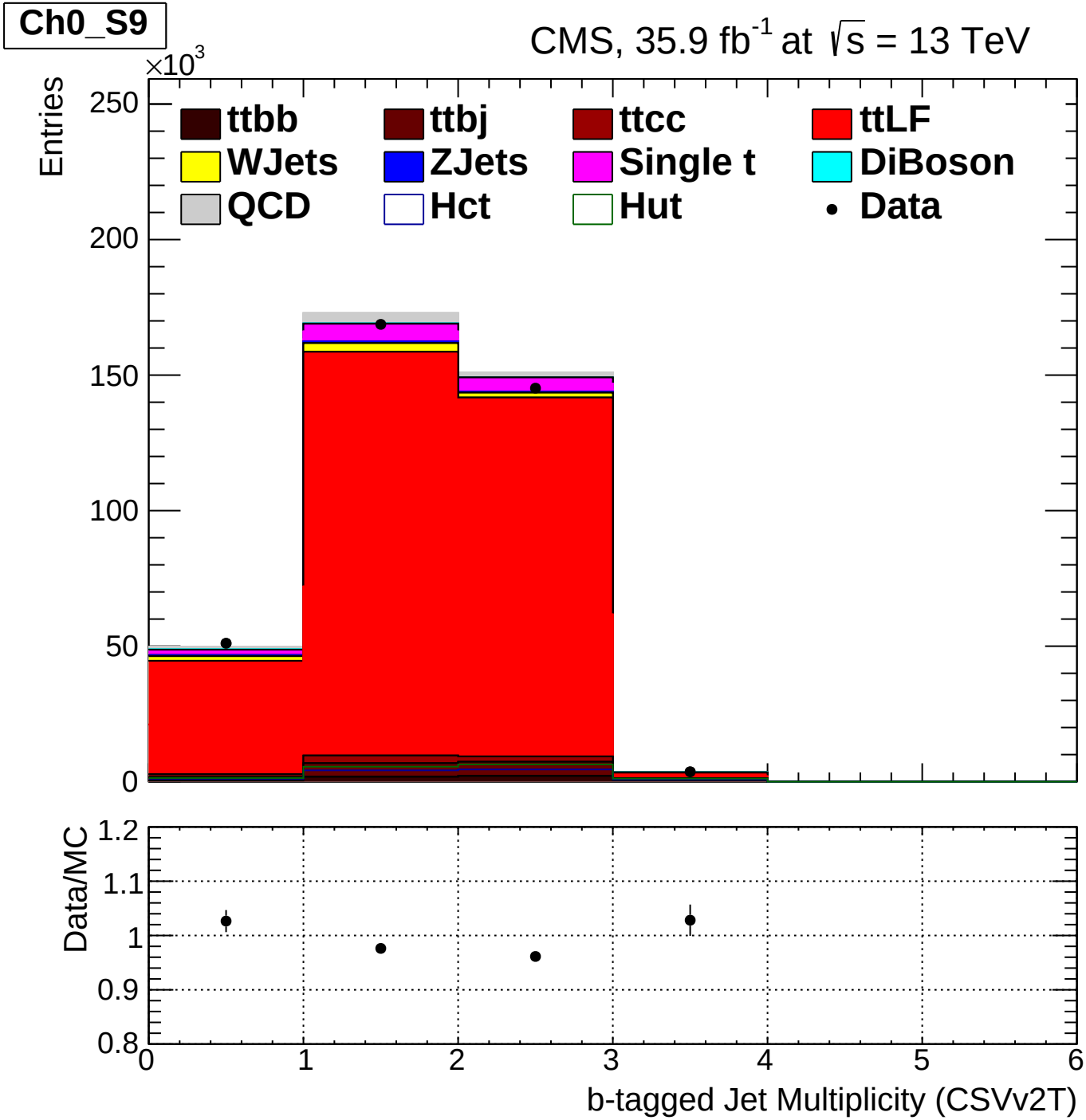

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

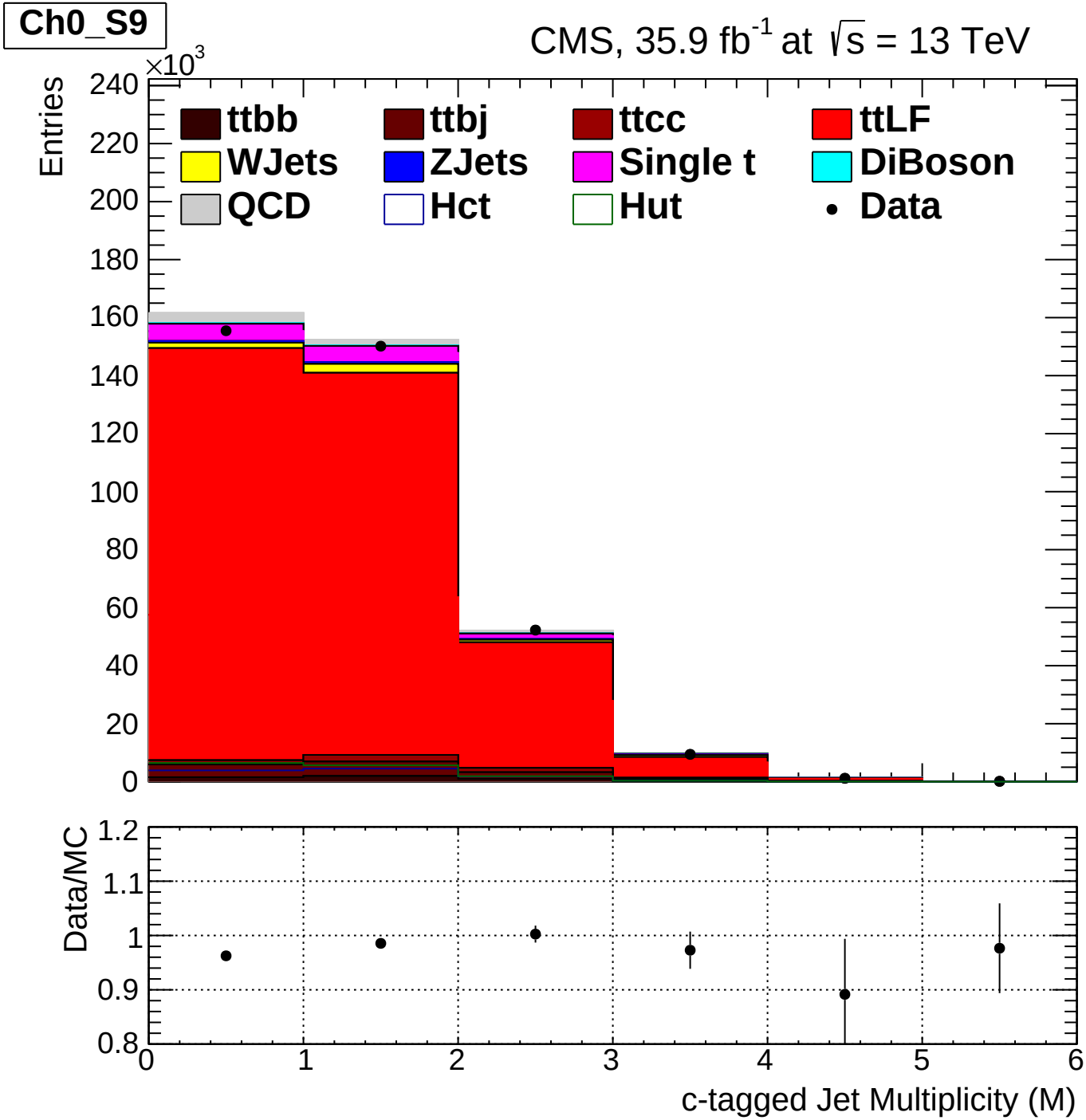

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

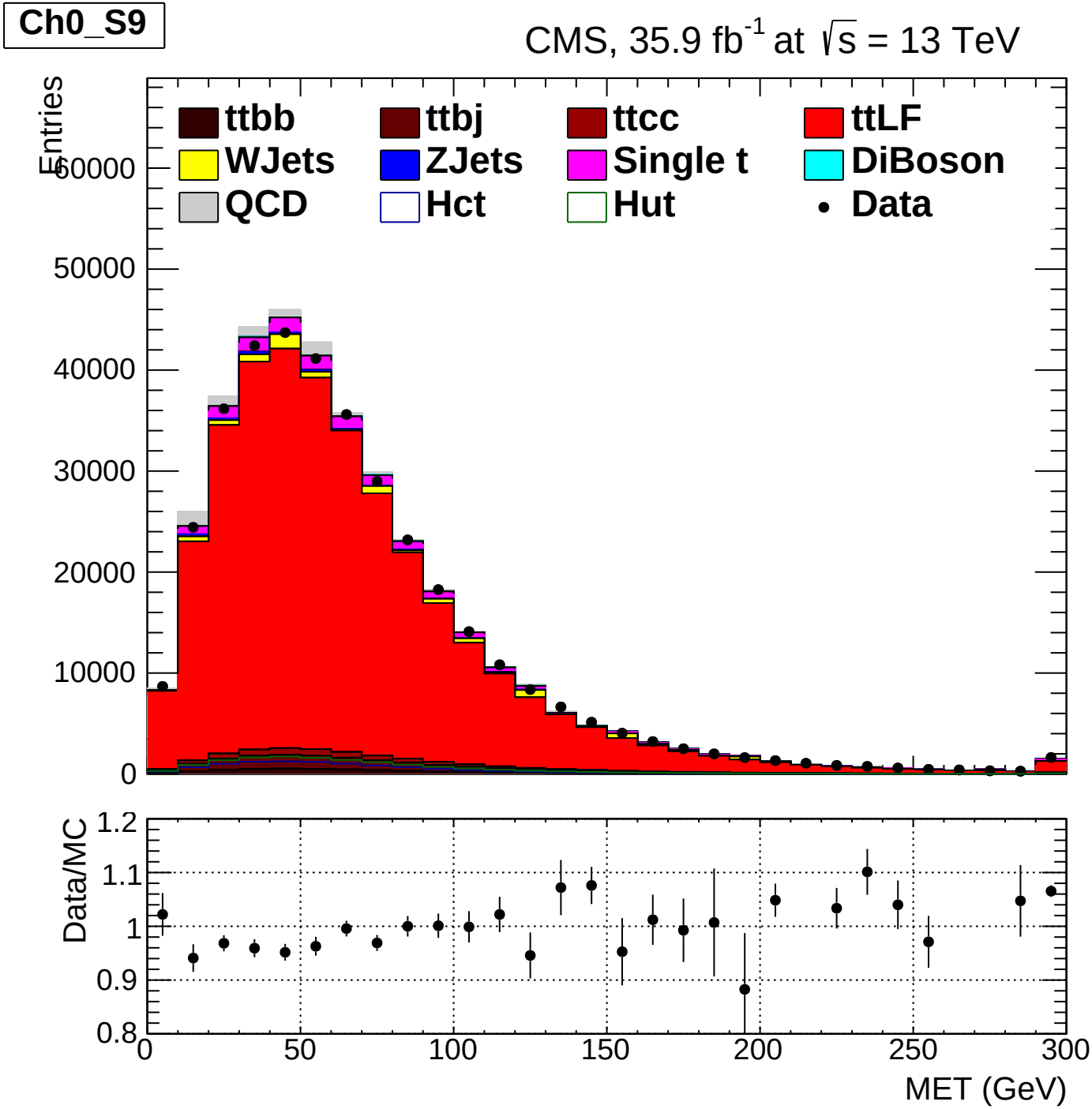

Ch0_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

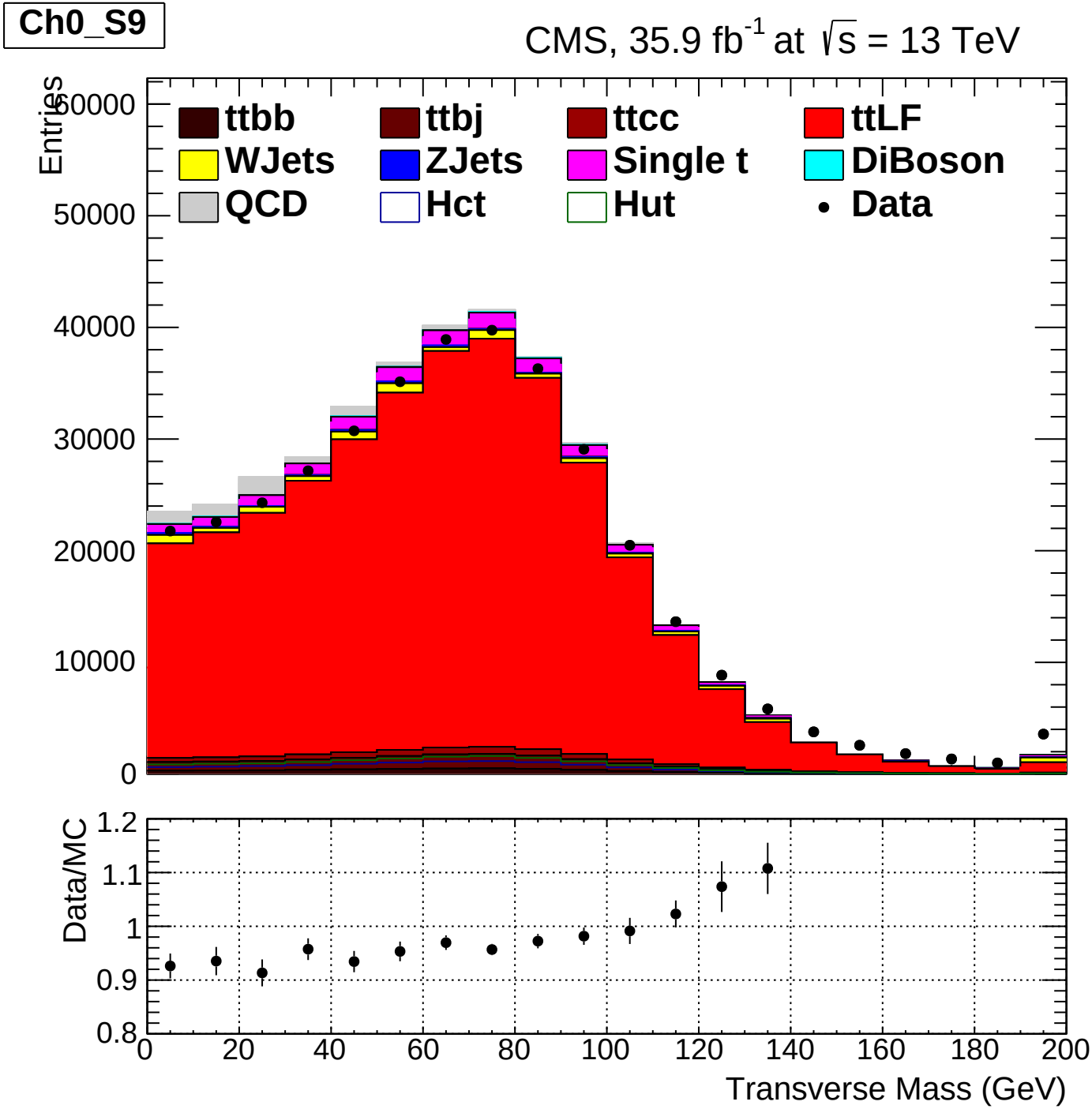

Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

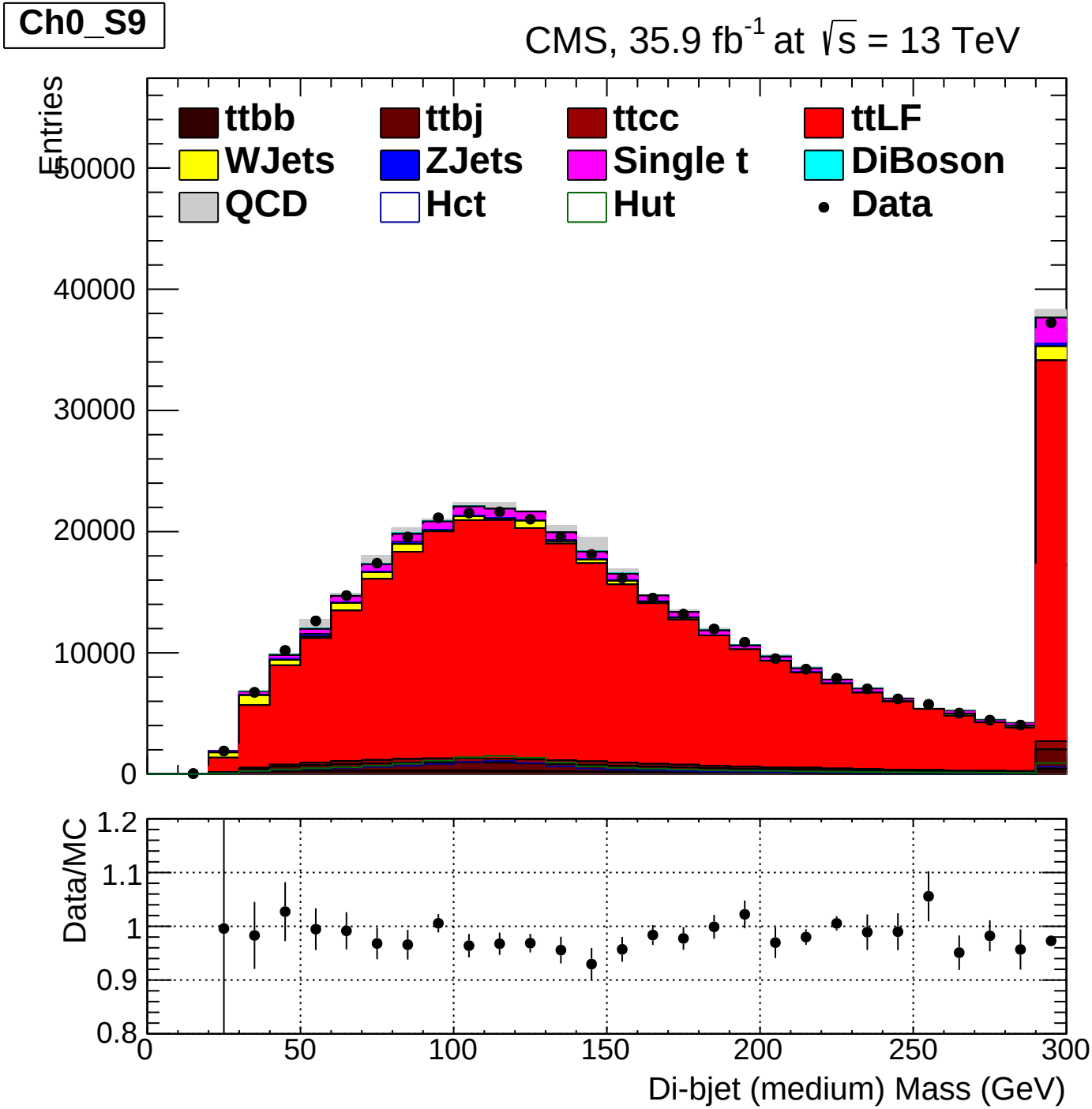

Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
MET (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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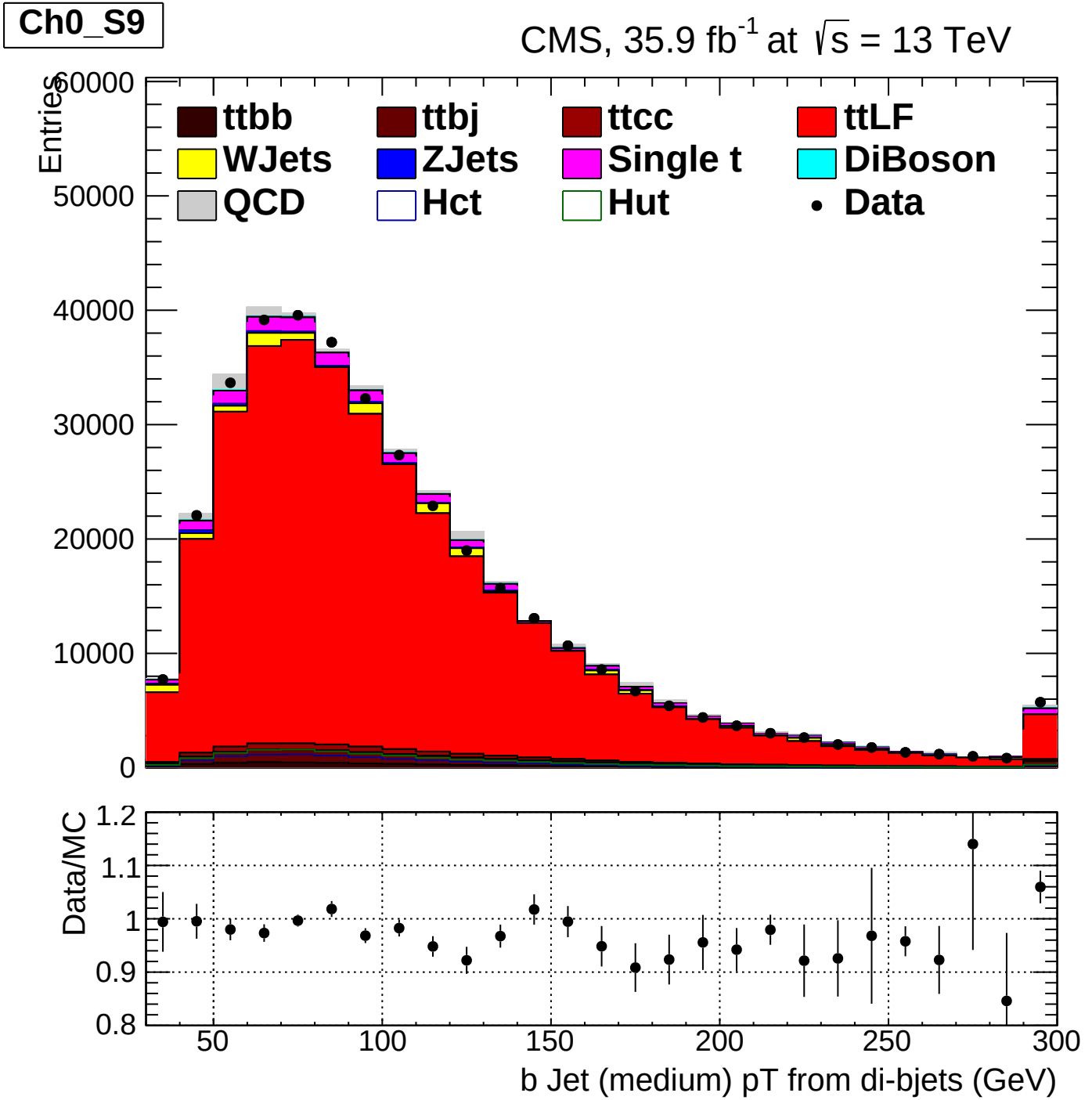
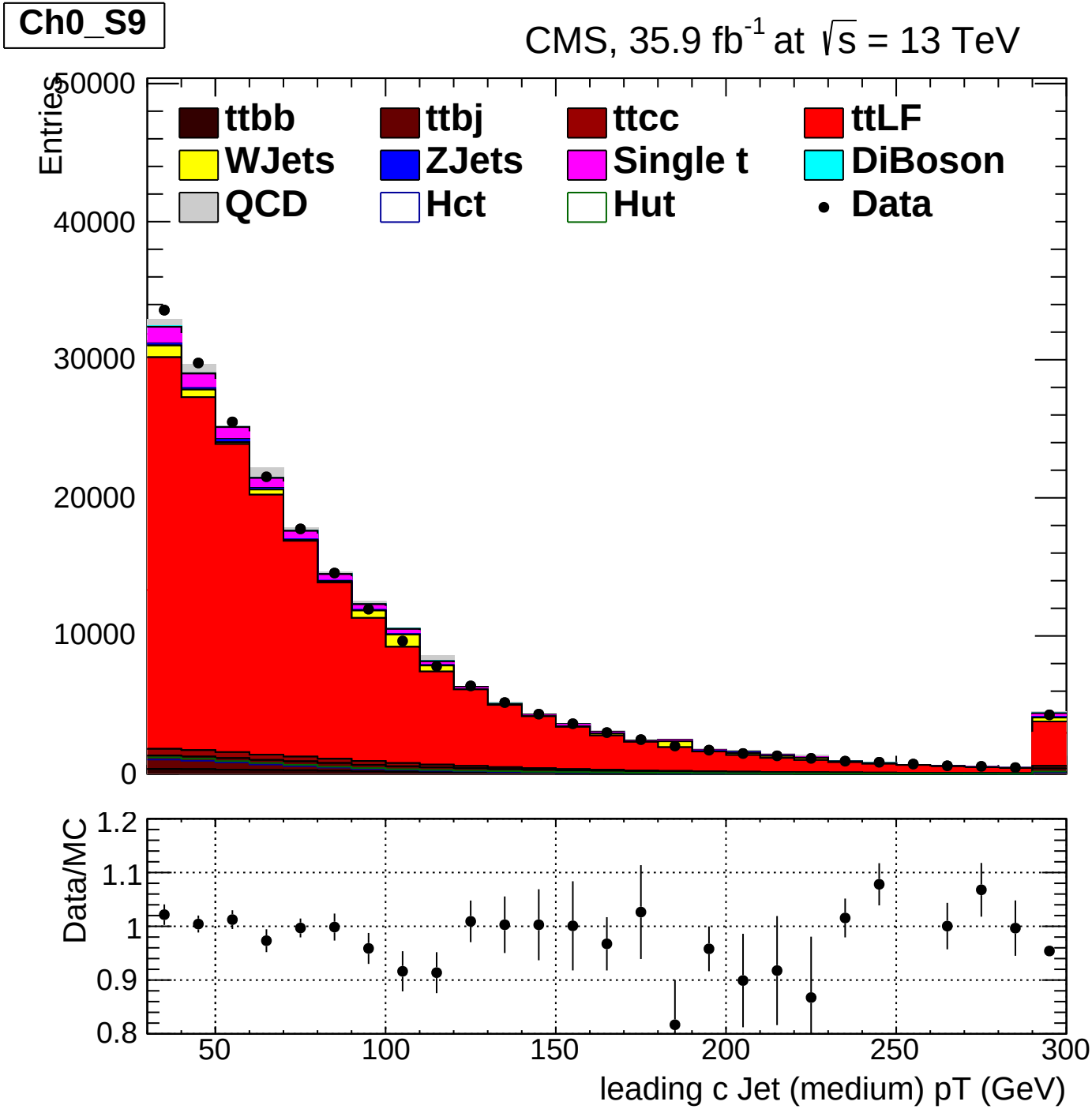
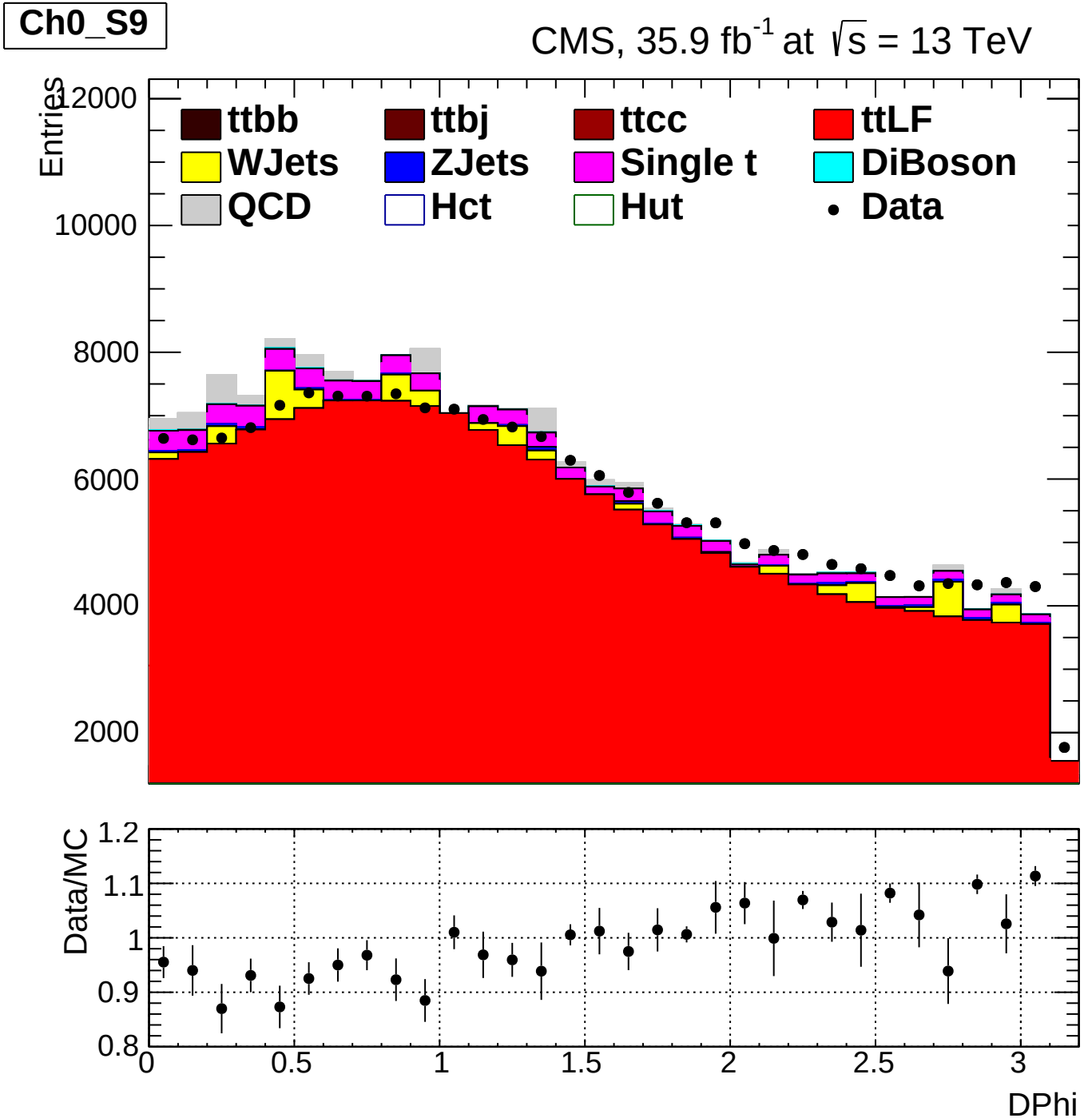
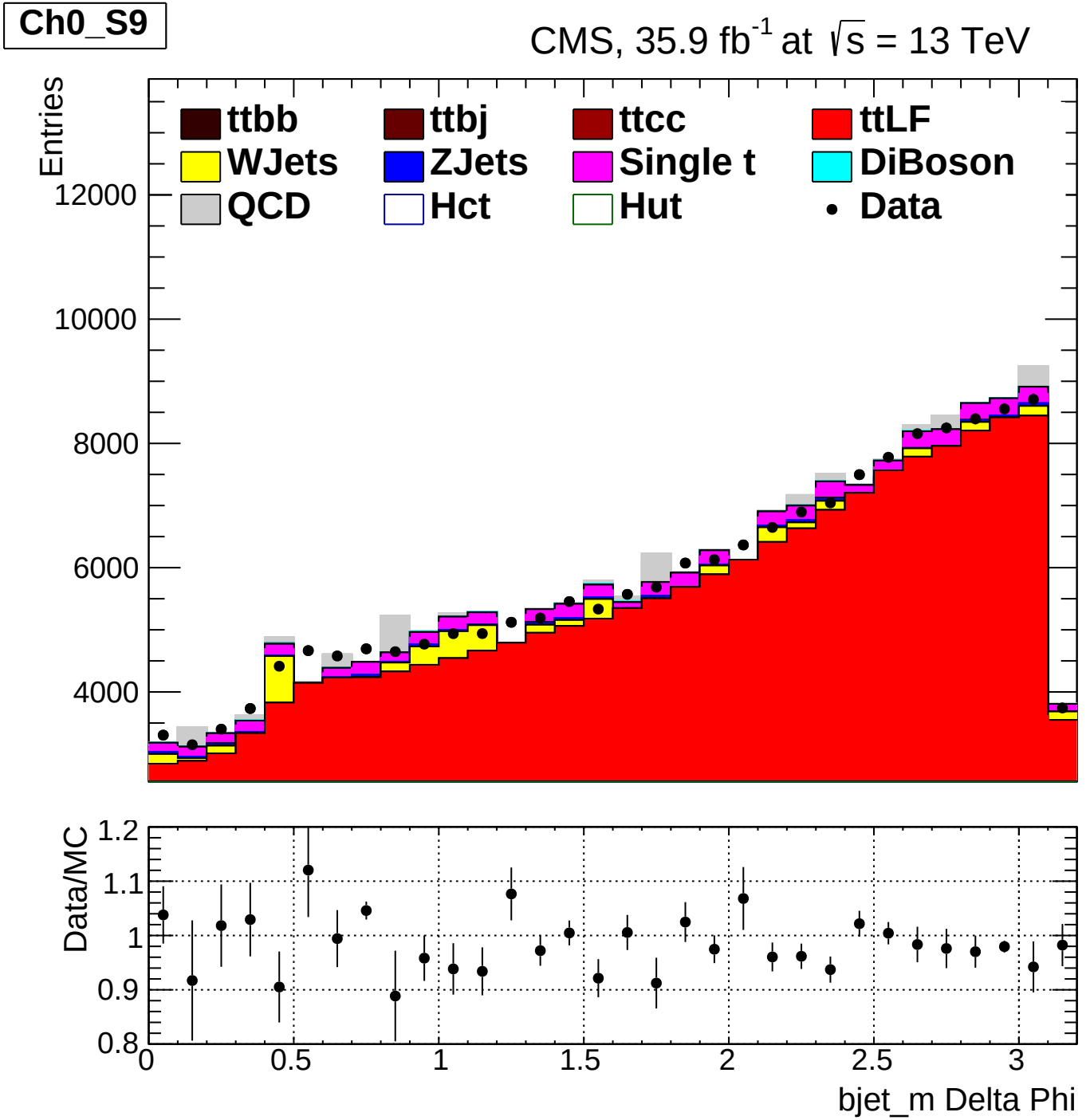
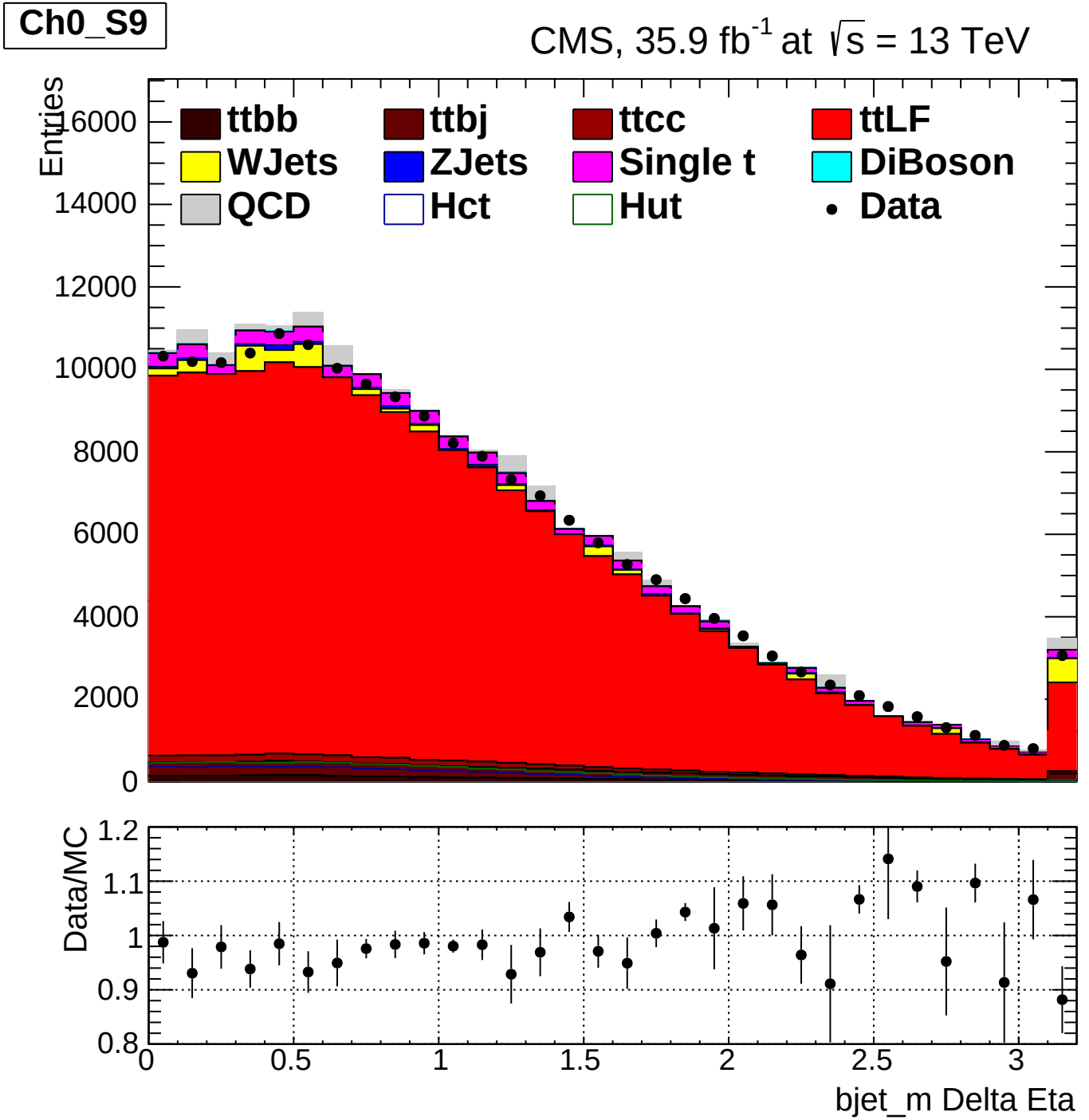
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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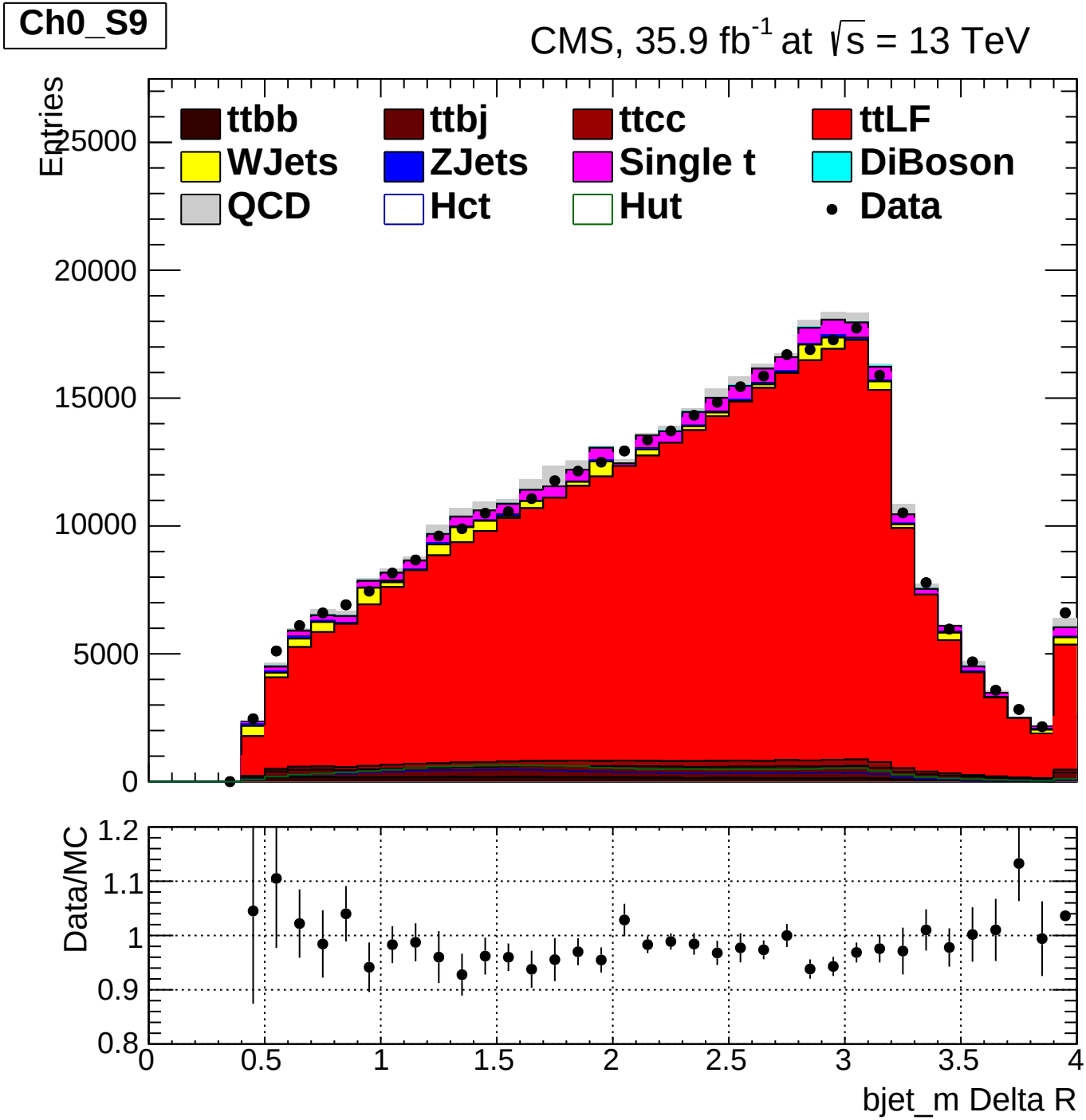
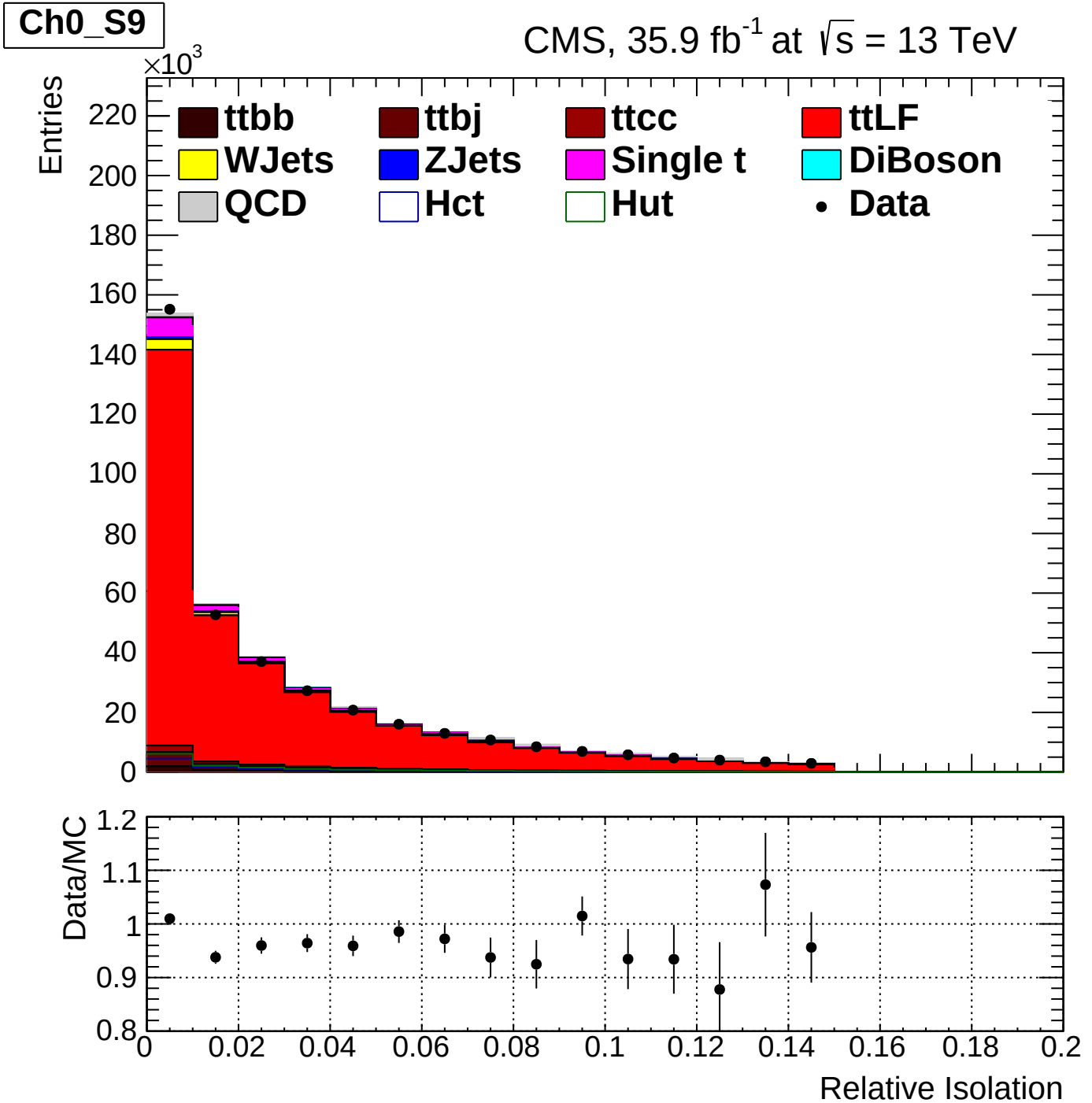
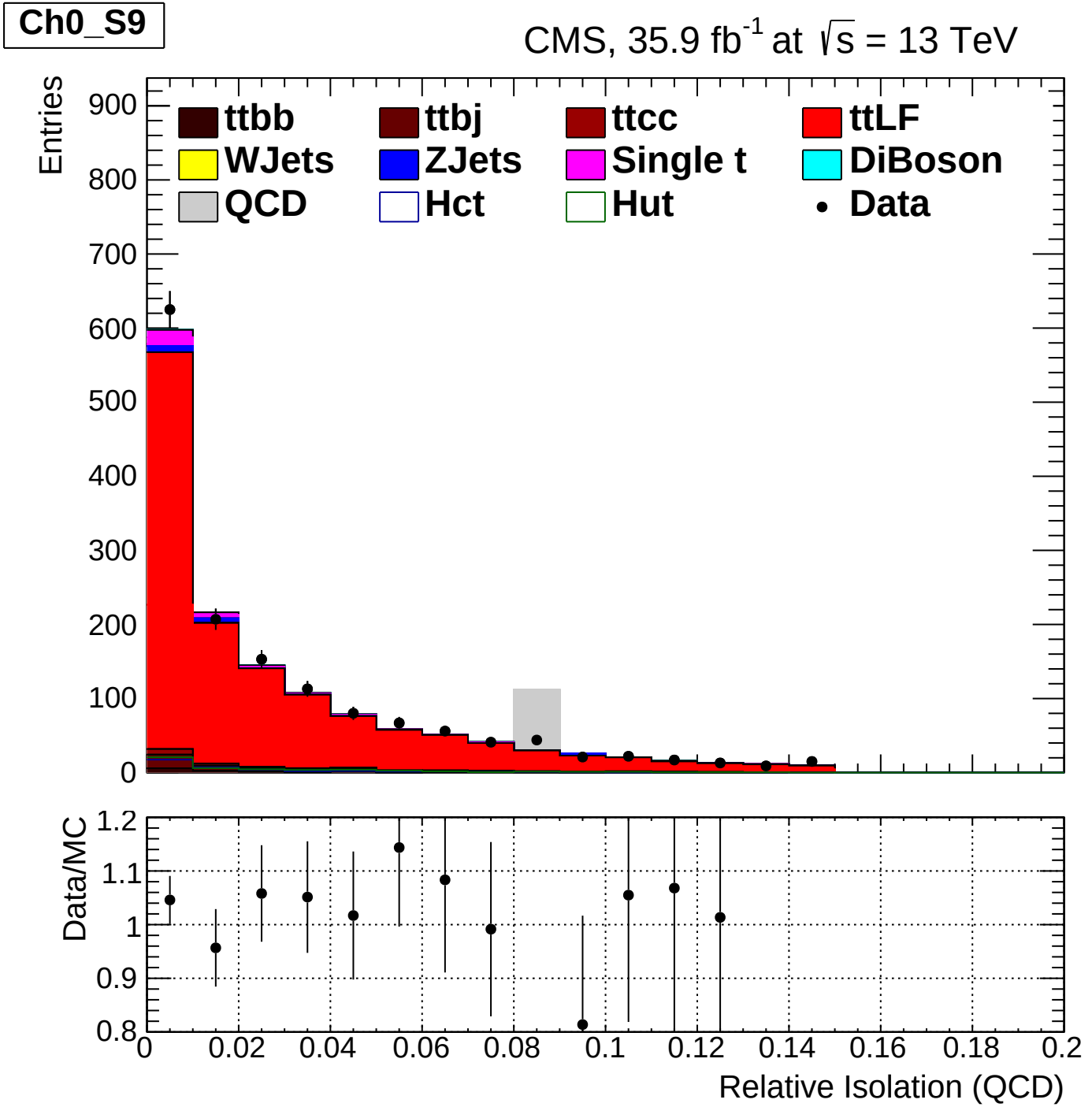
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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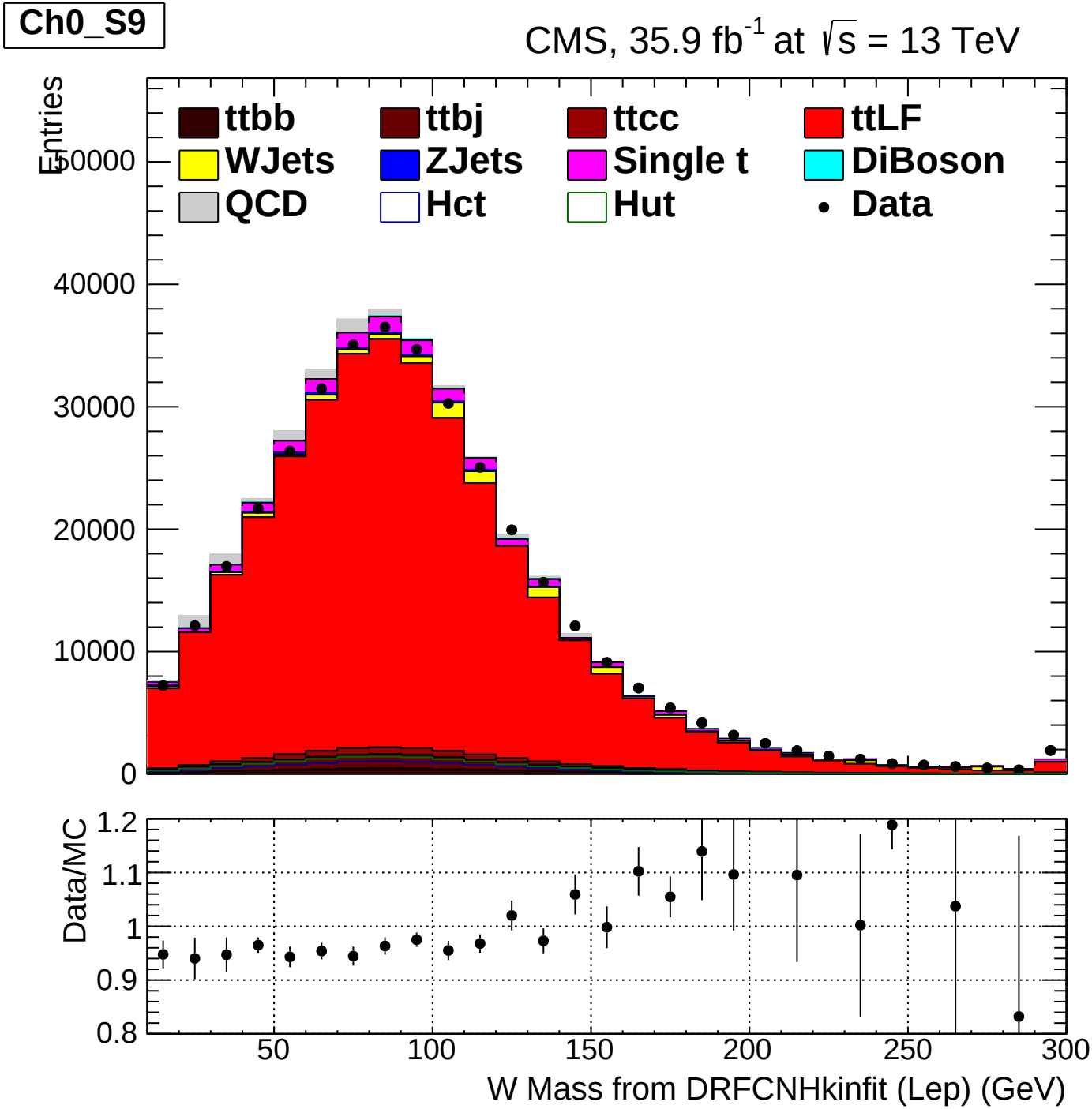
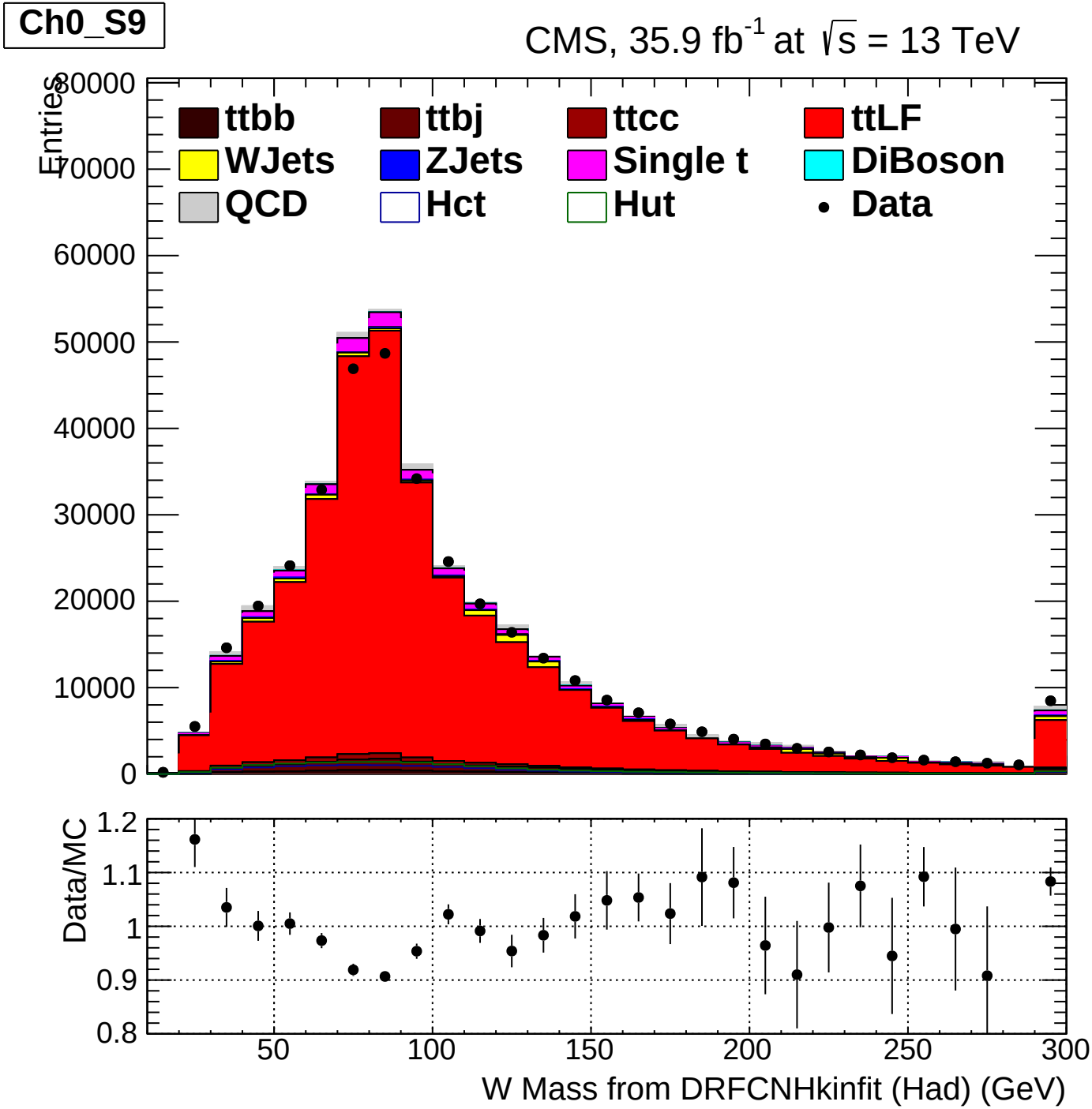
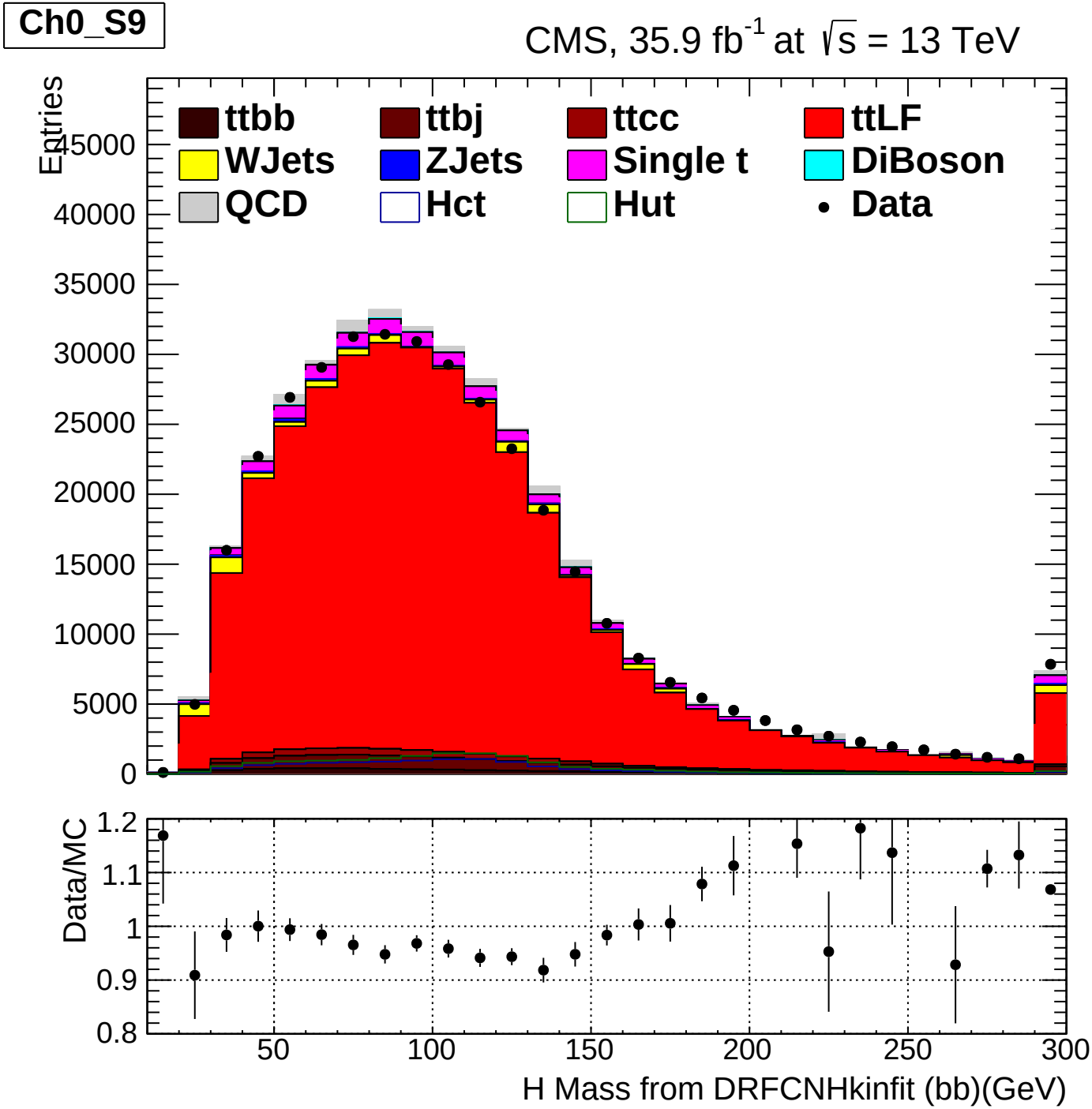
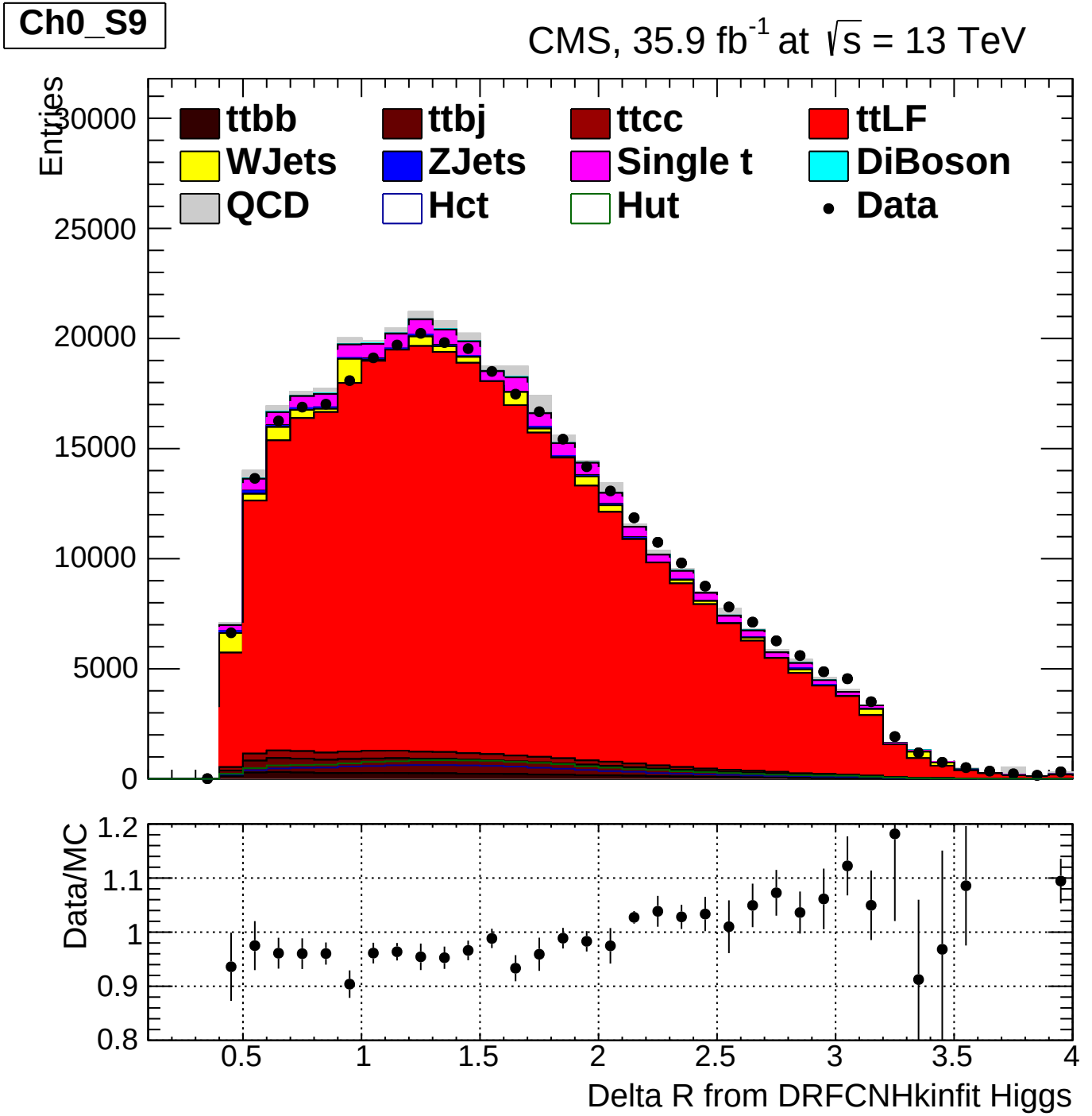
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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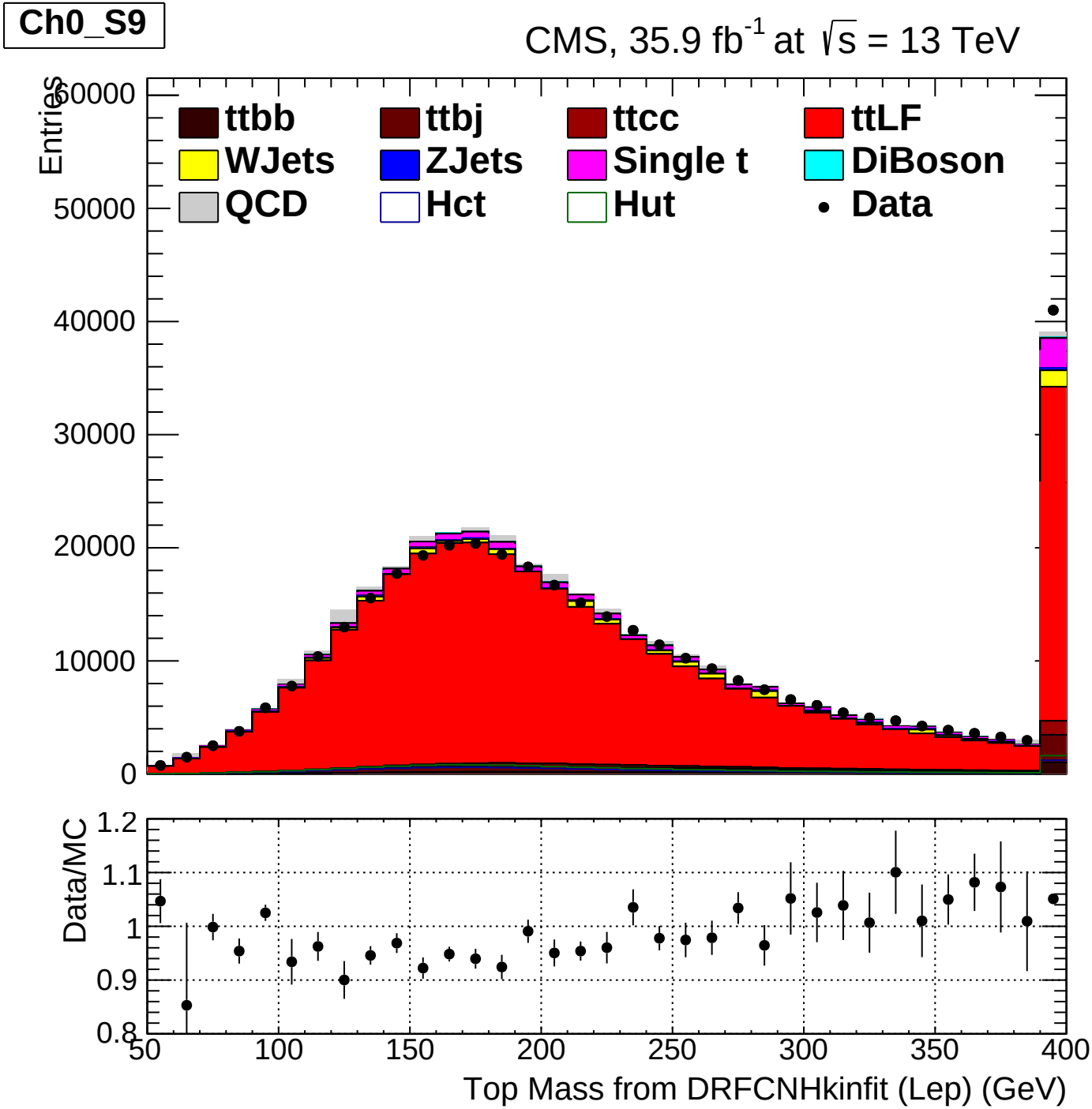
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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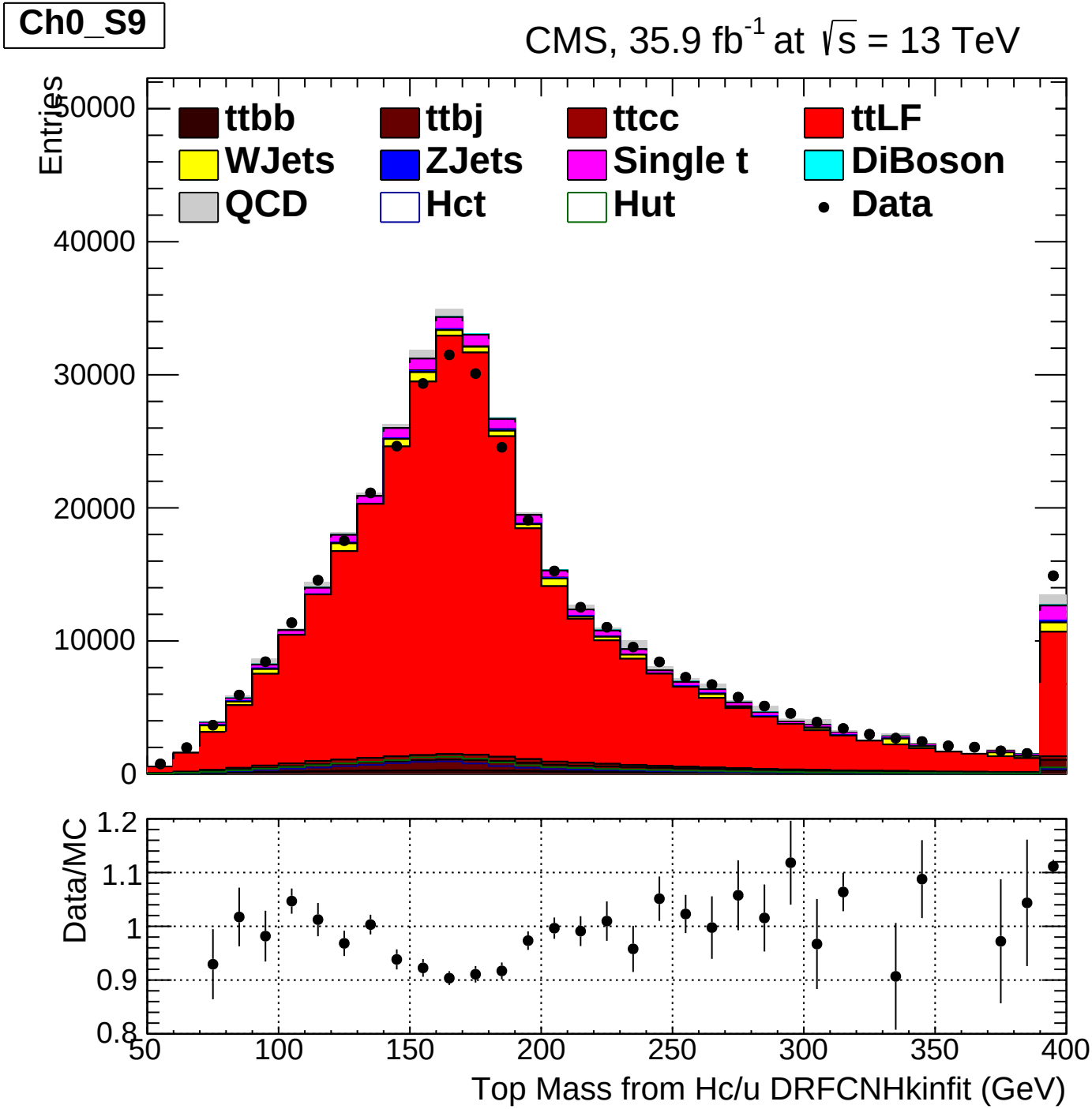
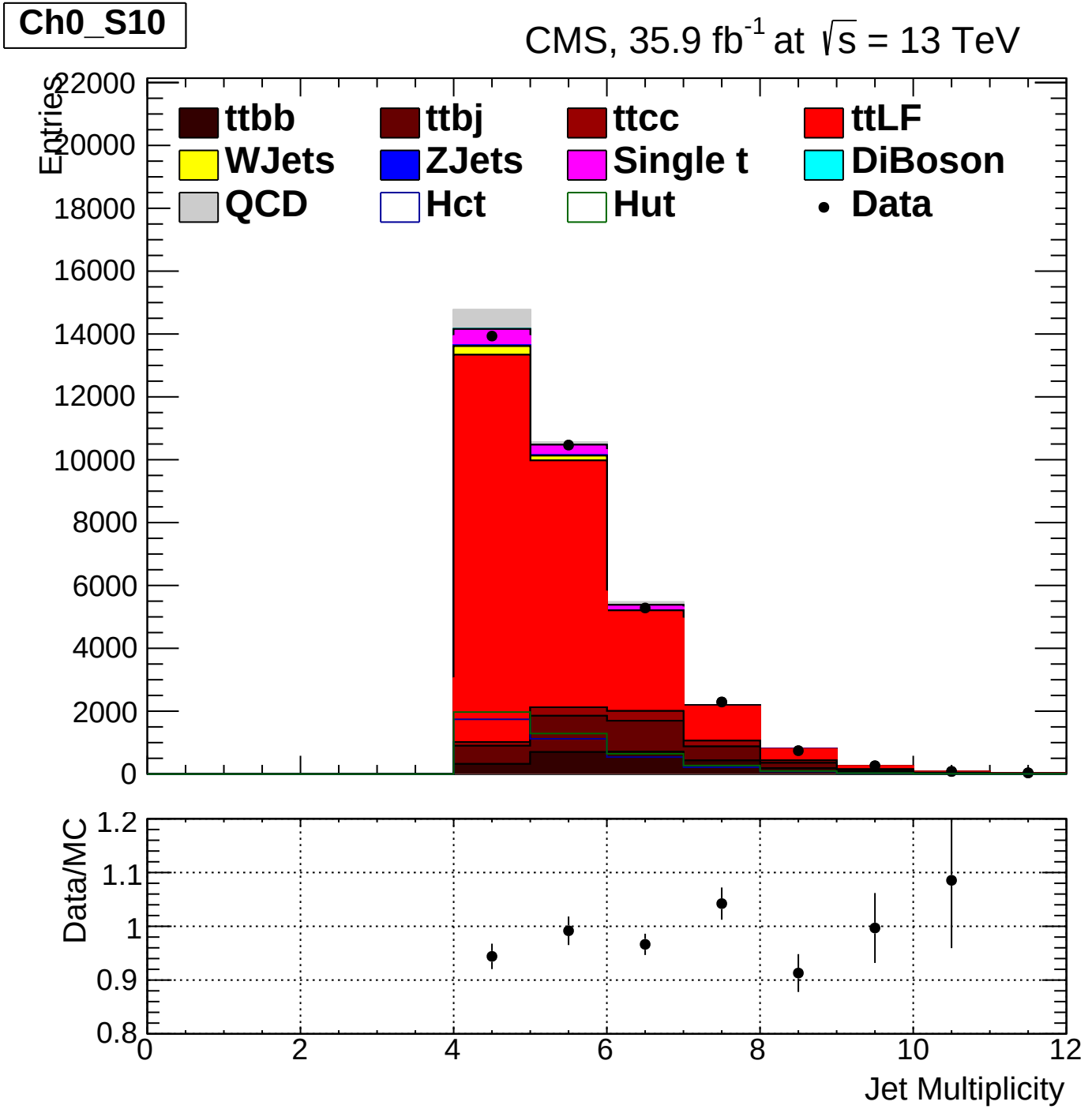
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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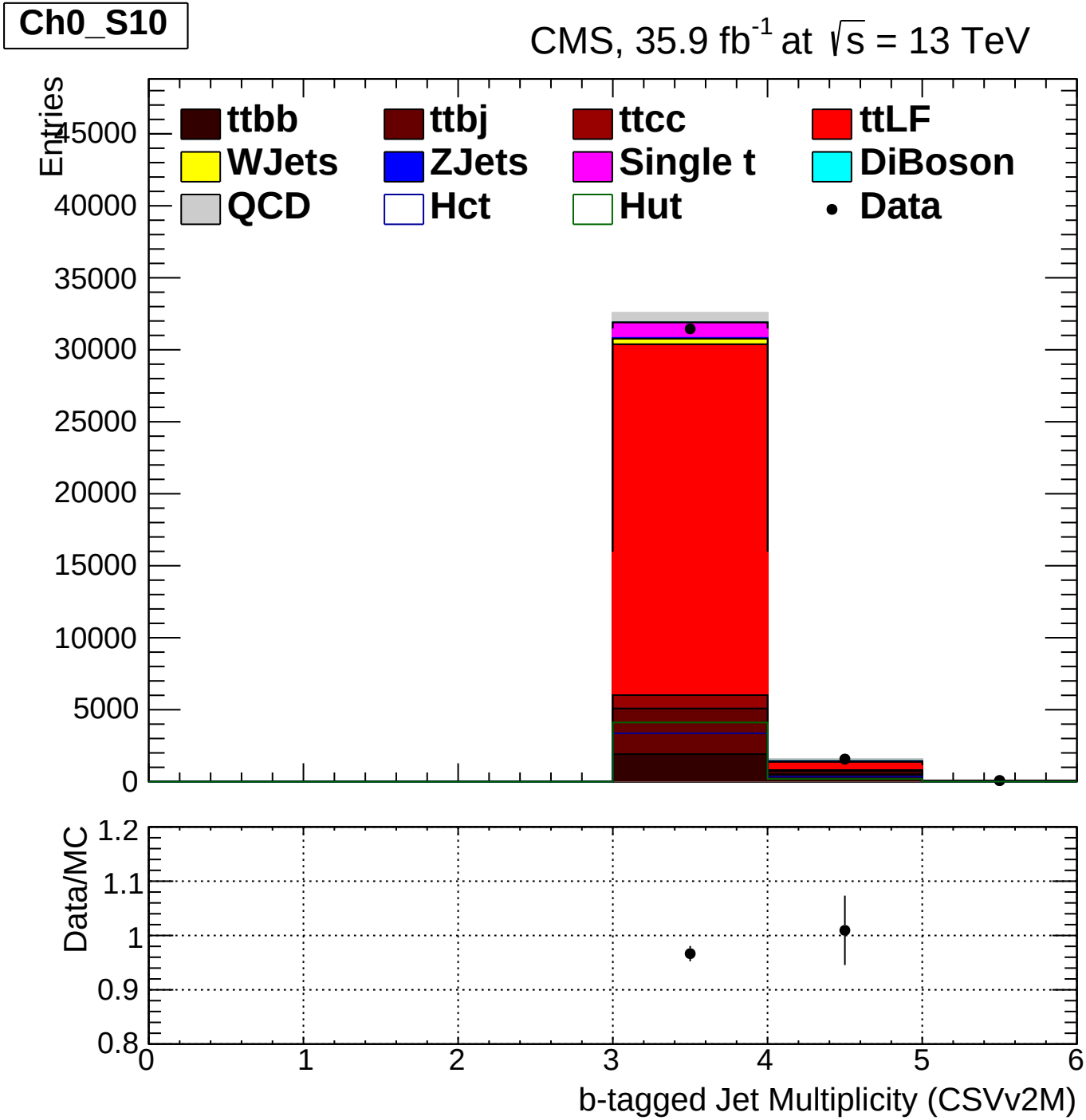
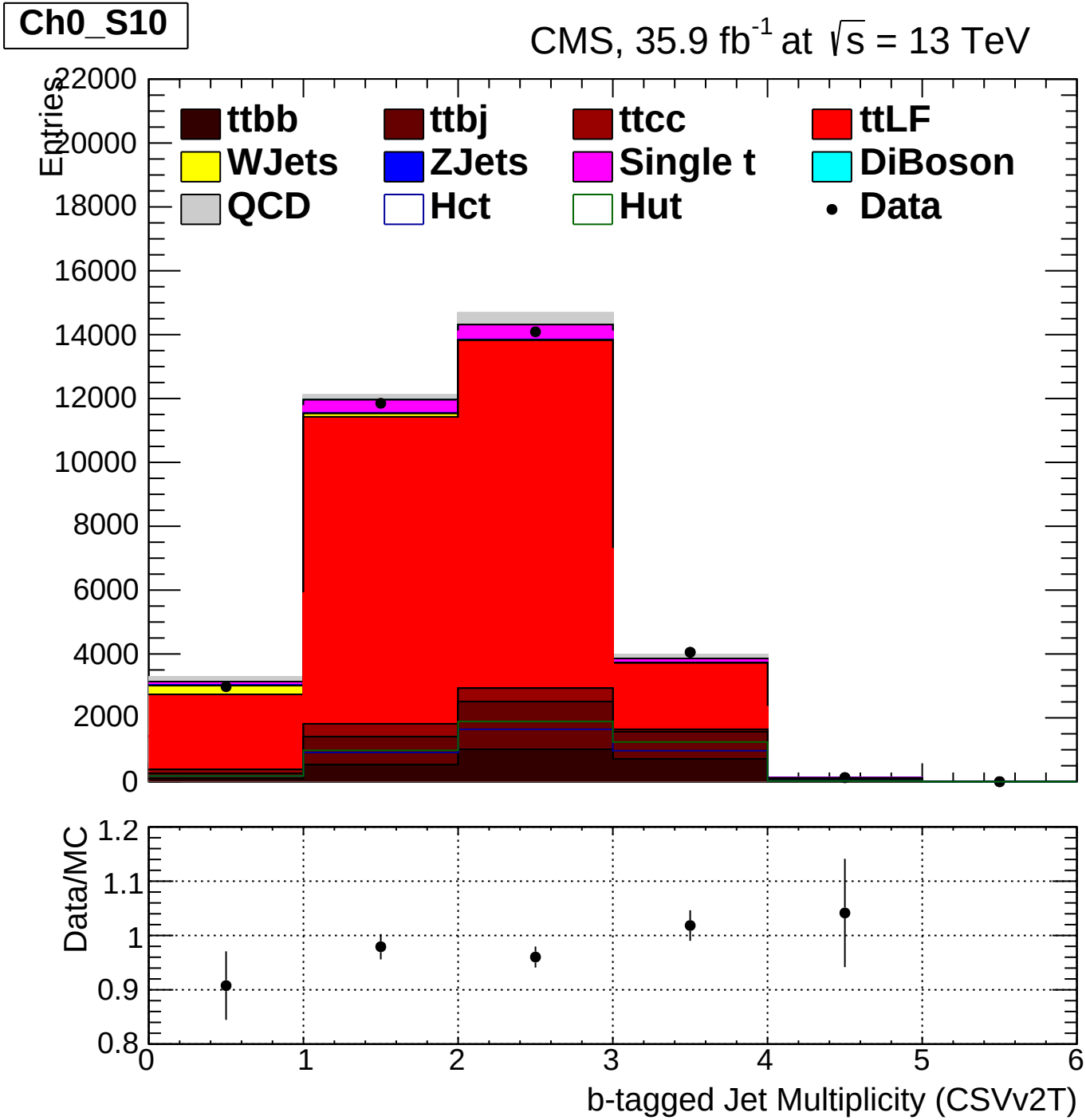
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttbj
ttcc
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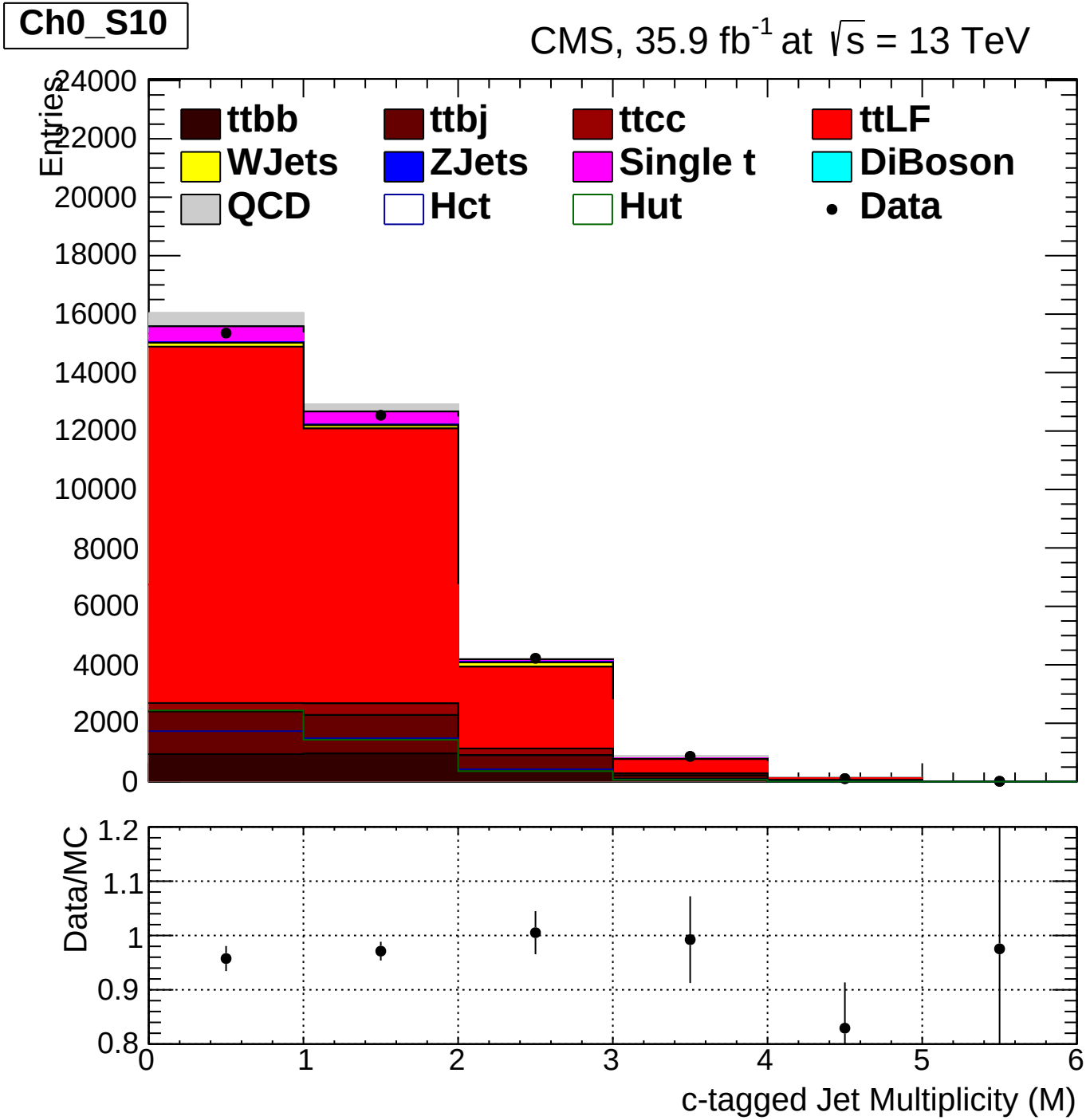
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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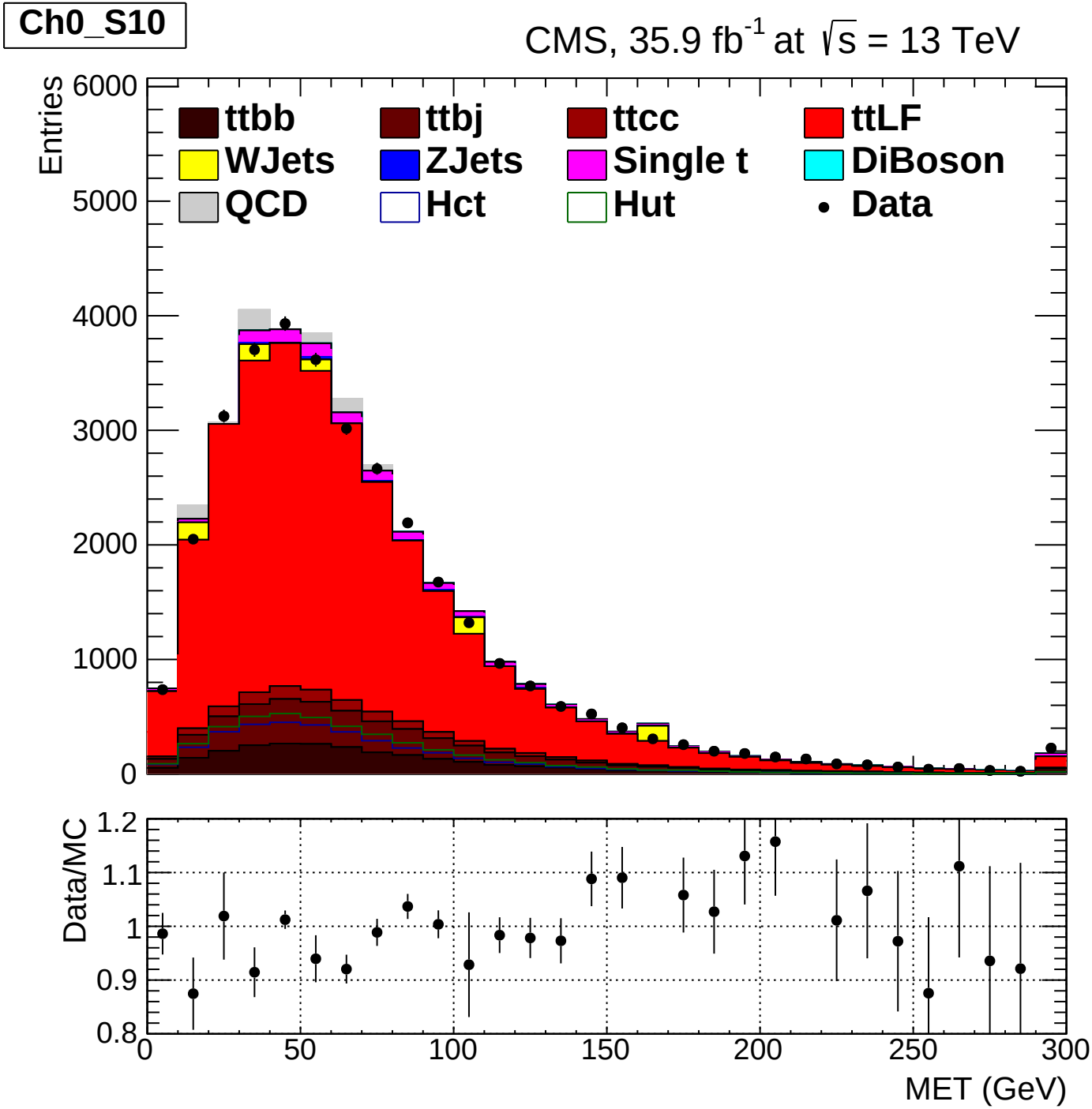
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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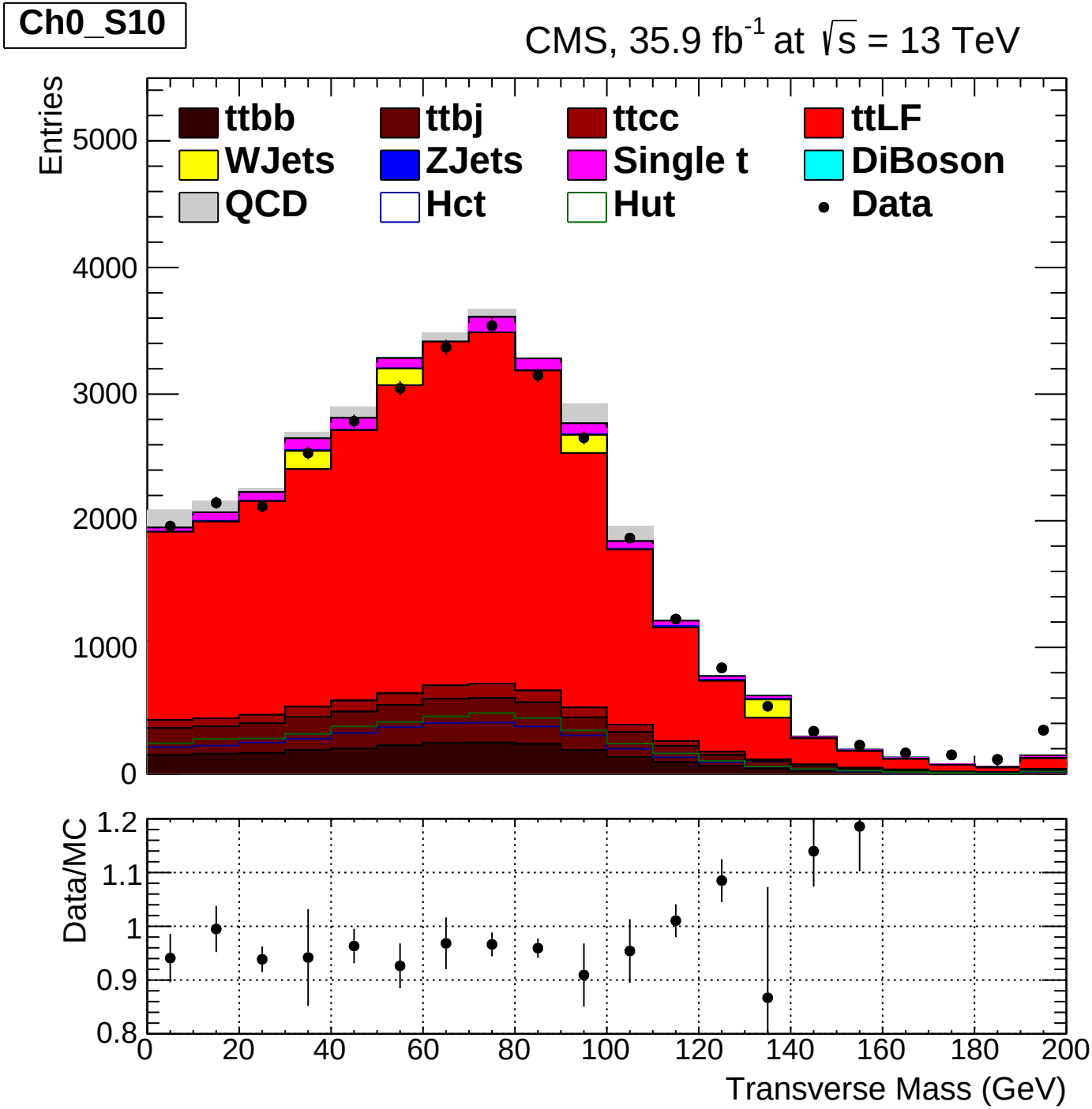
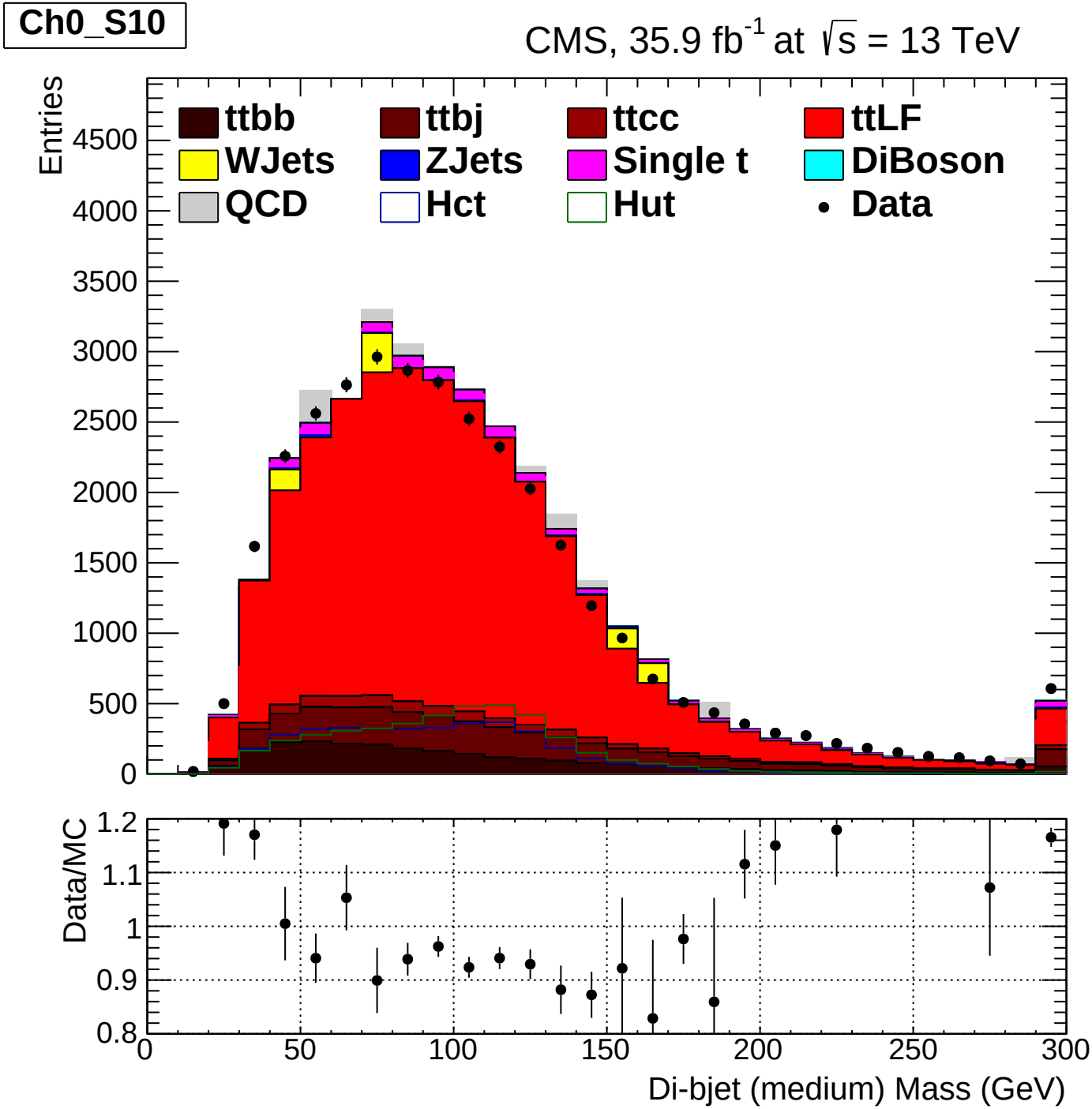
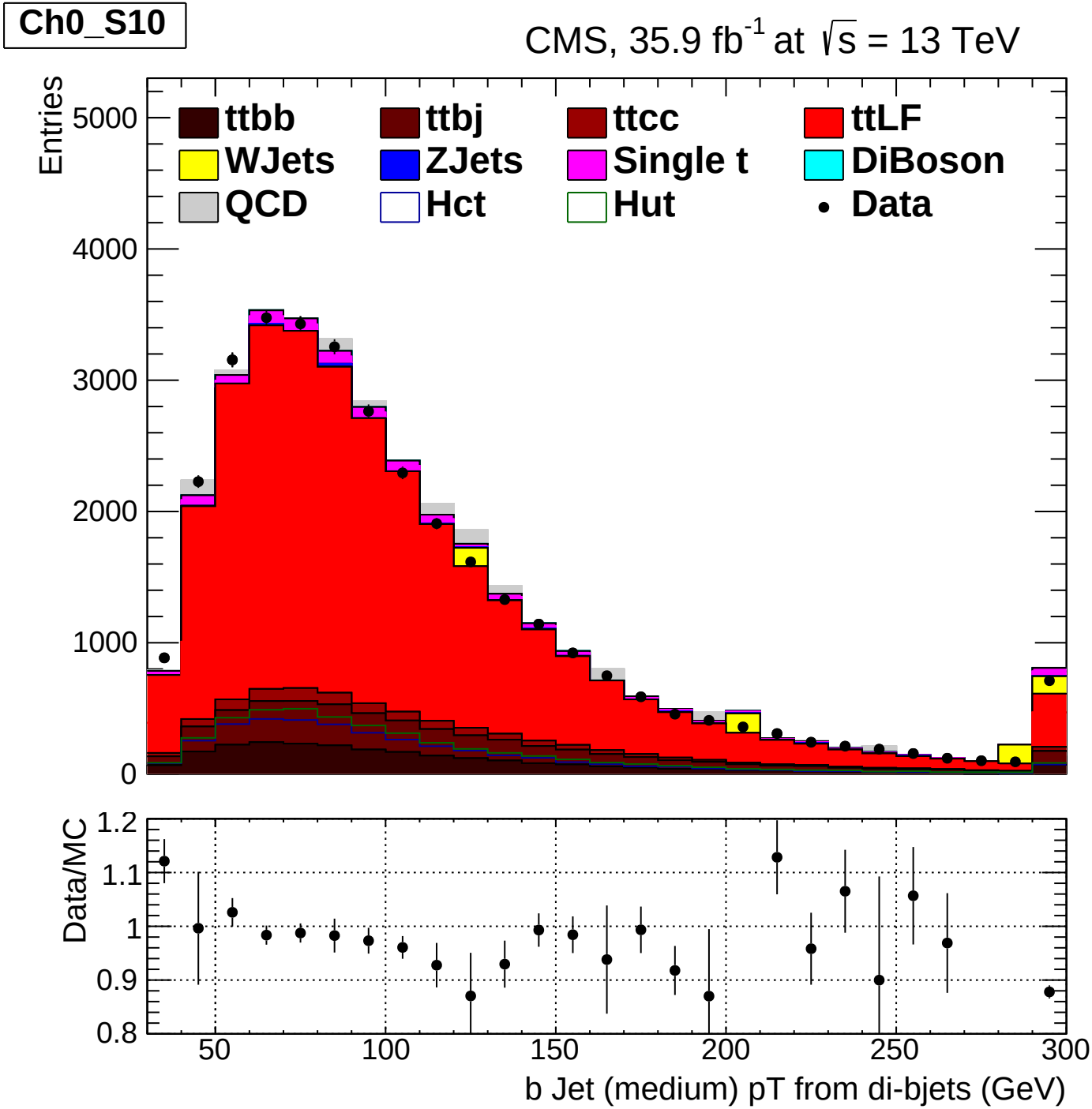
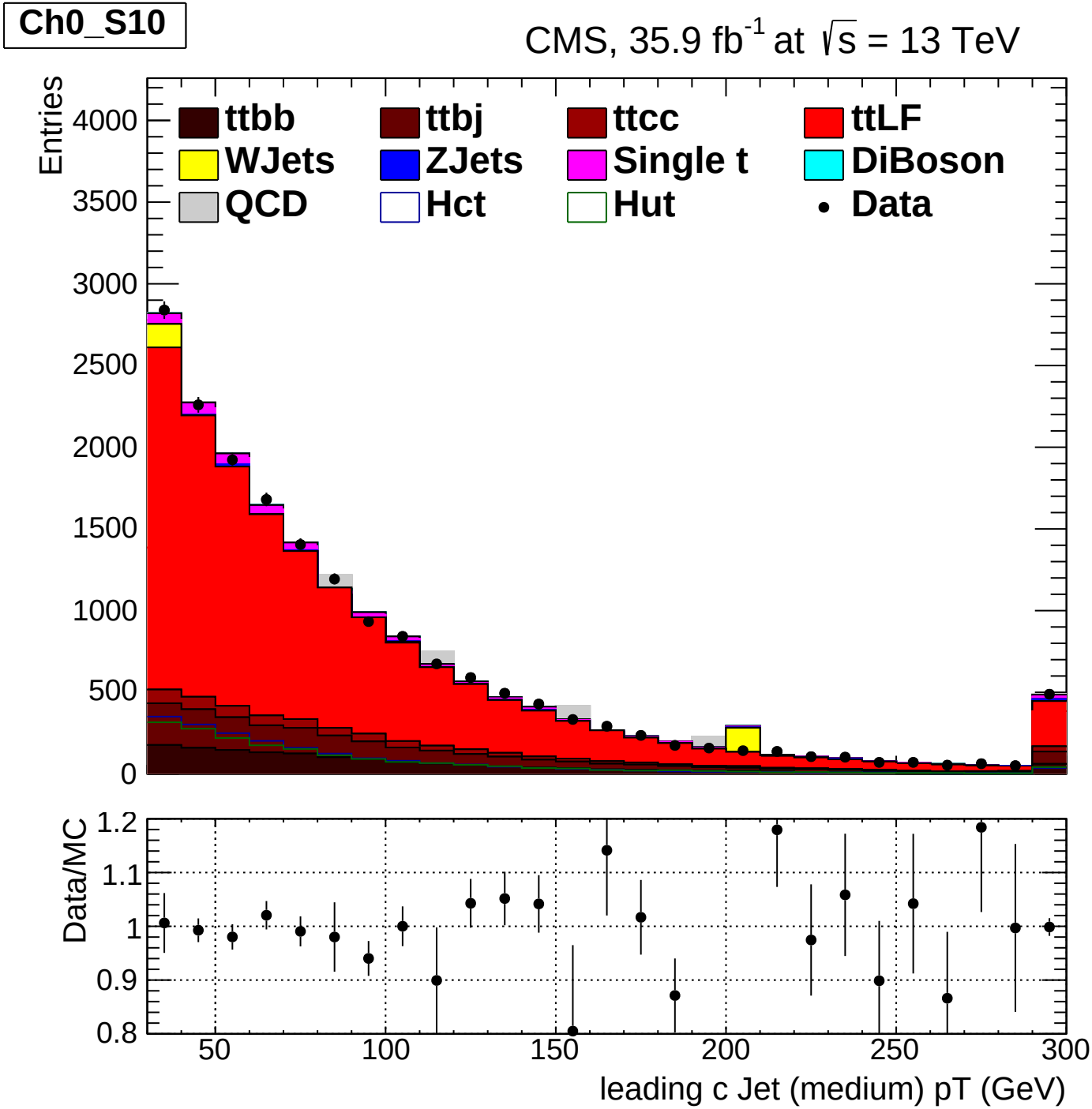
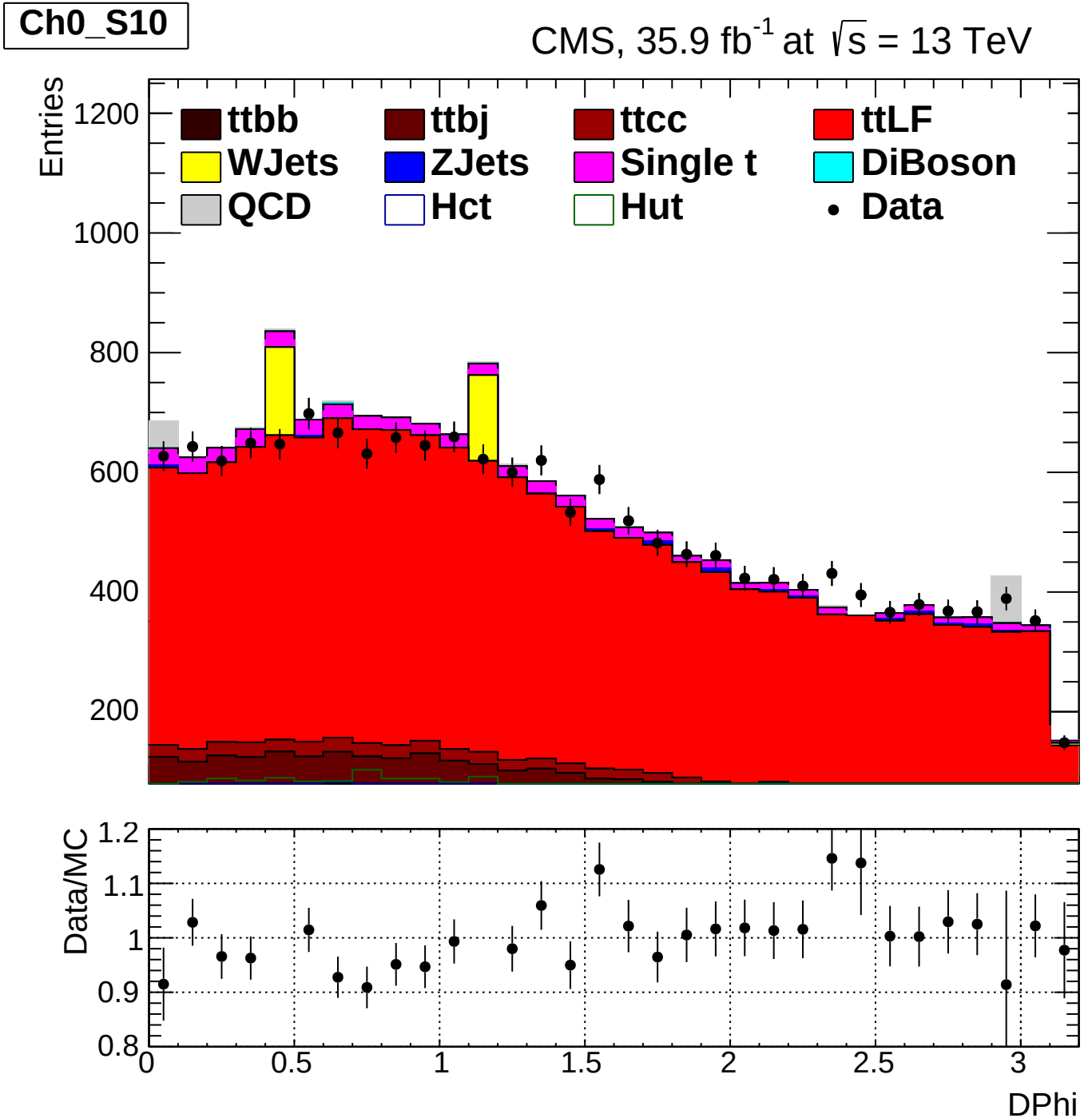
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

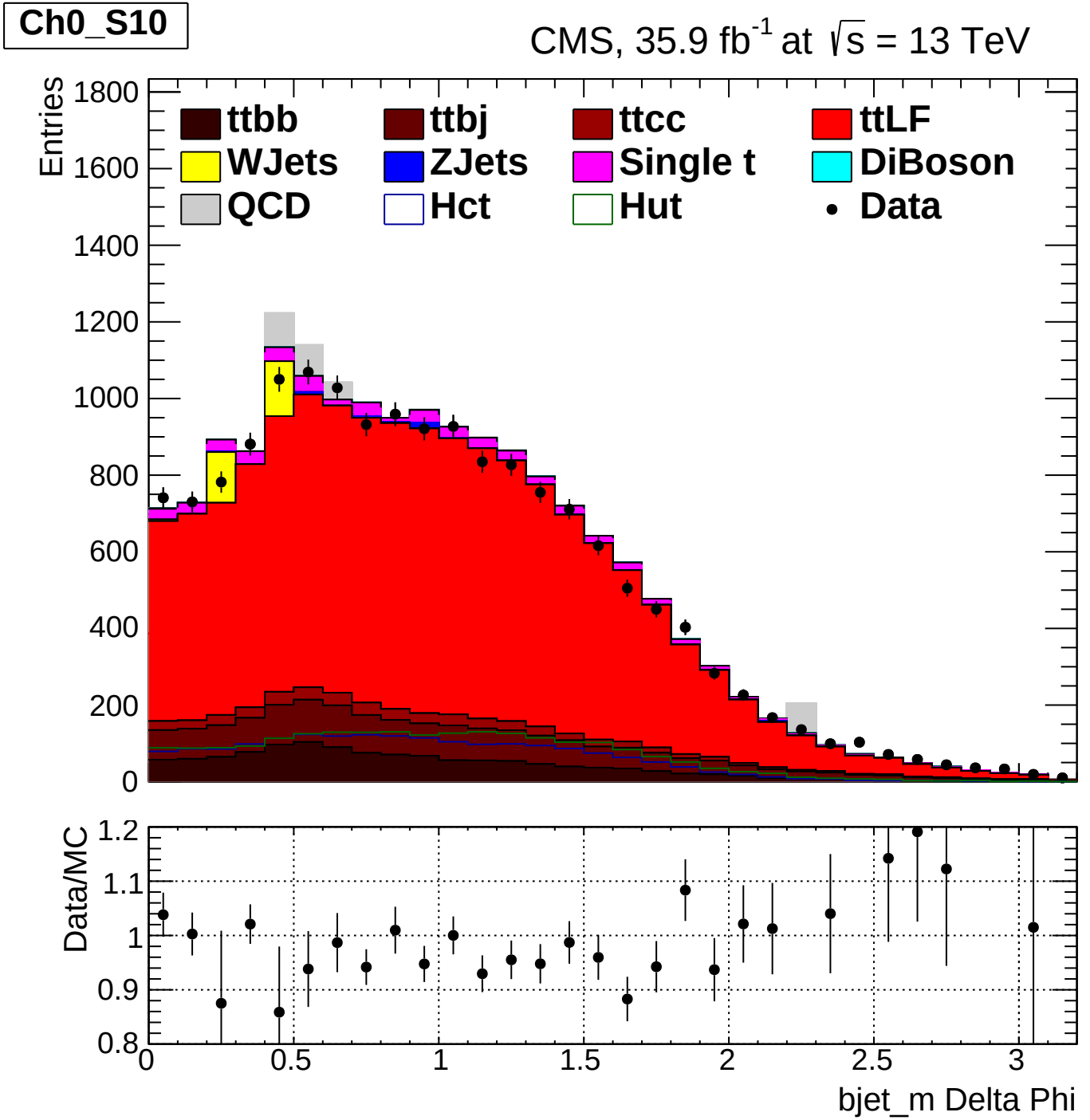

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

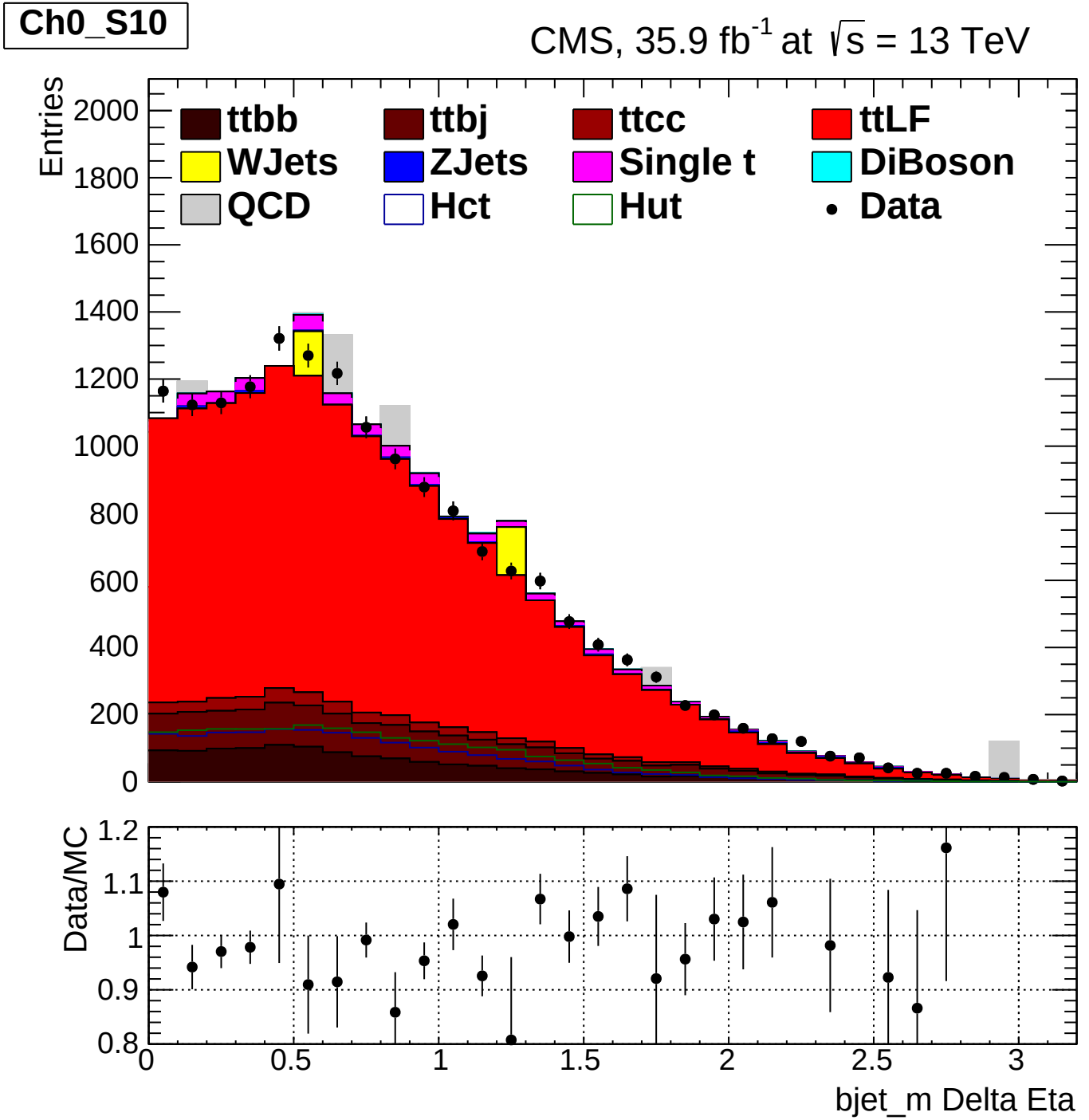

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

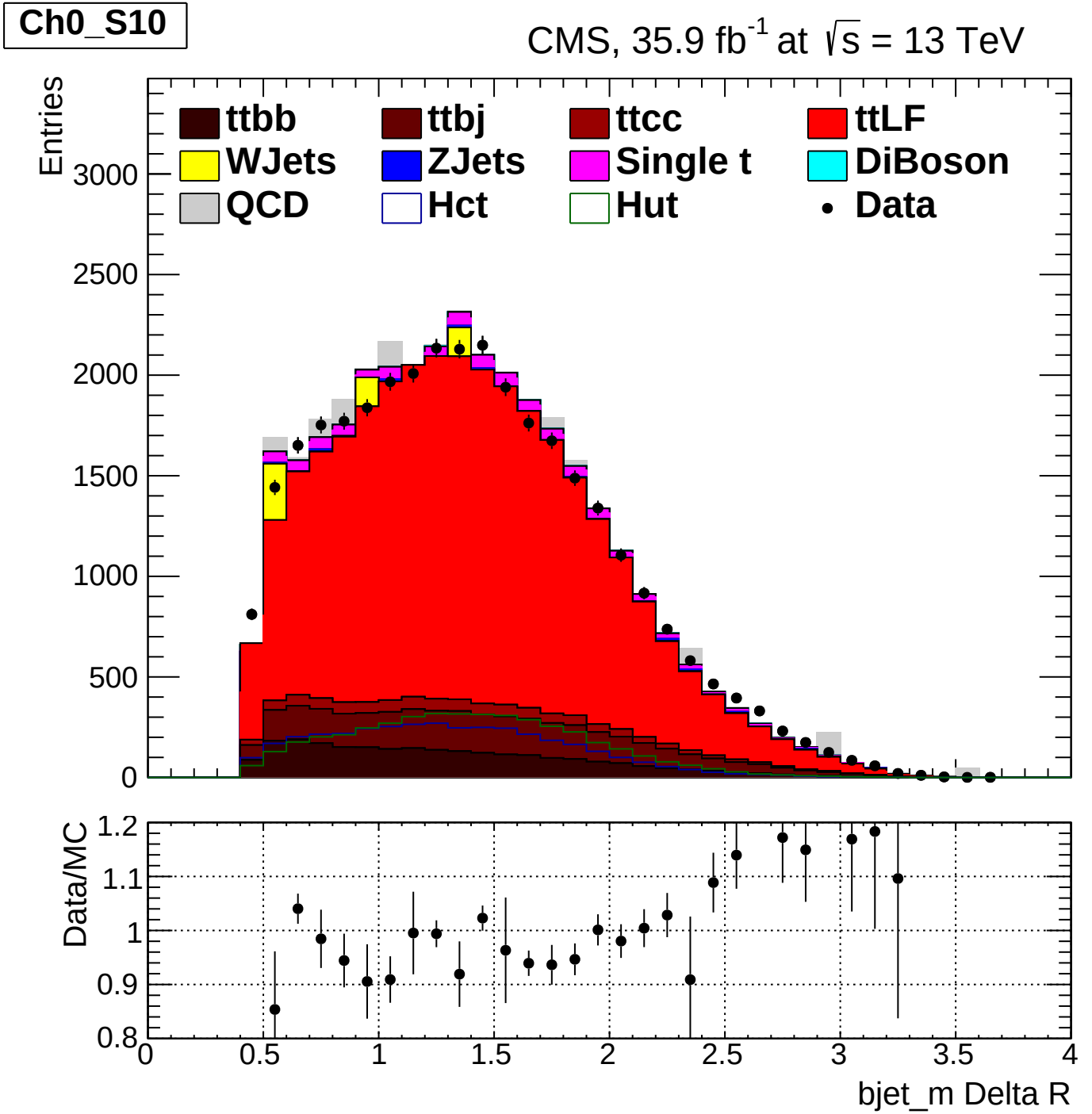

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1200
1000
800
600
400
200
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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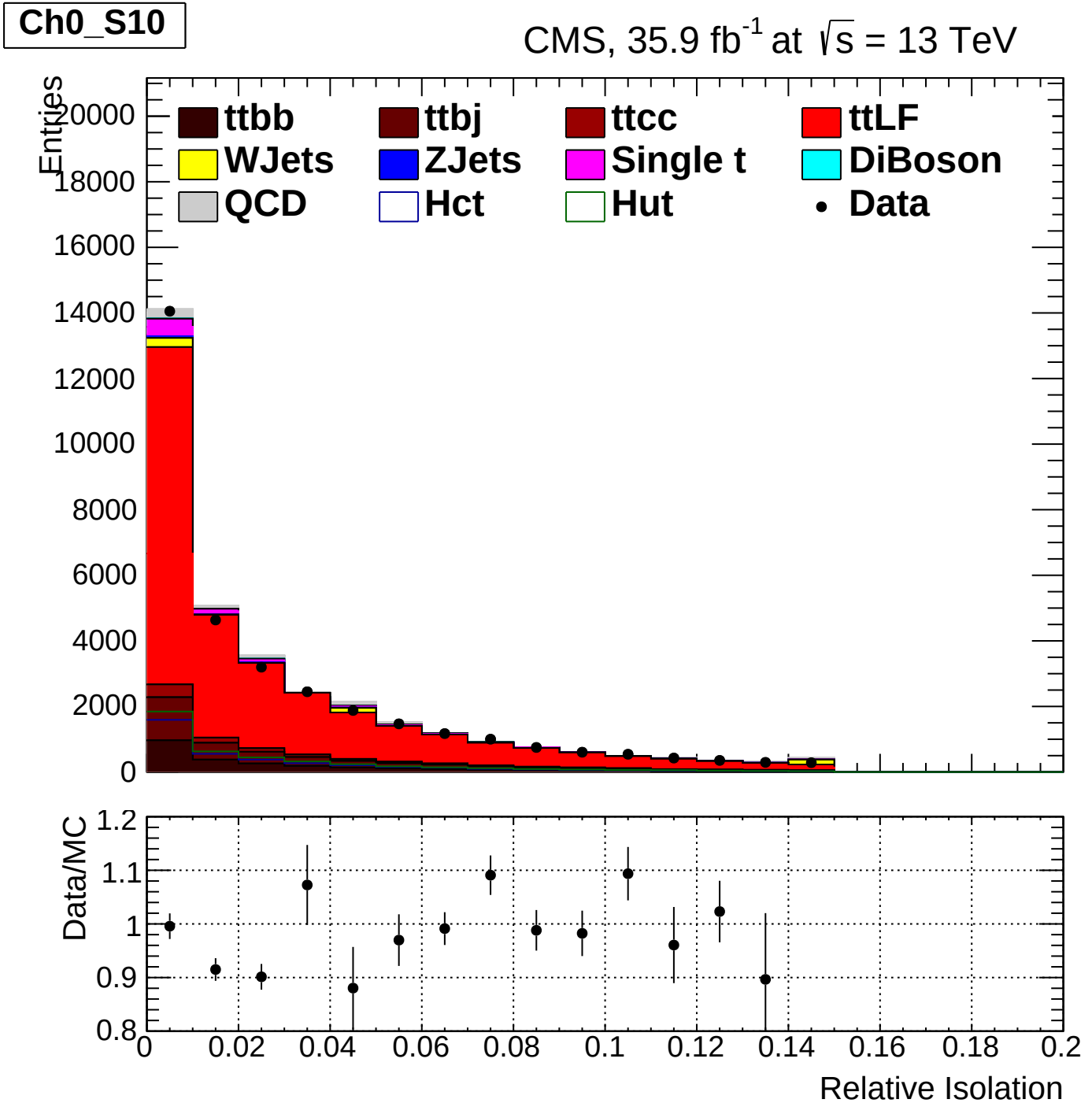
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R


Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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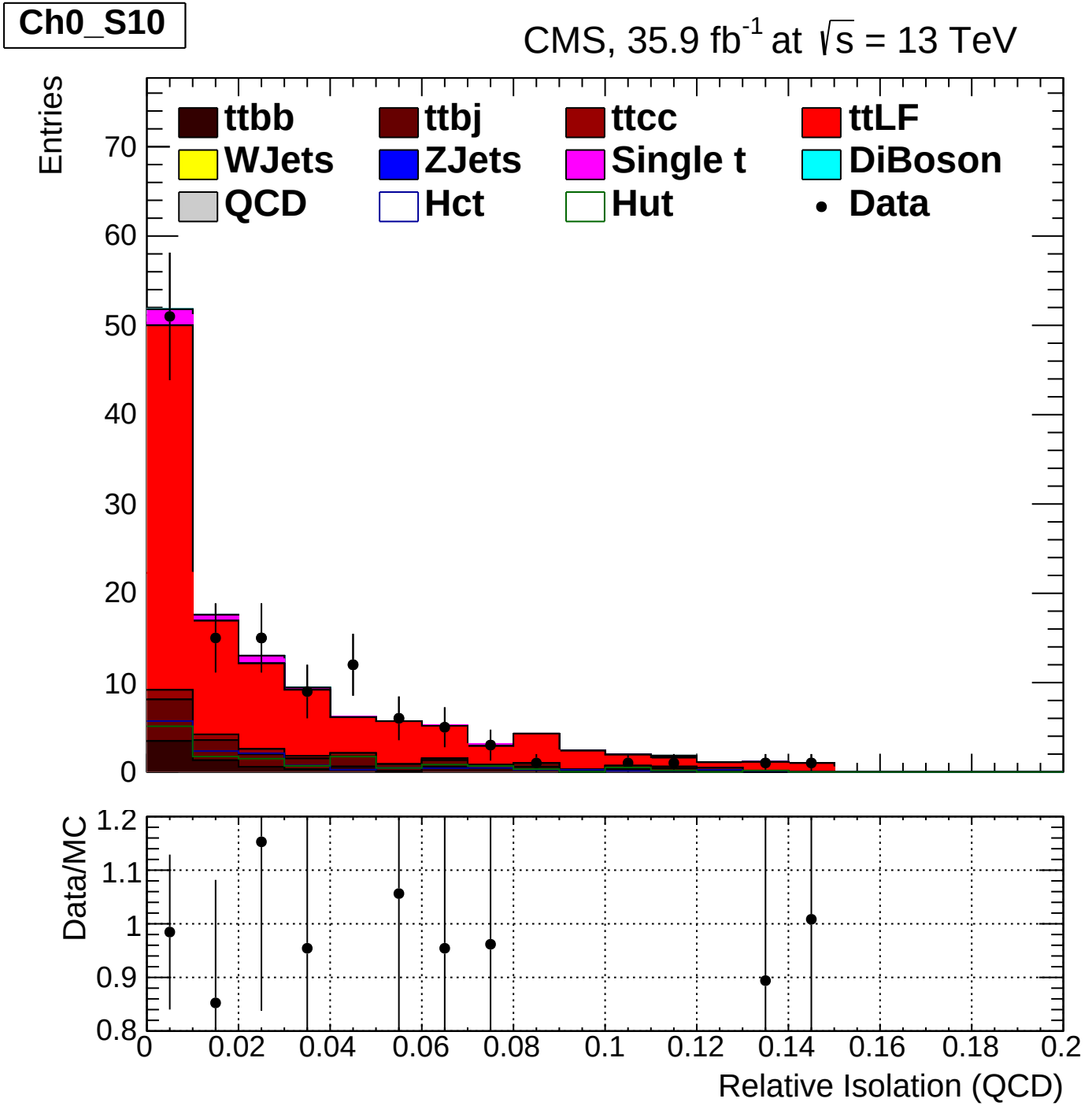
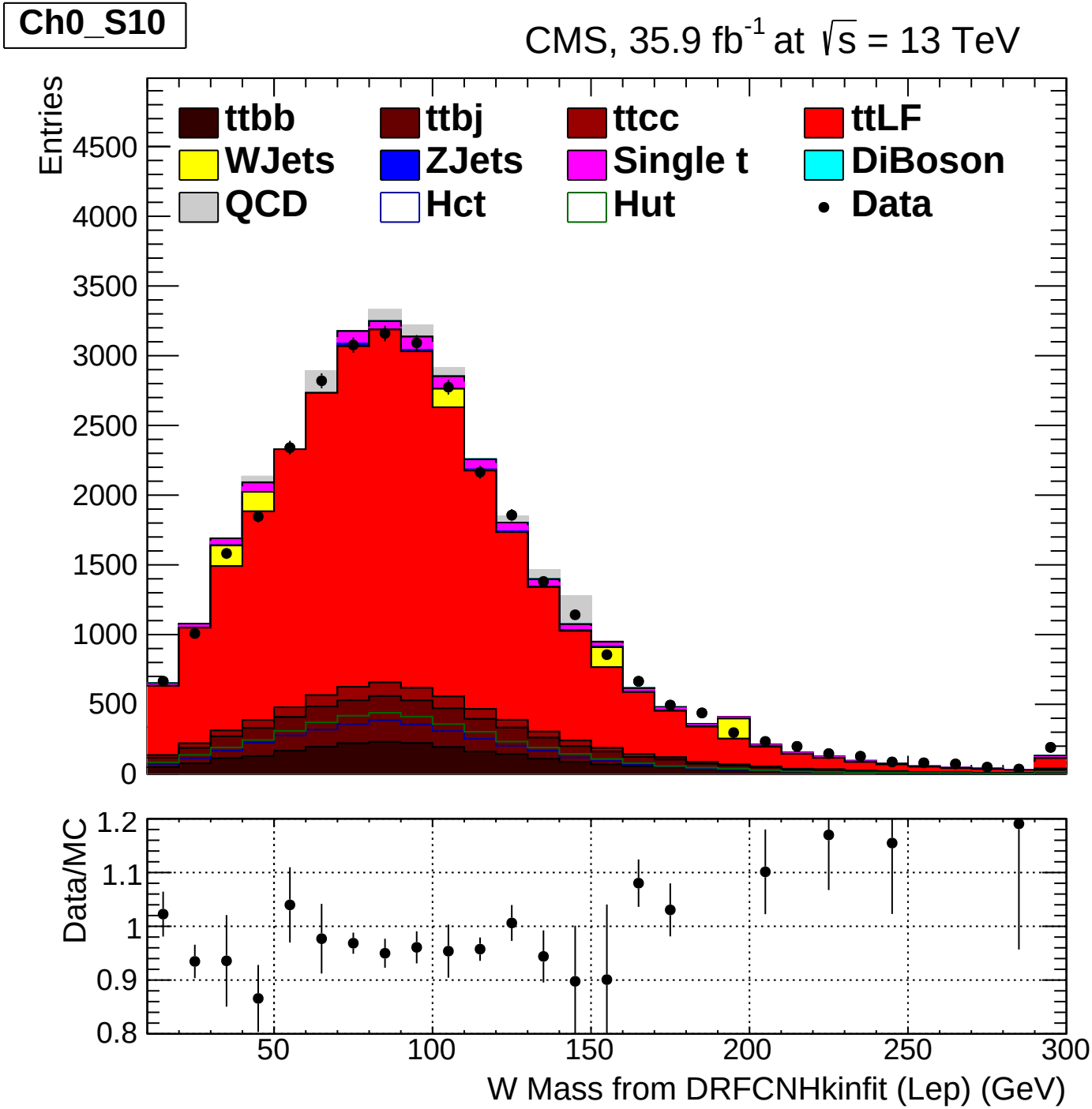
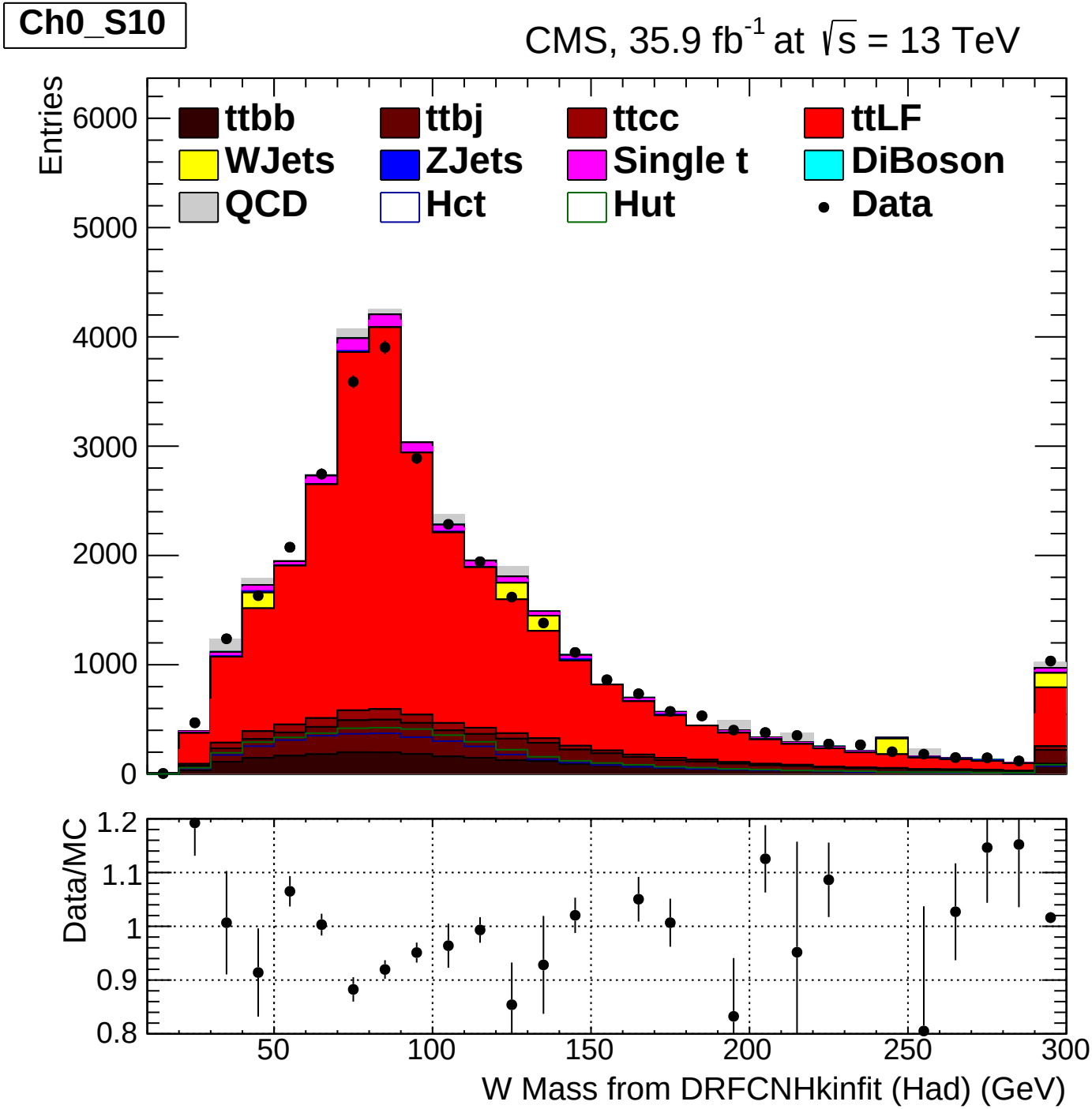
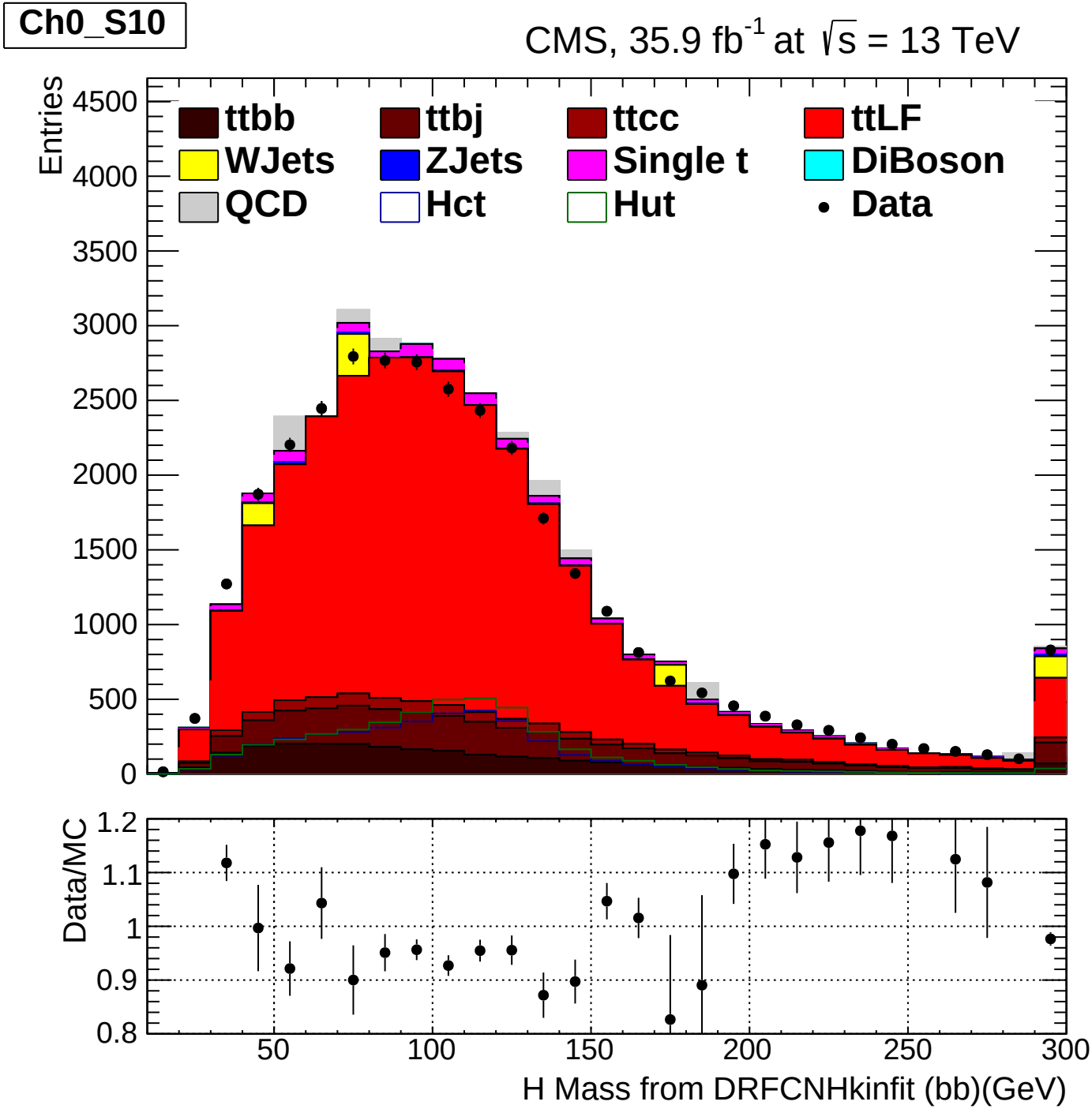
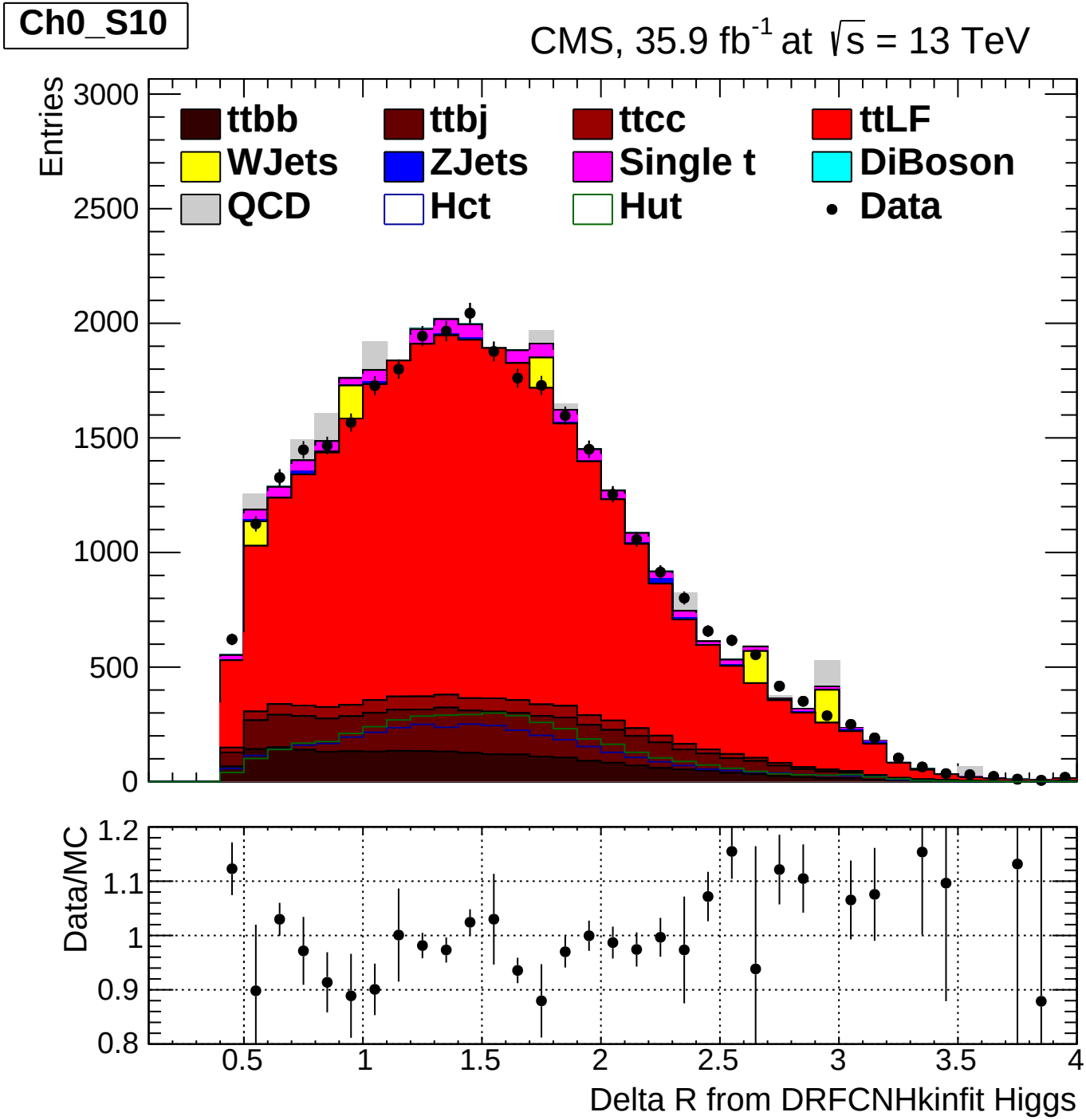
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

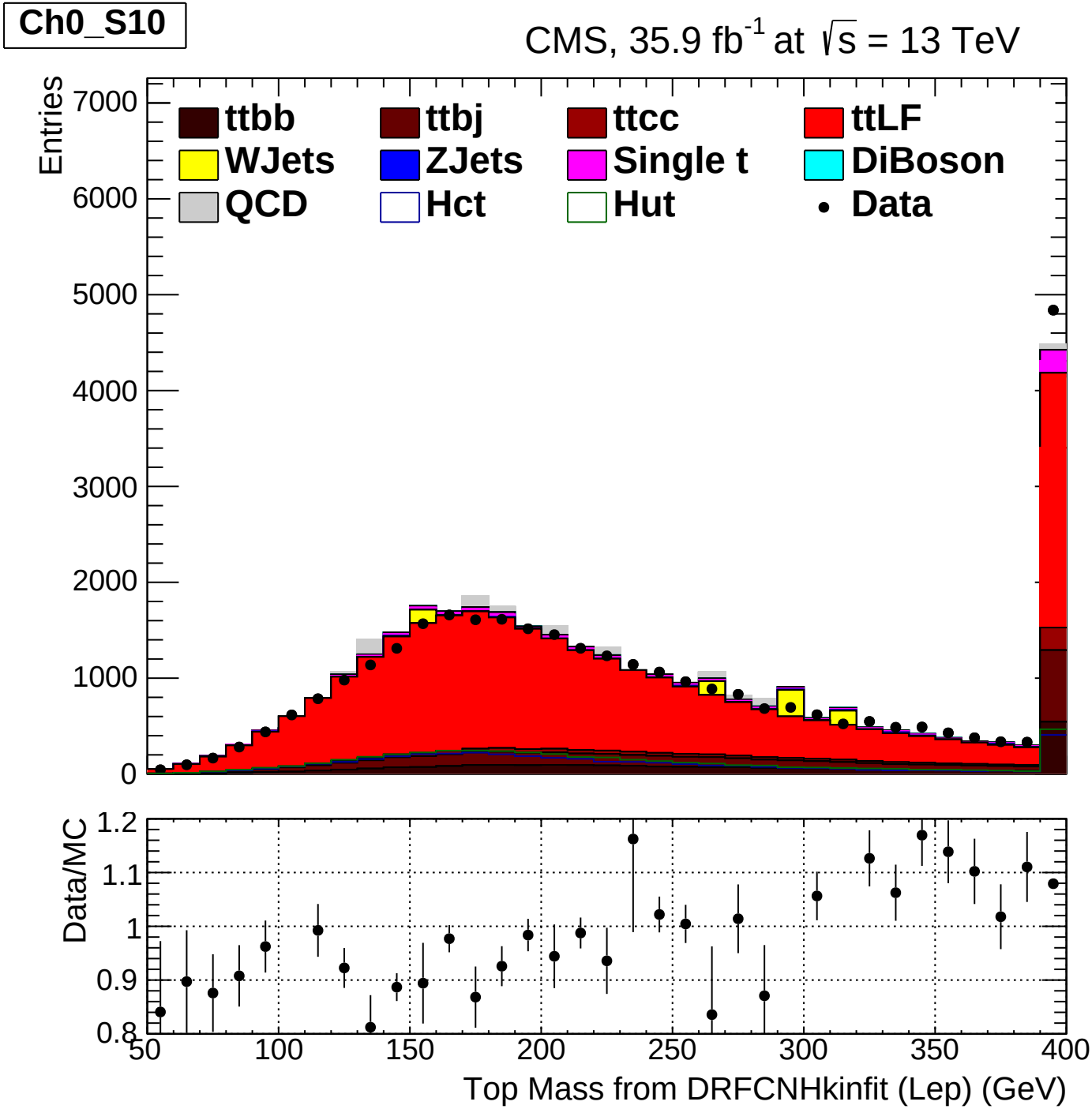

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

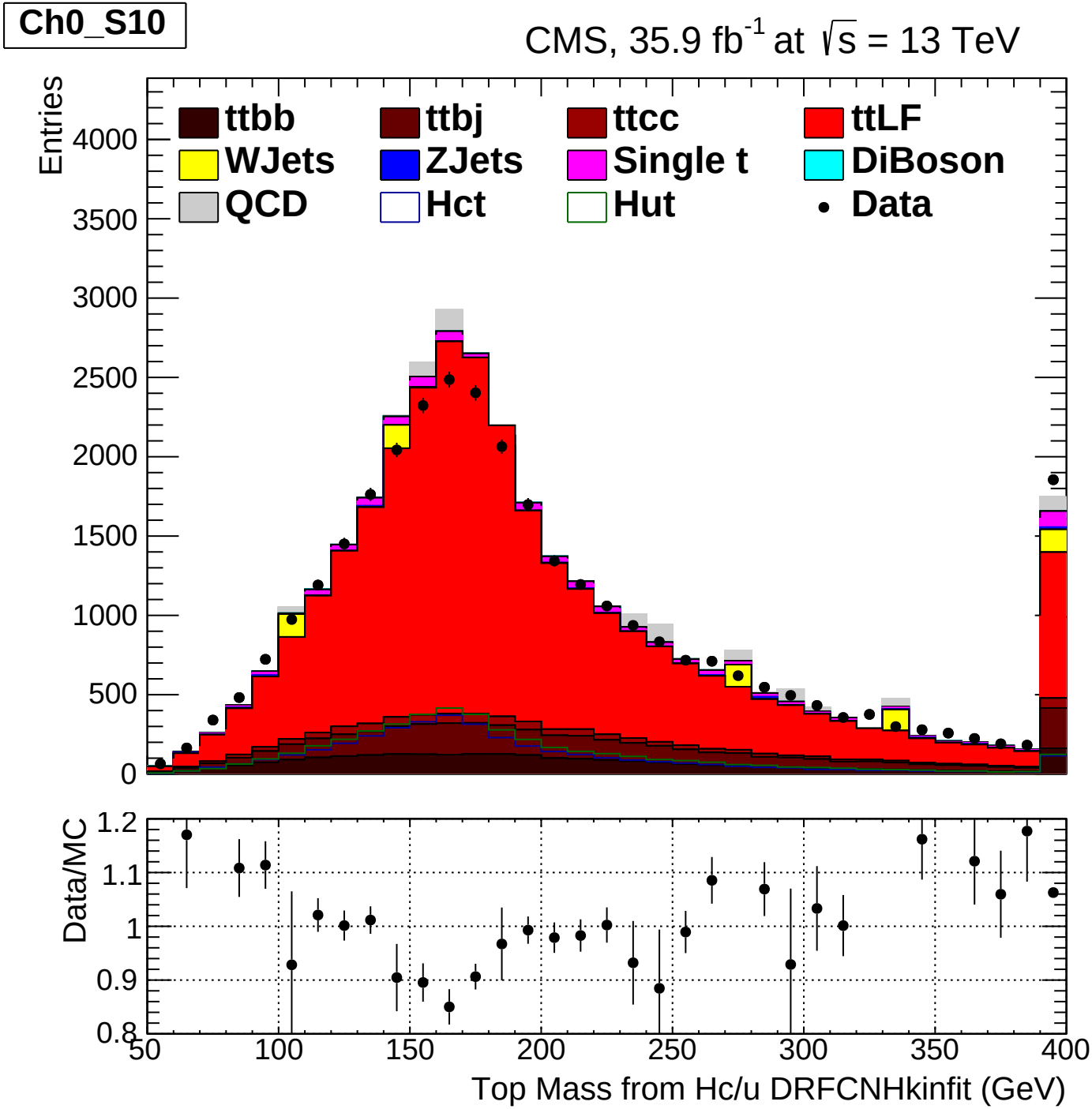

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

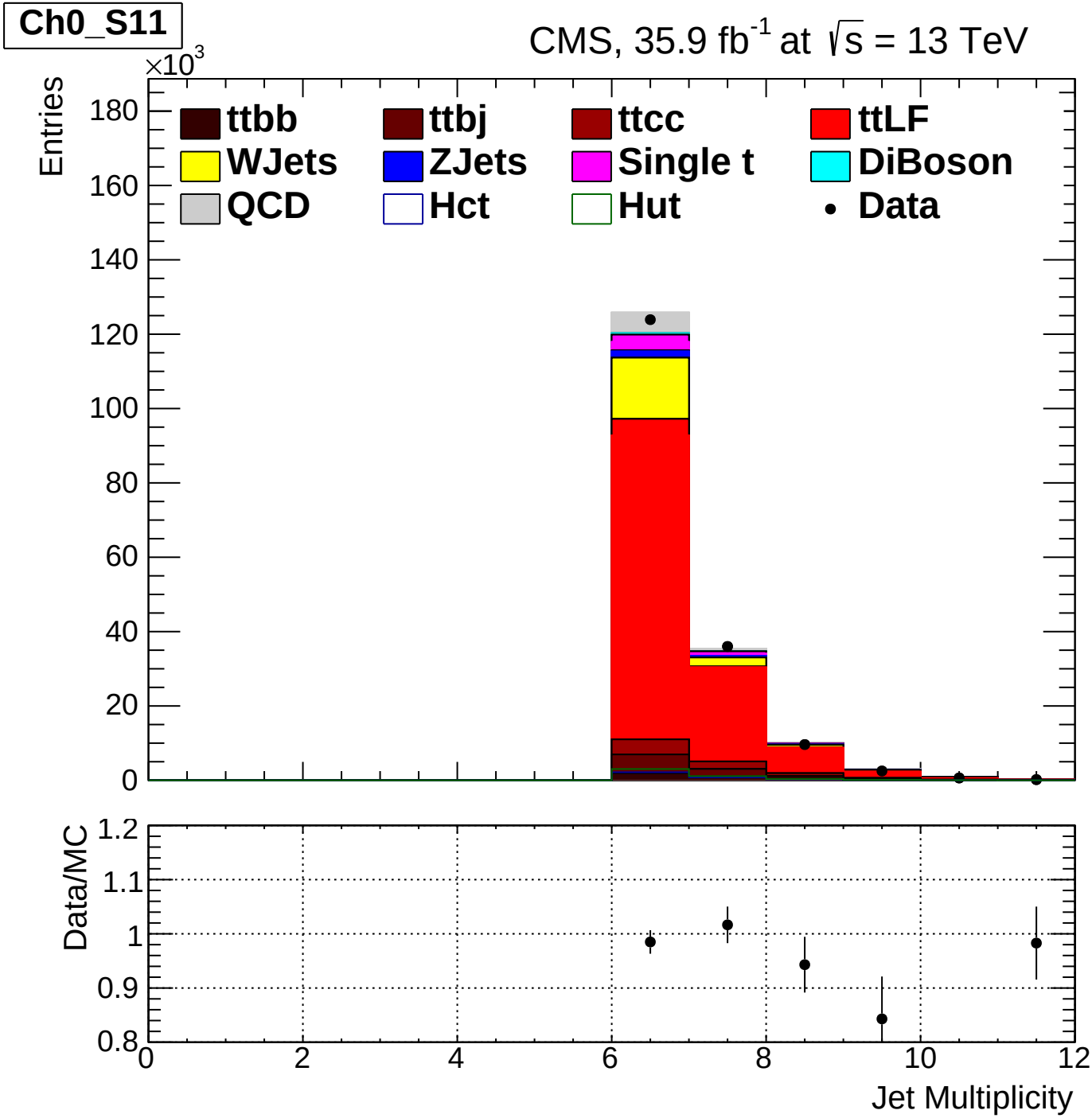

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

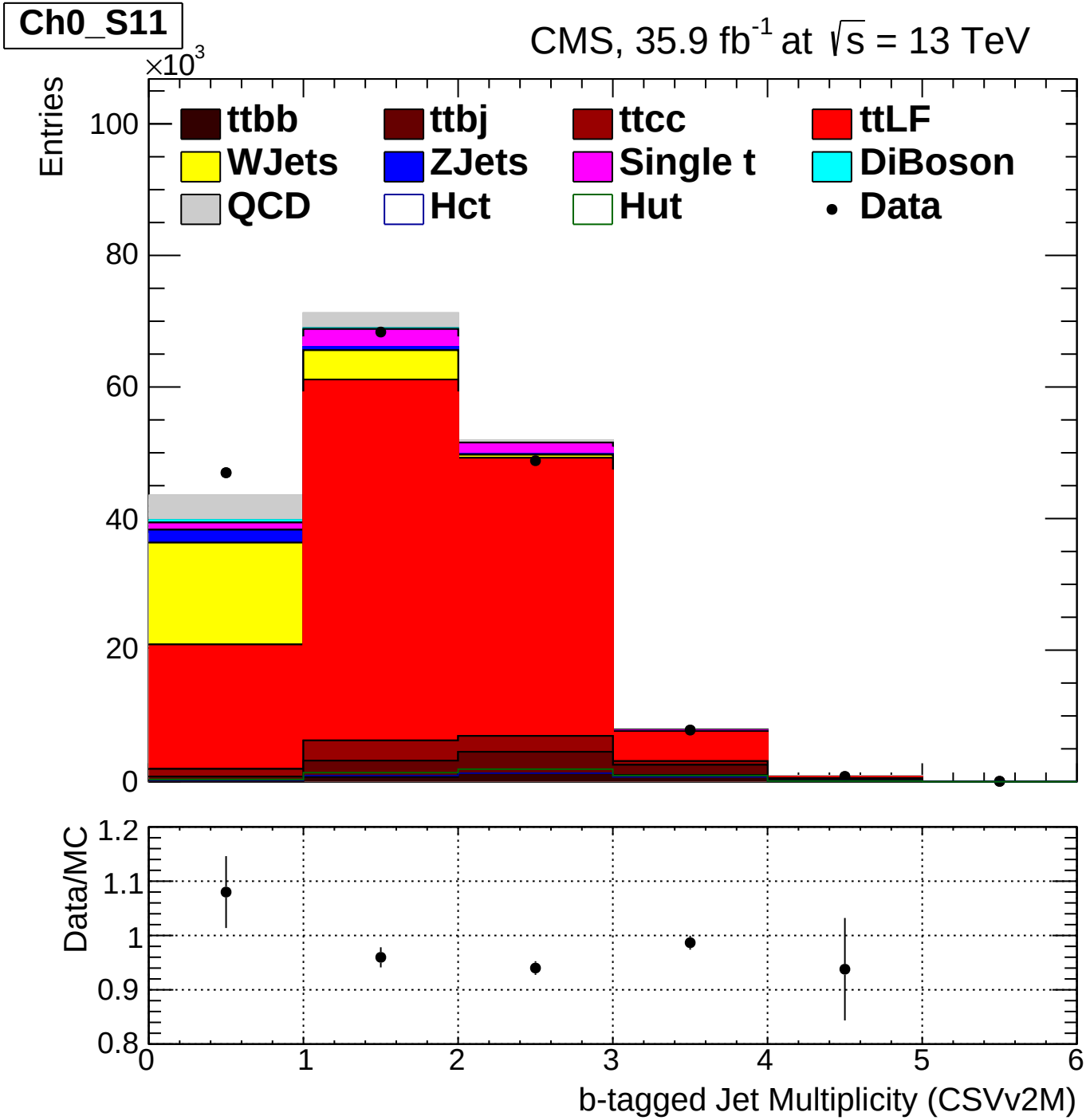

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

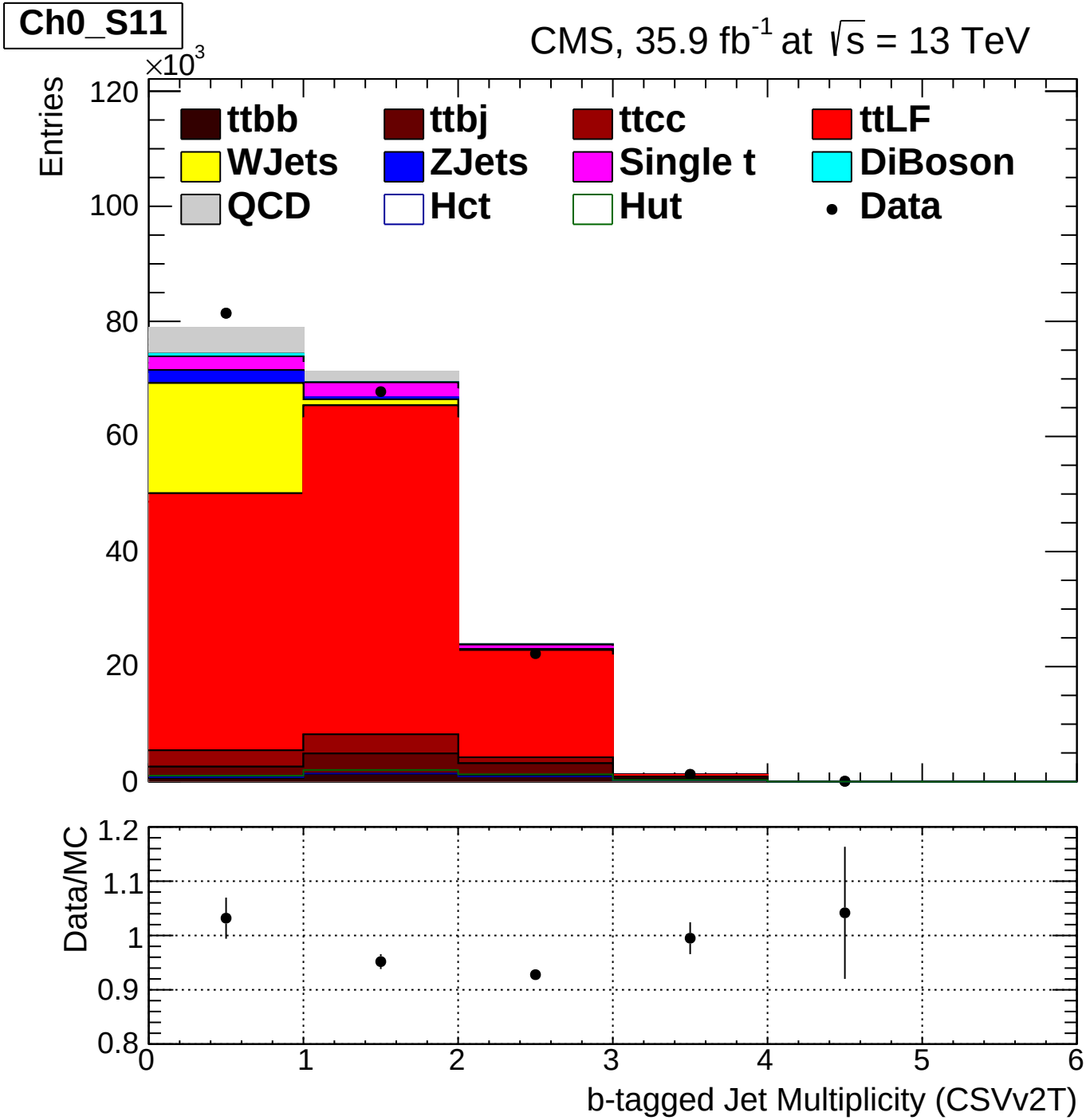

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

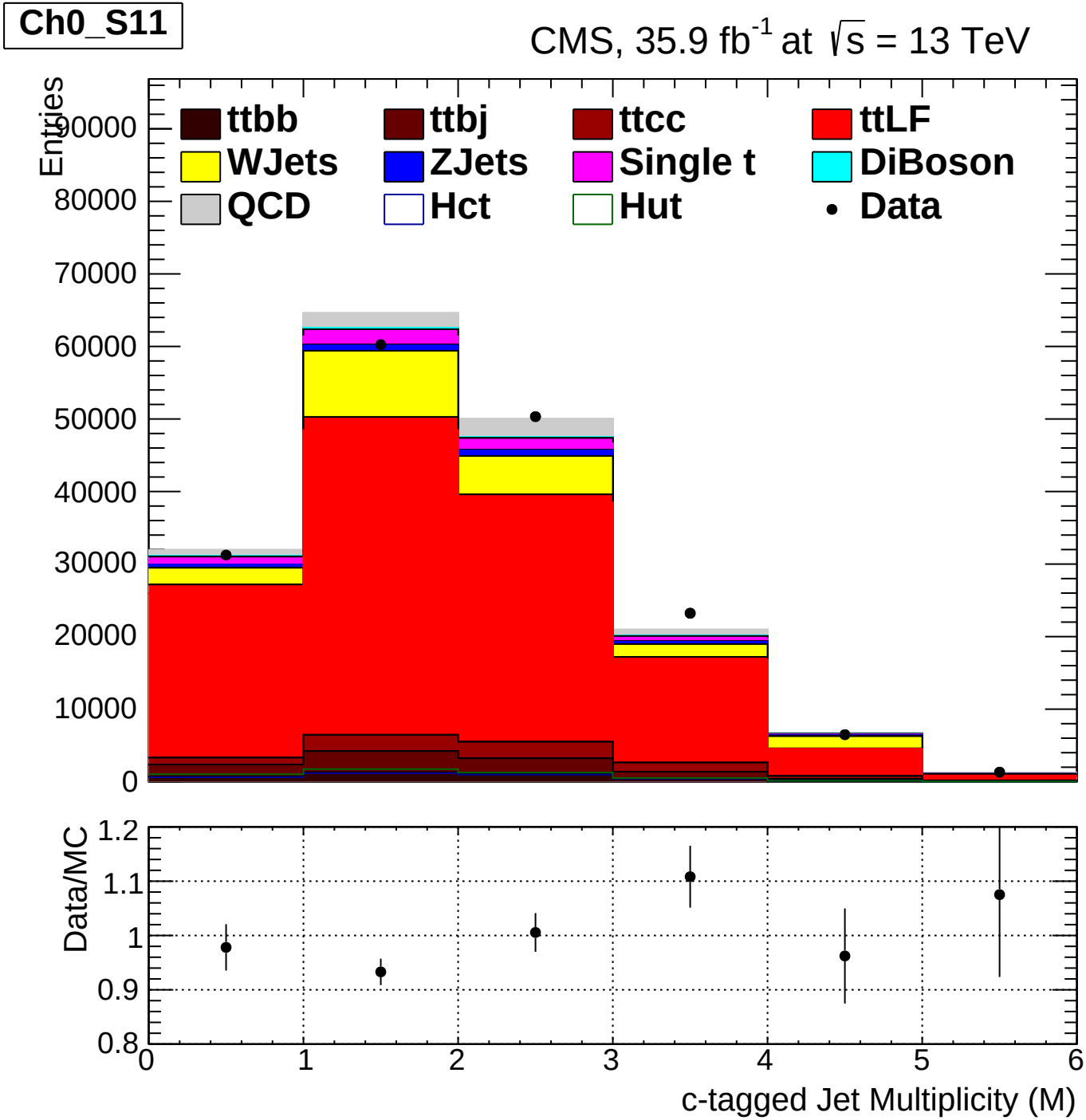

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

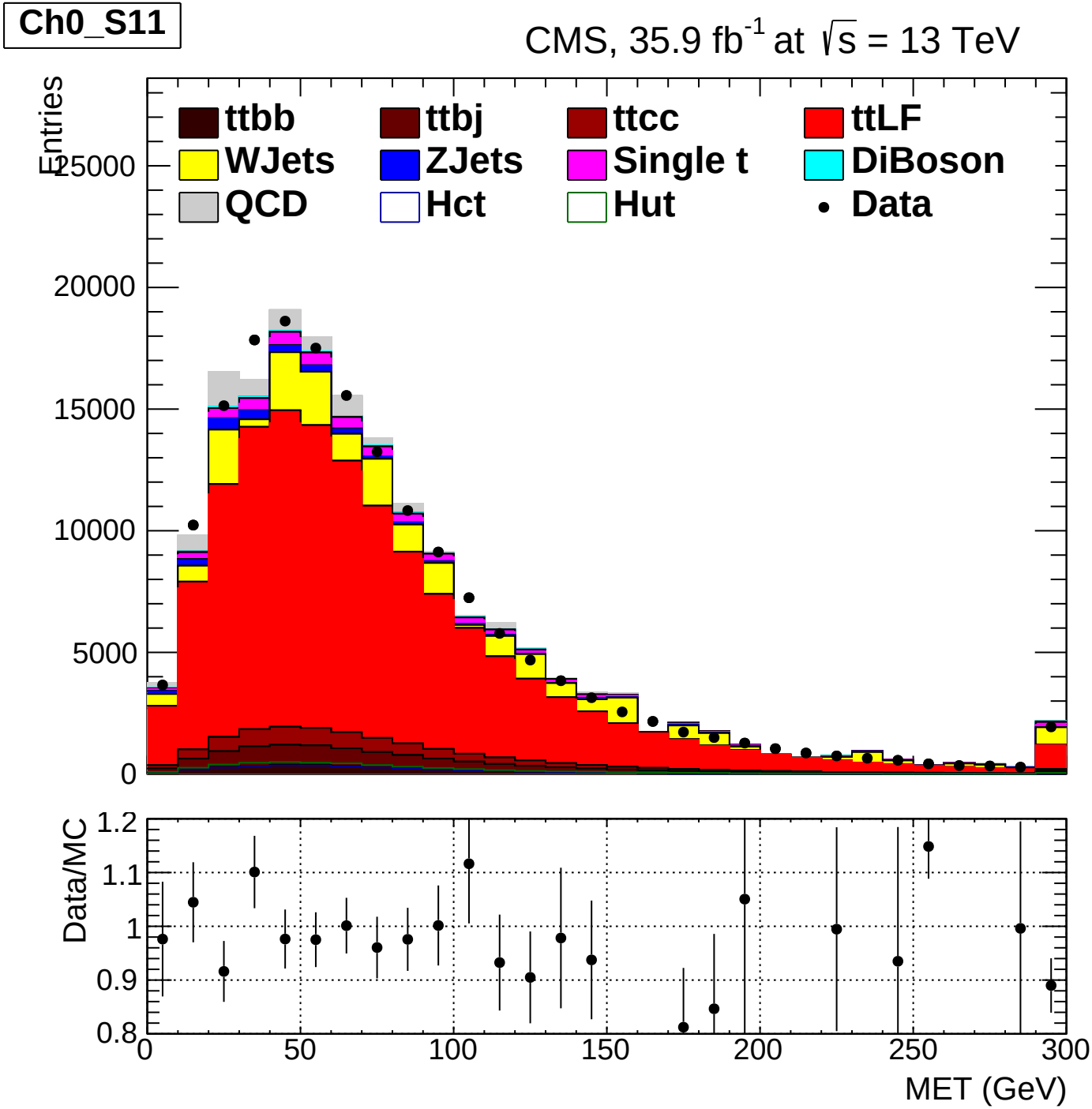

Ch0_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

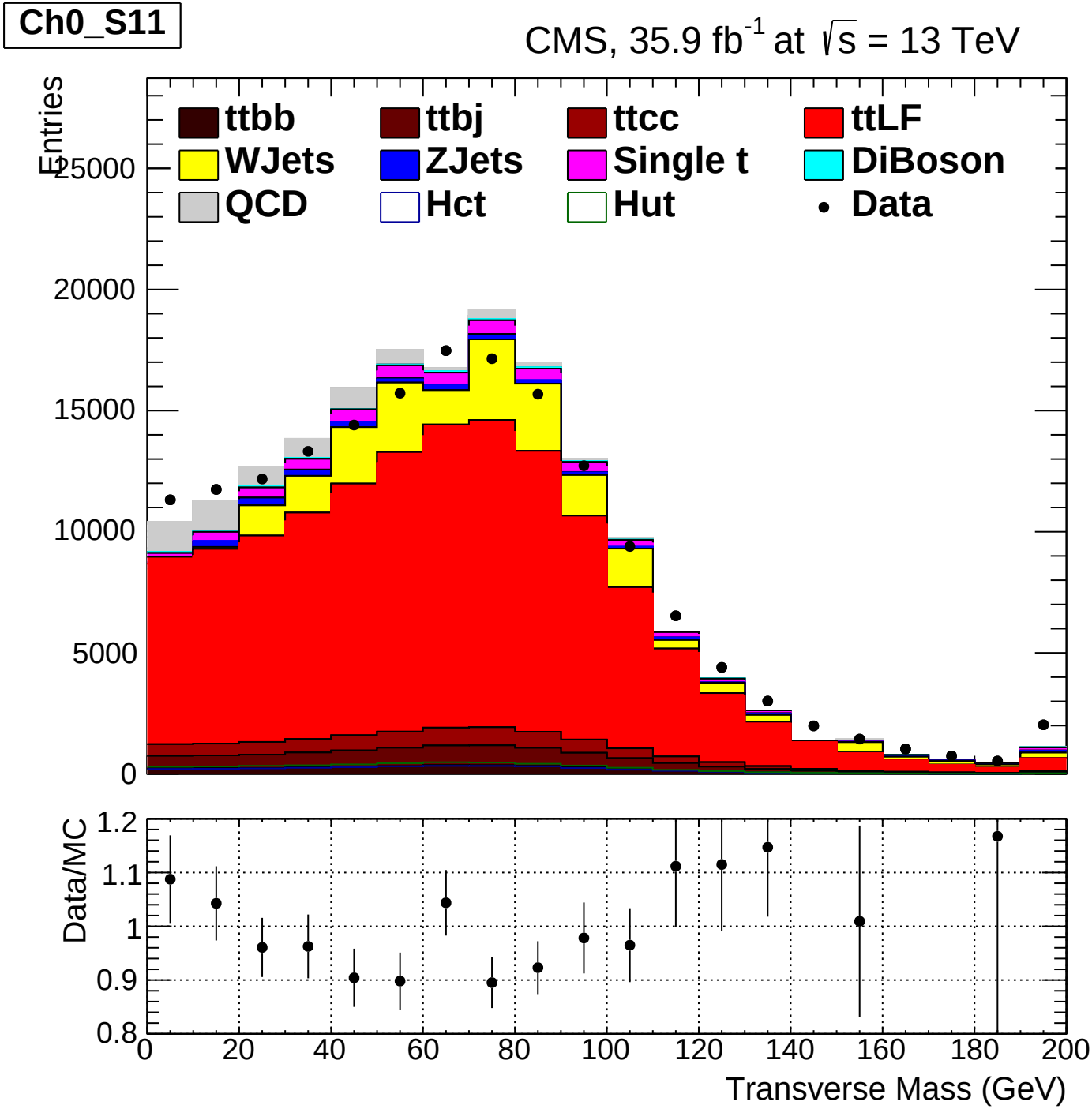

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

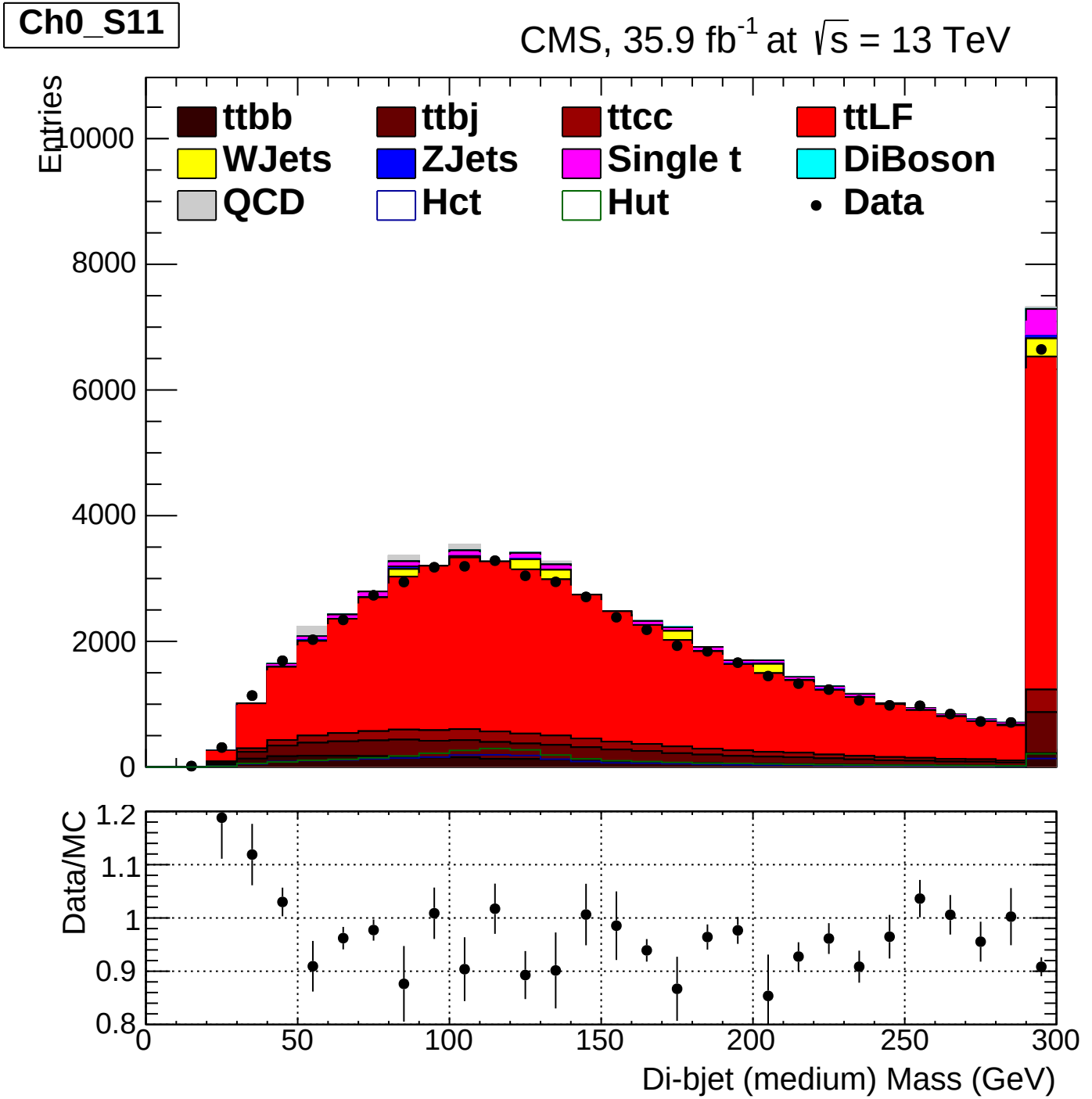

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

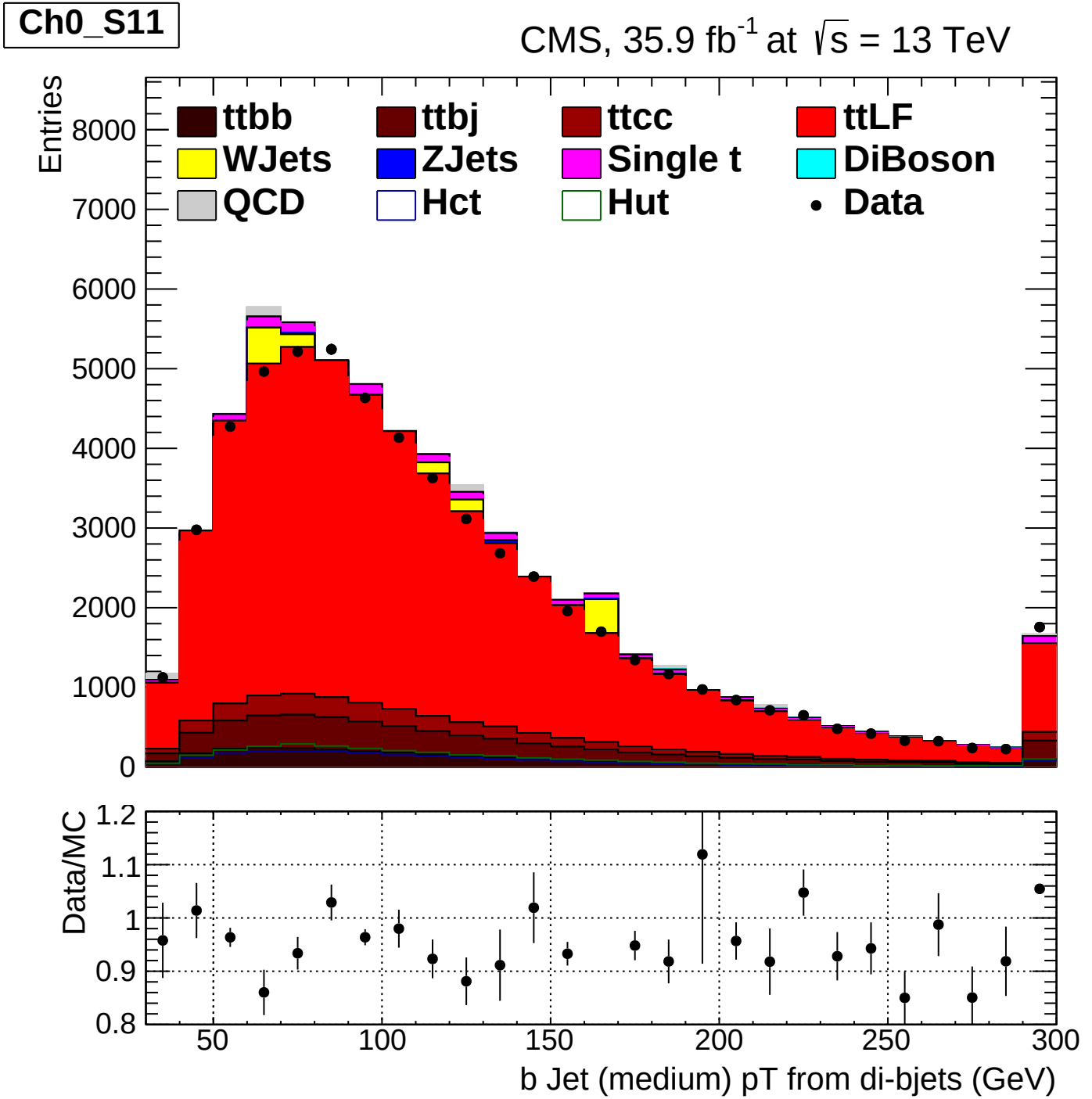

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

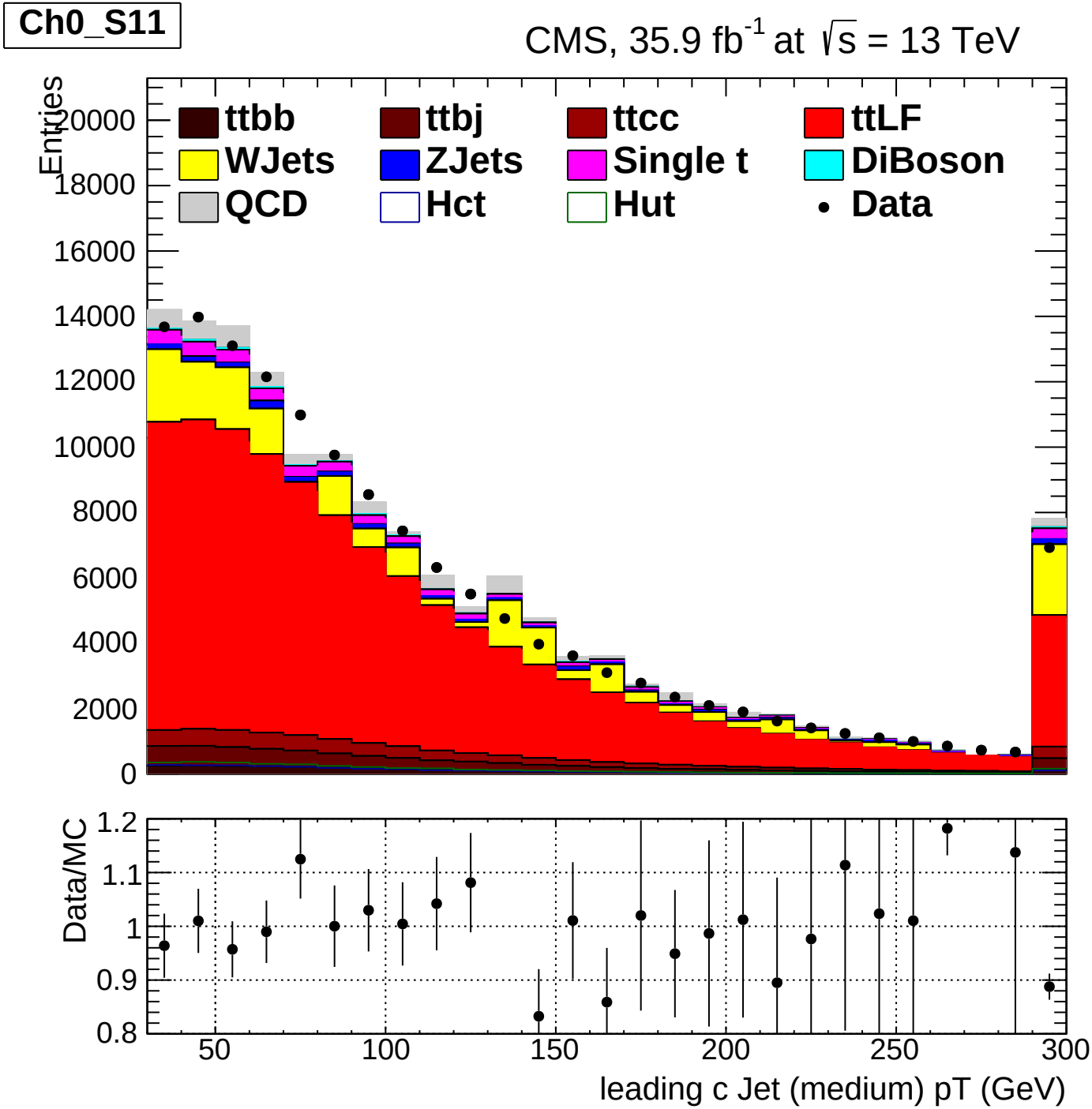

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

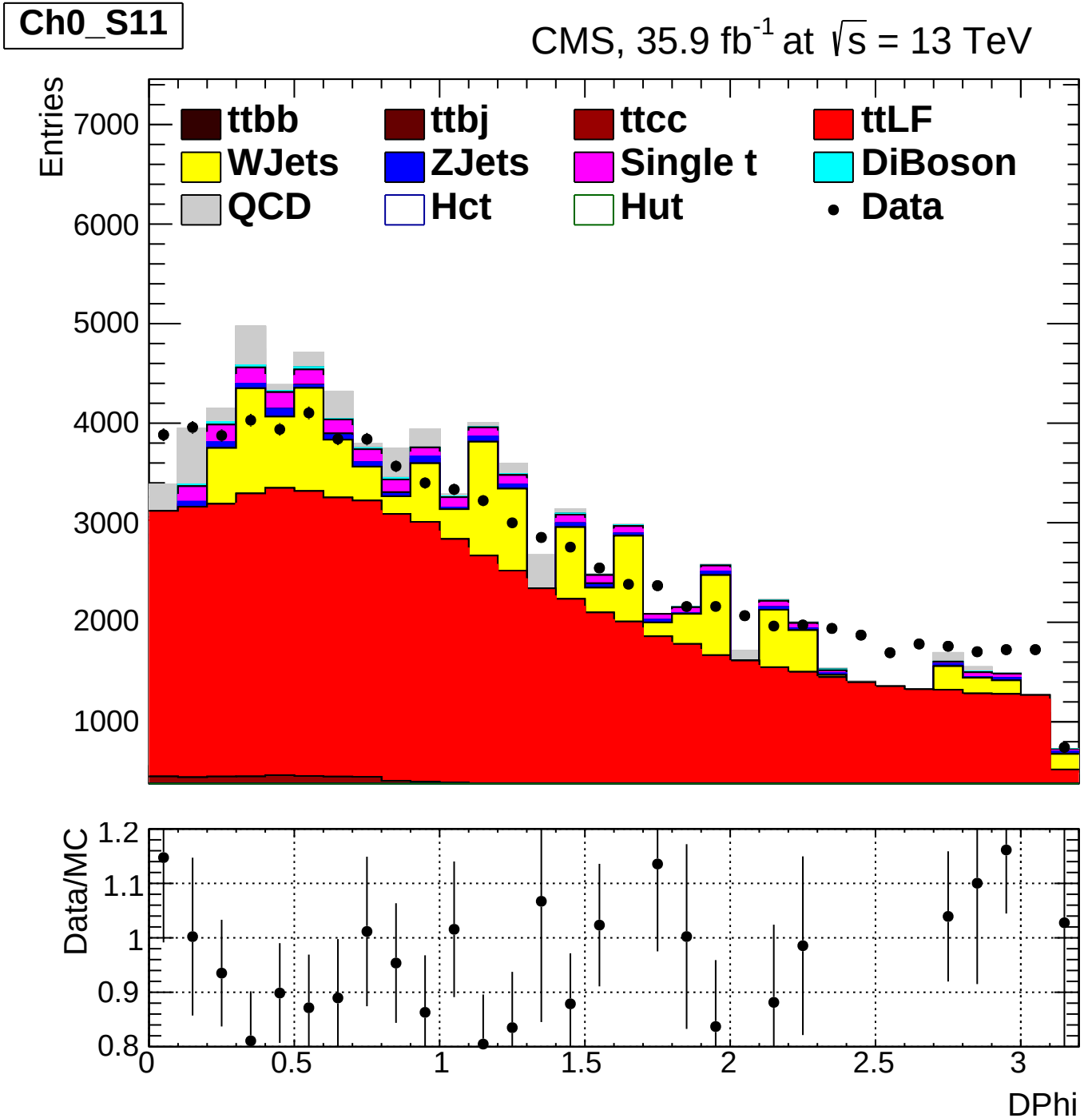

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
MET (GeV)


Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
20
40
60
80
100
120
140
160
180
200
Transverse Mass (GeV)


Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)


Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
7000
6000
5000
4000
3000
2000
1000
Data/MC
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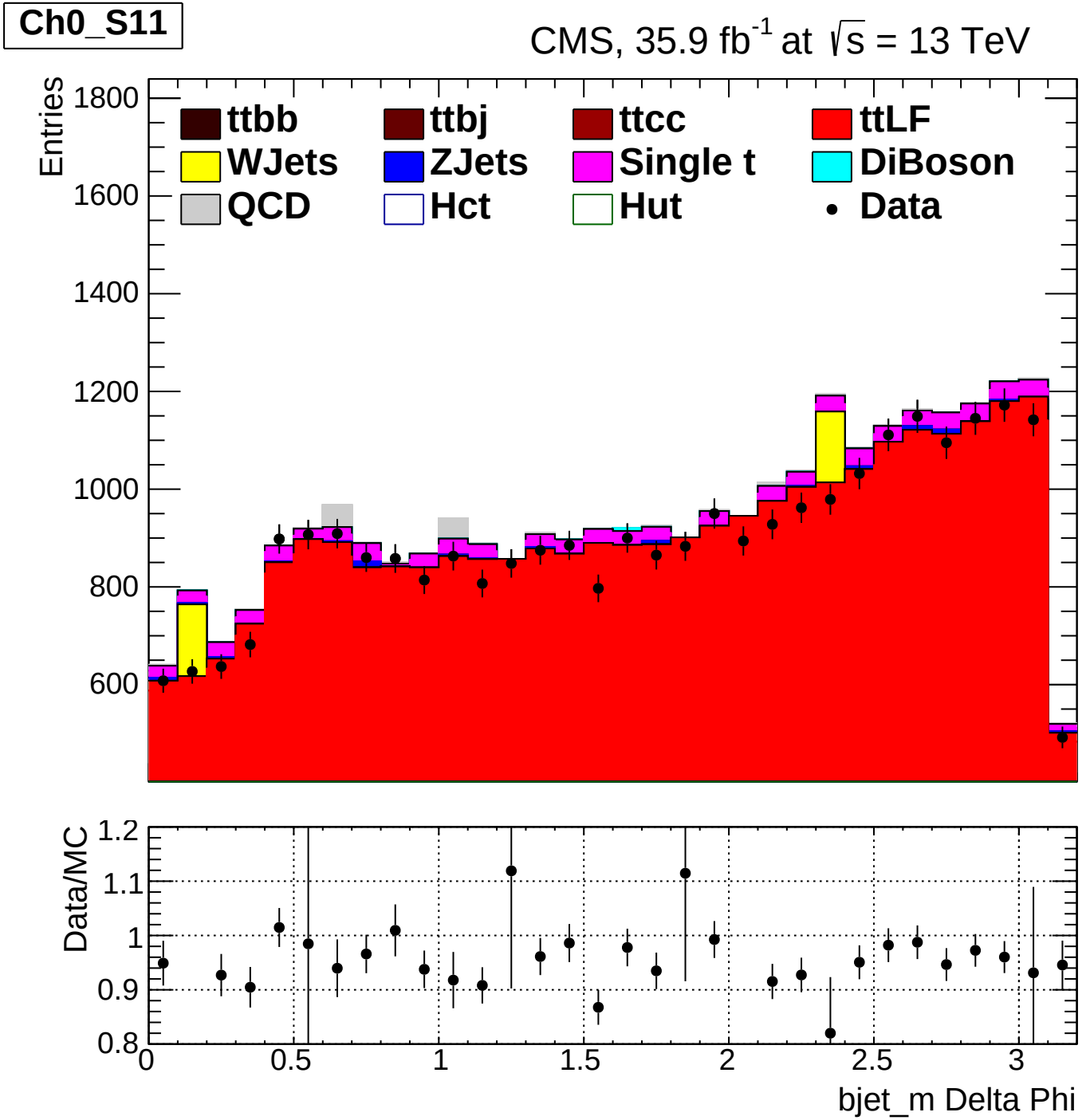
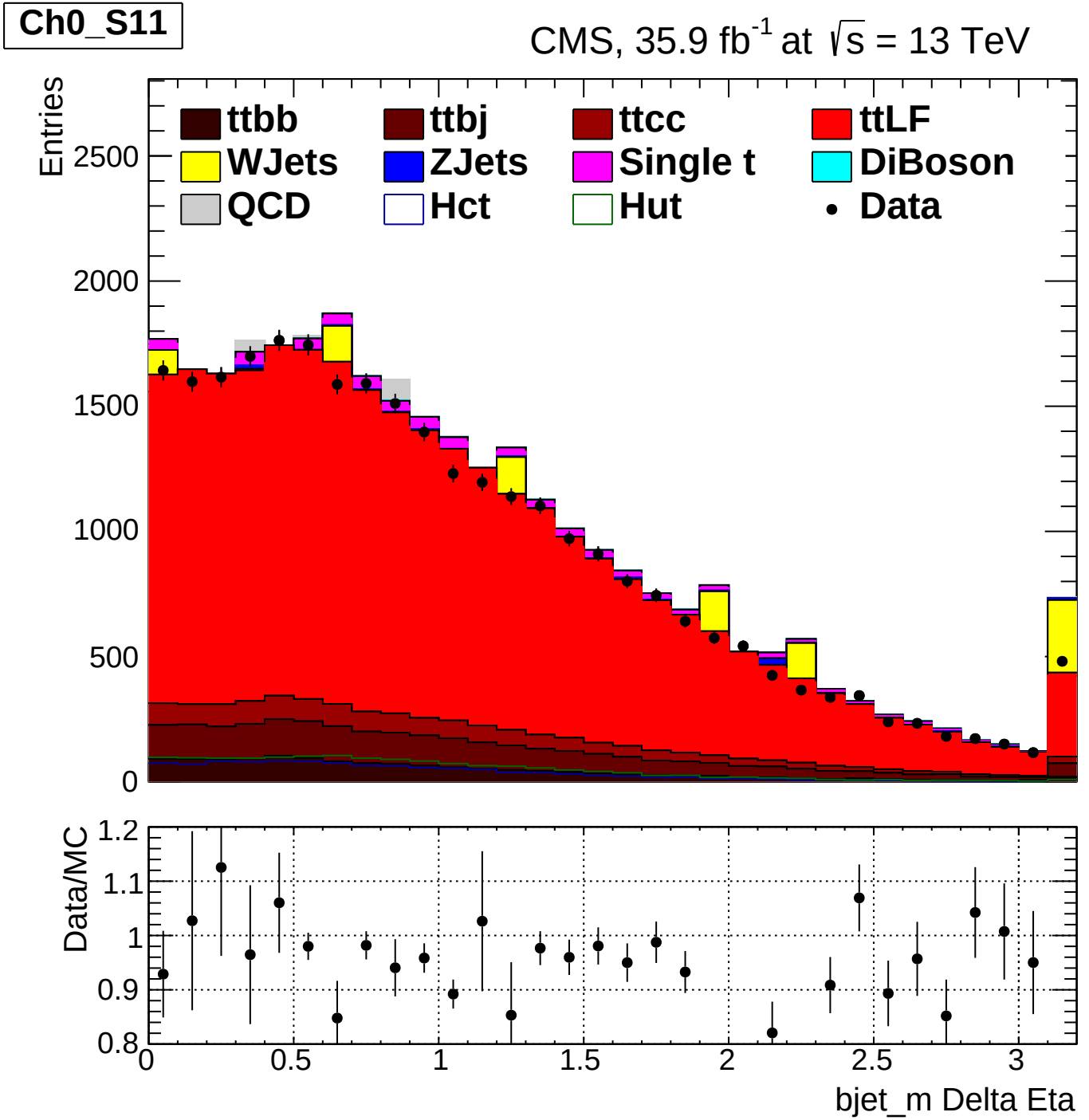
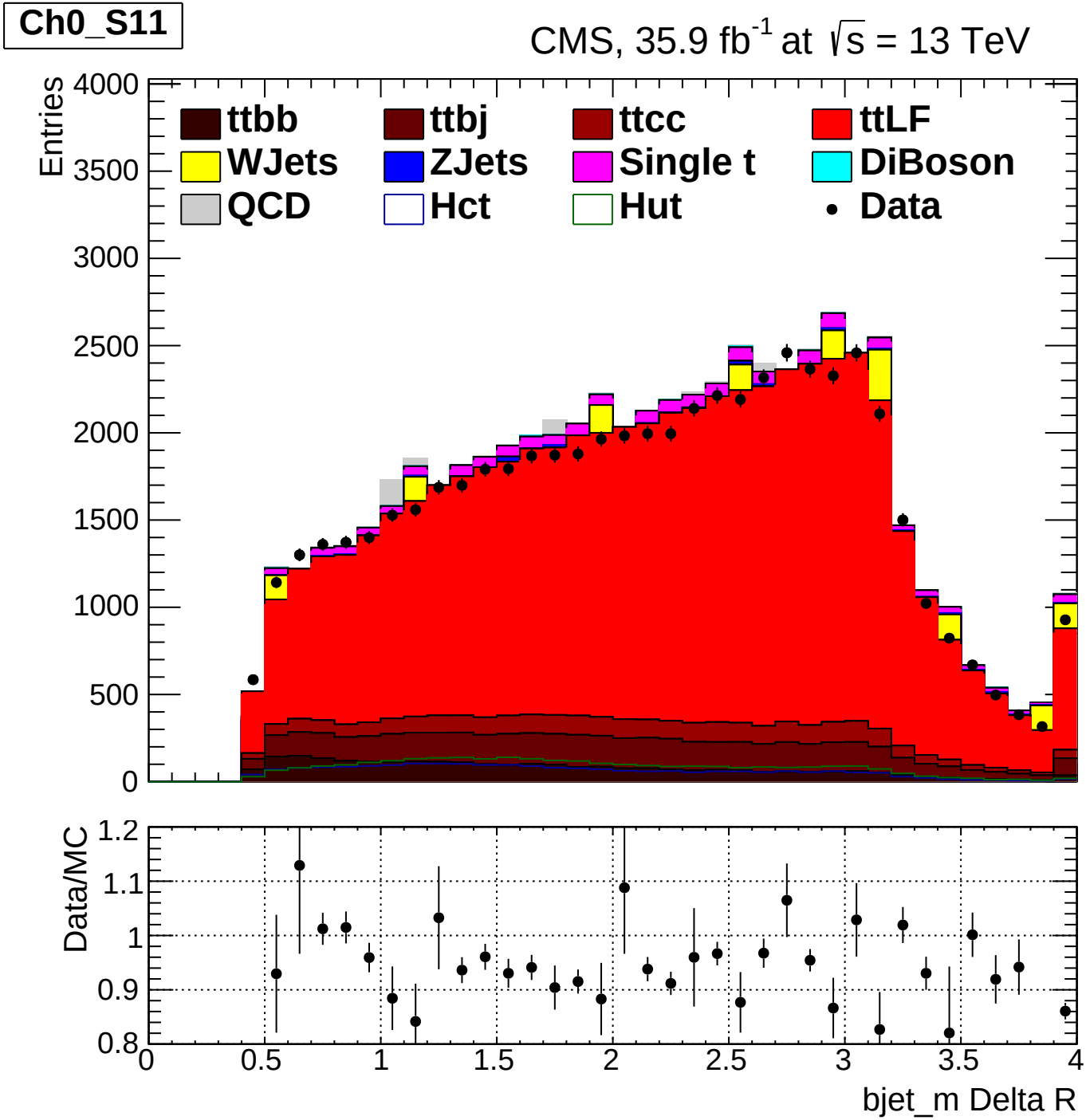
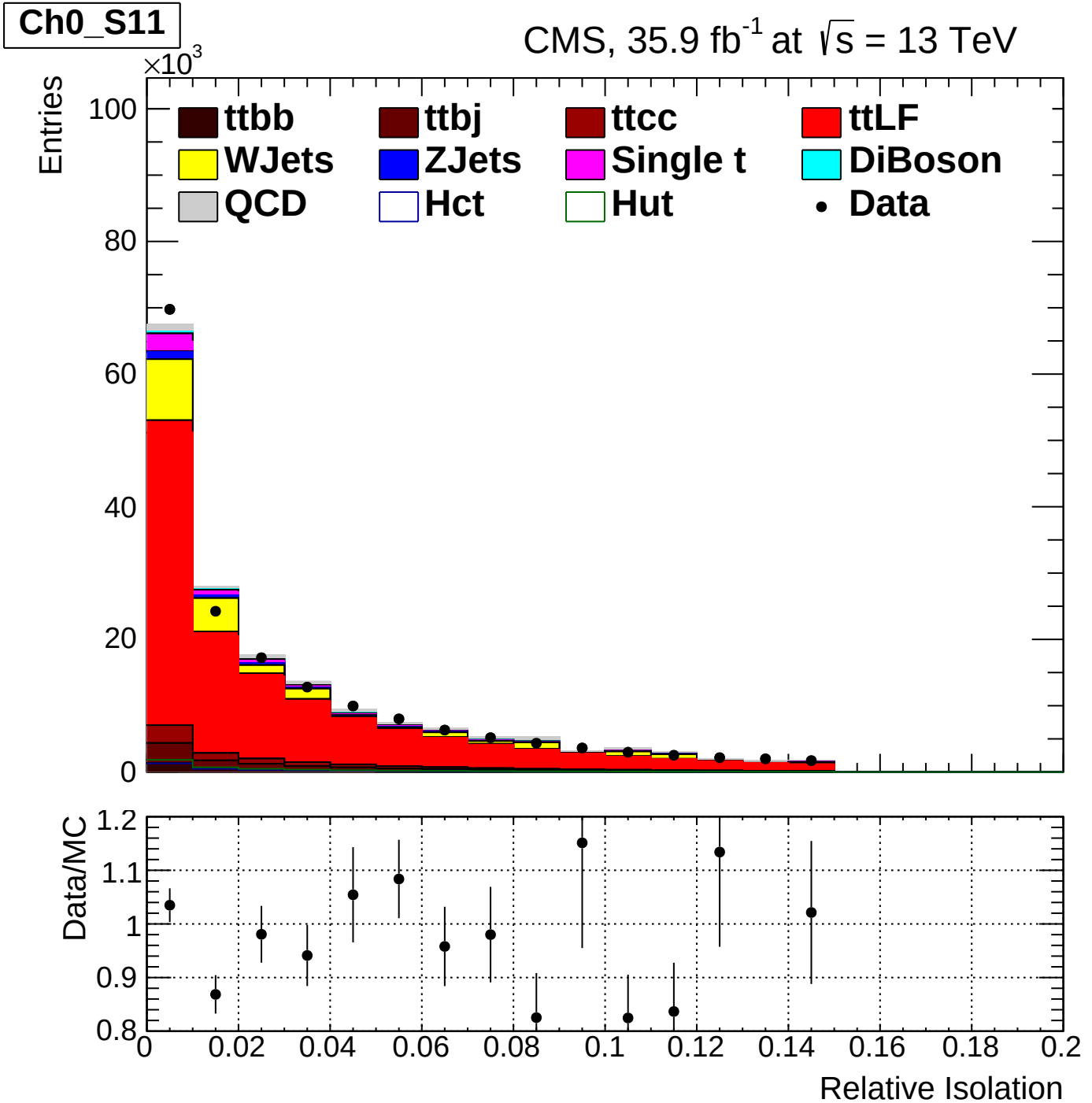
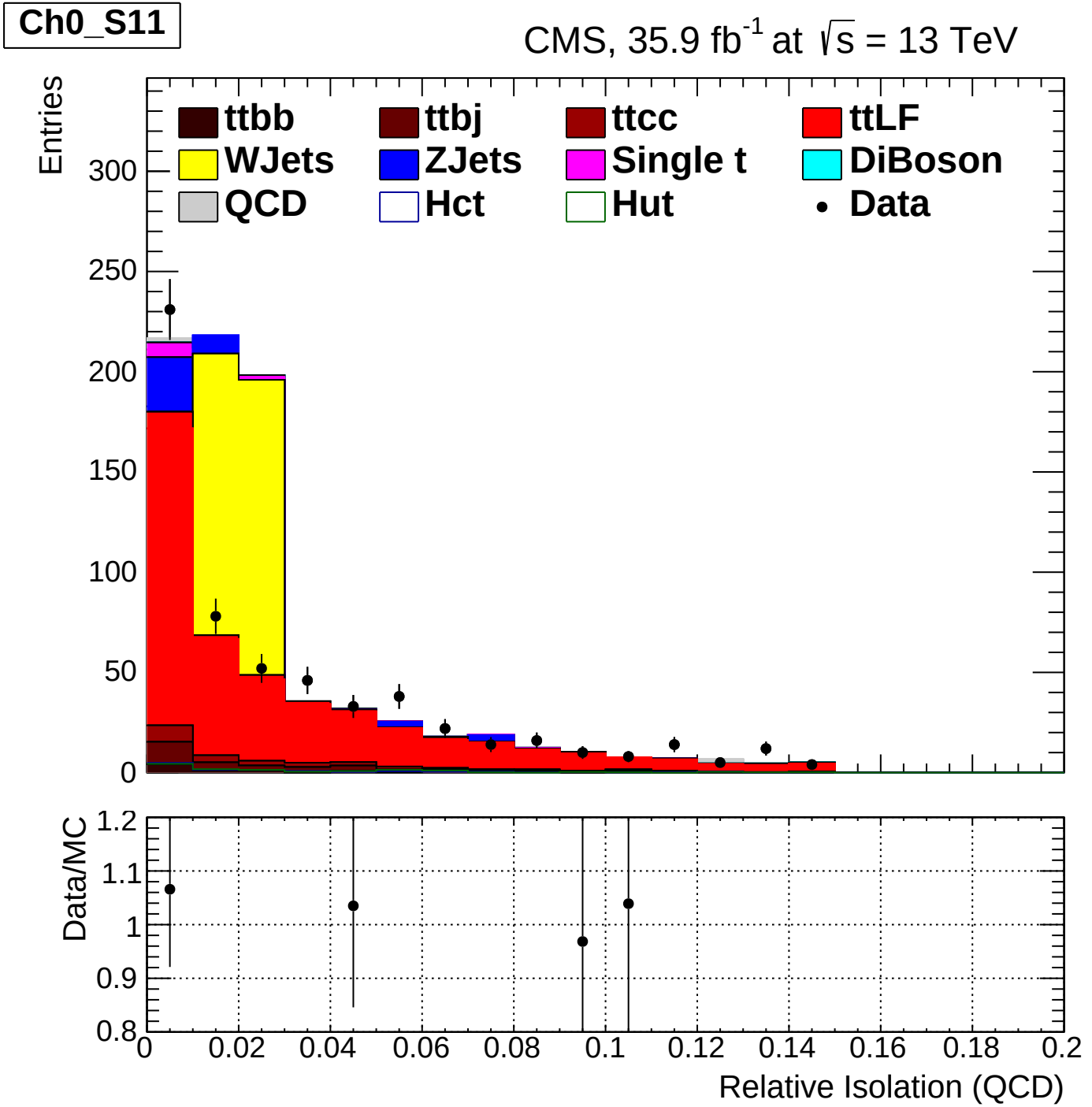
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

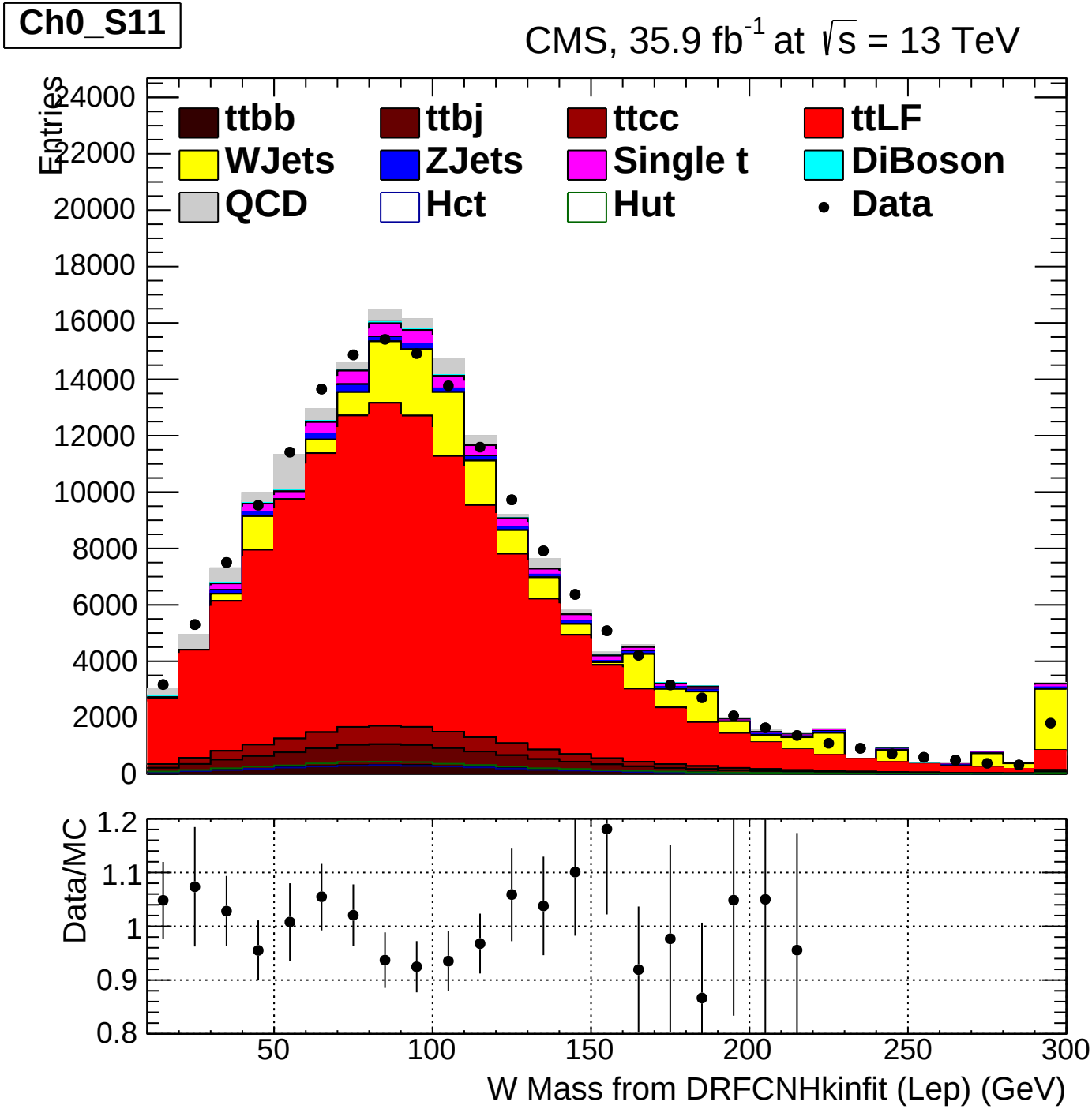

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1800
1600
1400
1200
1000
800
600
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

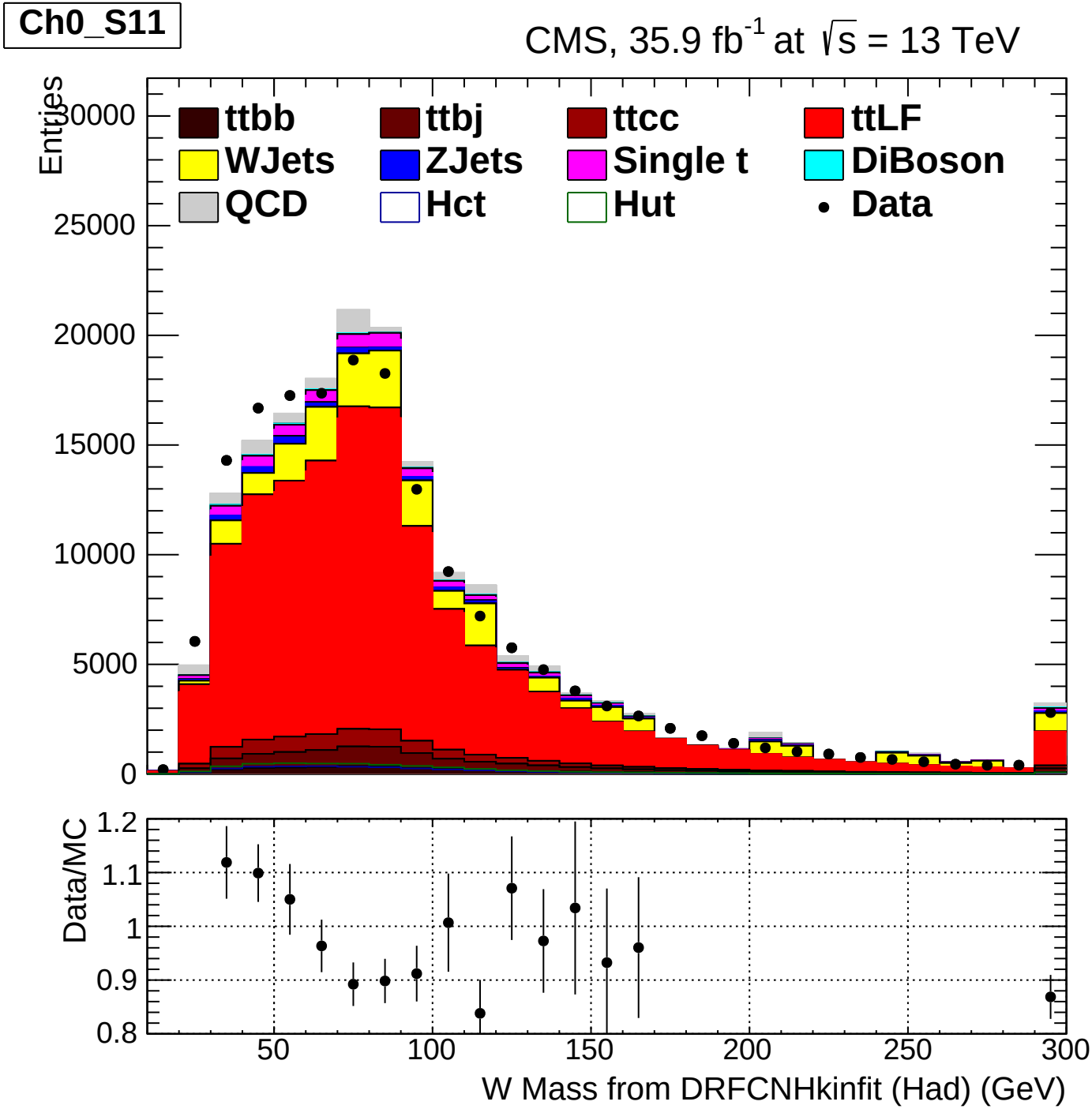

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

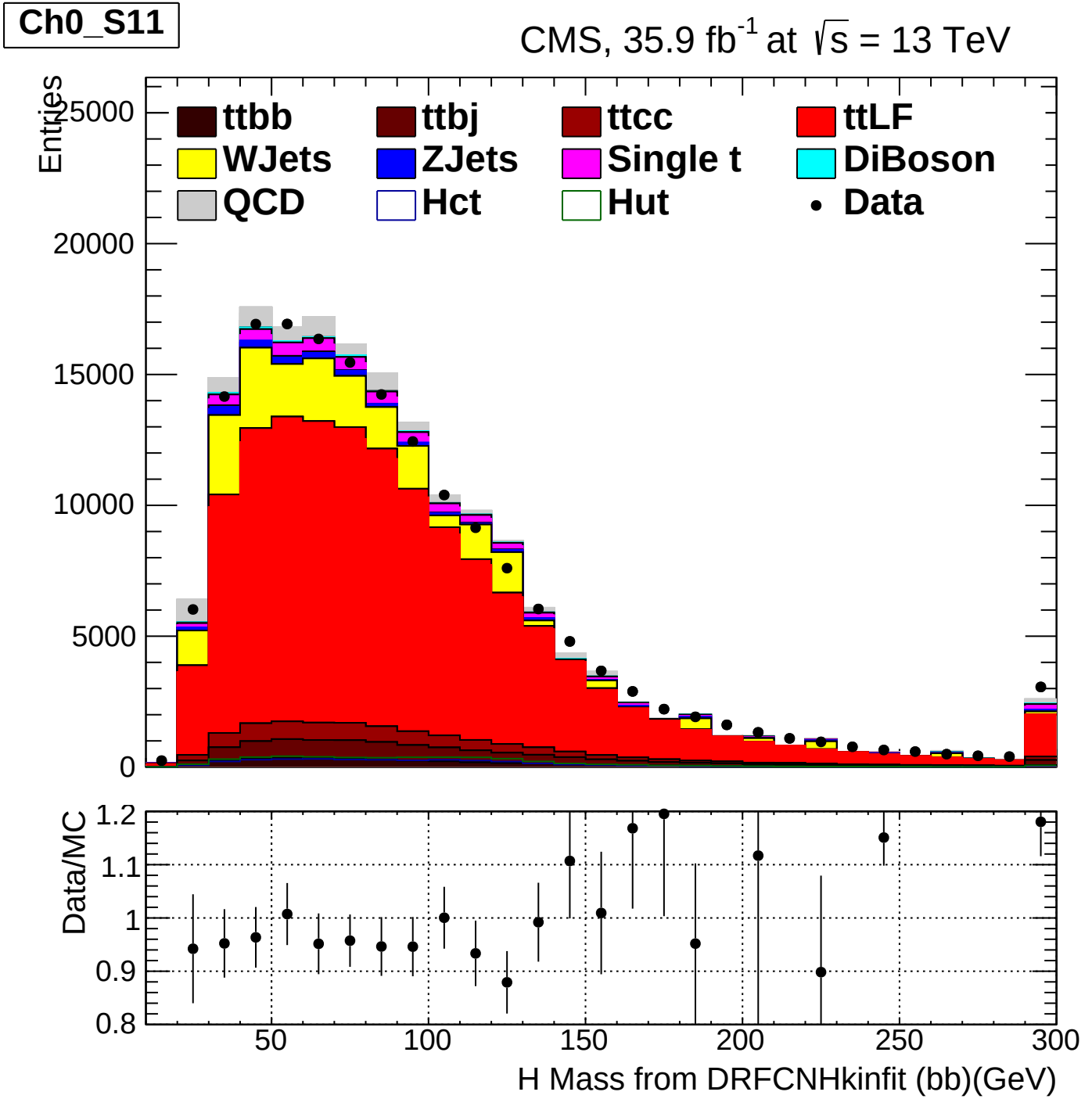

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

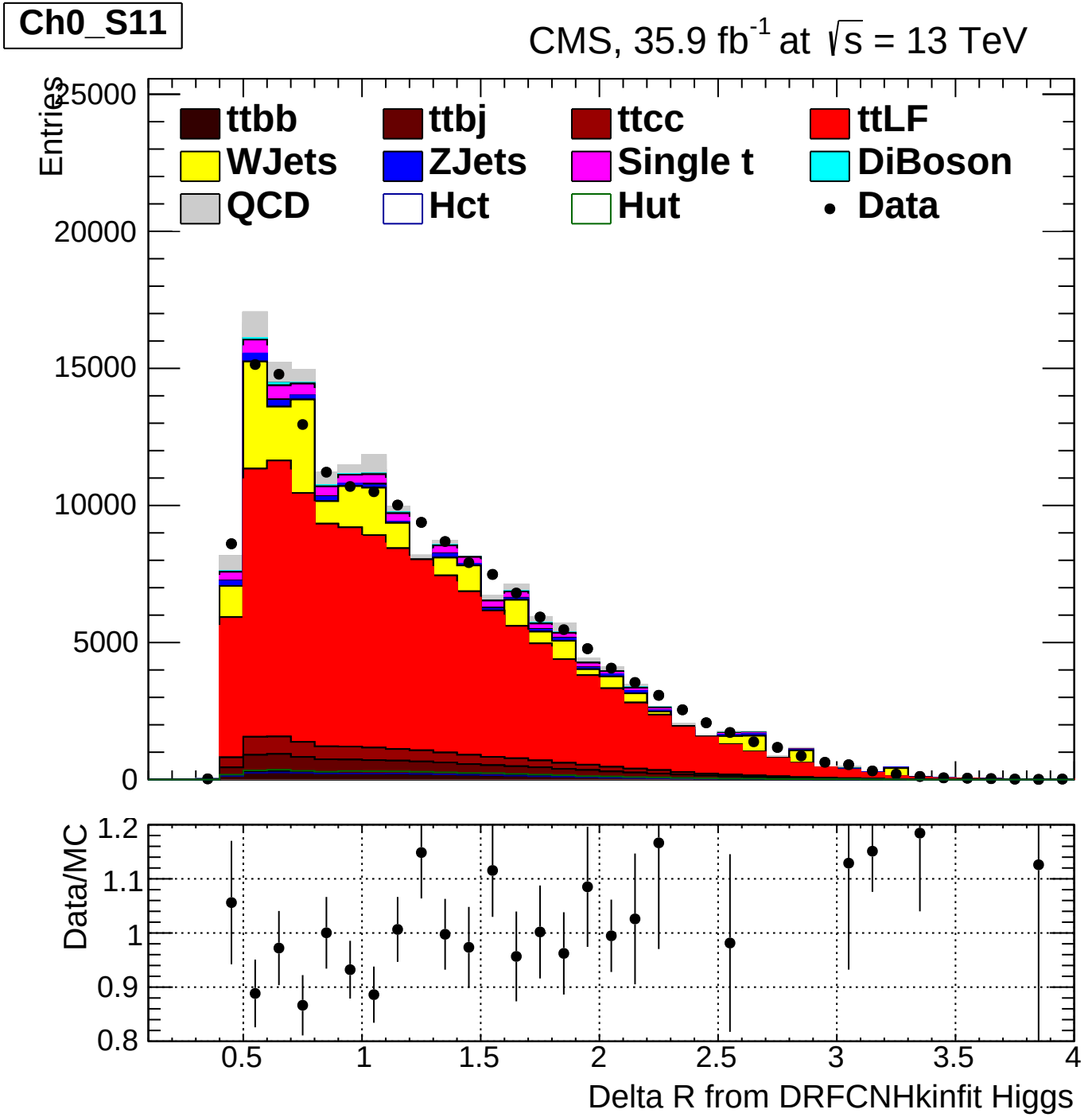

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

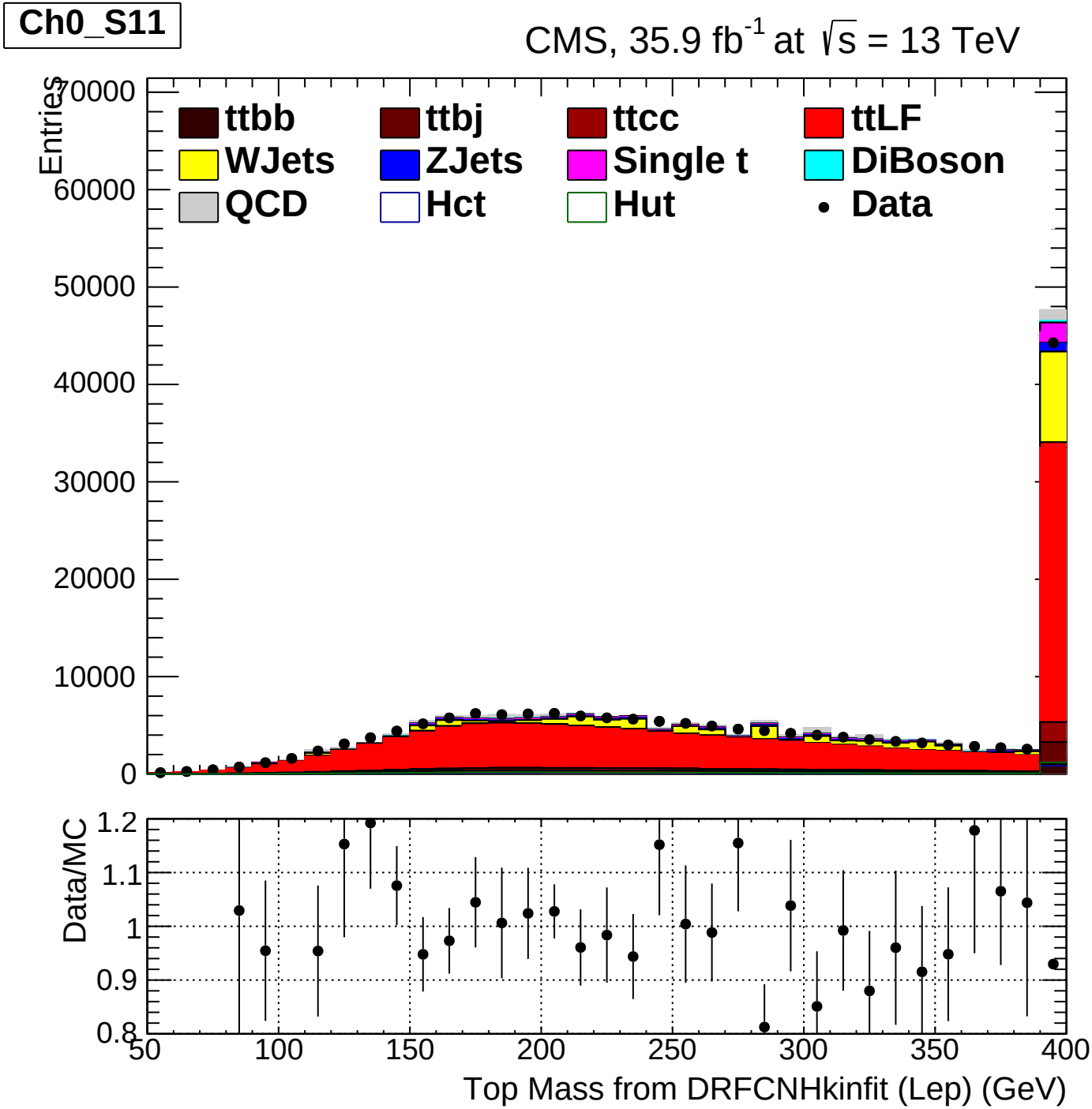

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

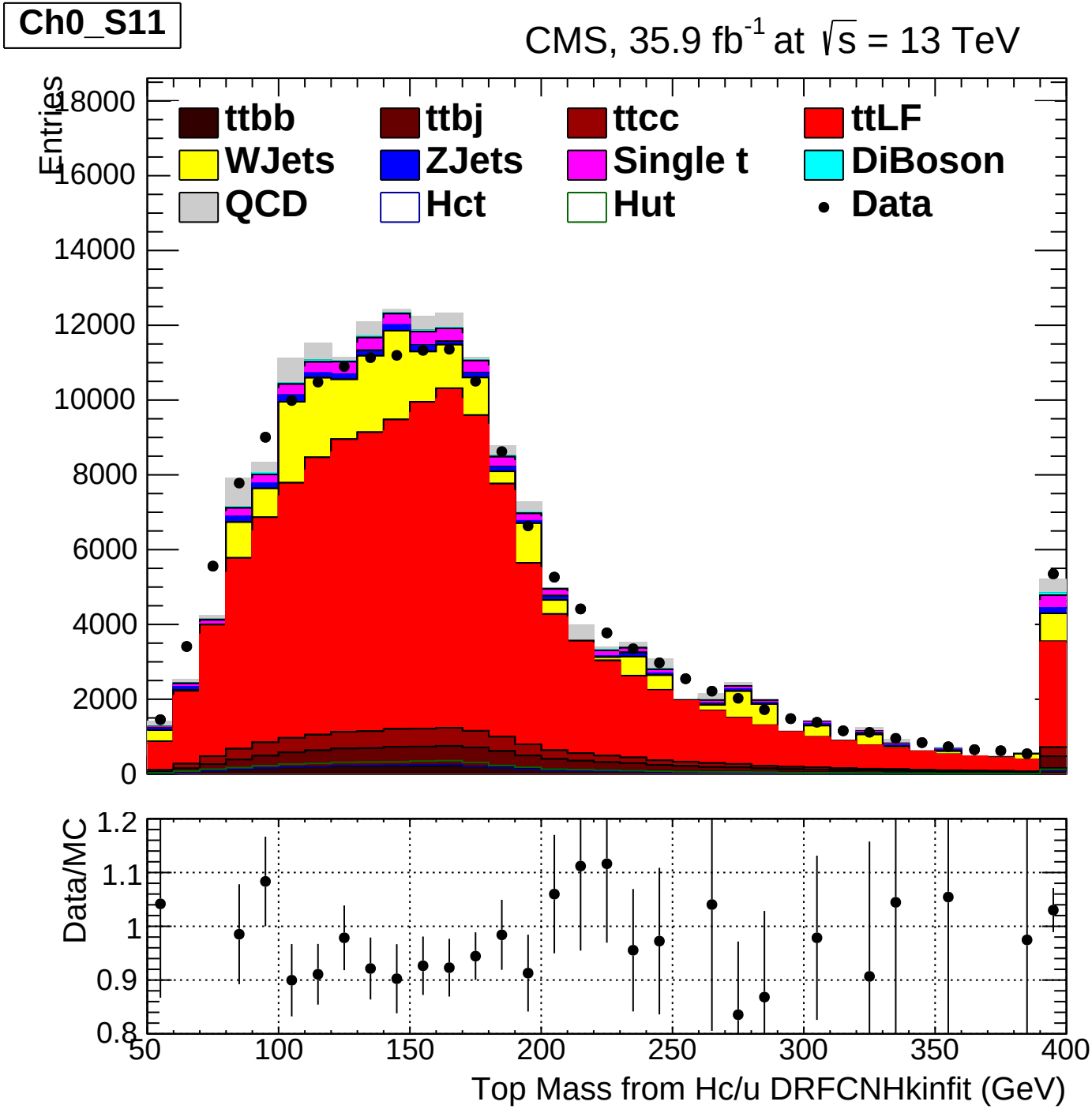

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

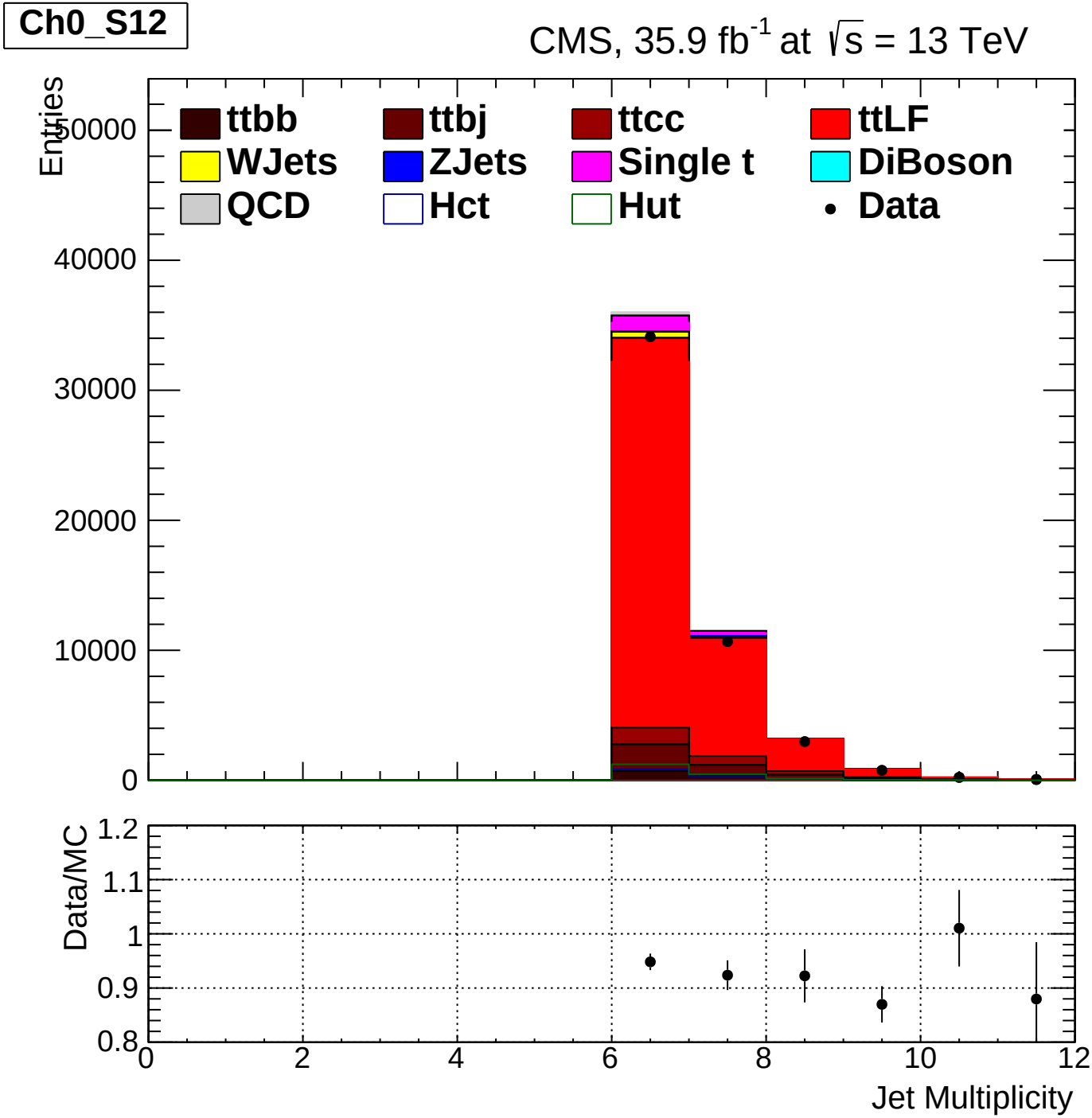

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

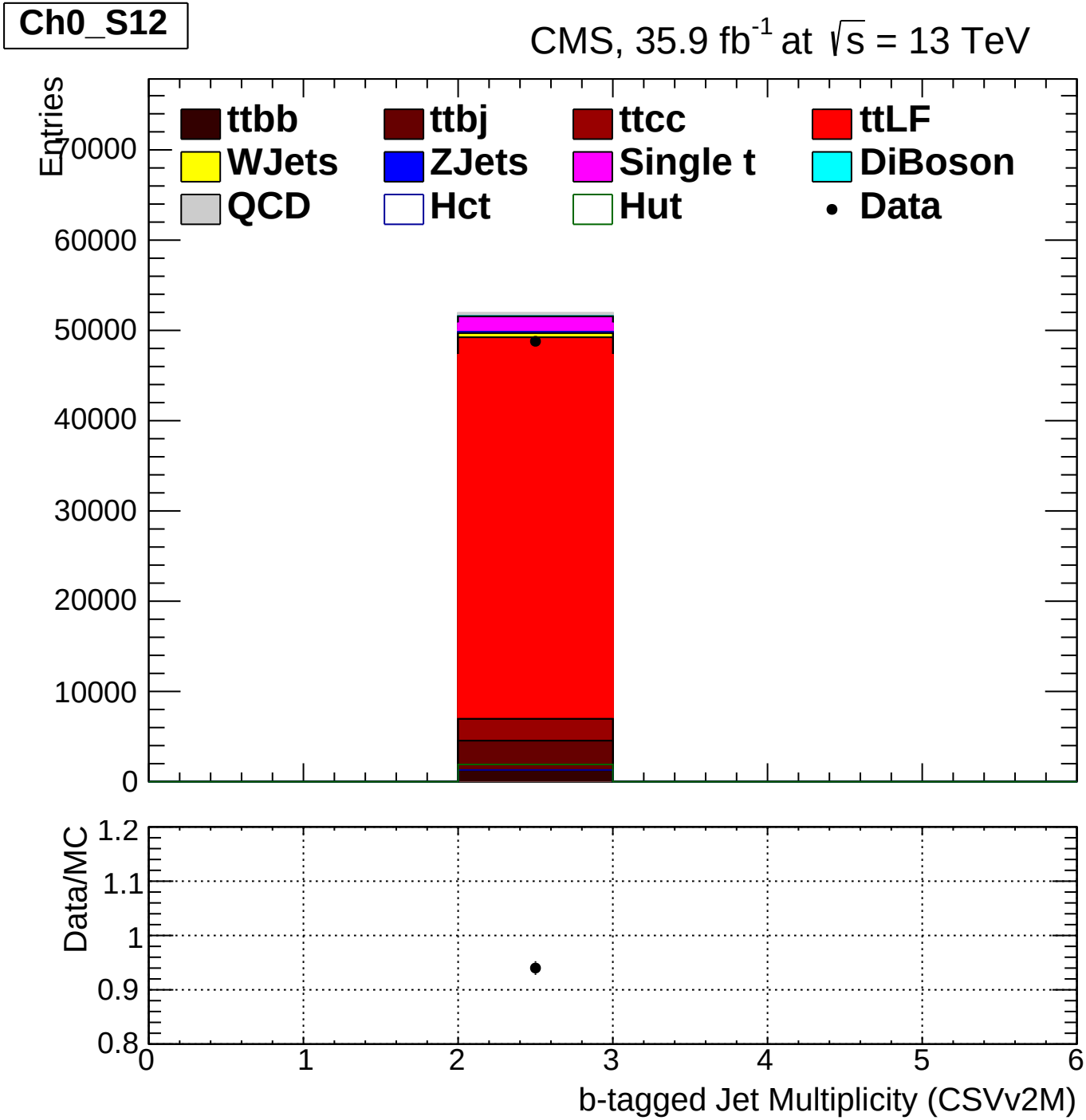

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)

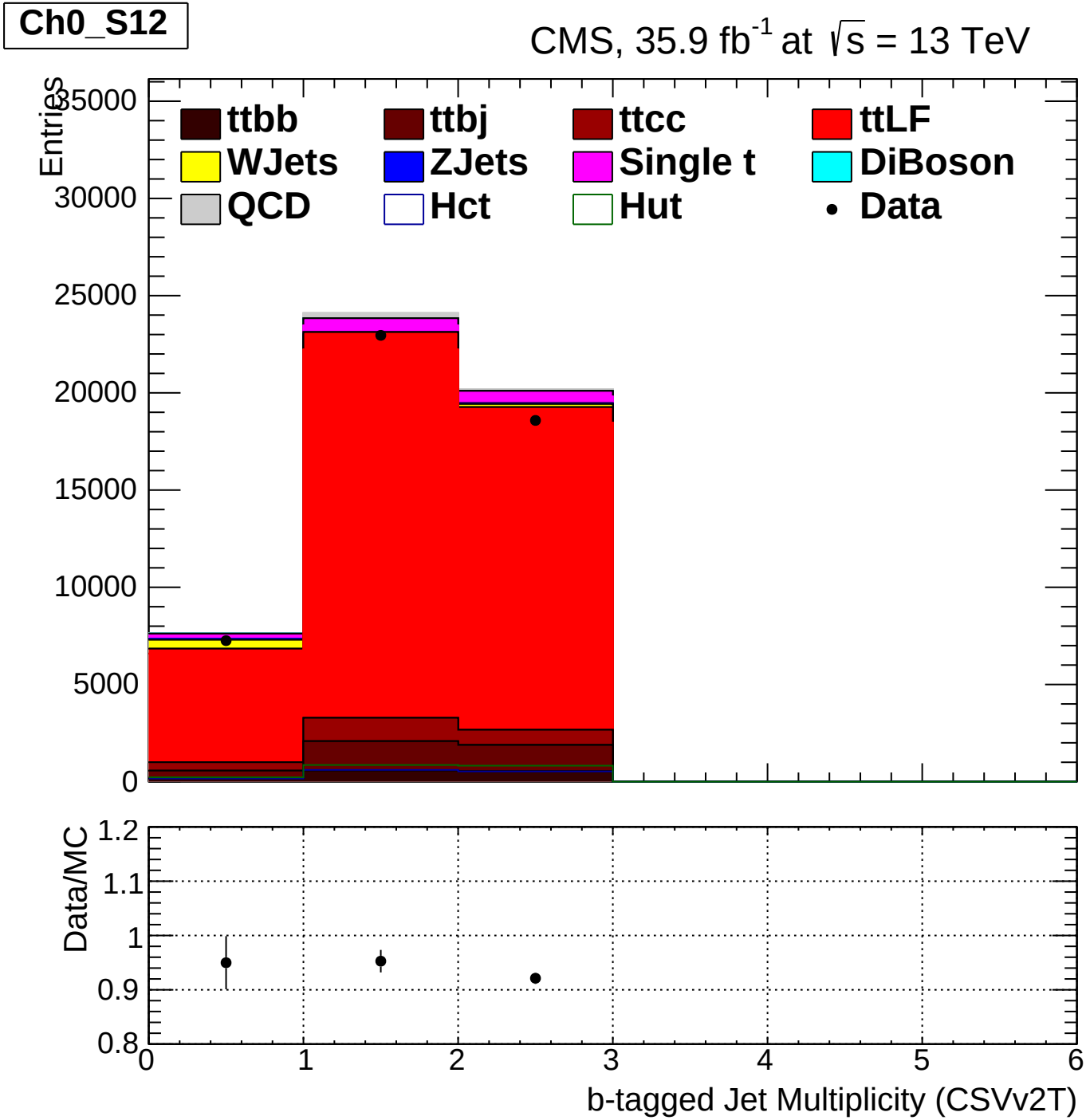

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

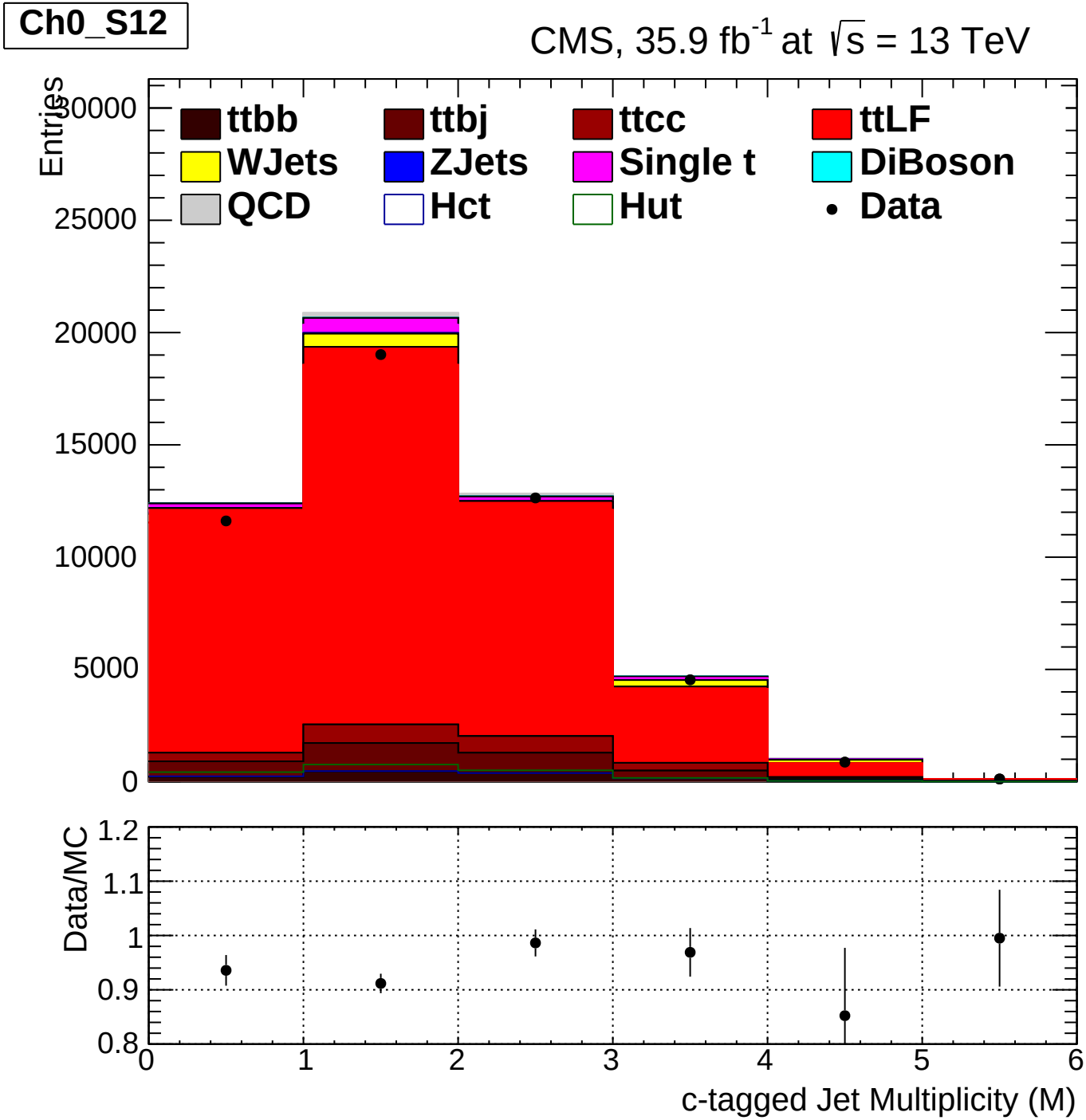

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

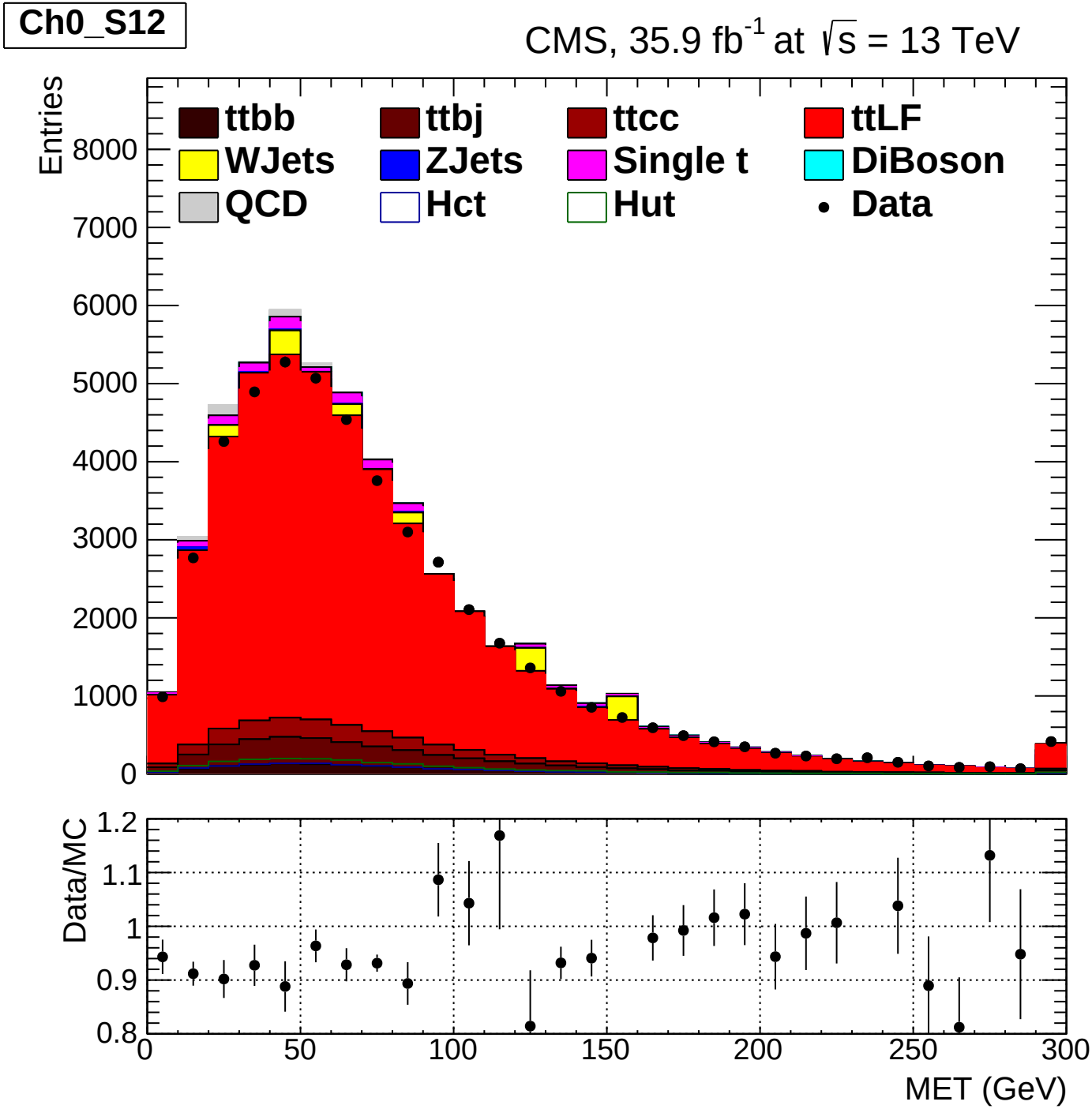

Ch0_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

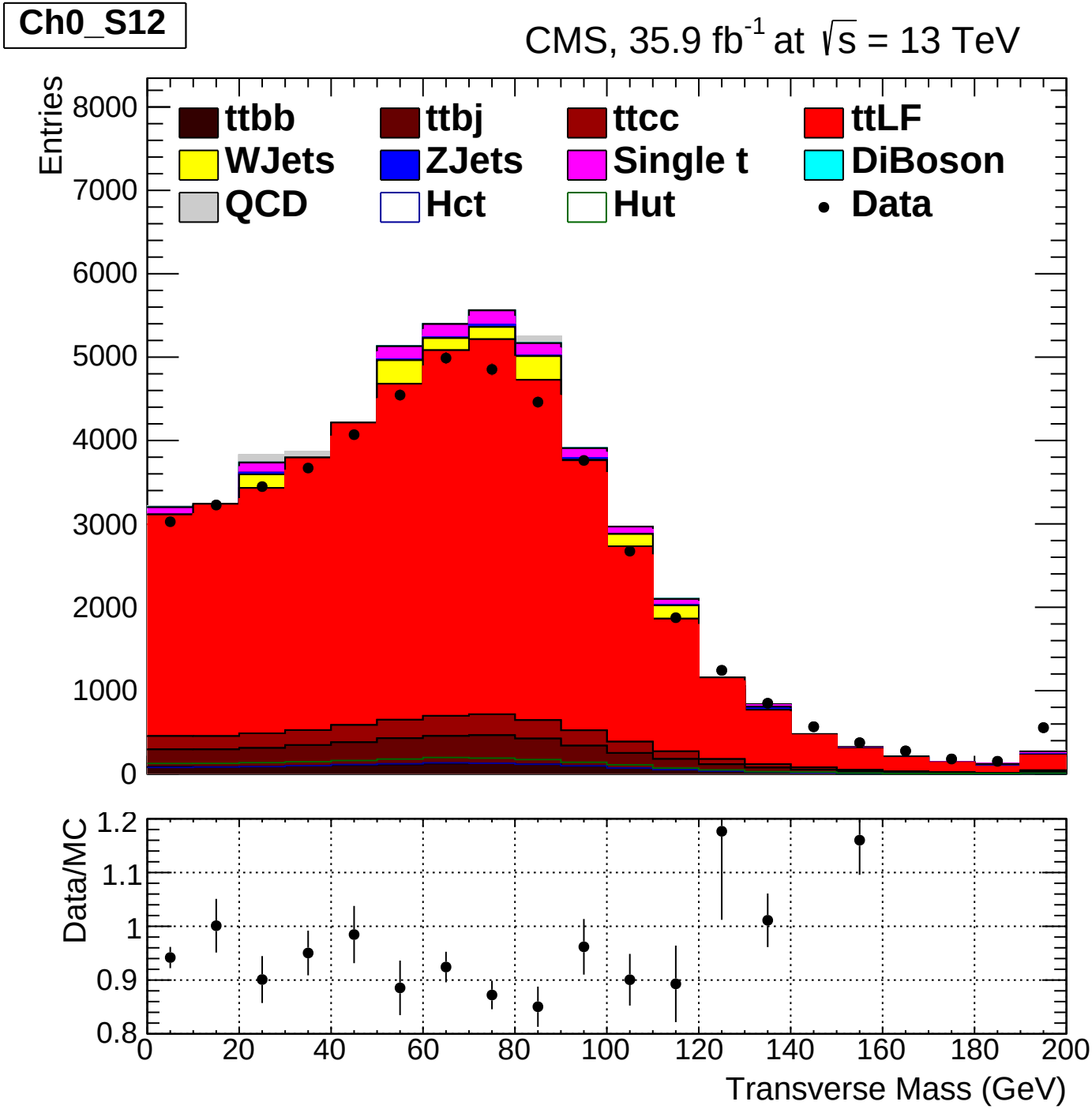

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

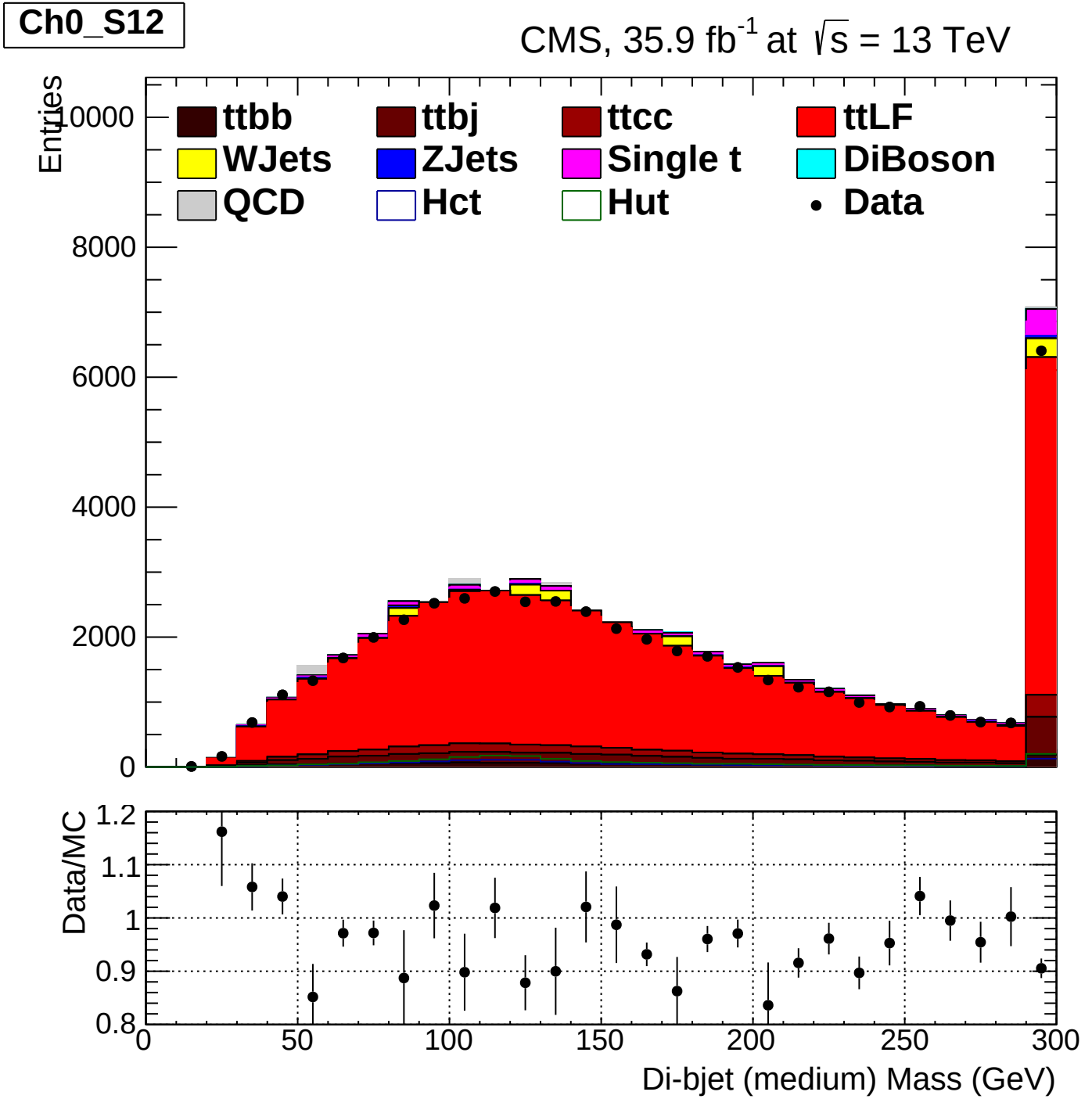

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

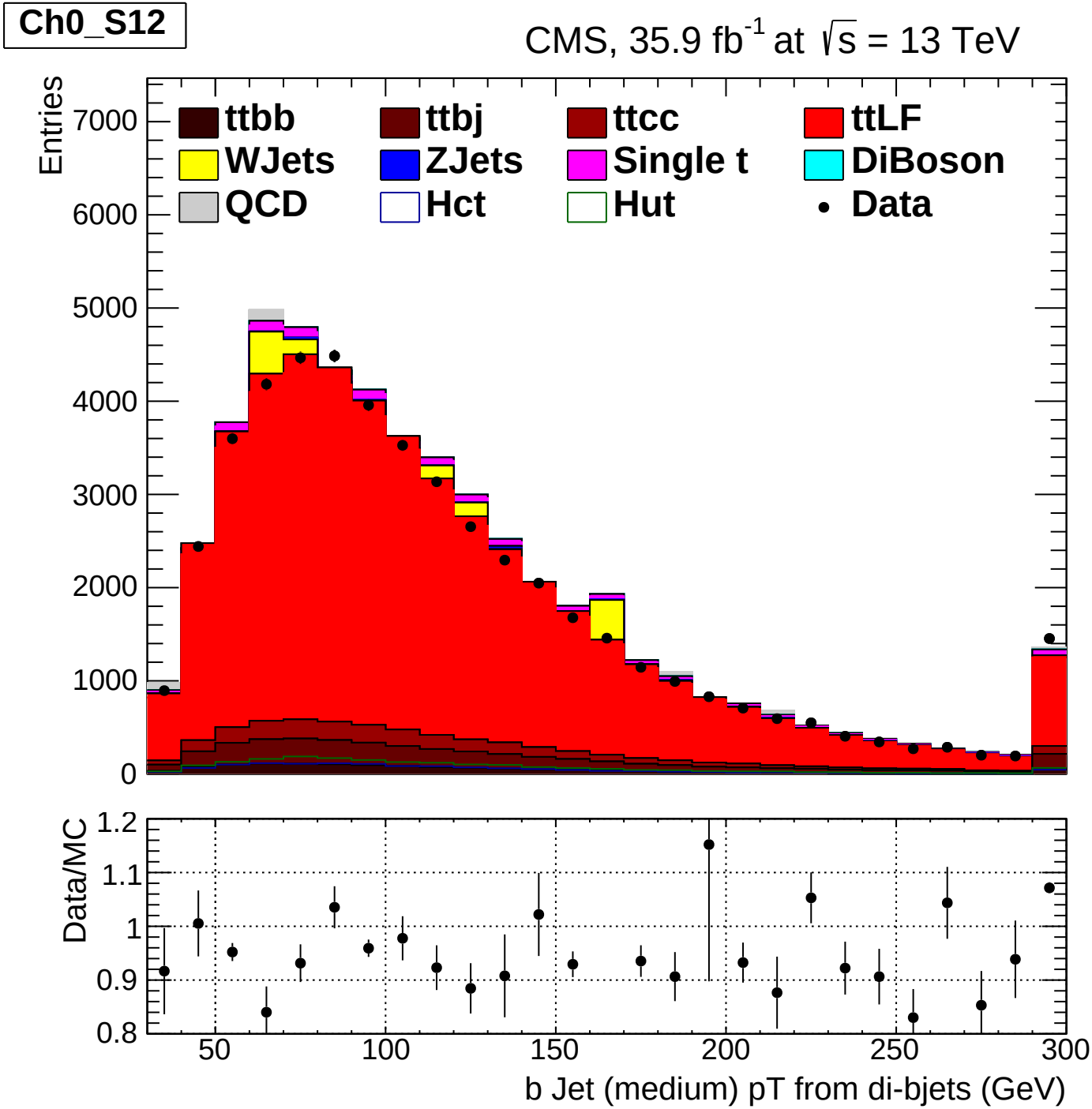

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

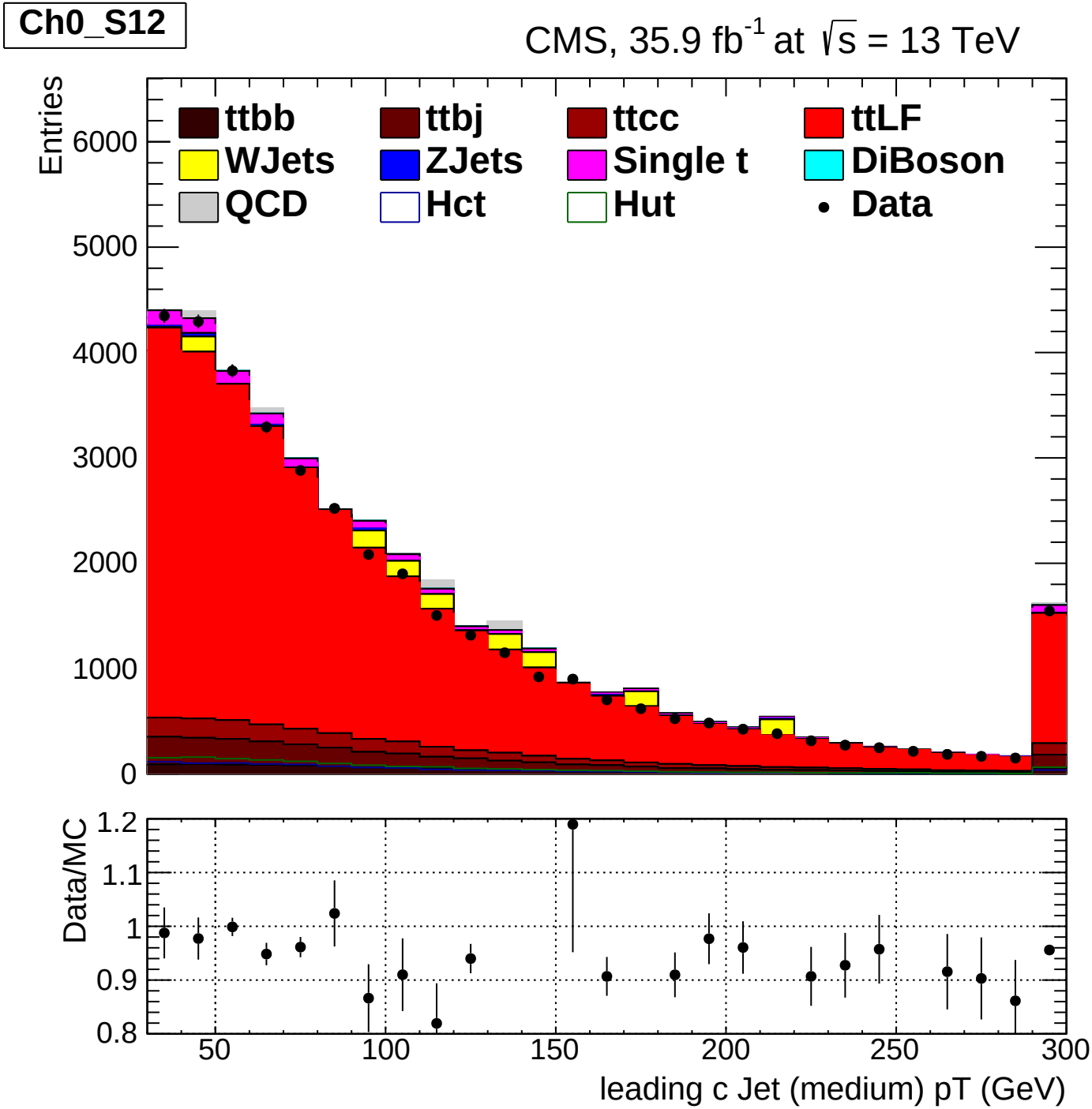

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

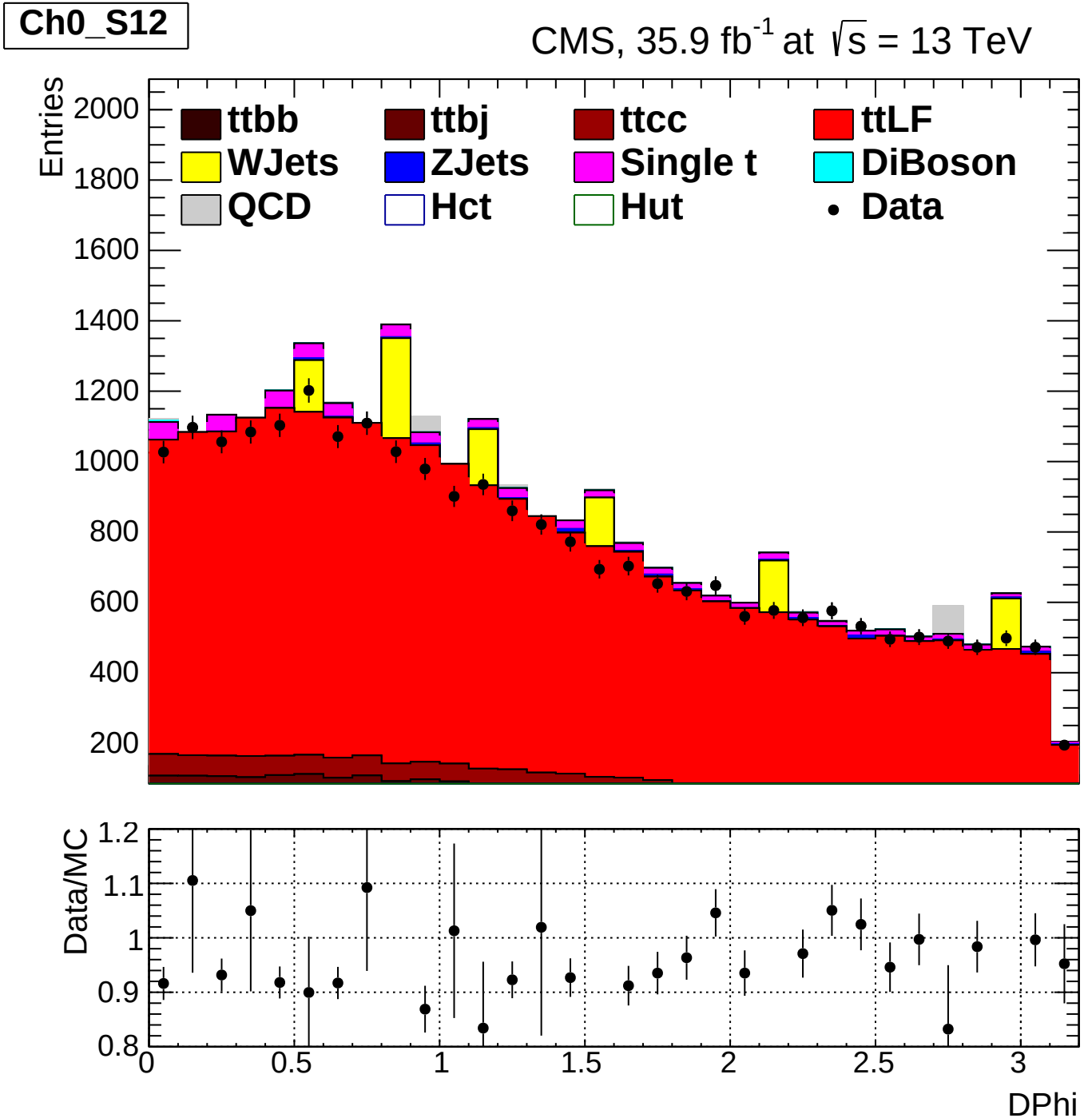

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

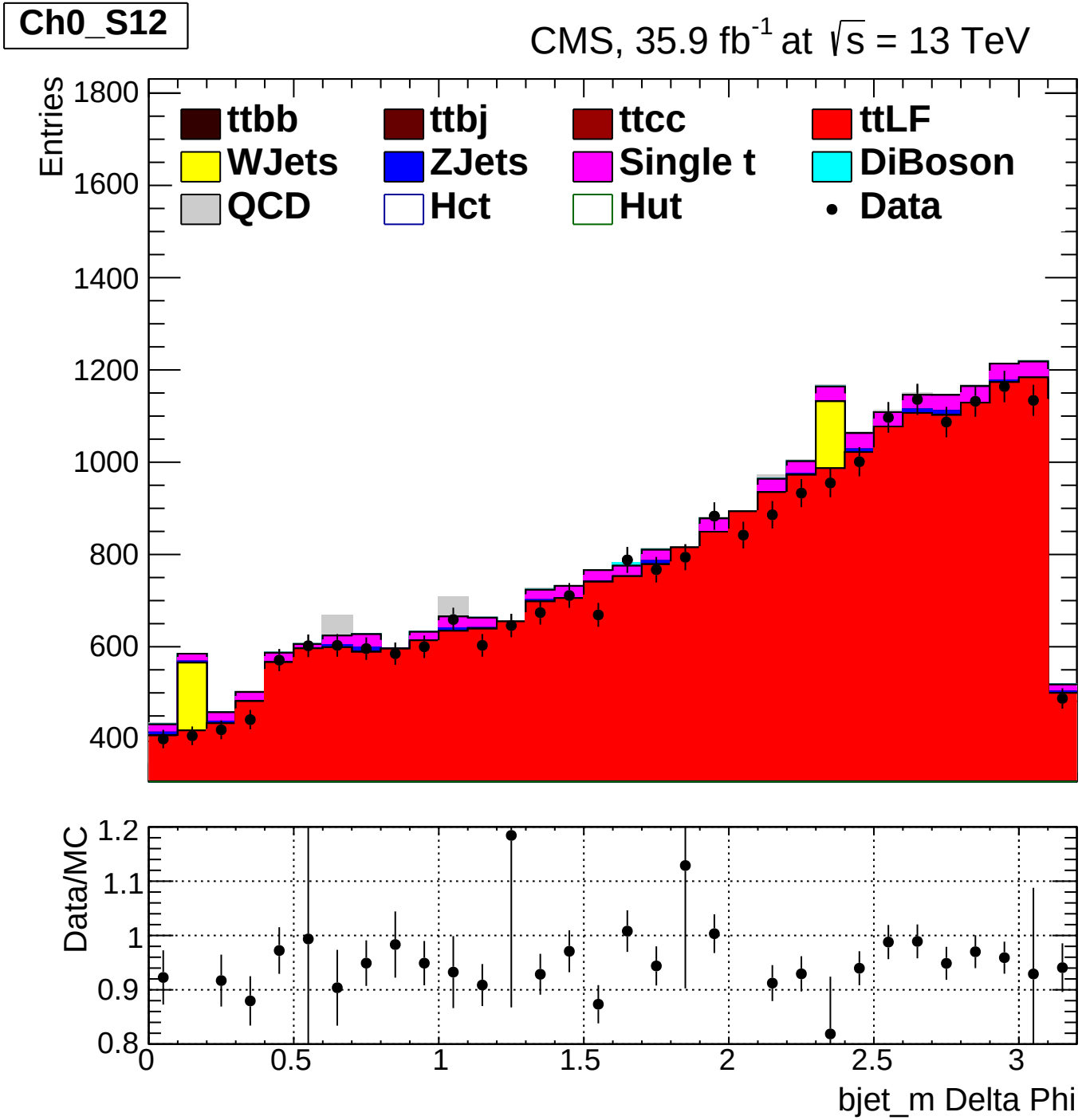

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

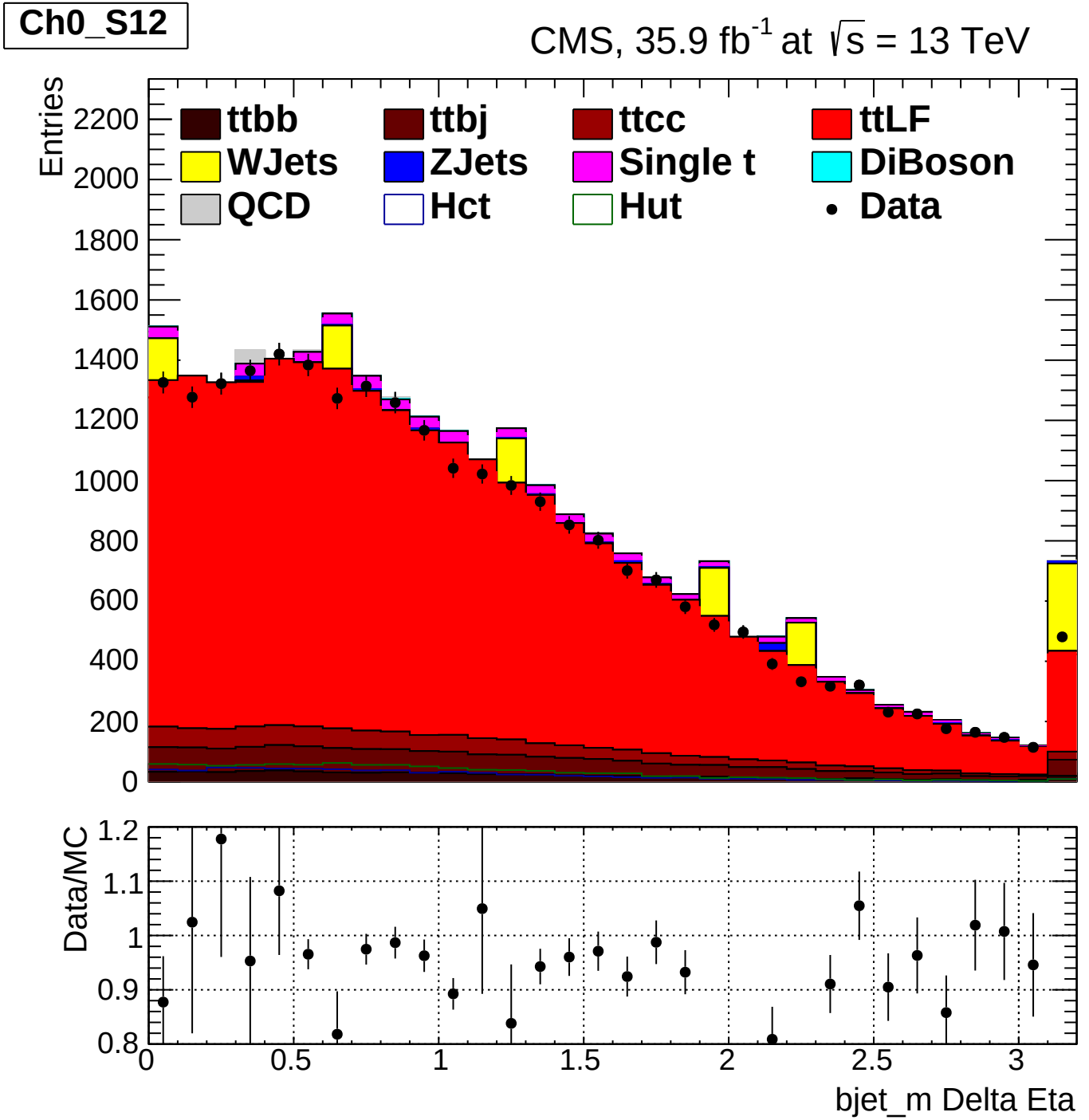

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)

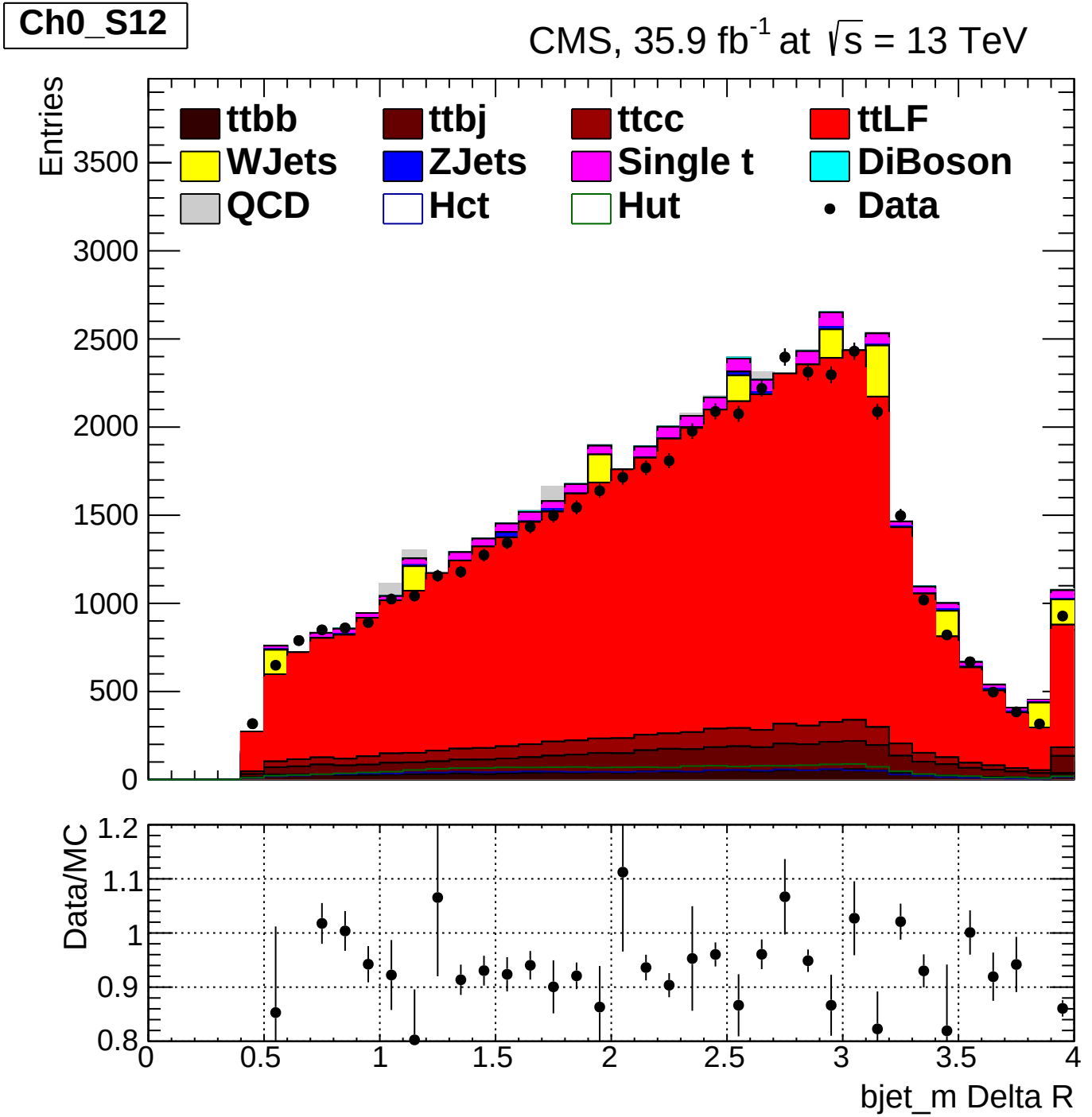

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

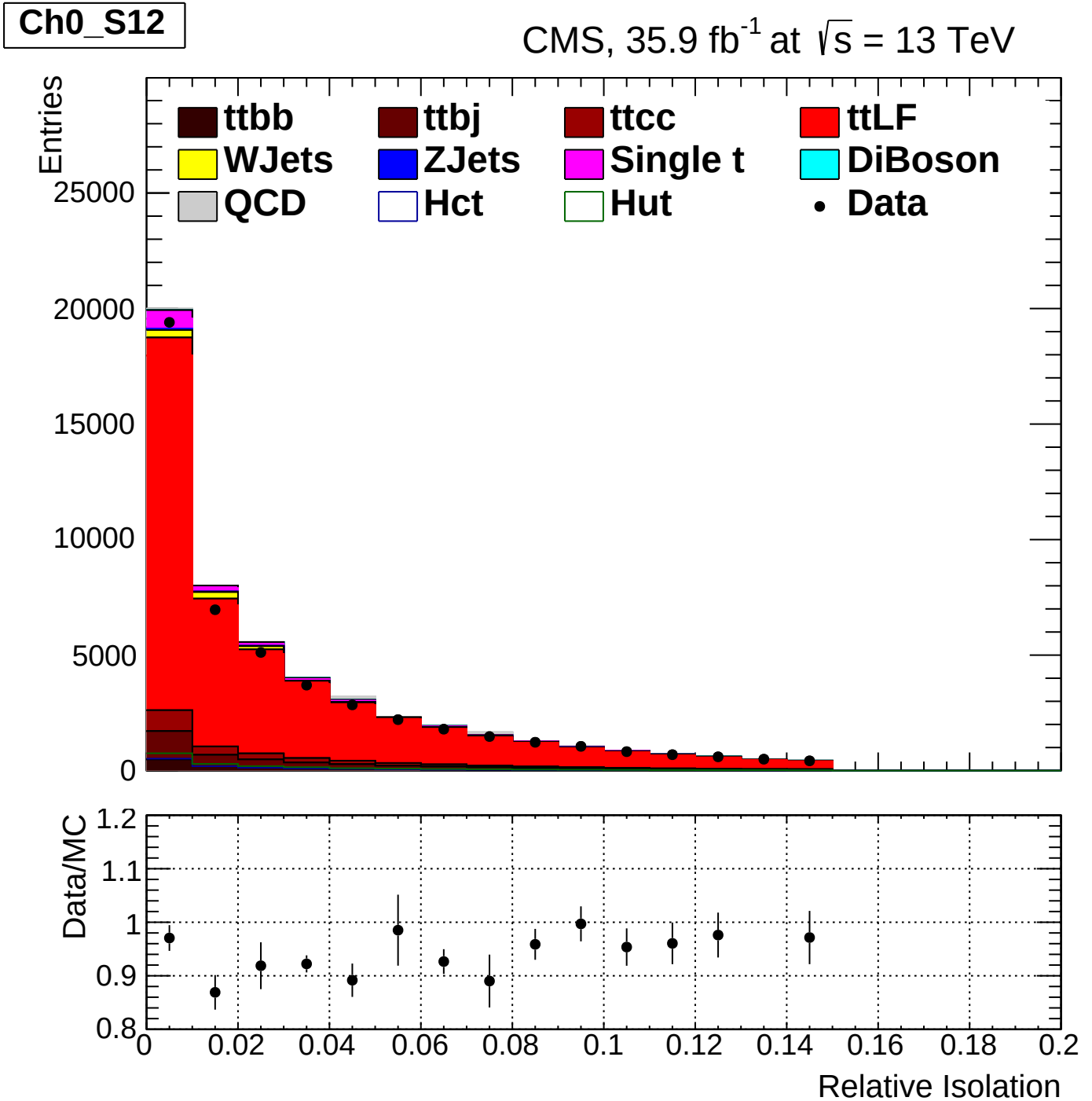

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

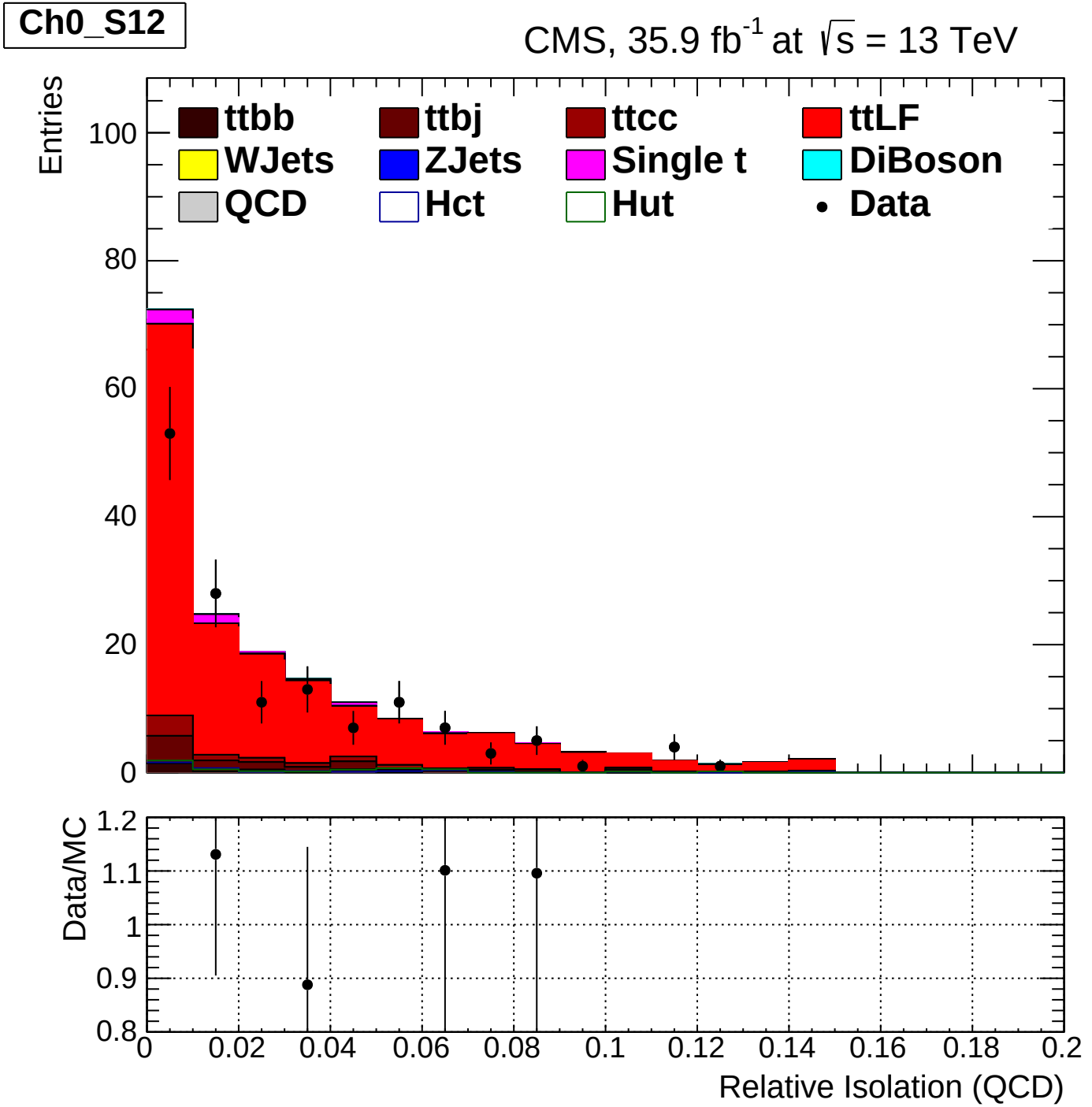

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi

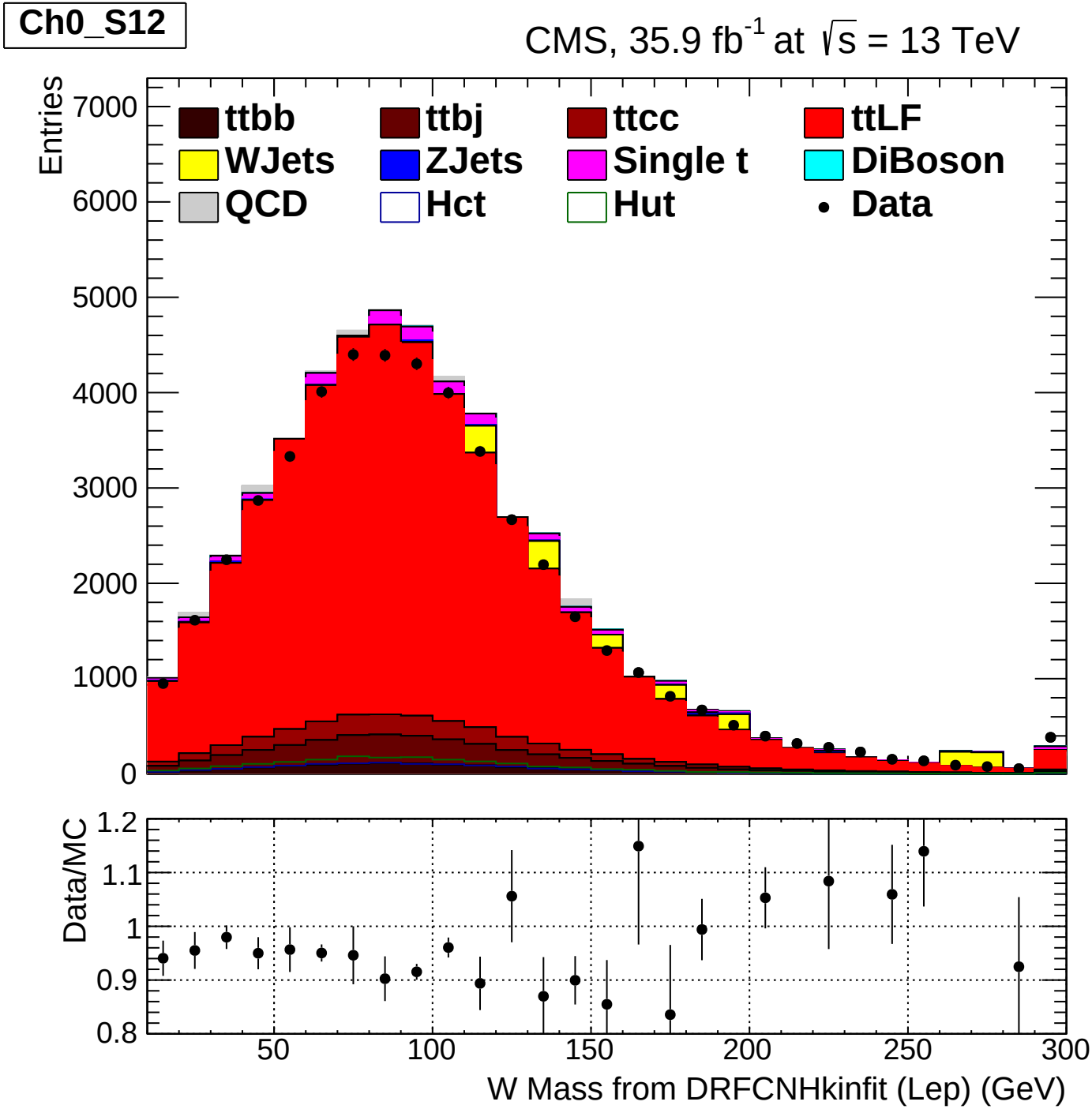

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

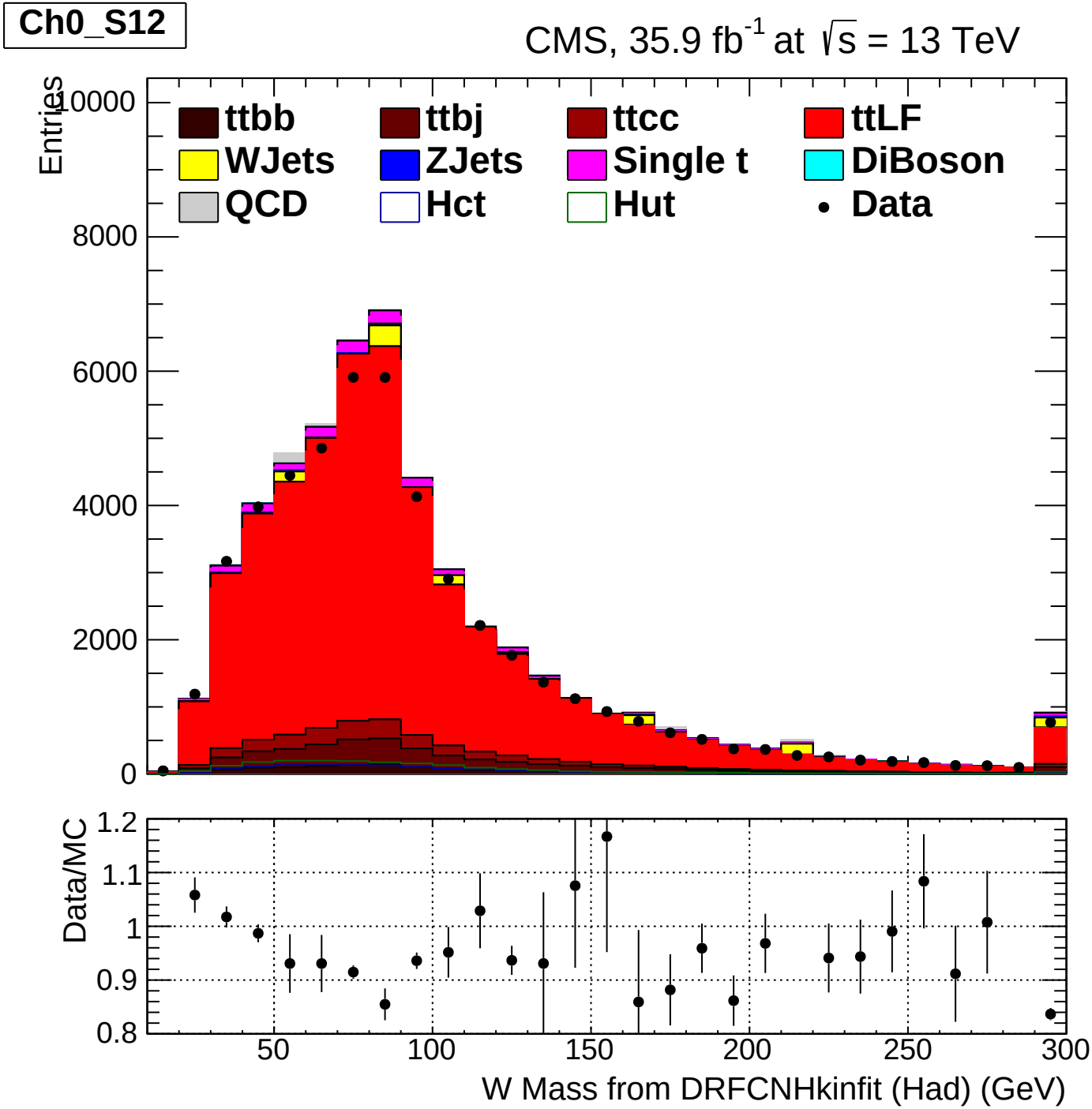

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

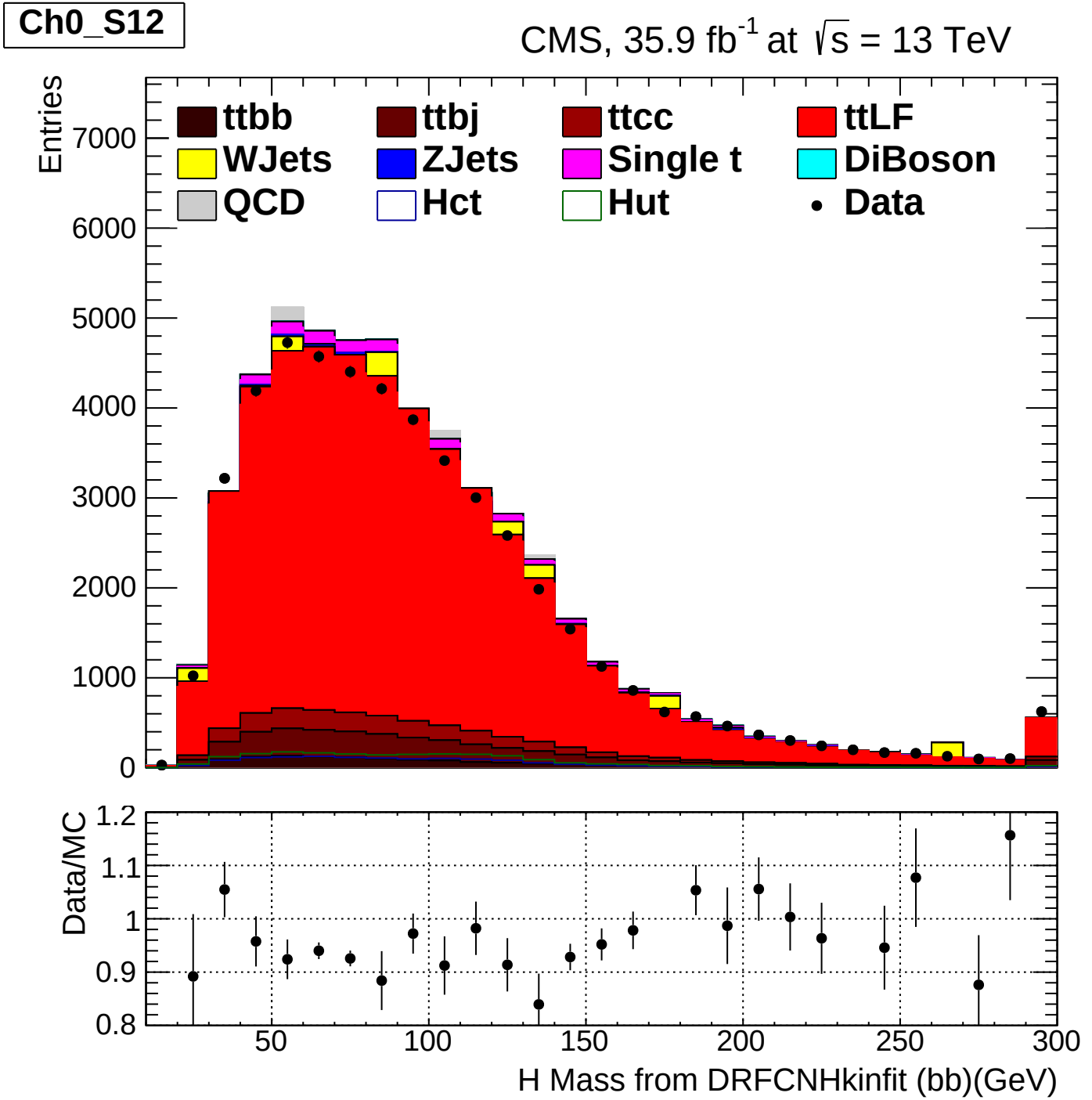

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

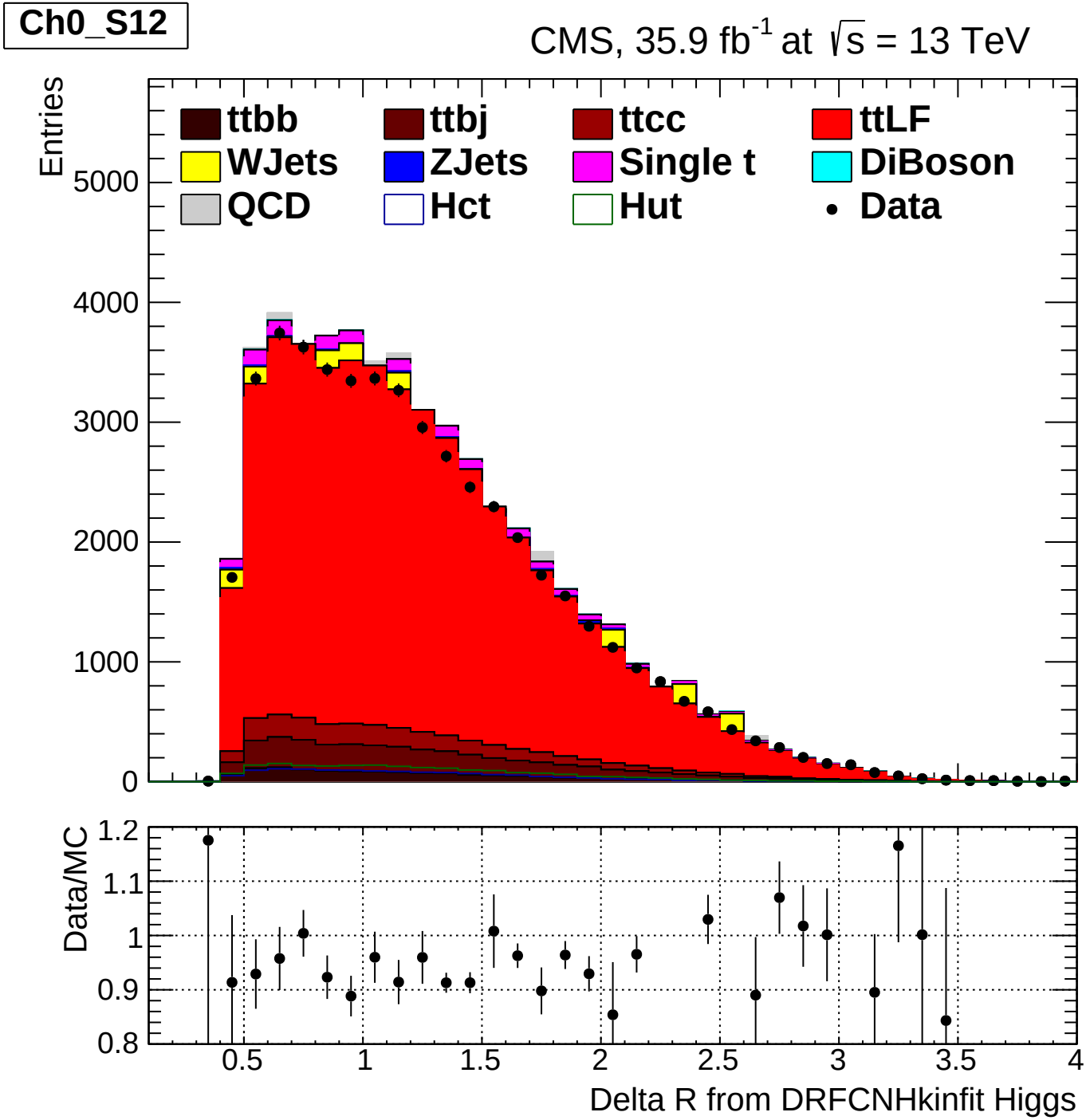

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

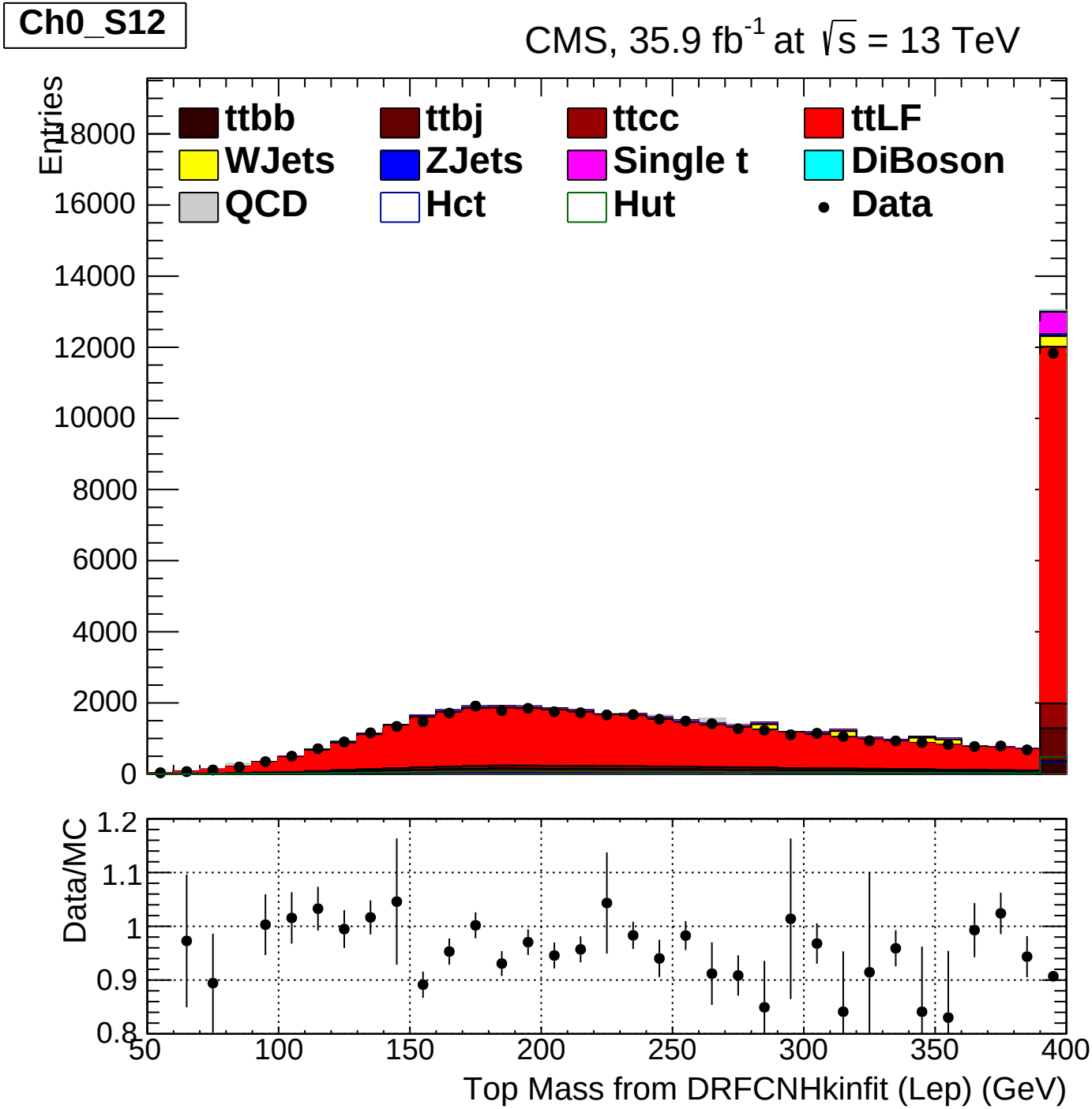

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

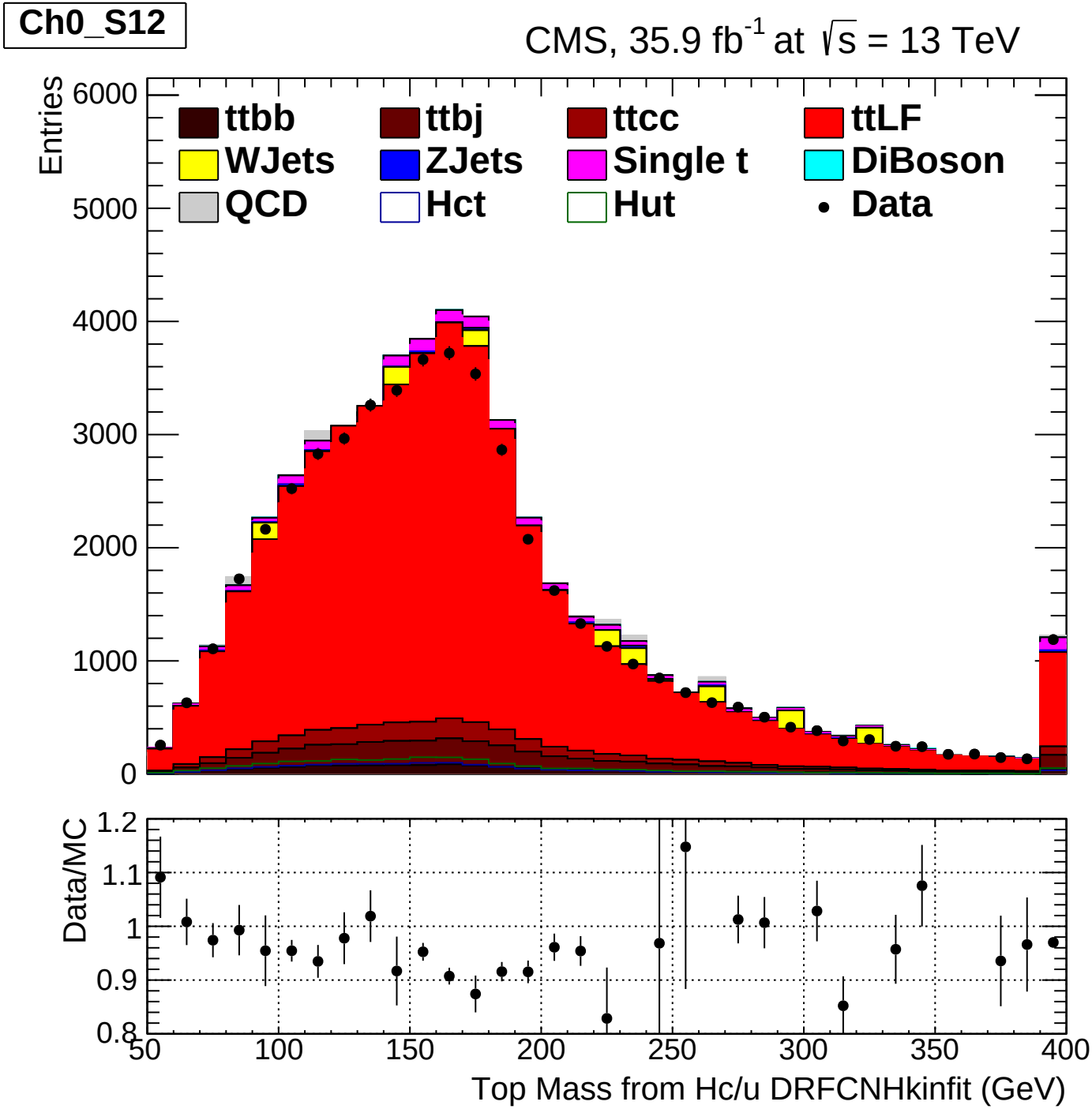

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

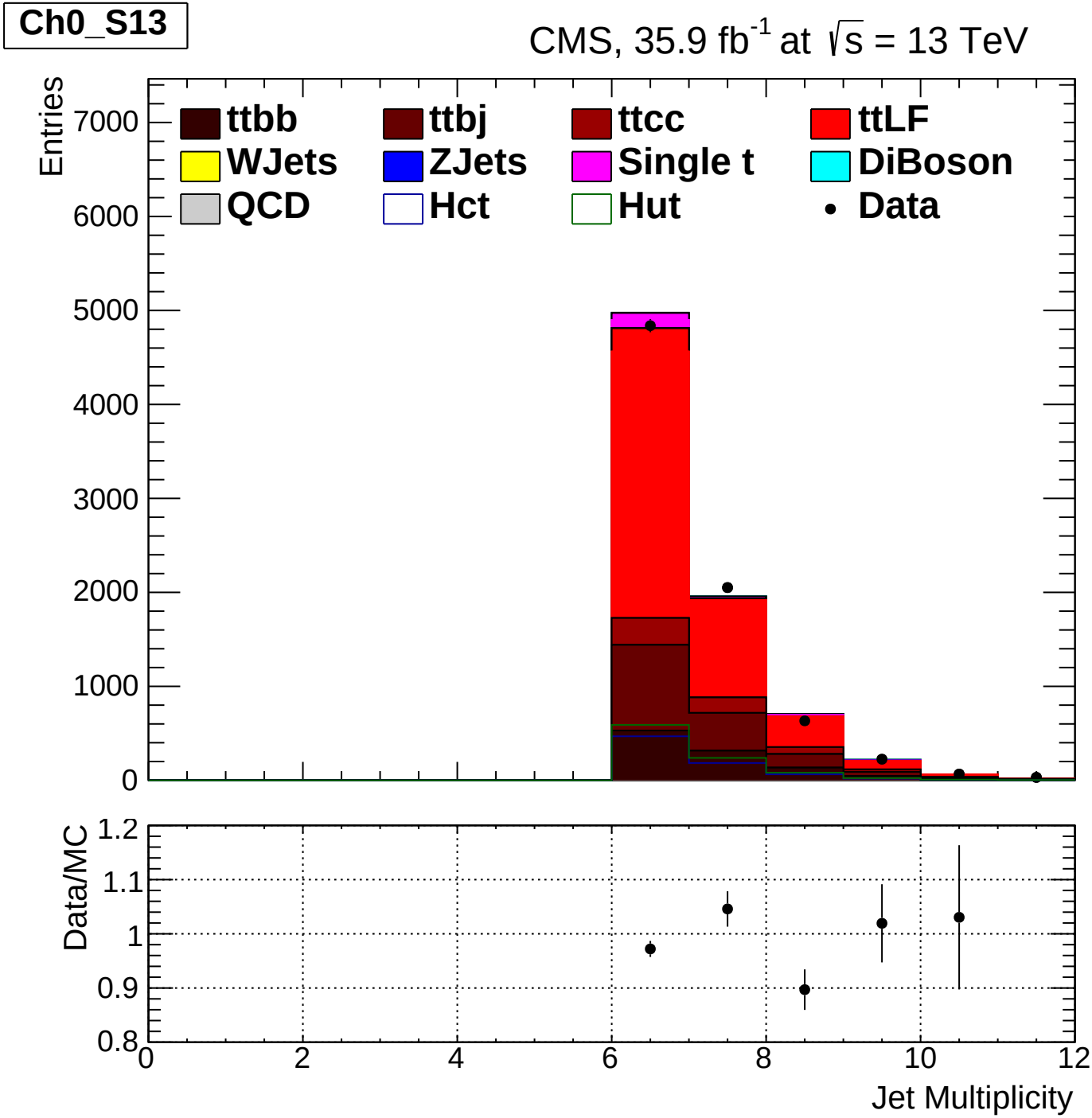

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

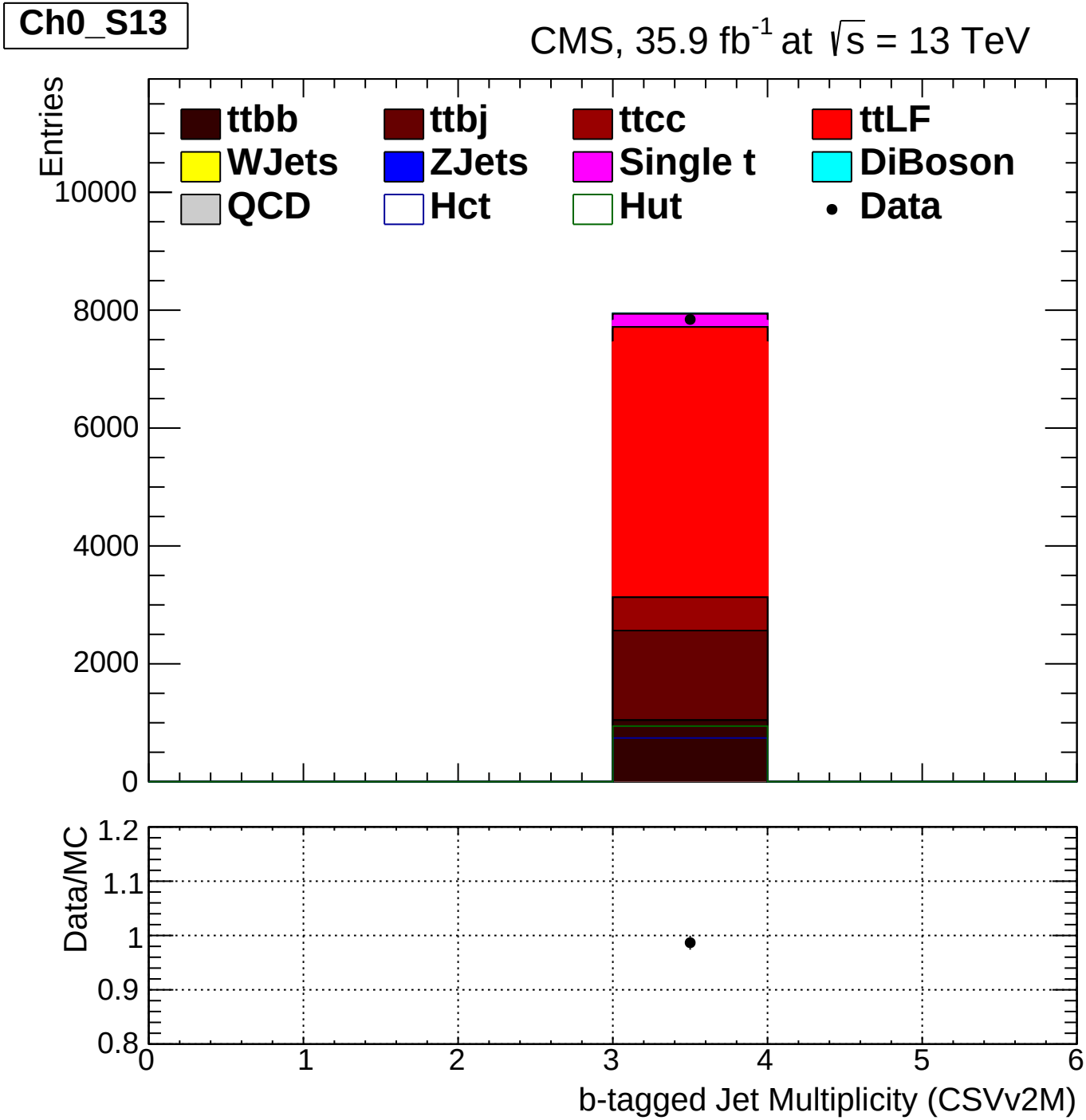

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

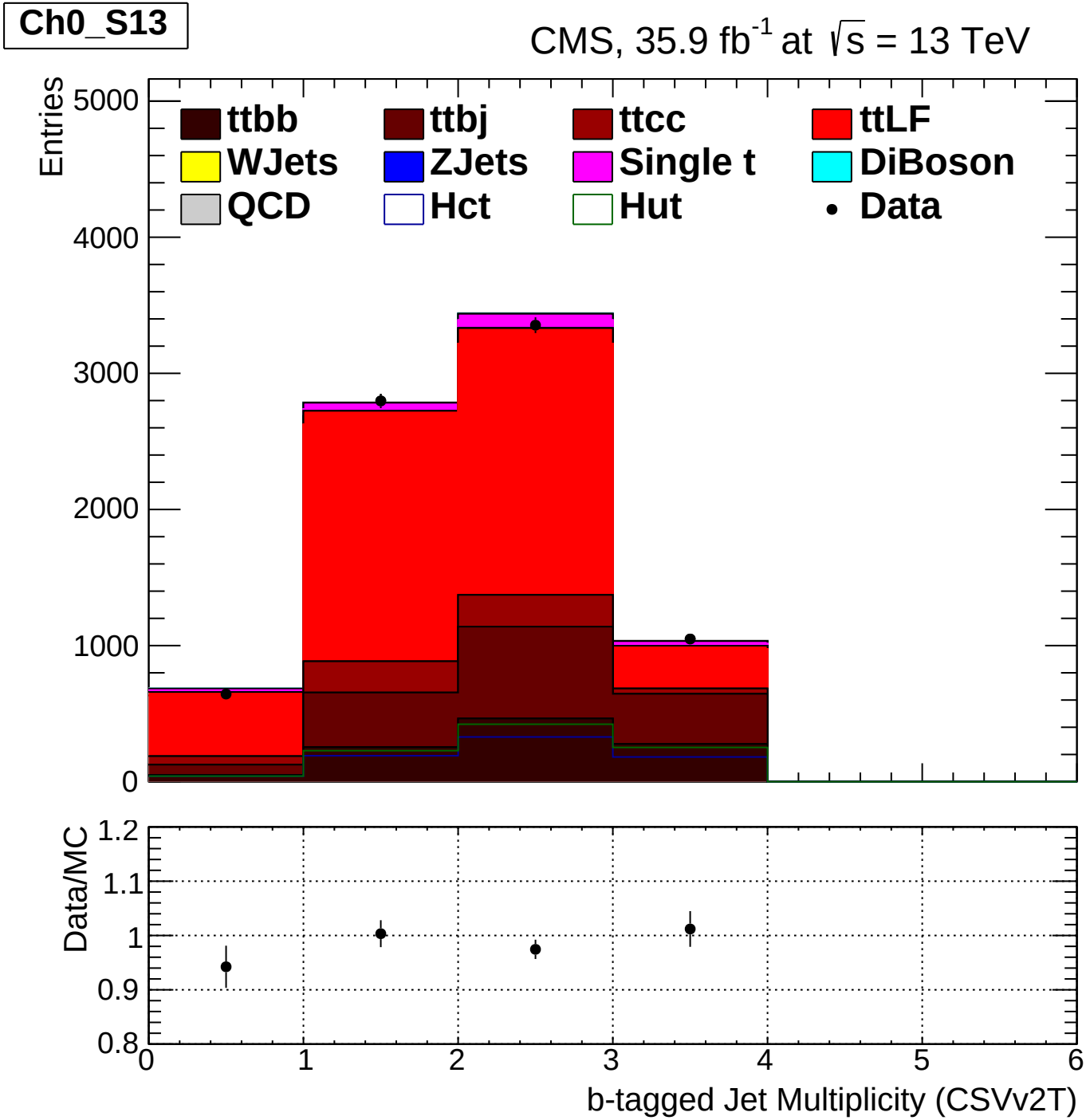

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

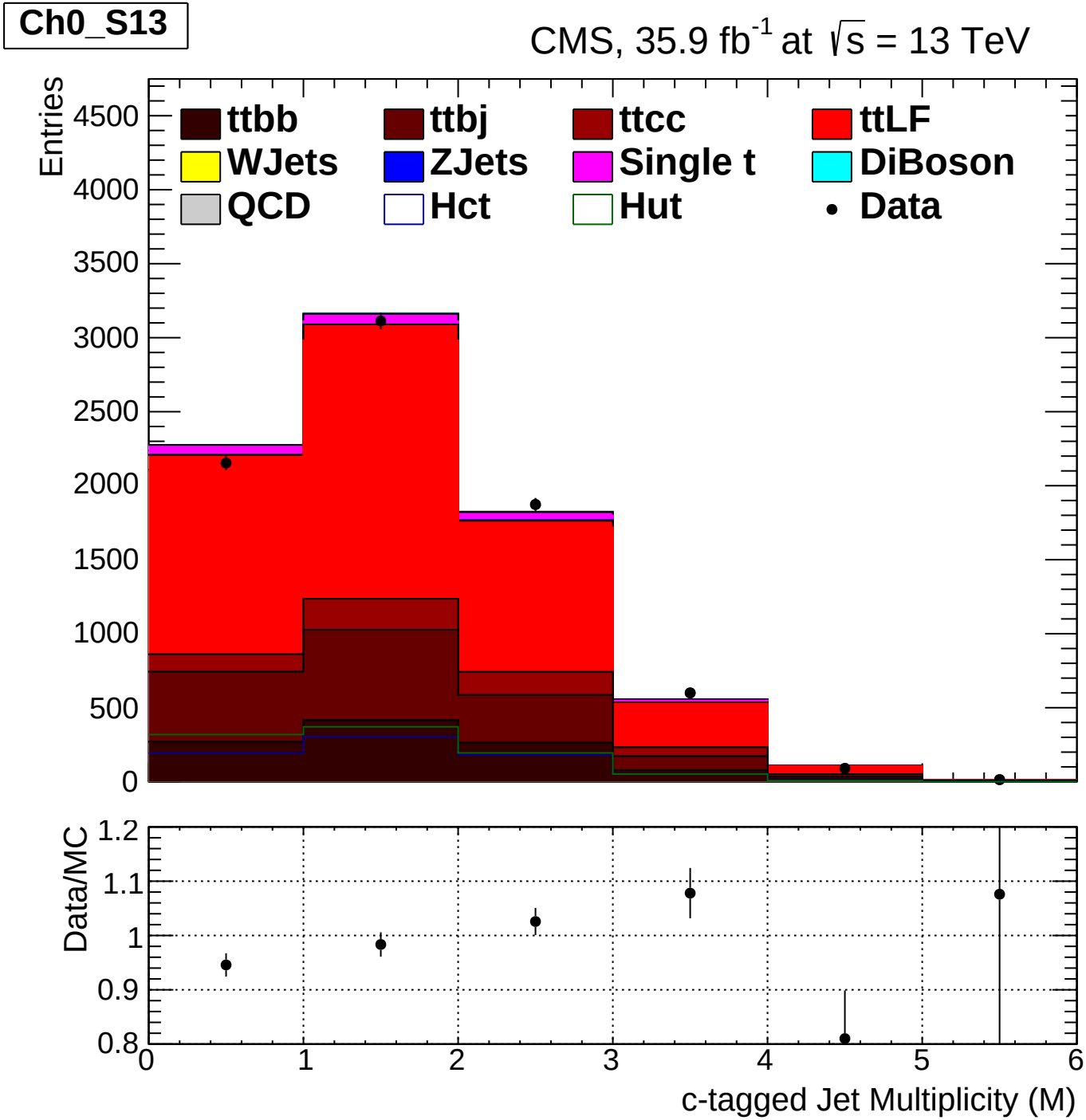

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

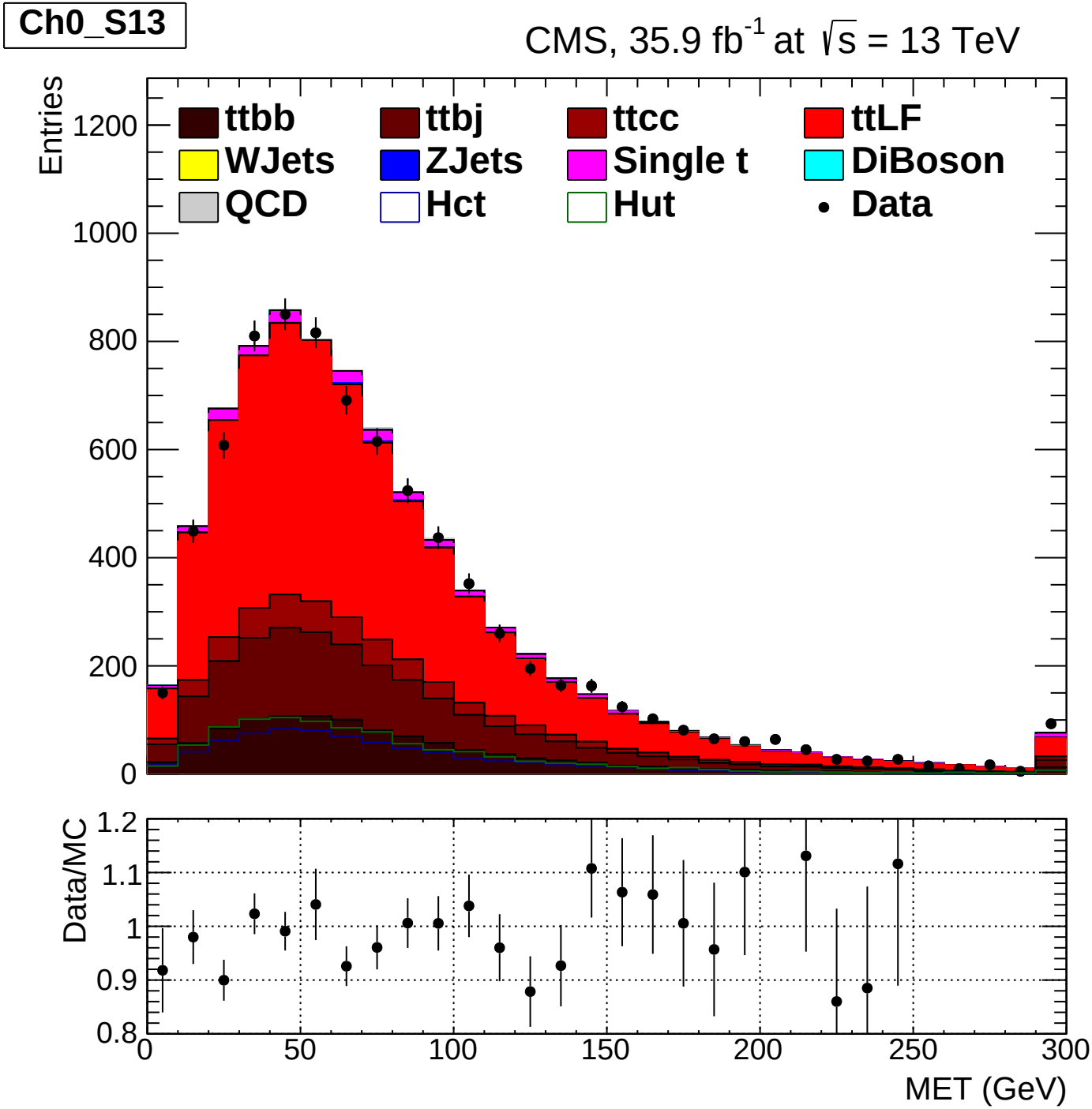

Ch0_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

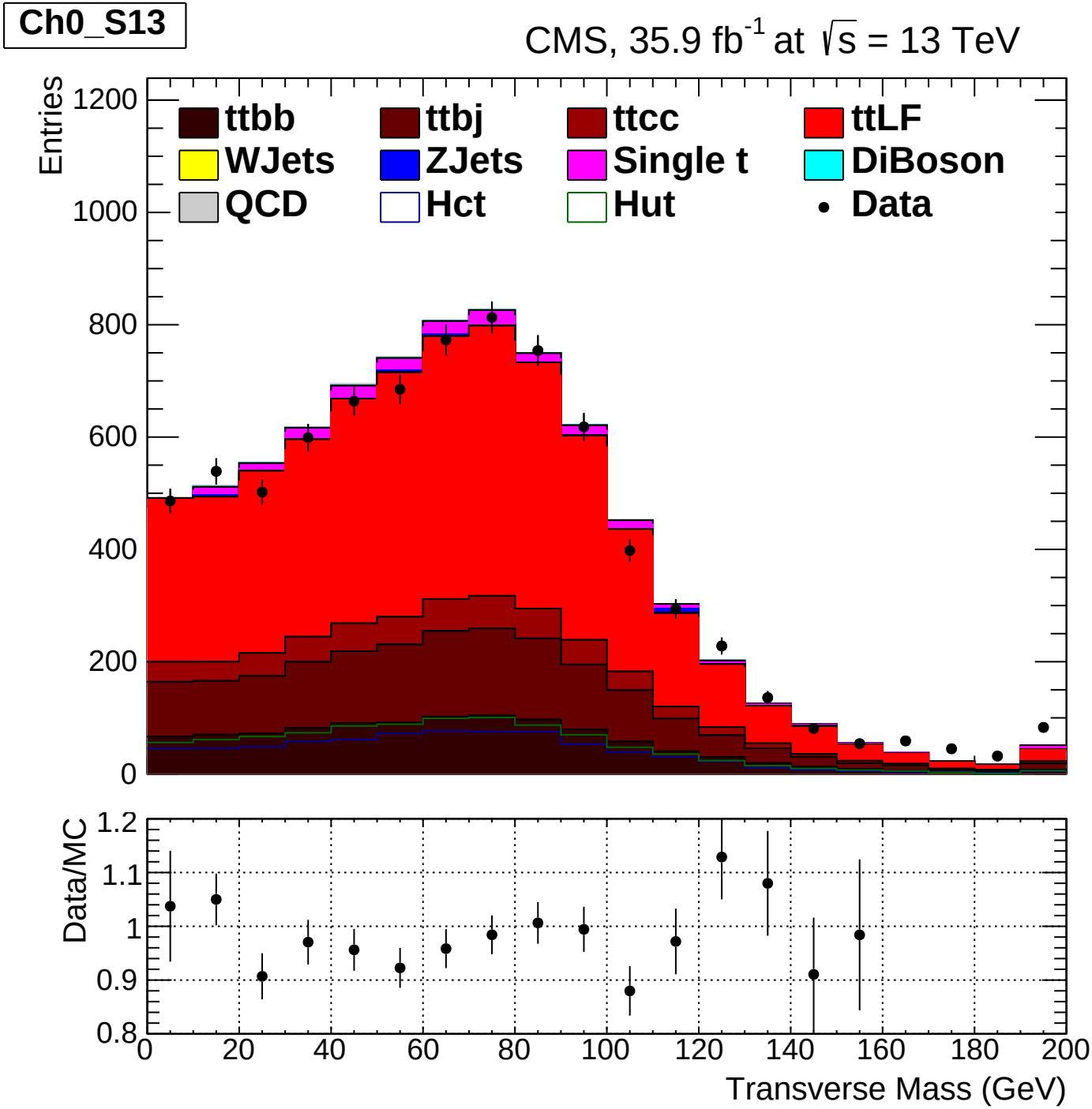

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

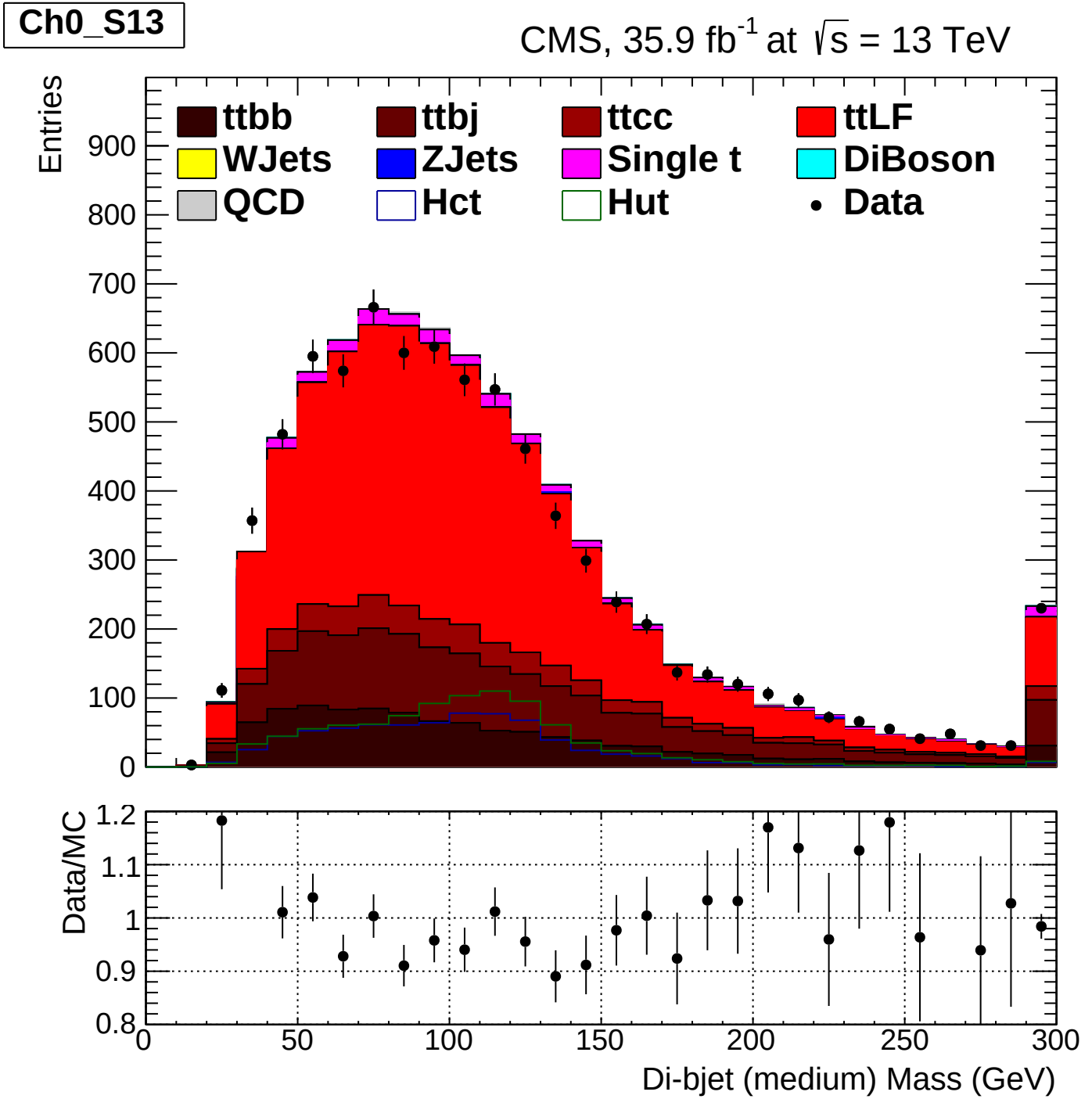

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

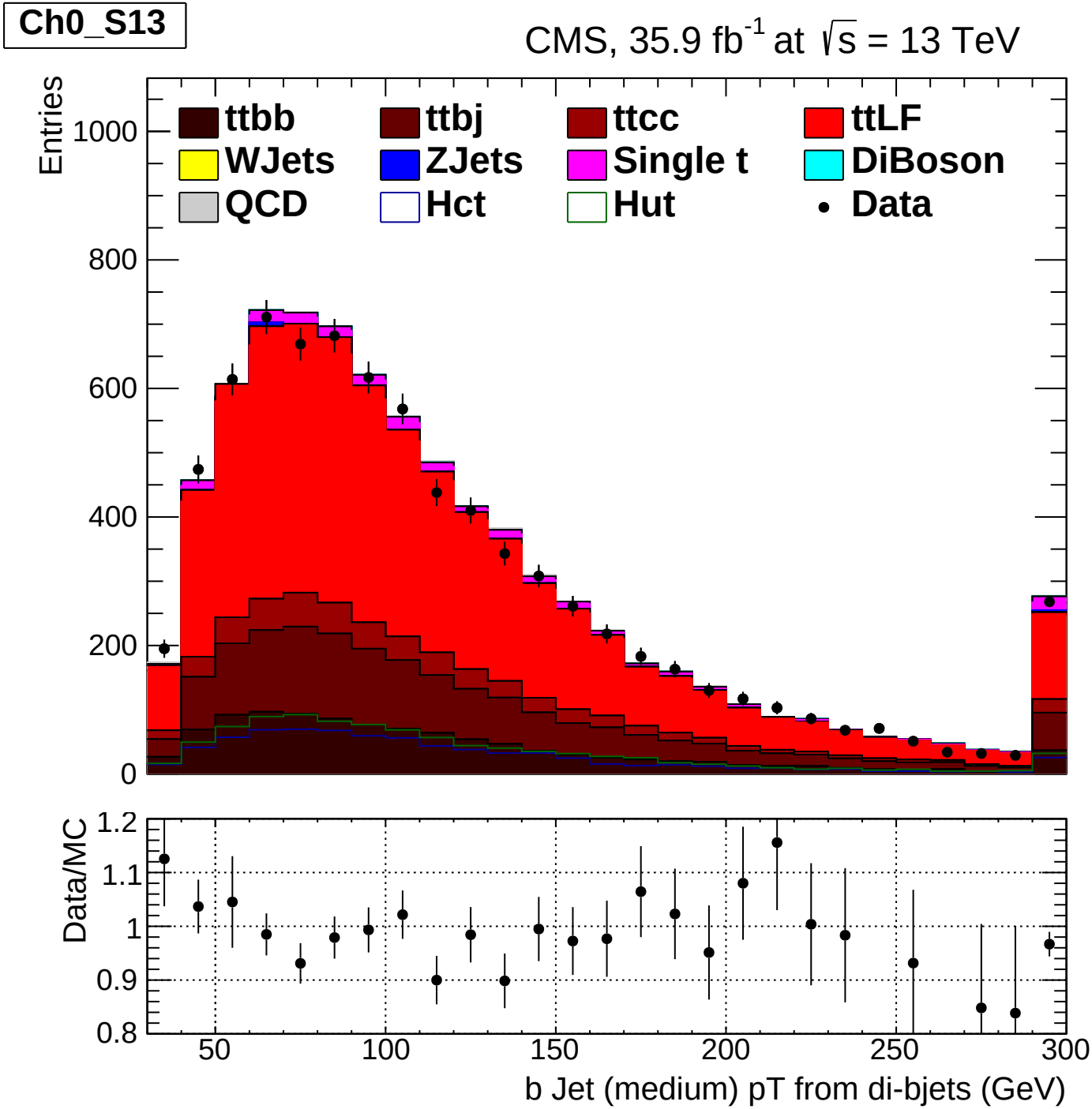

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

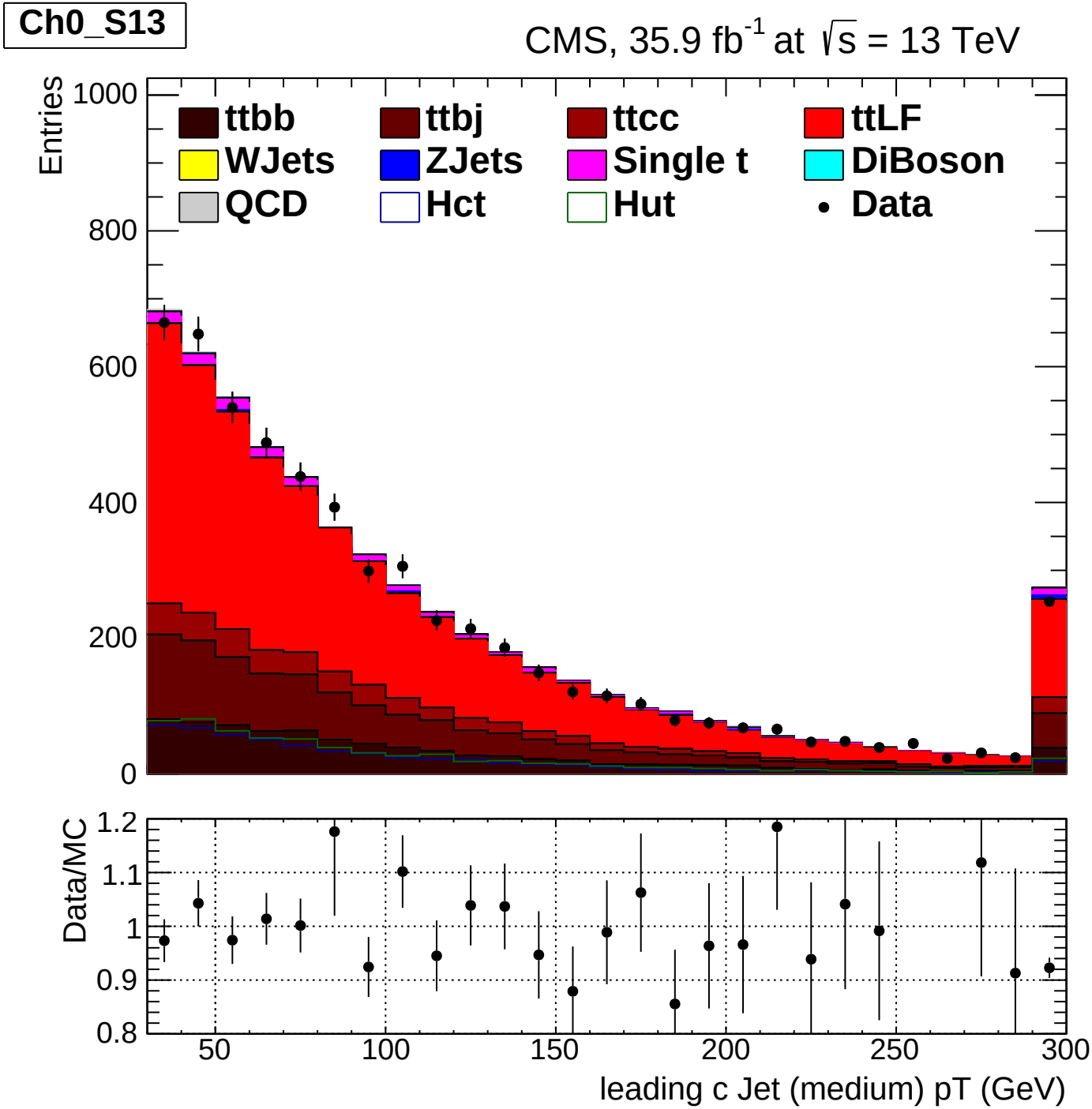

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

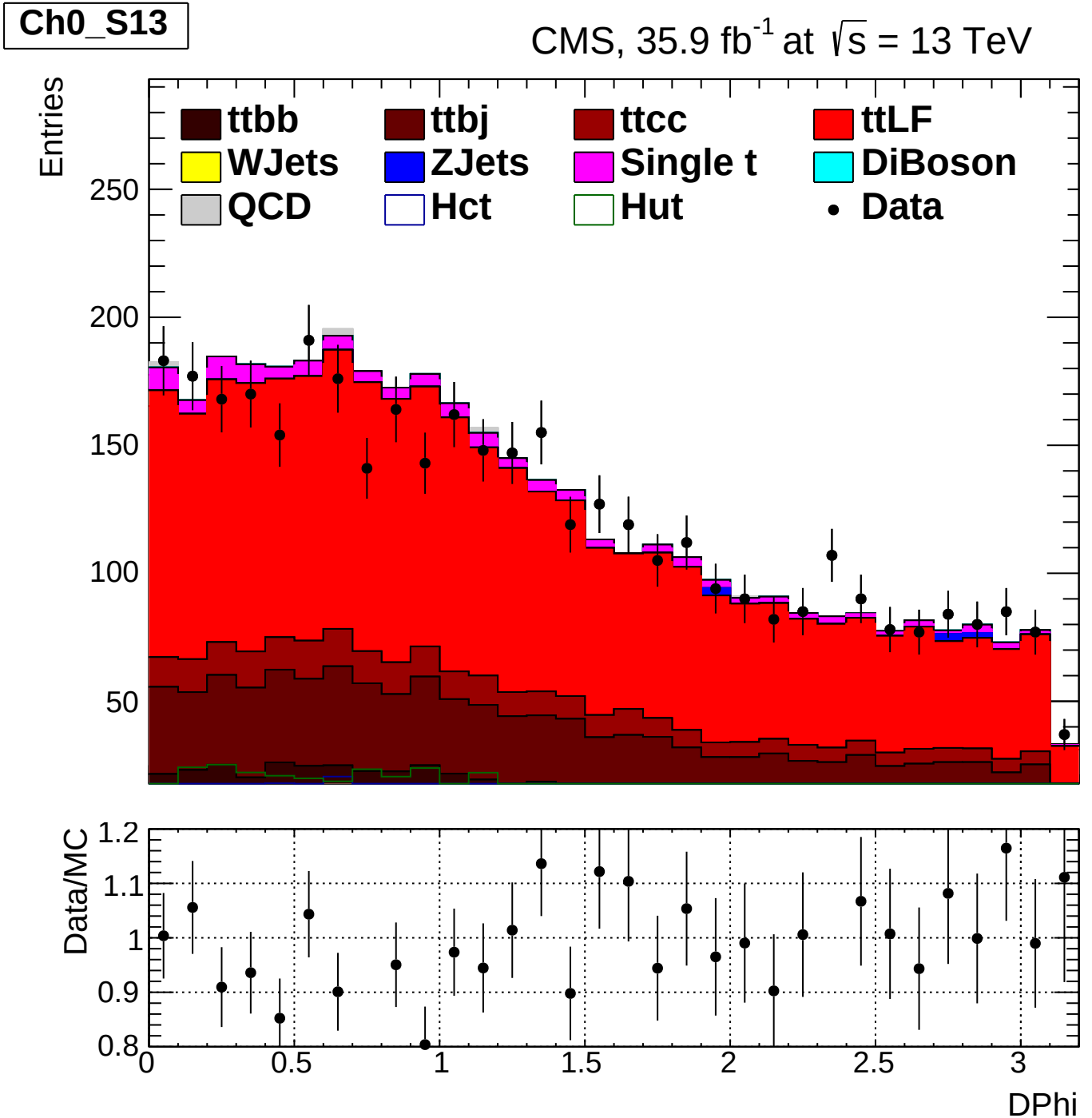

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

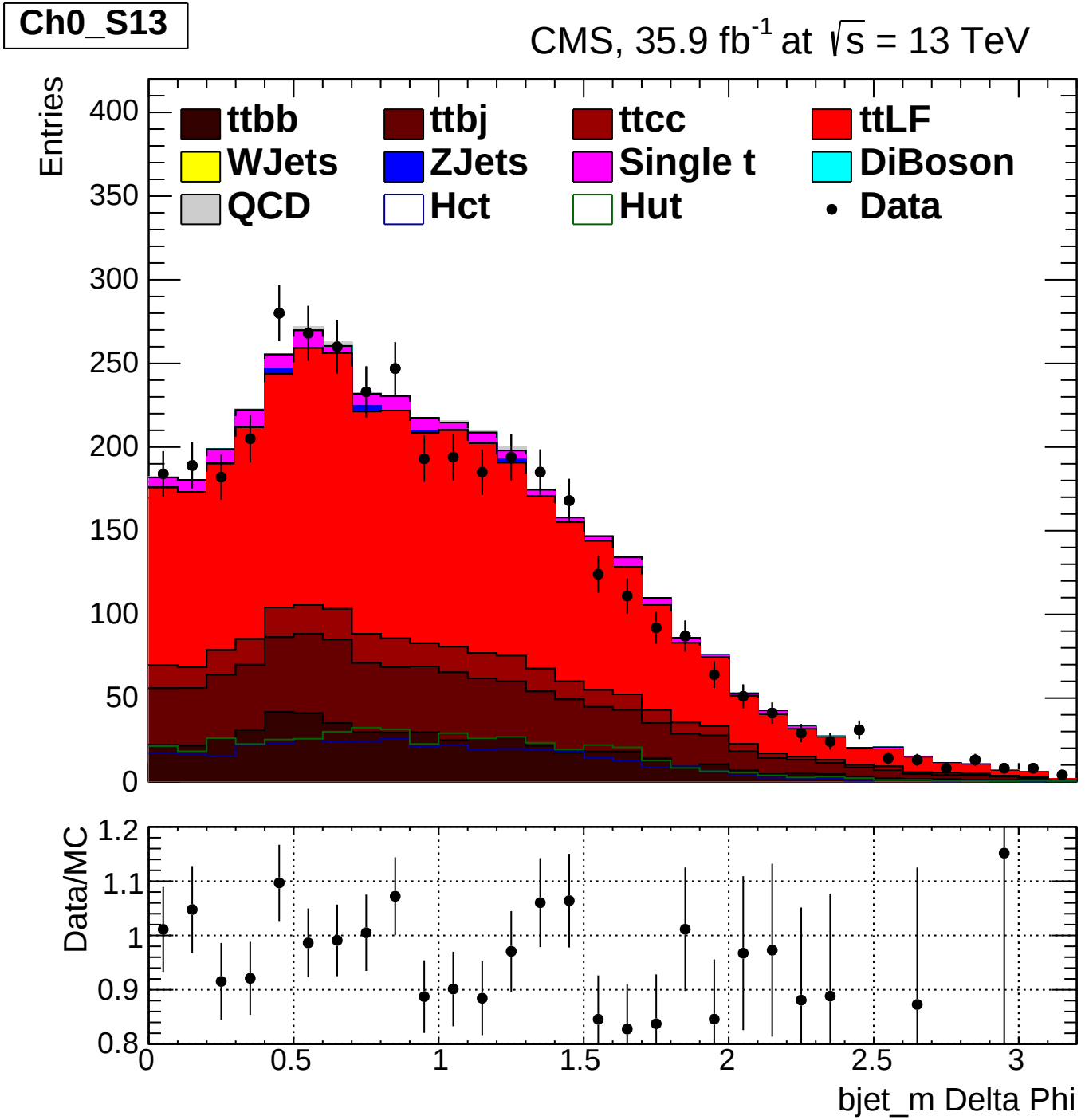

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

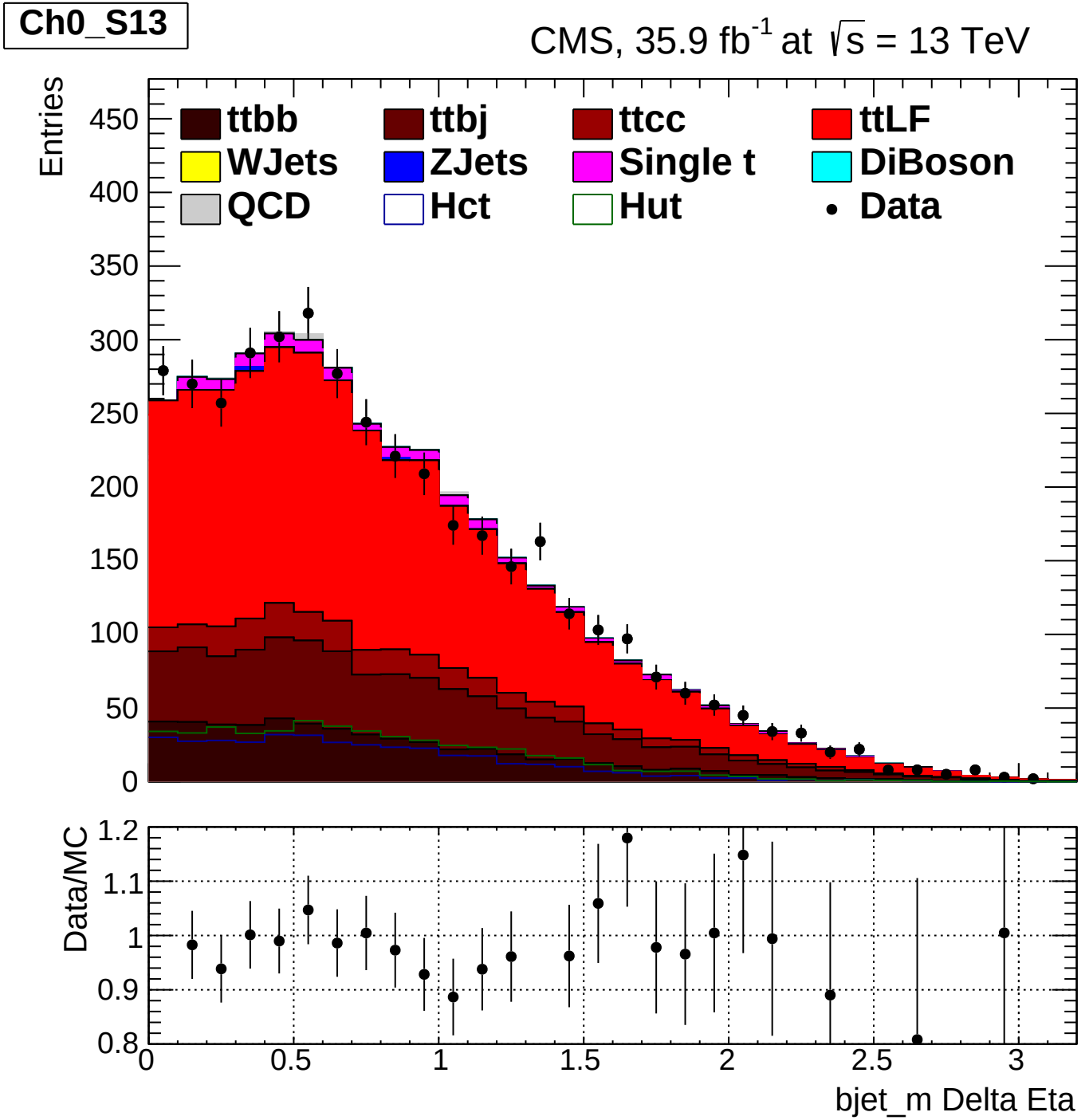

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

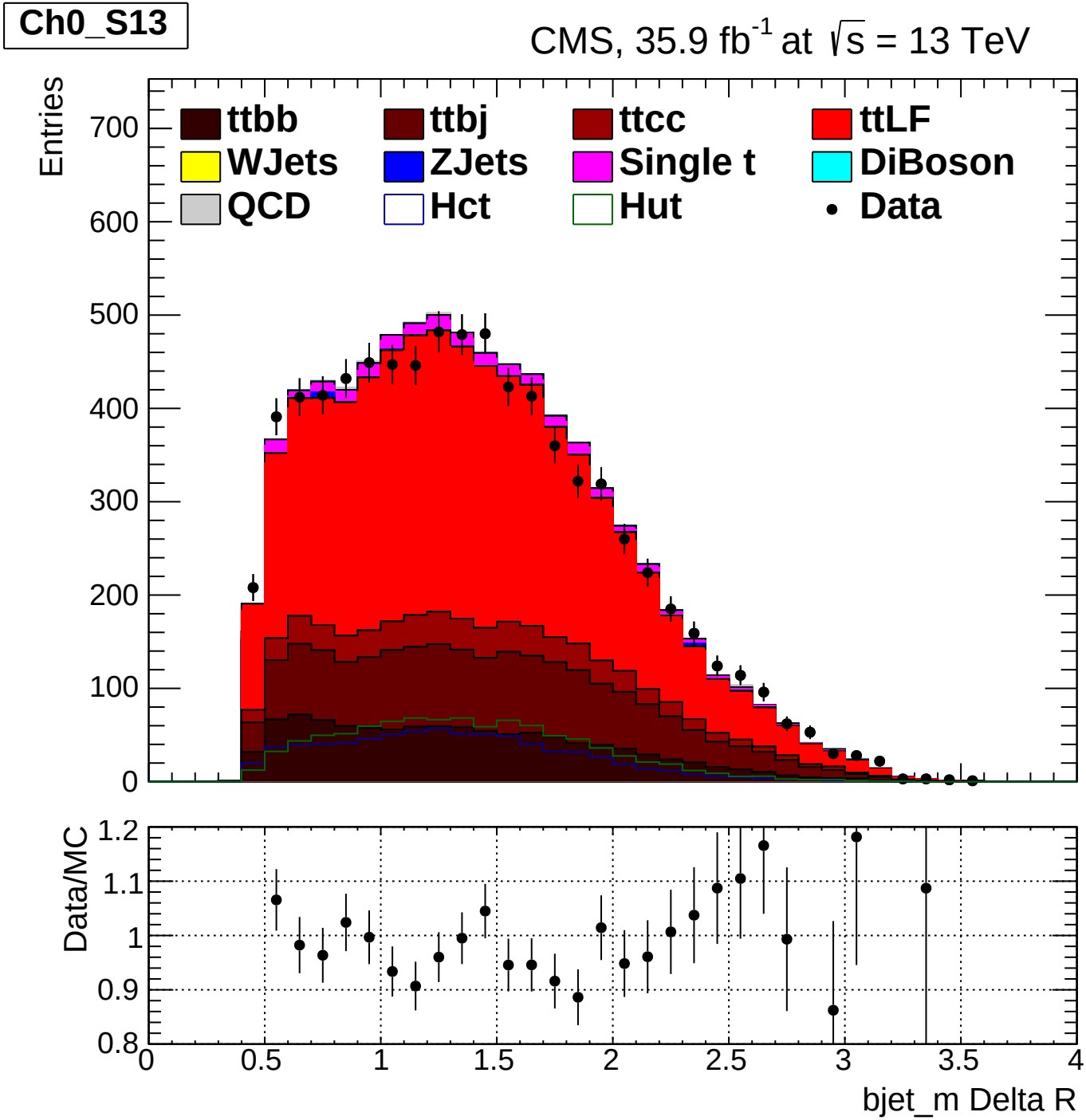

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
250
200
150
100
50
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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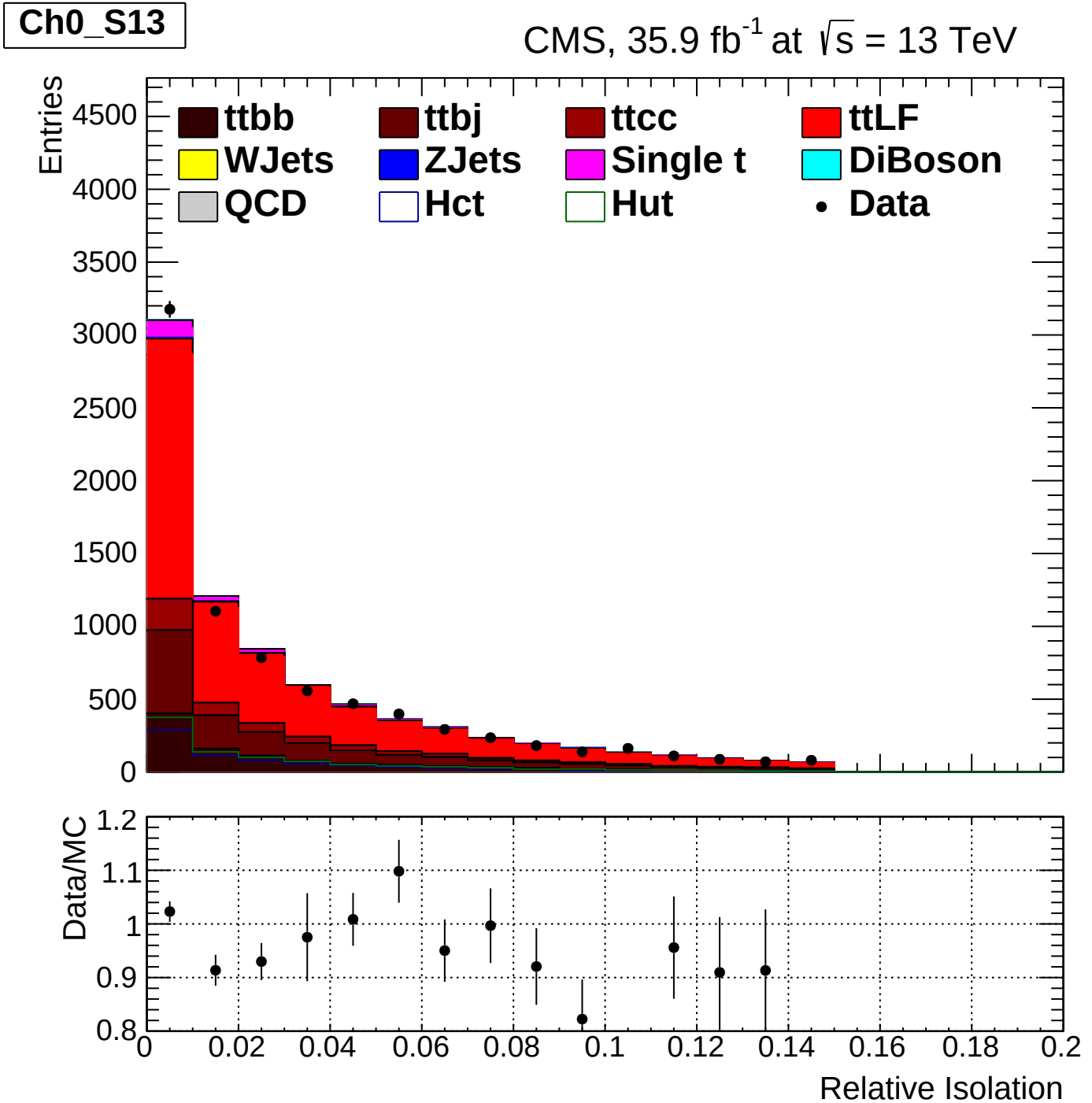
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R


Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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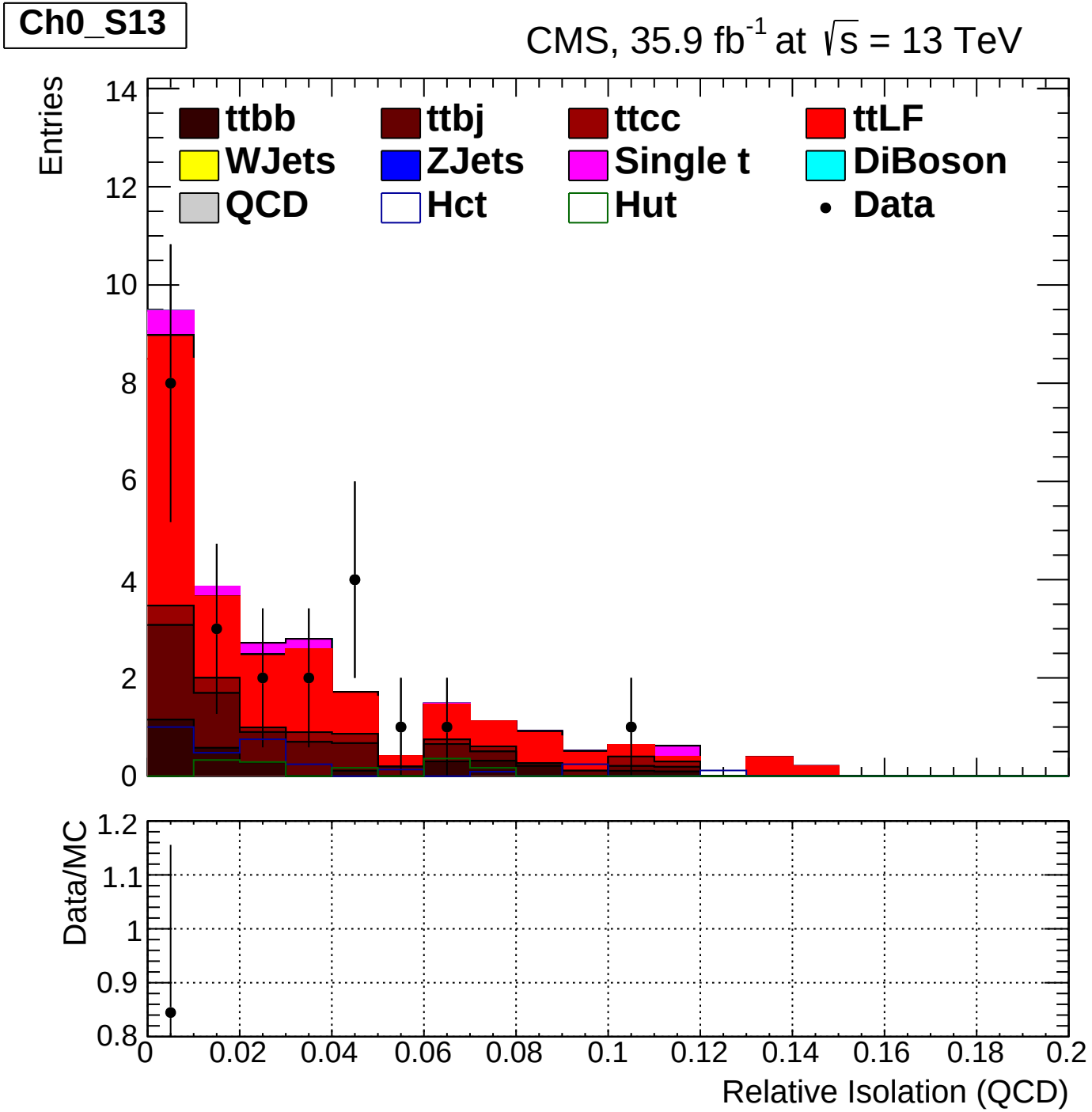
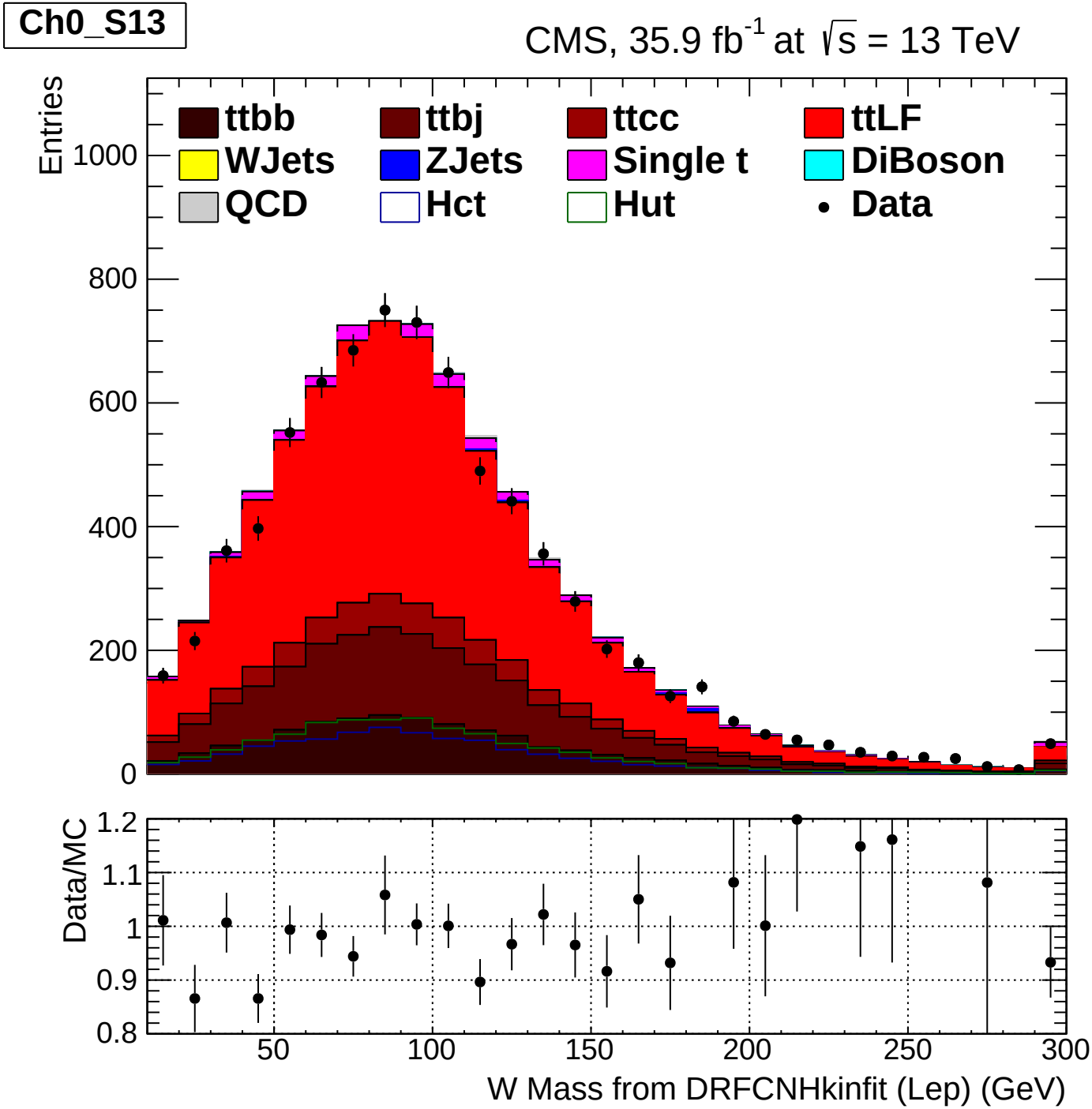
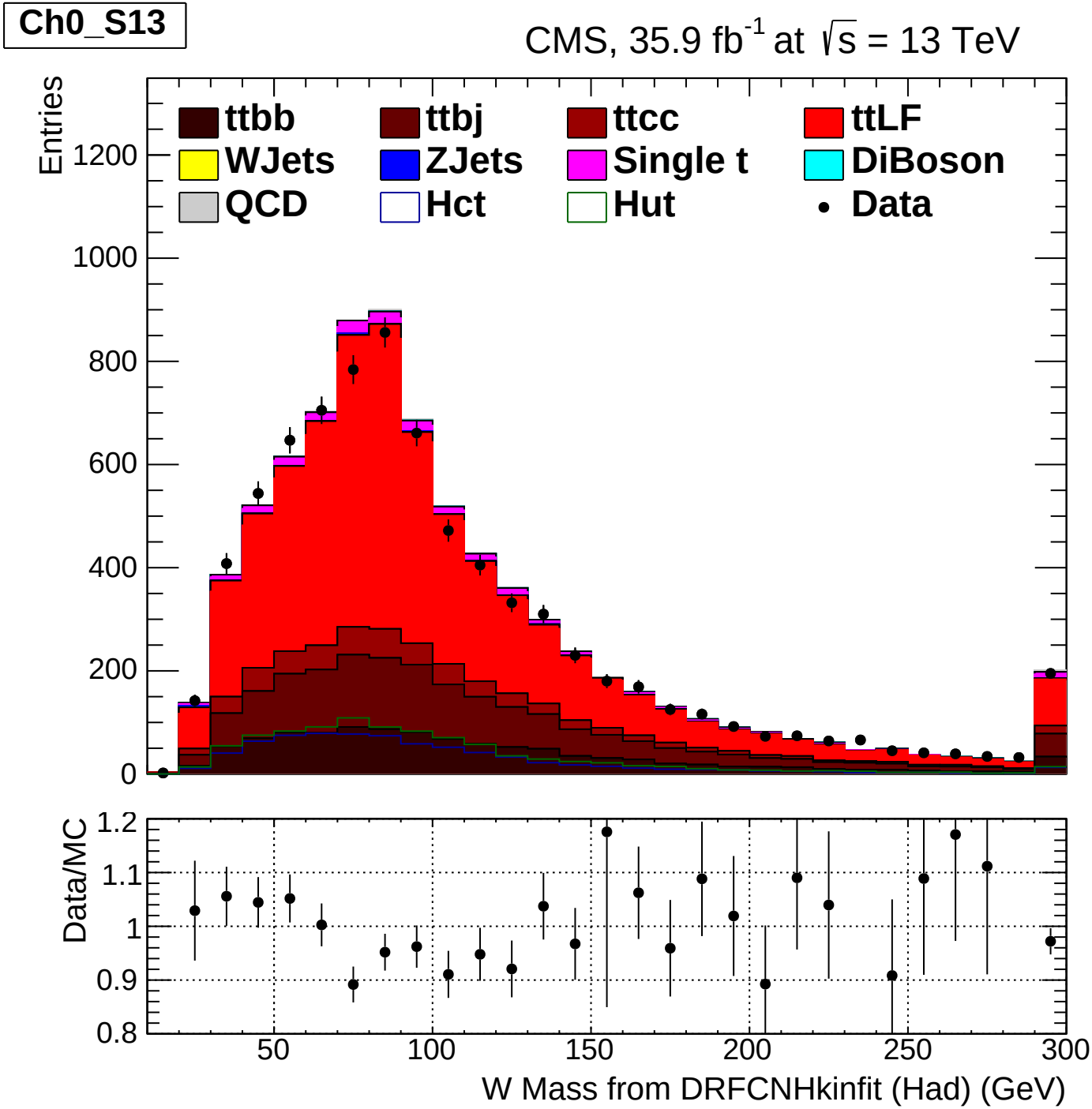
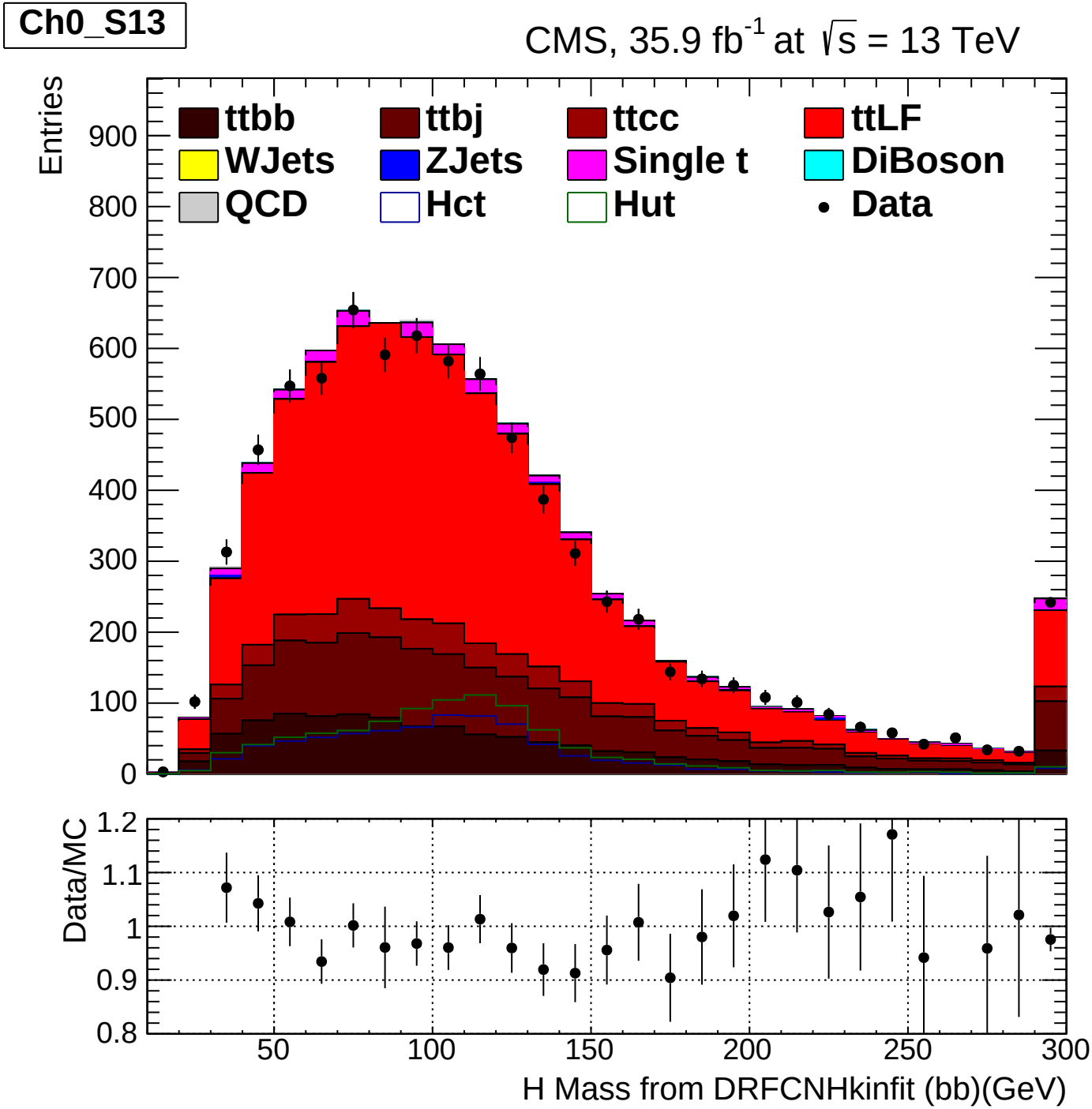
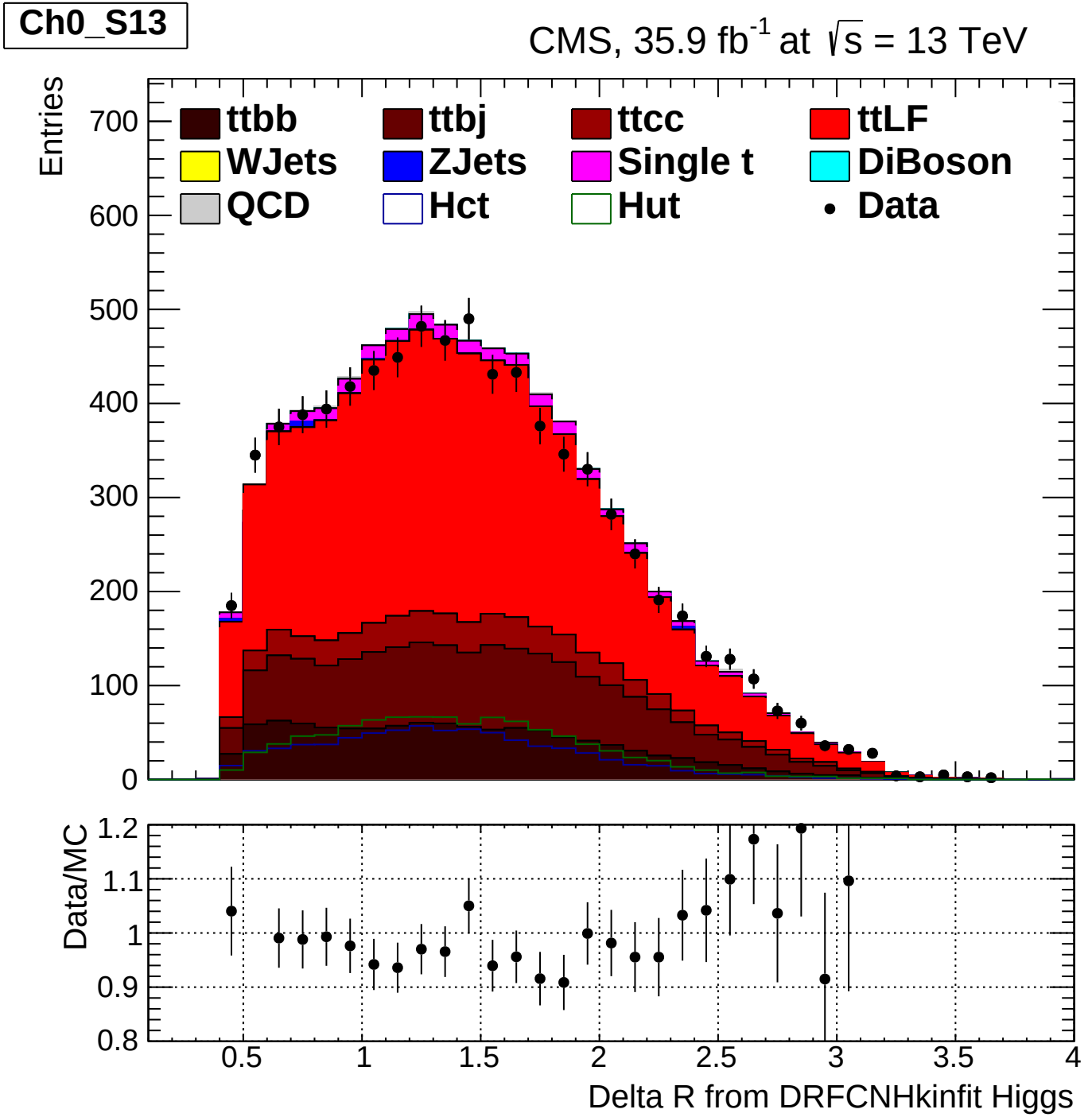
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

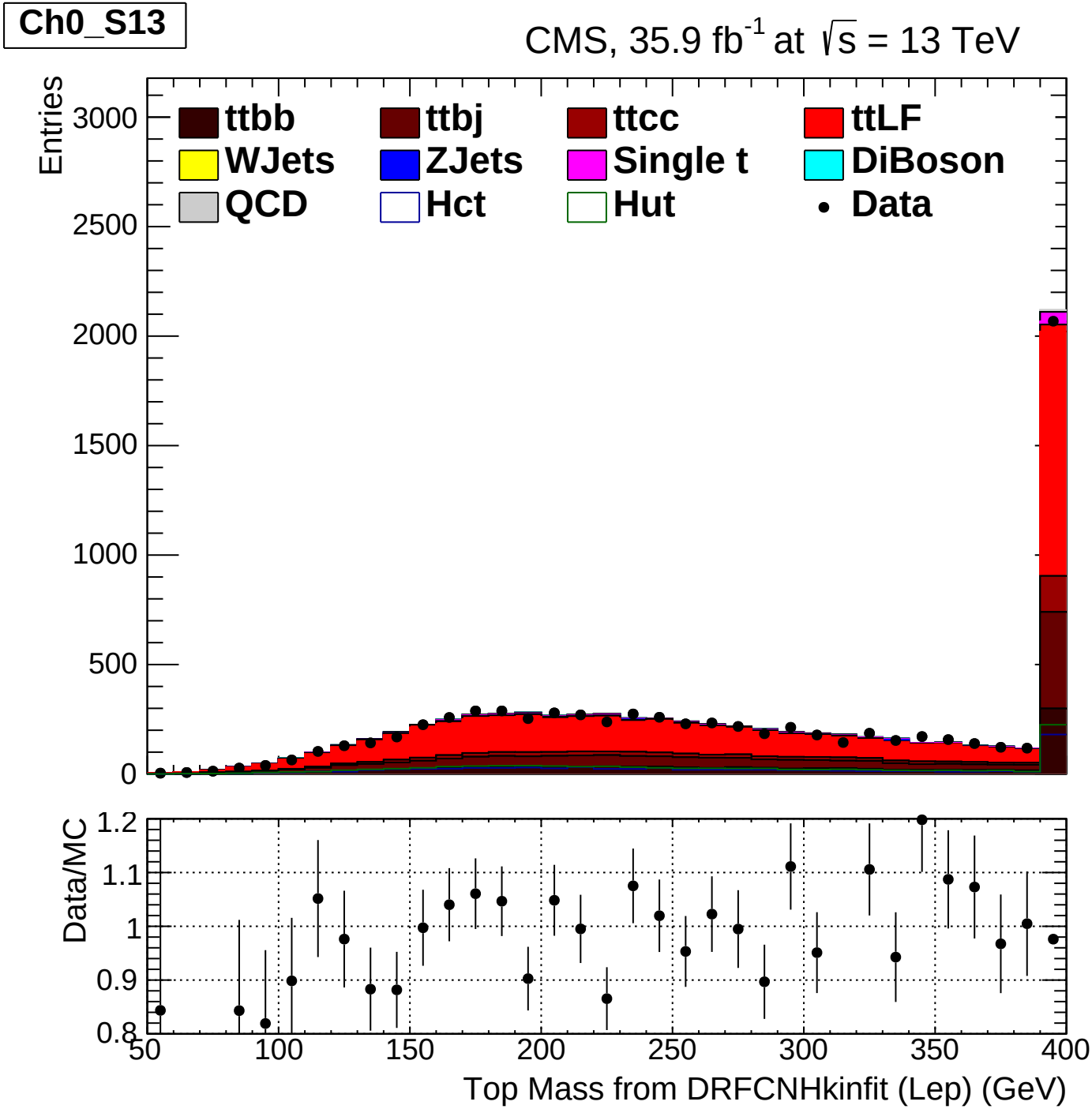

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

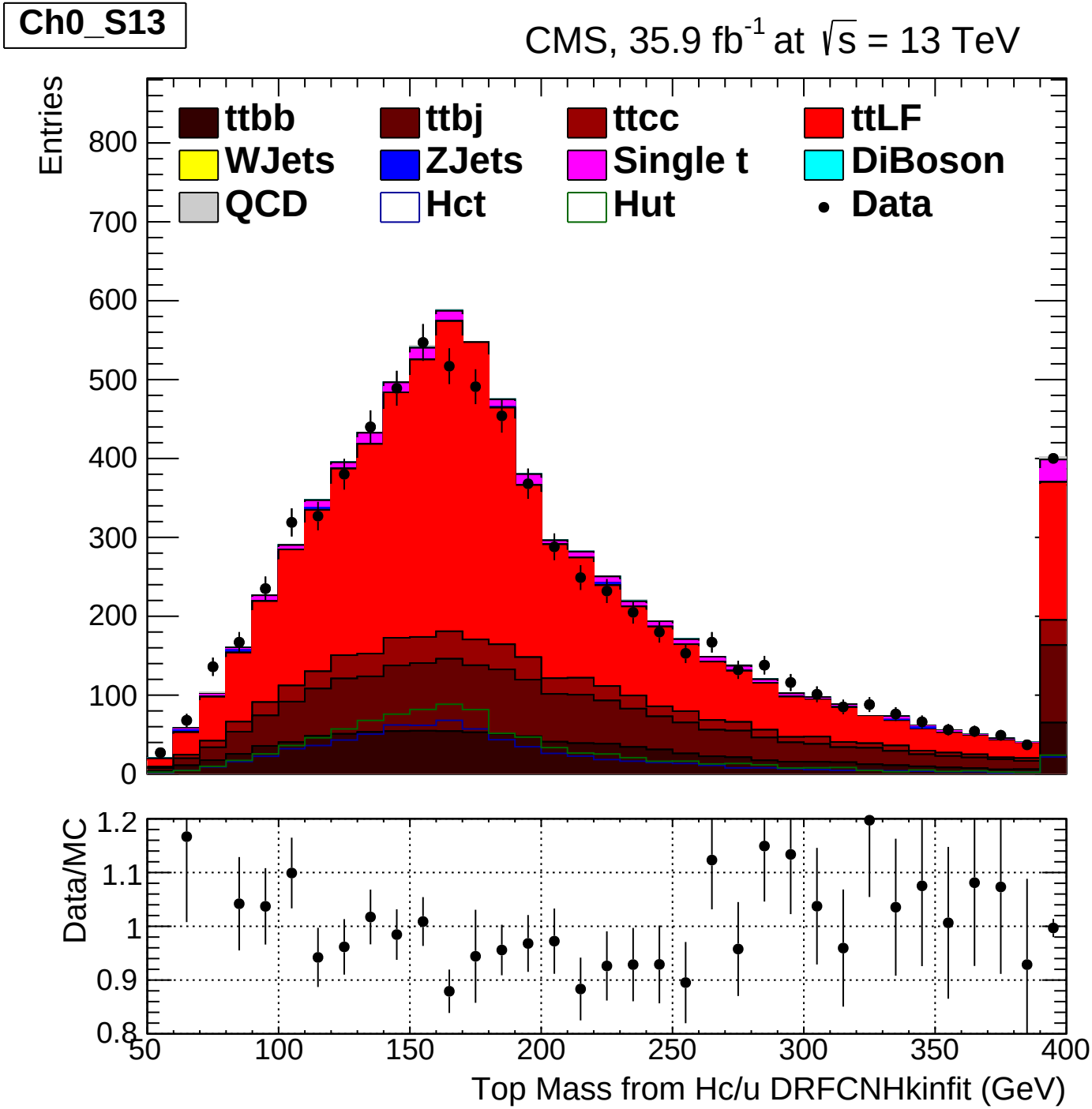

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)

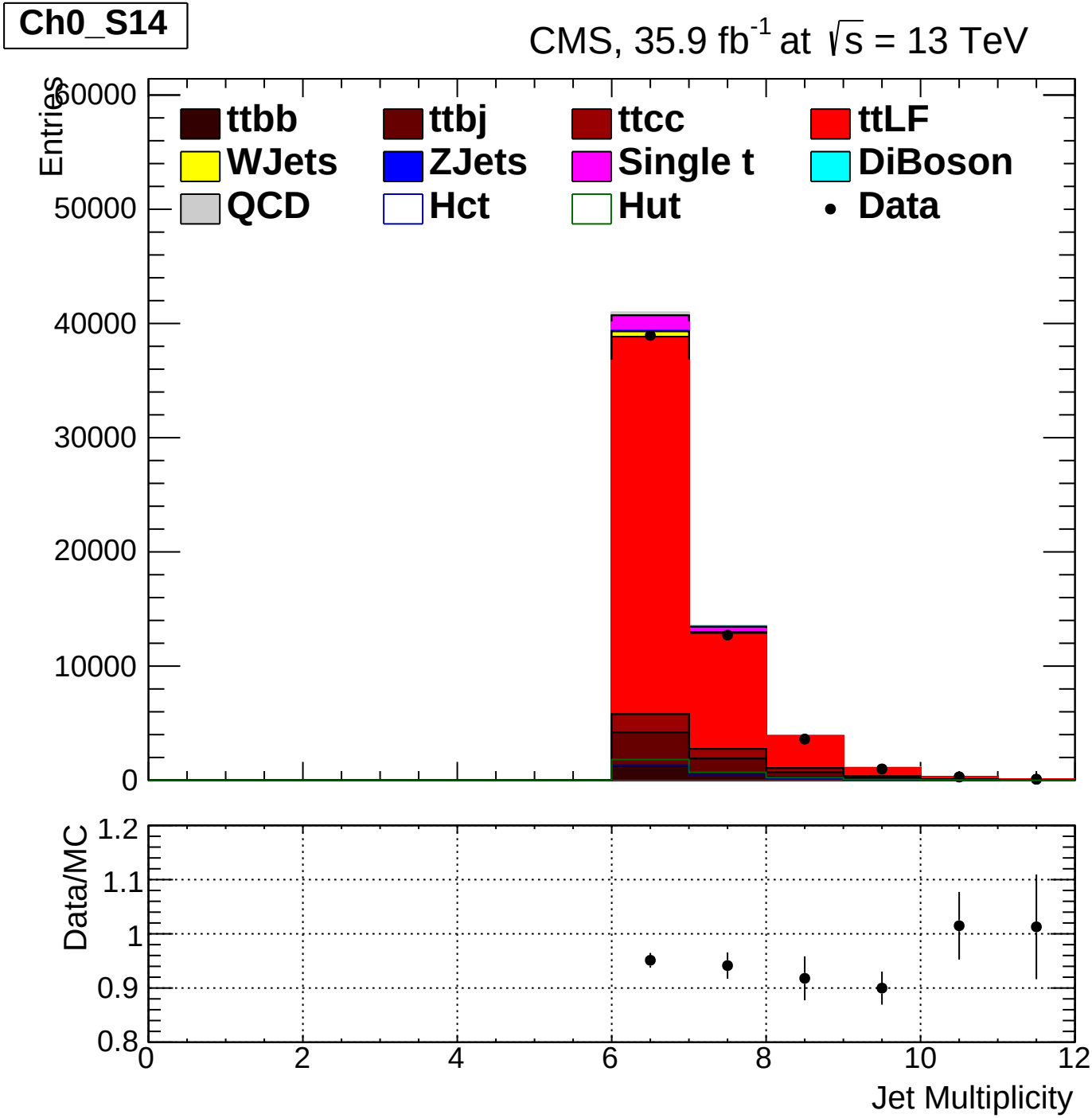

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
1200
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

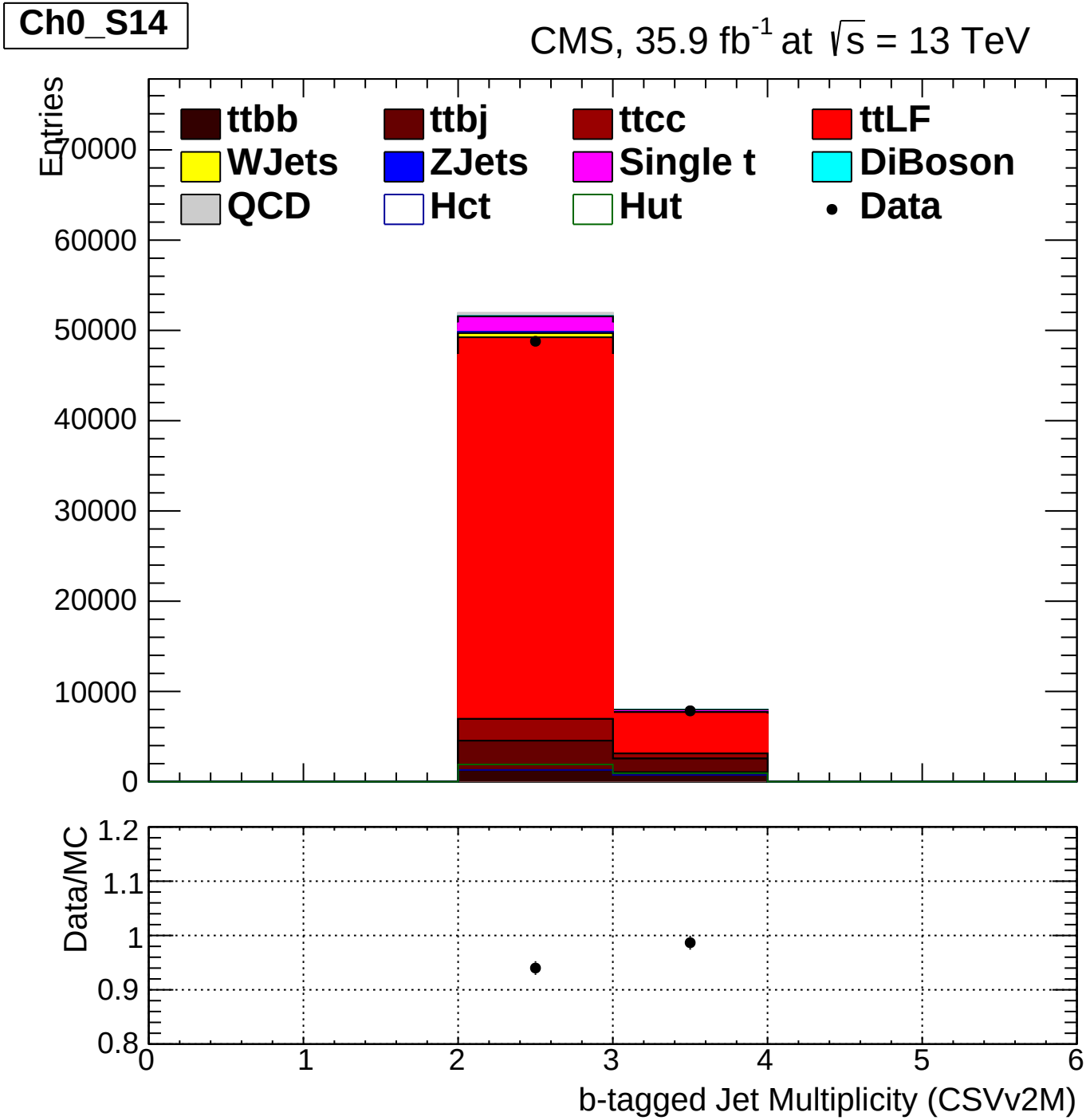

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

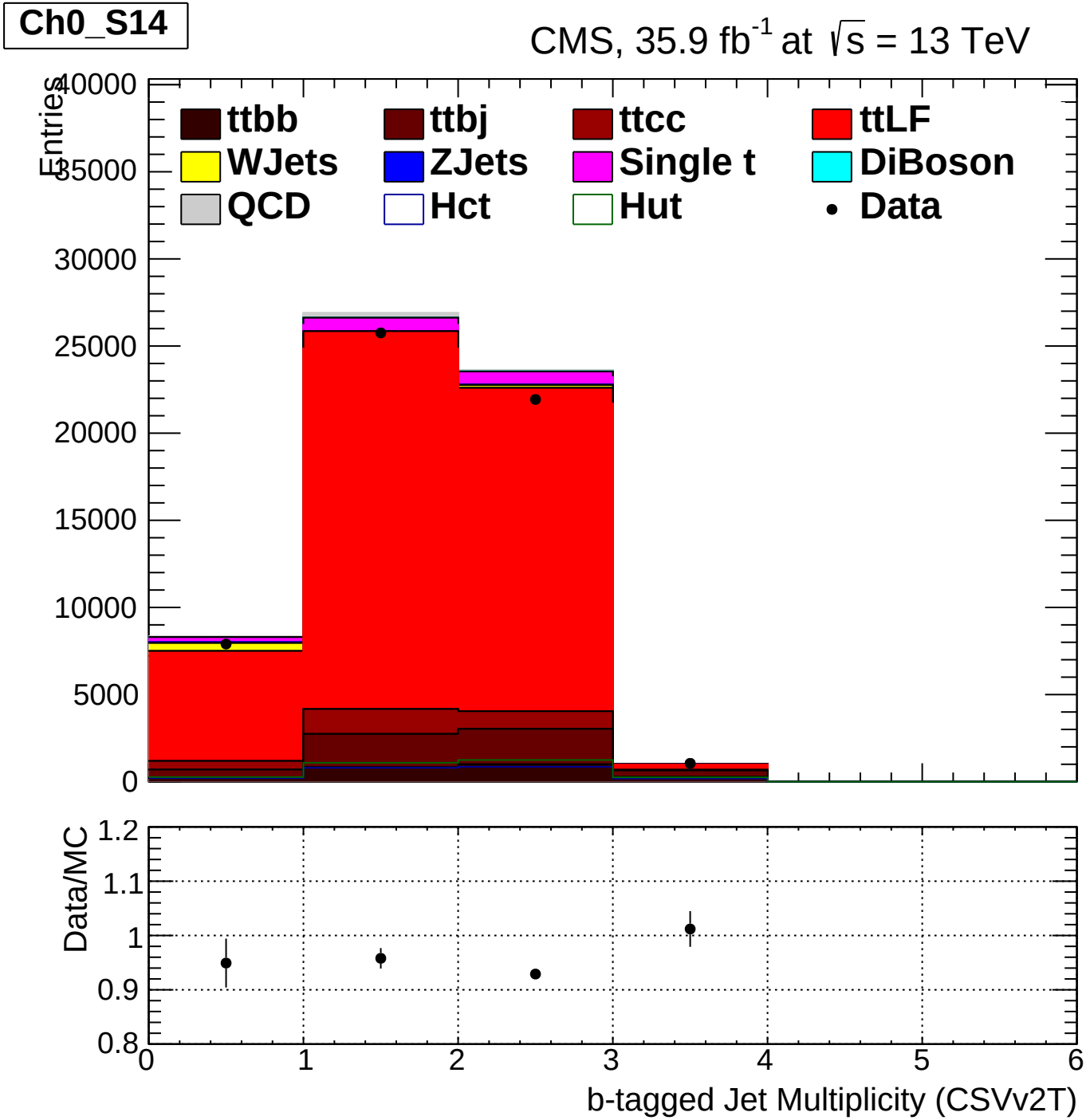

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

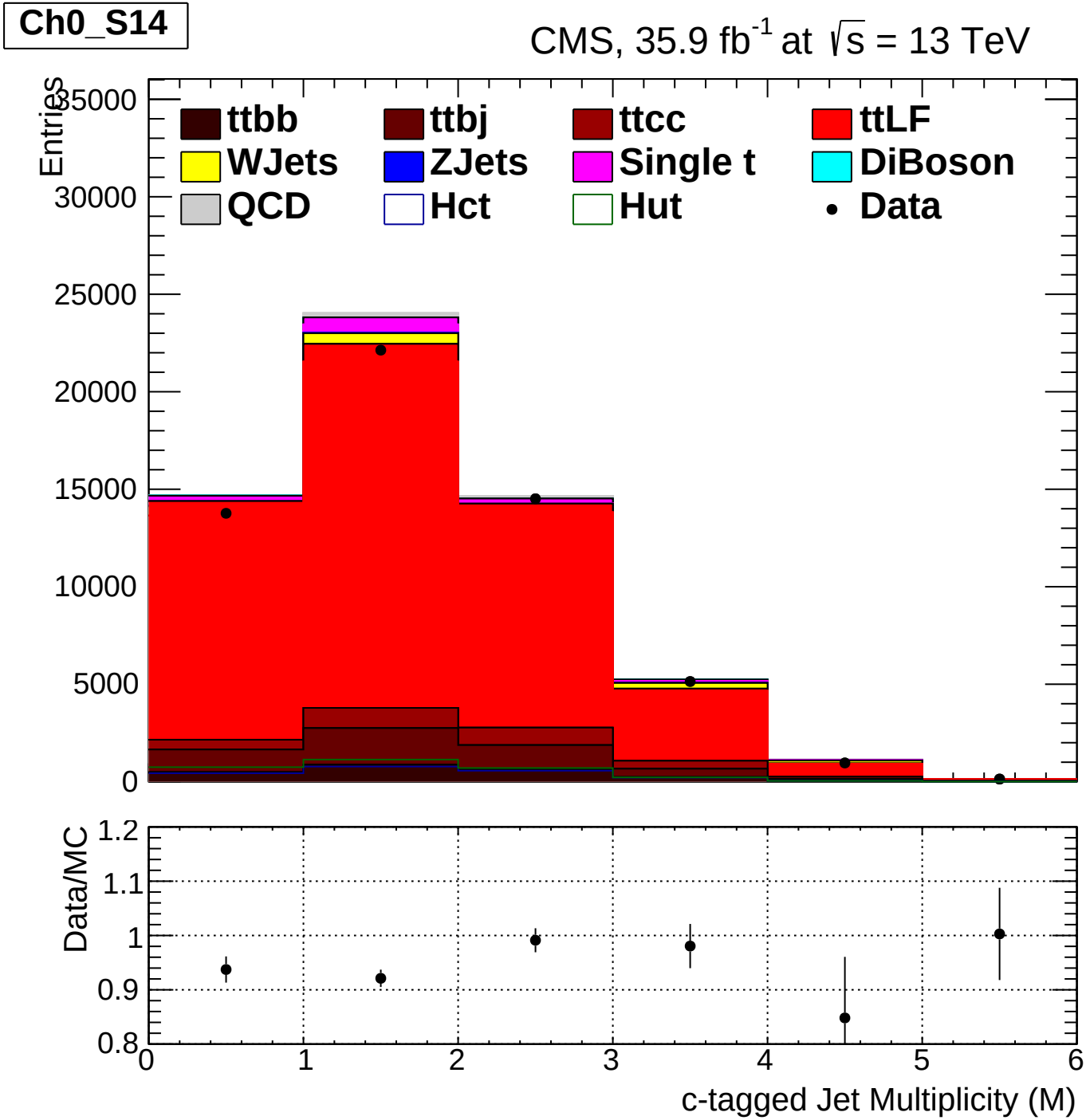

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

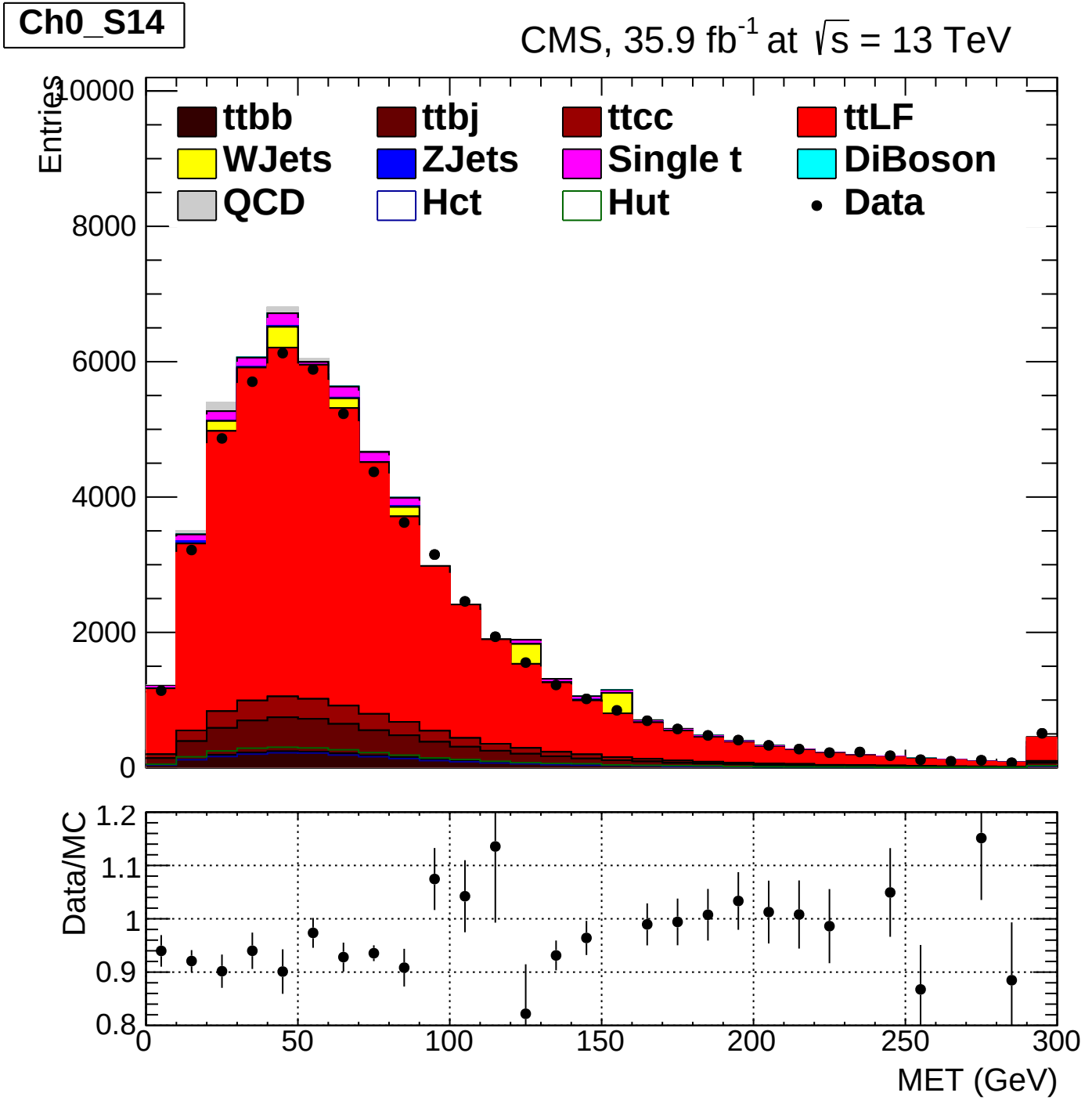

Ch0_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

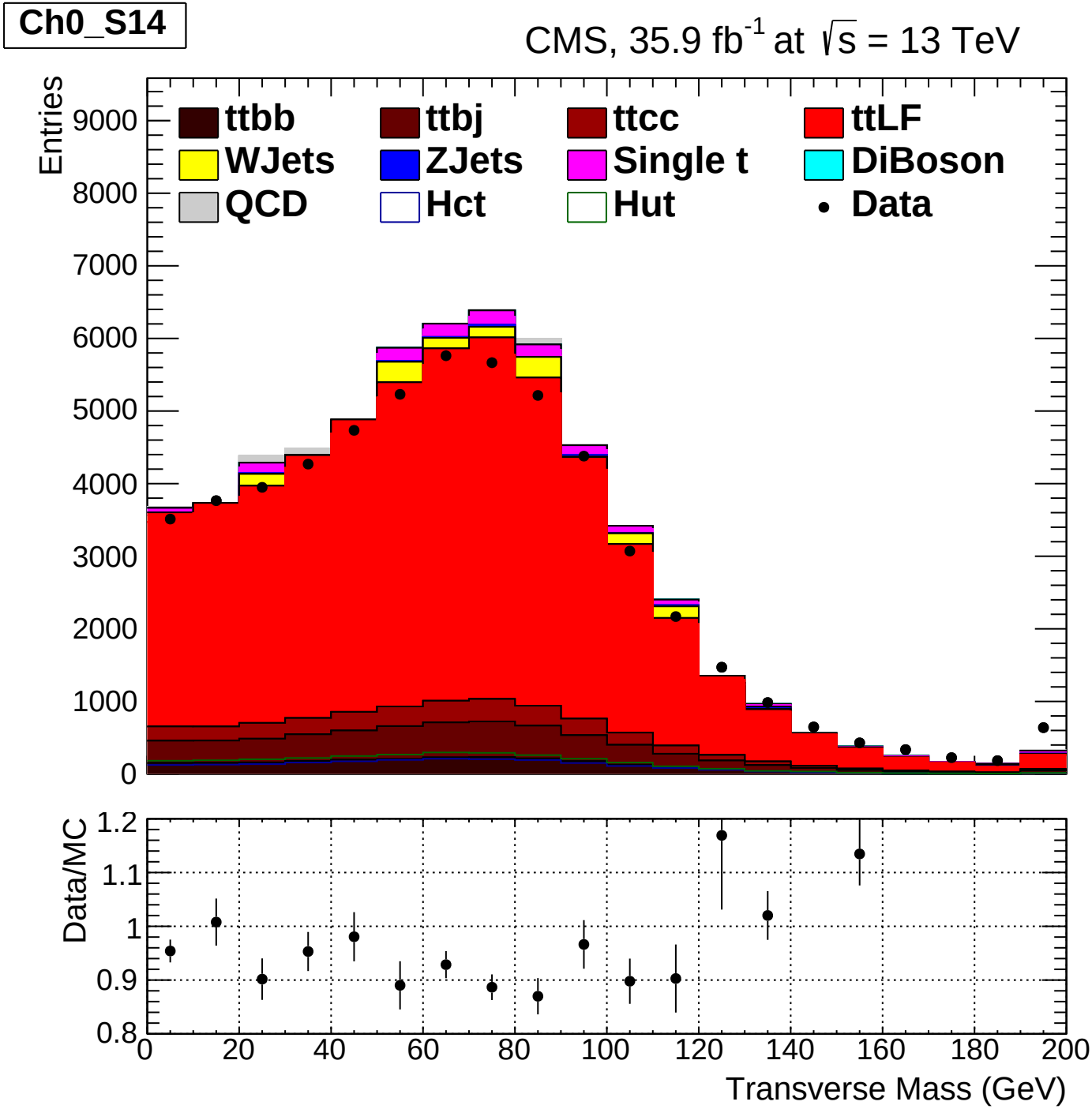

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

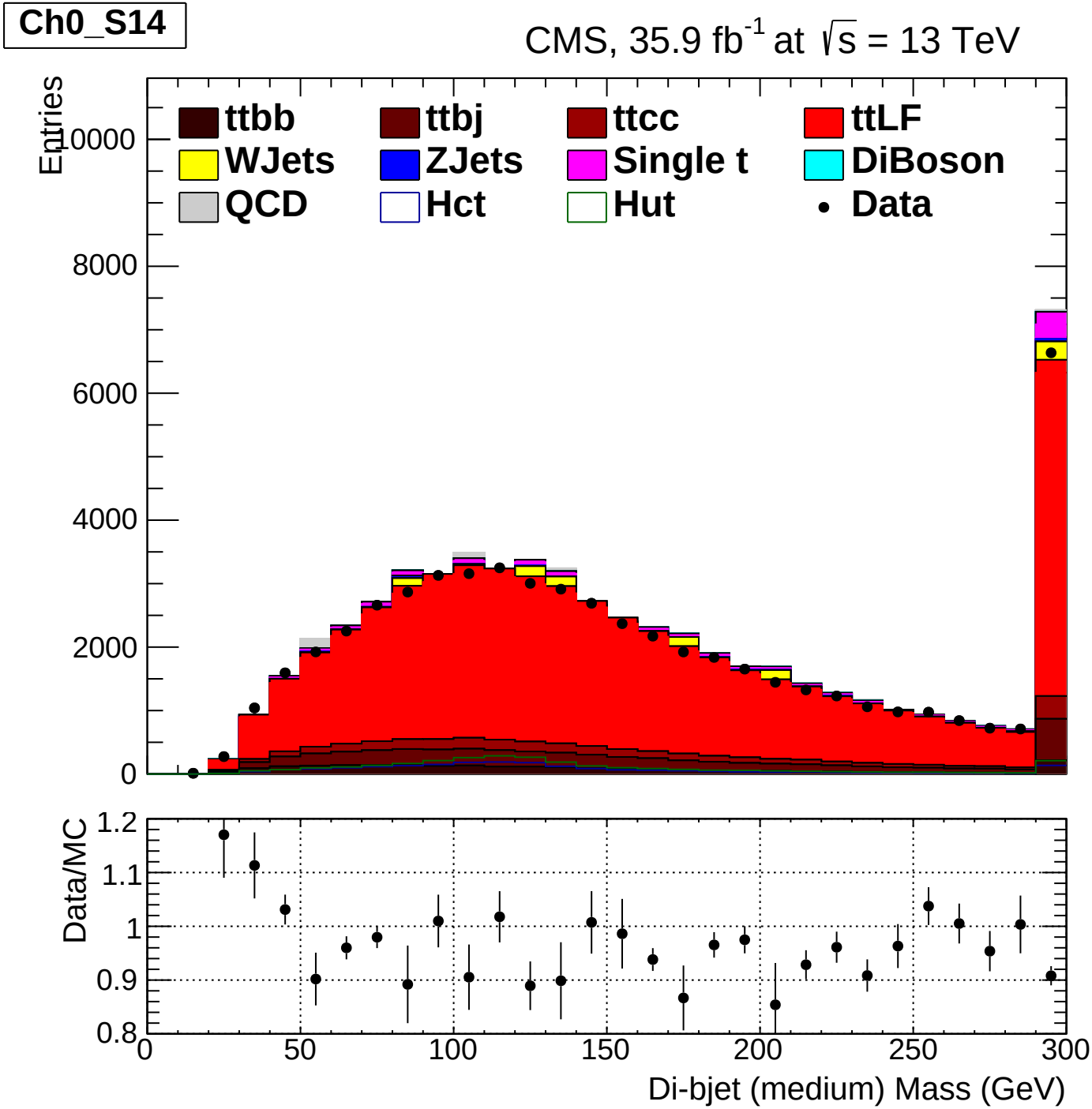

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

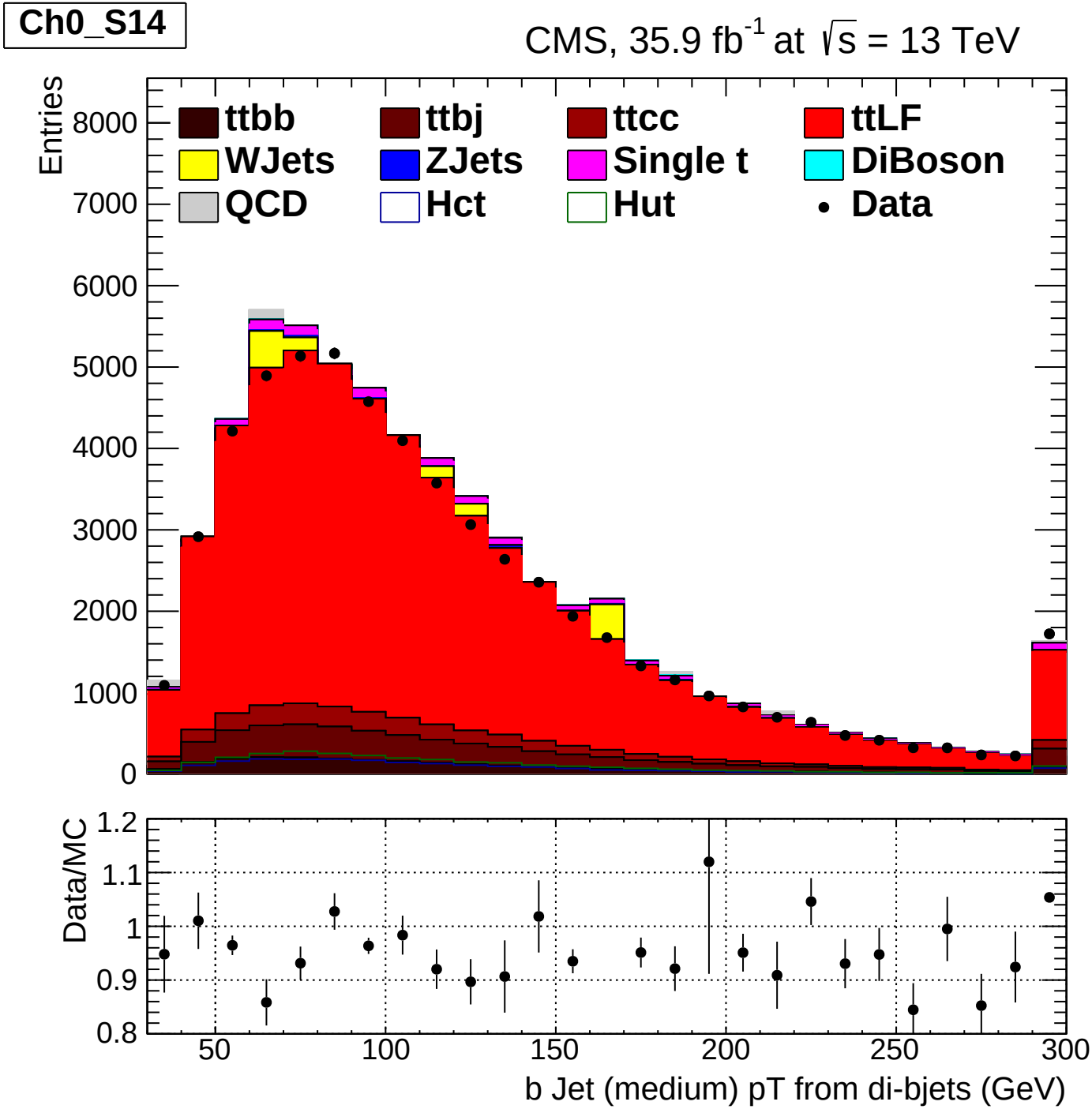

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

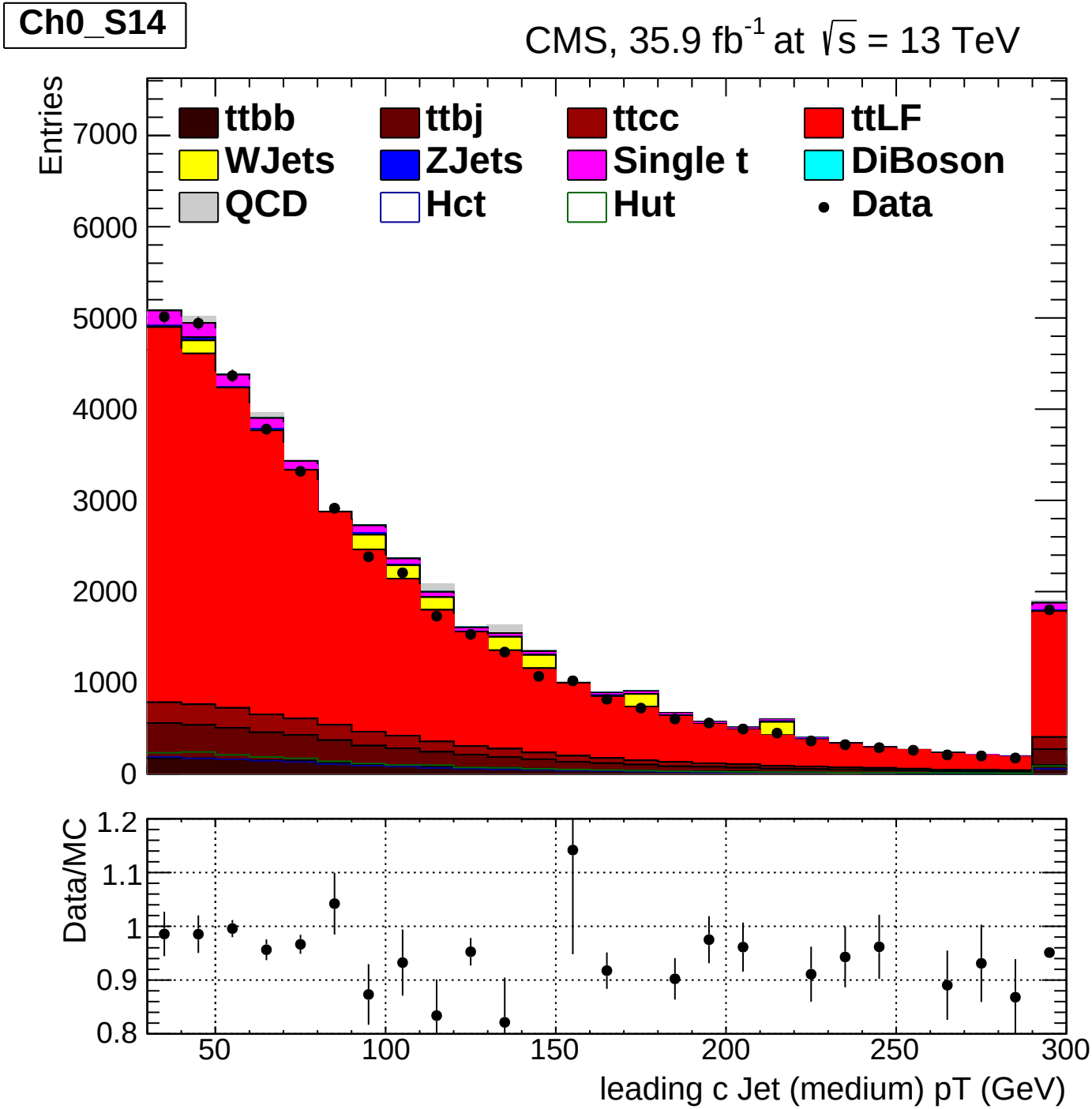

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

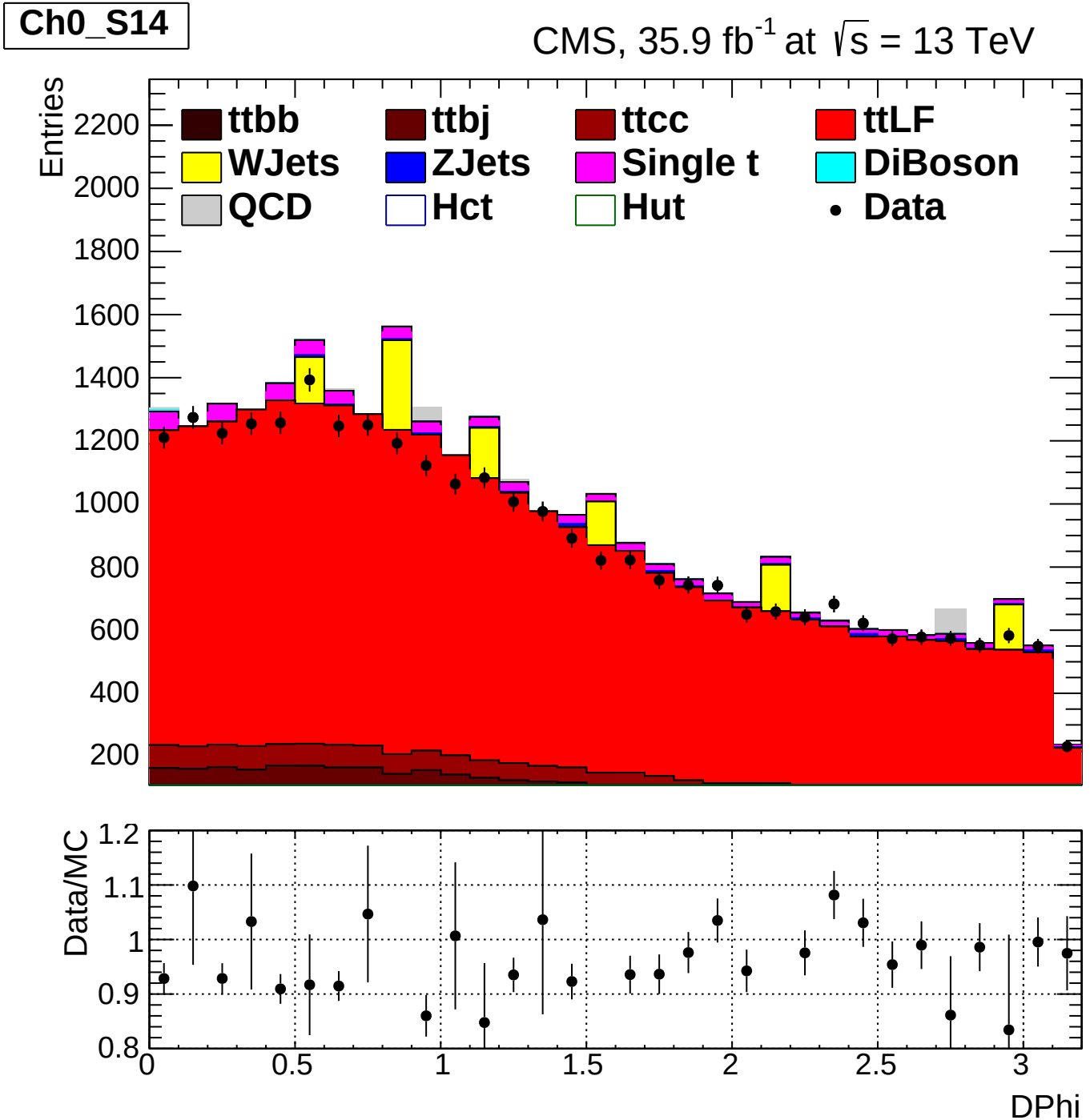

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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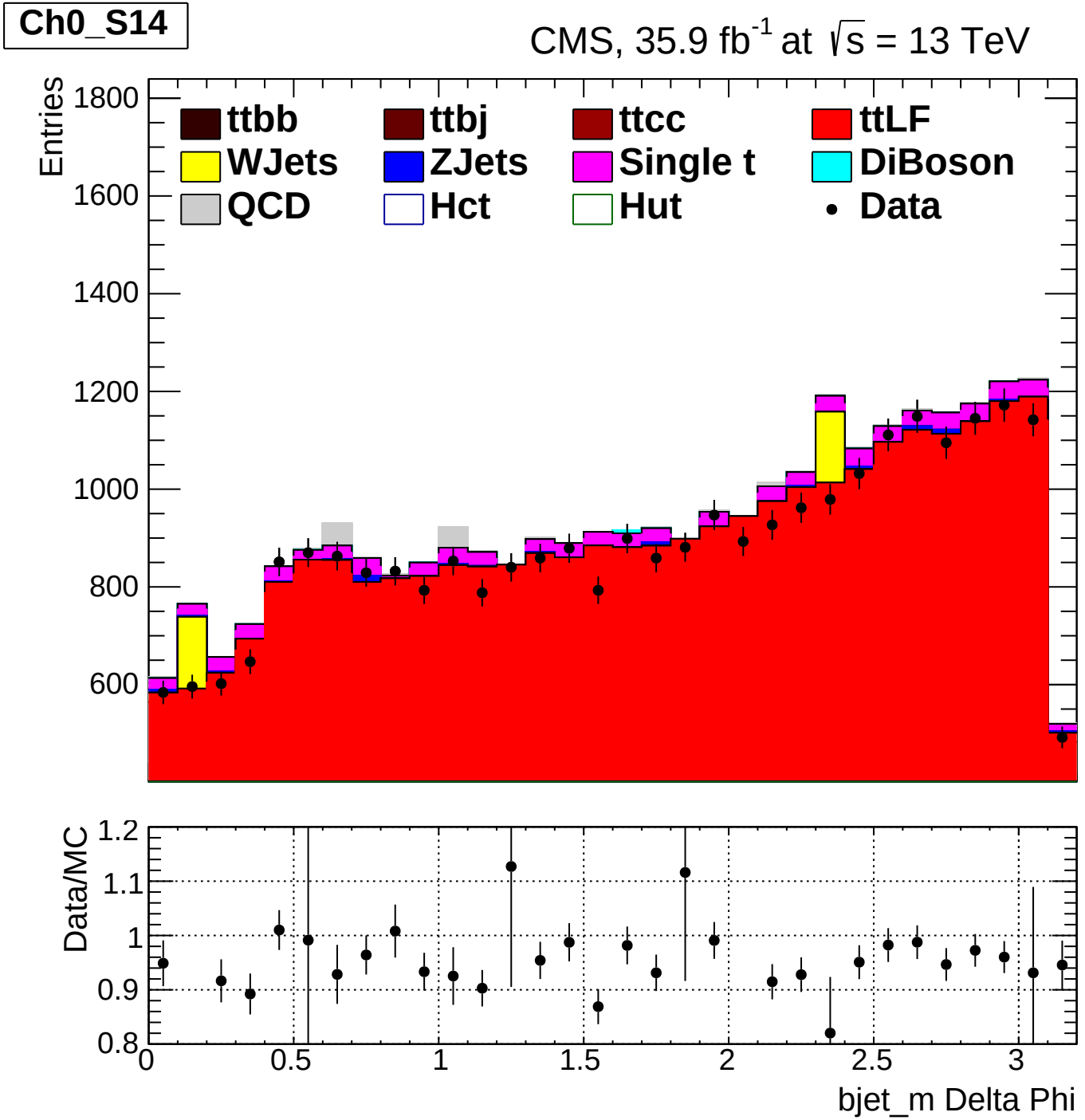
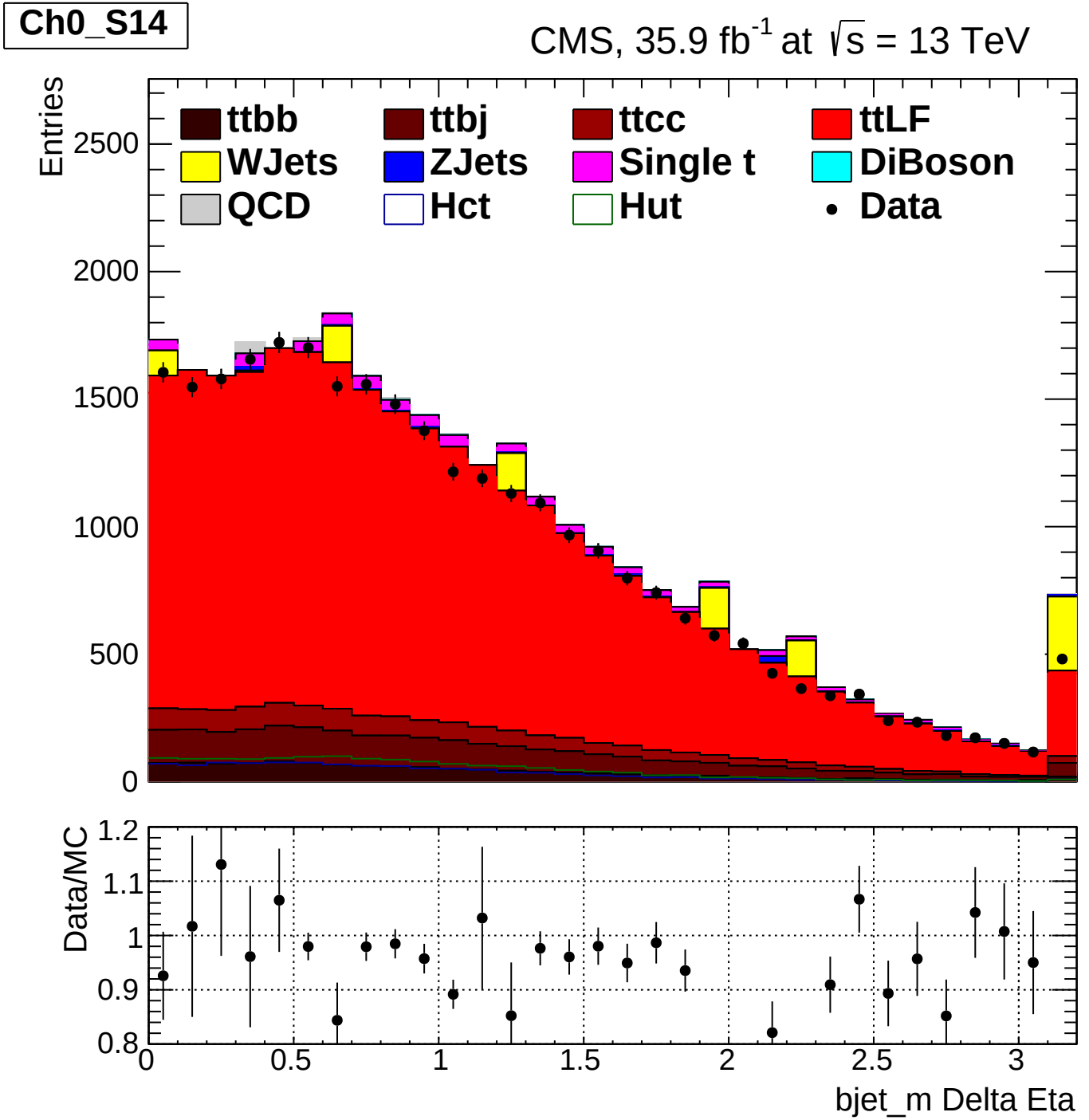
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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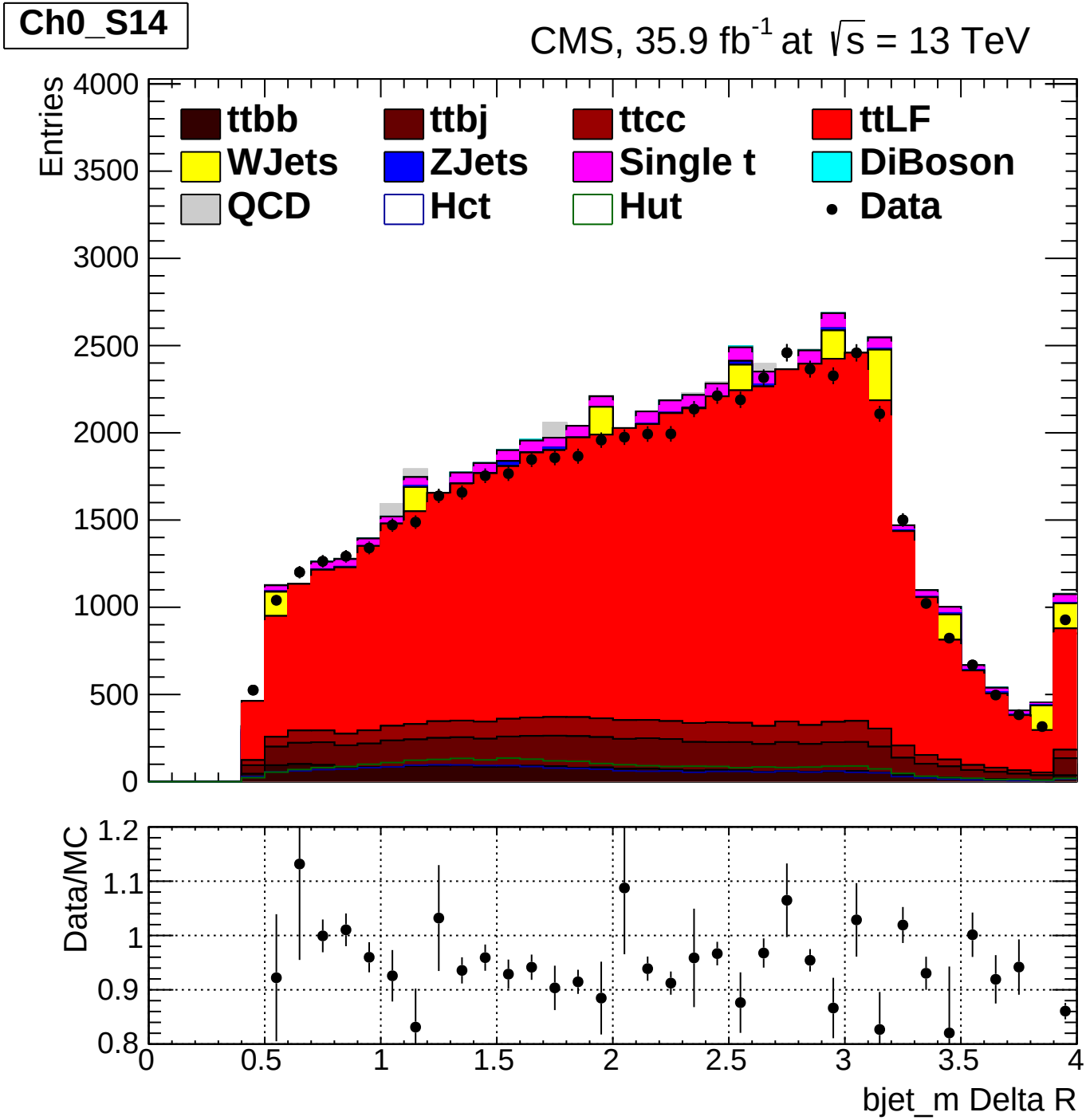
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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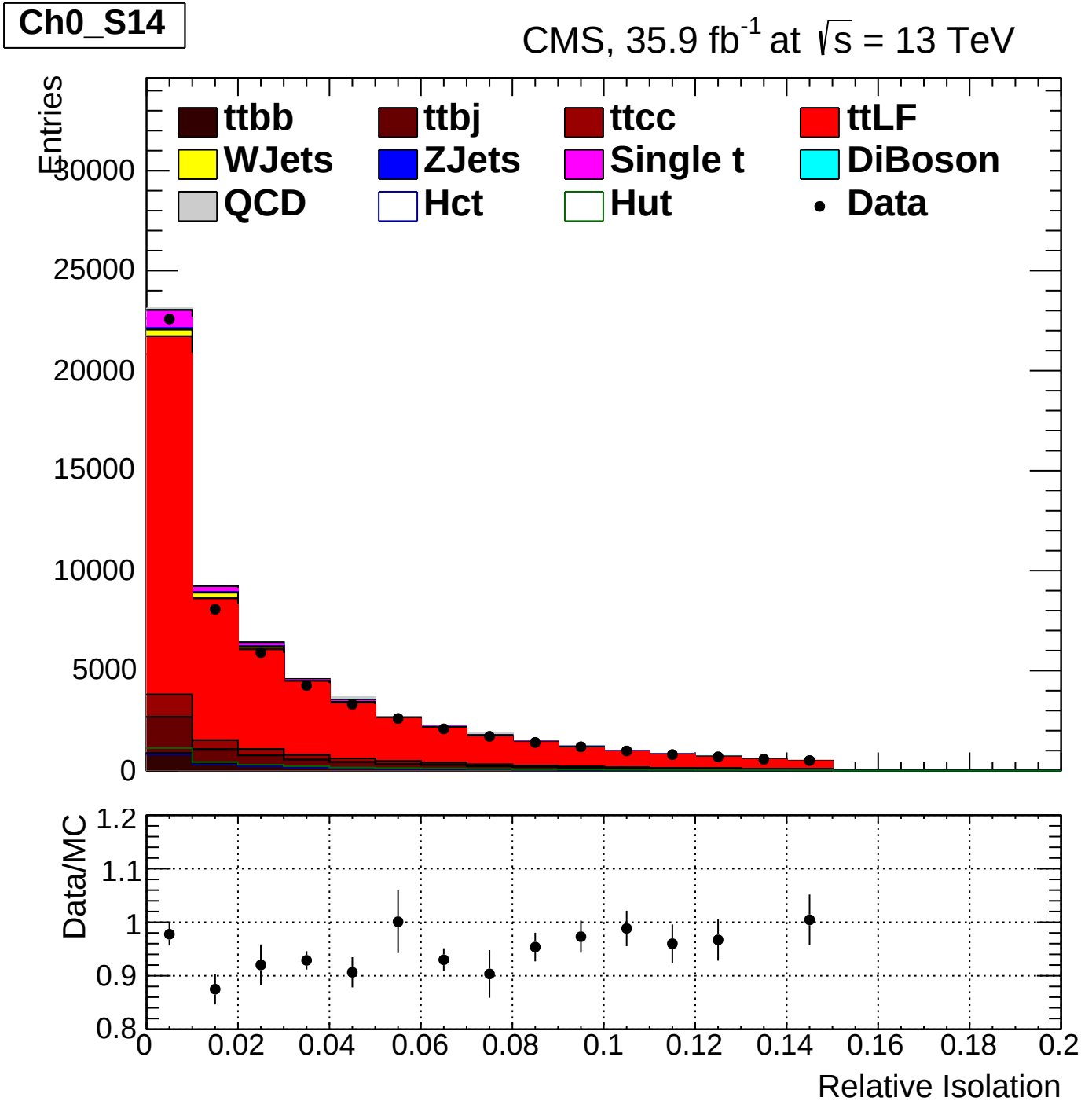
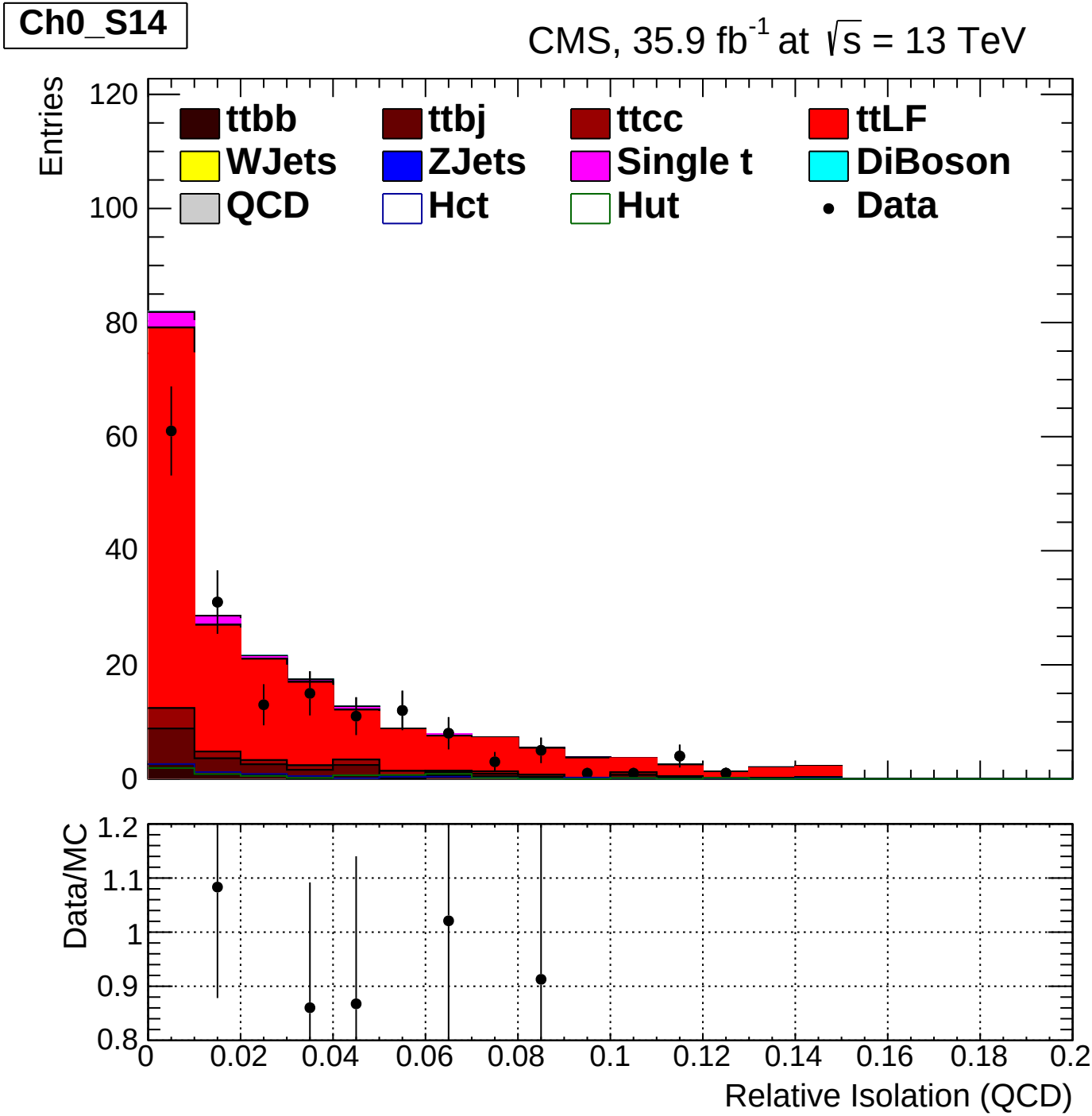
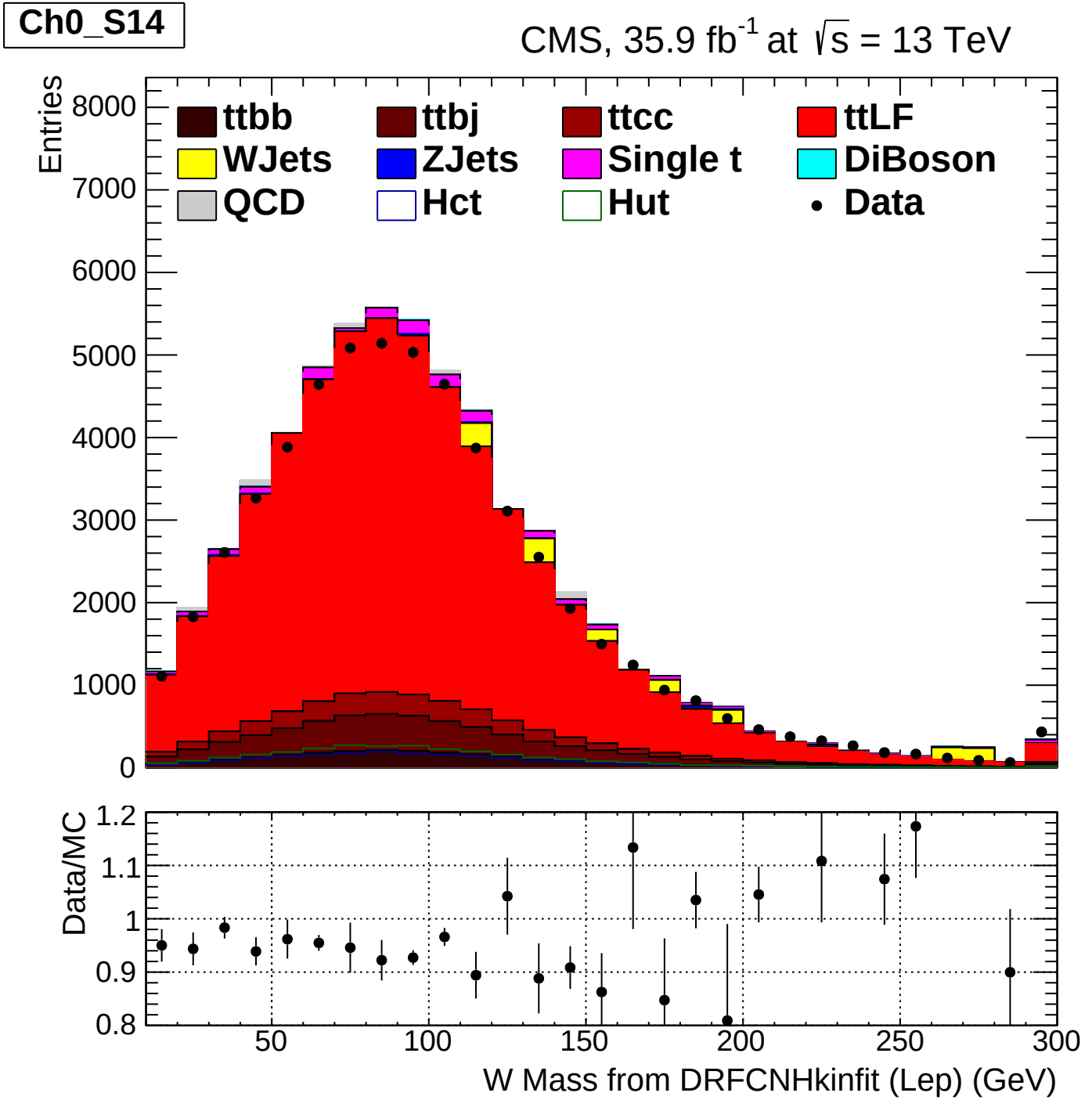
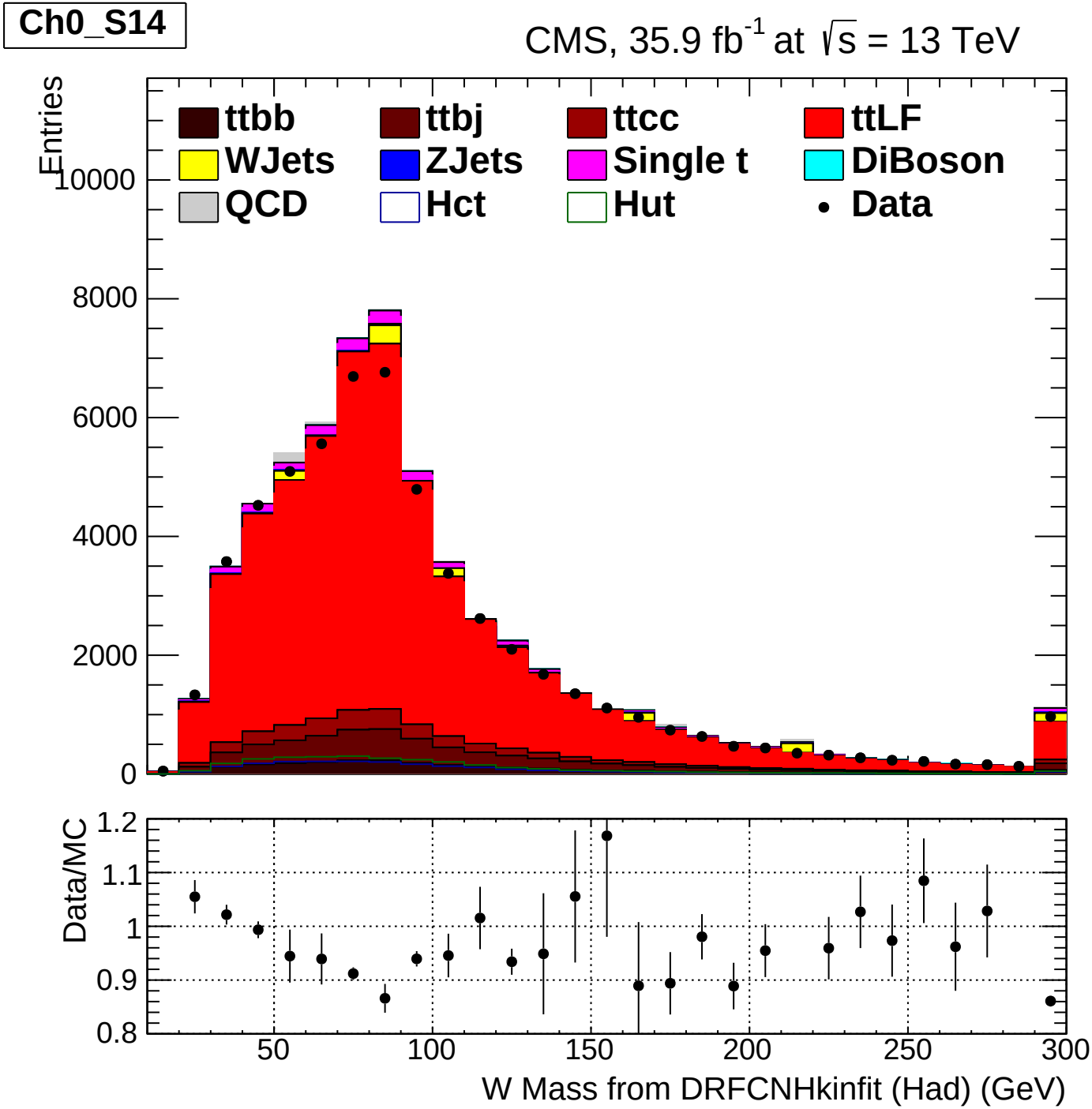
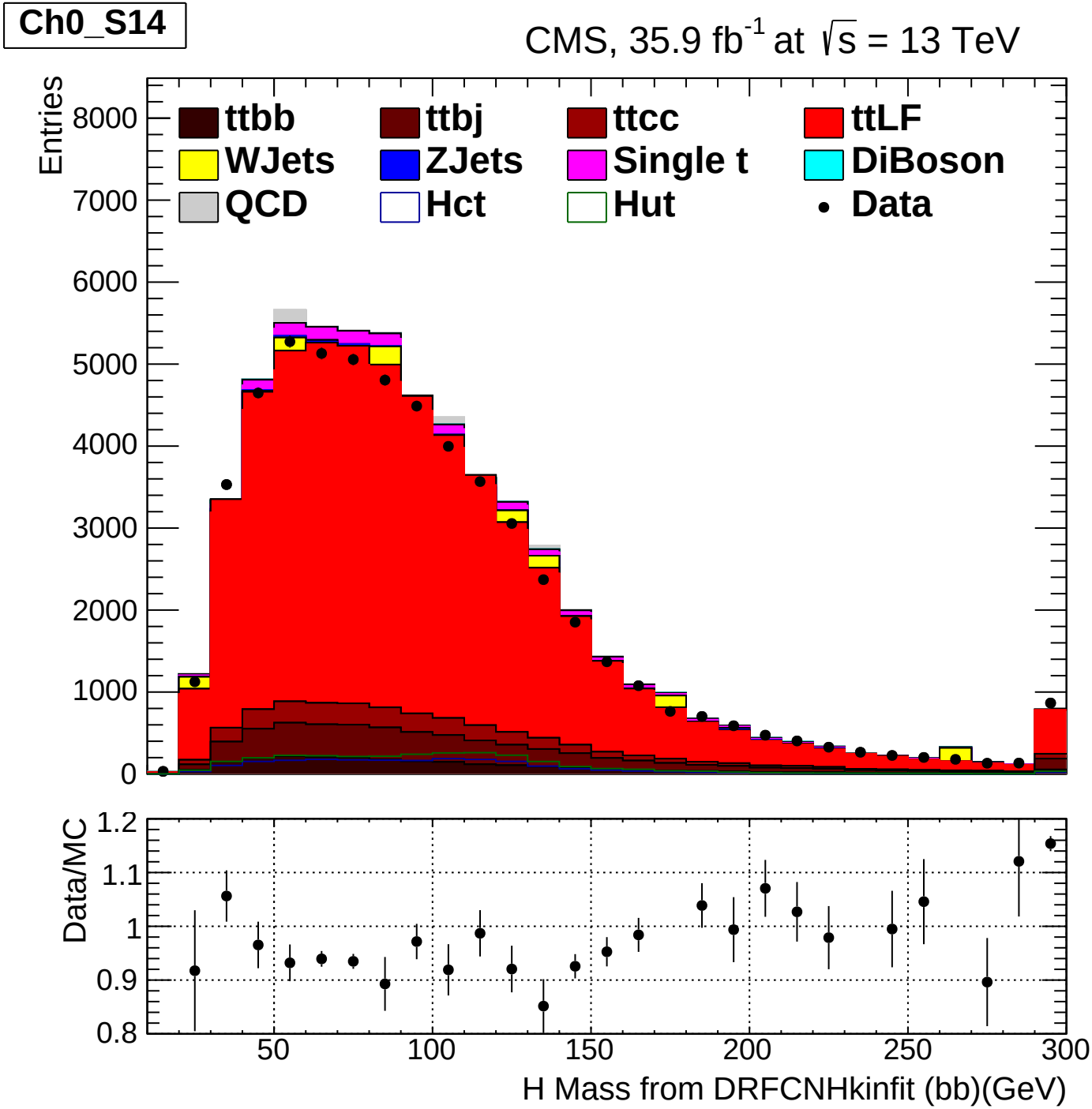
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

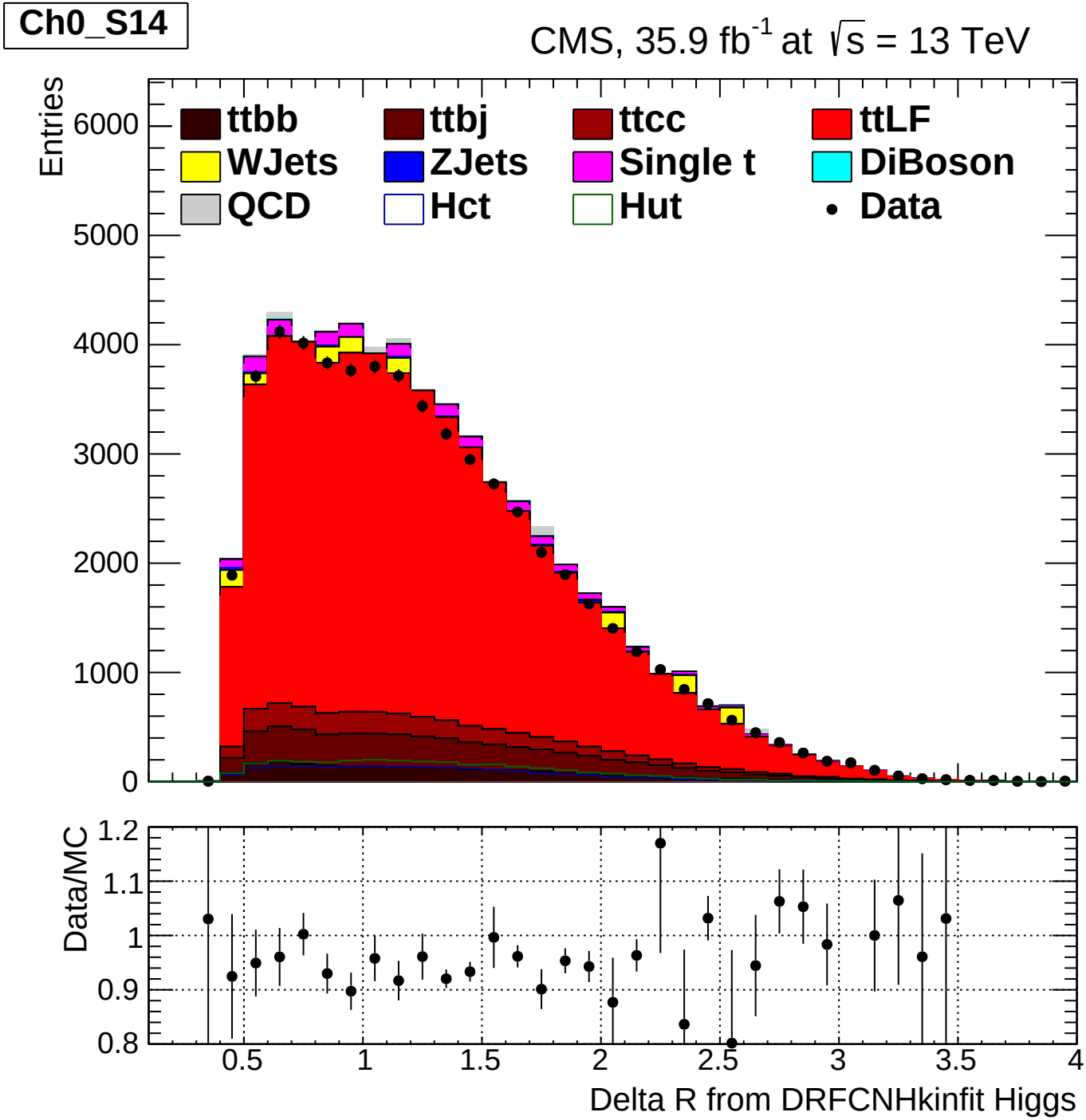

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

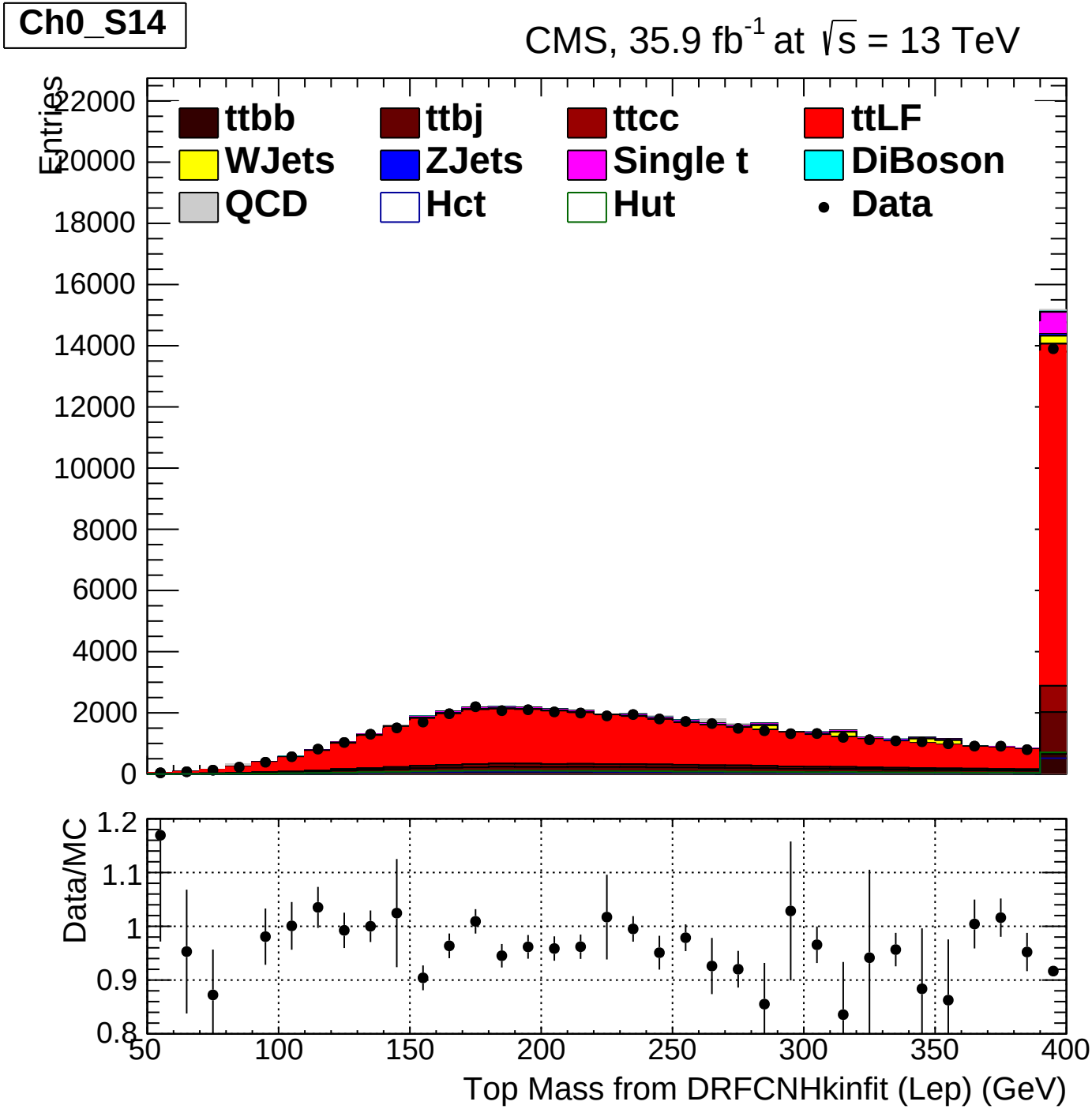

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

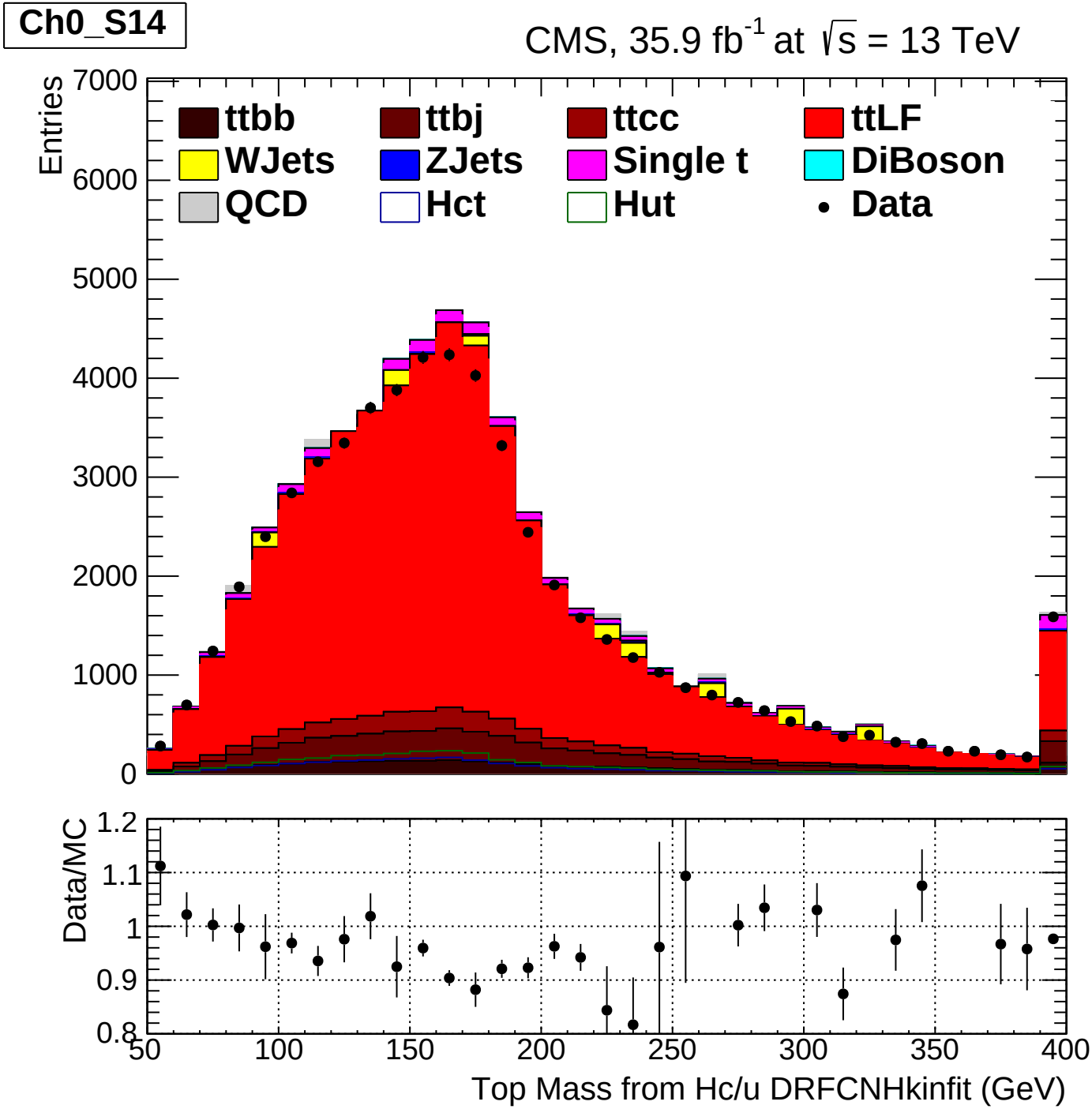

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

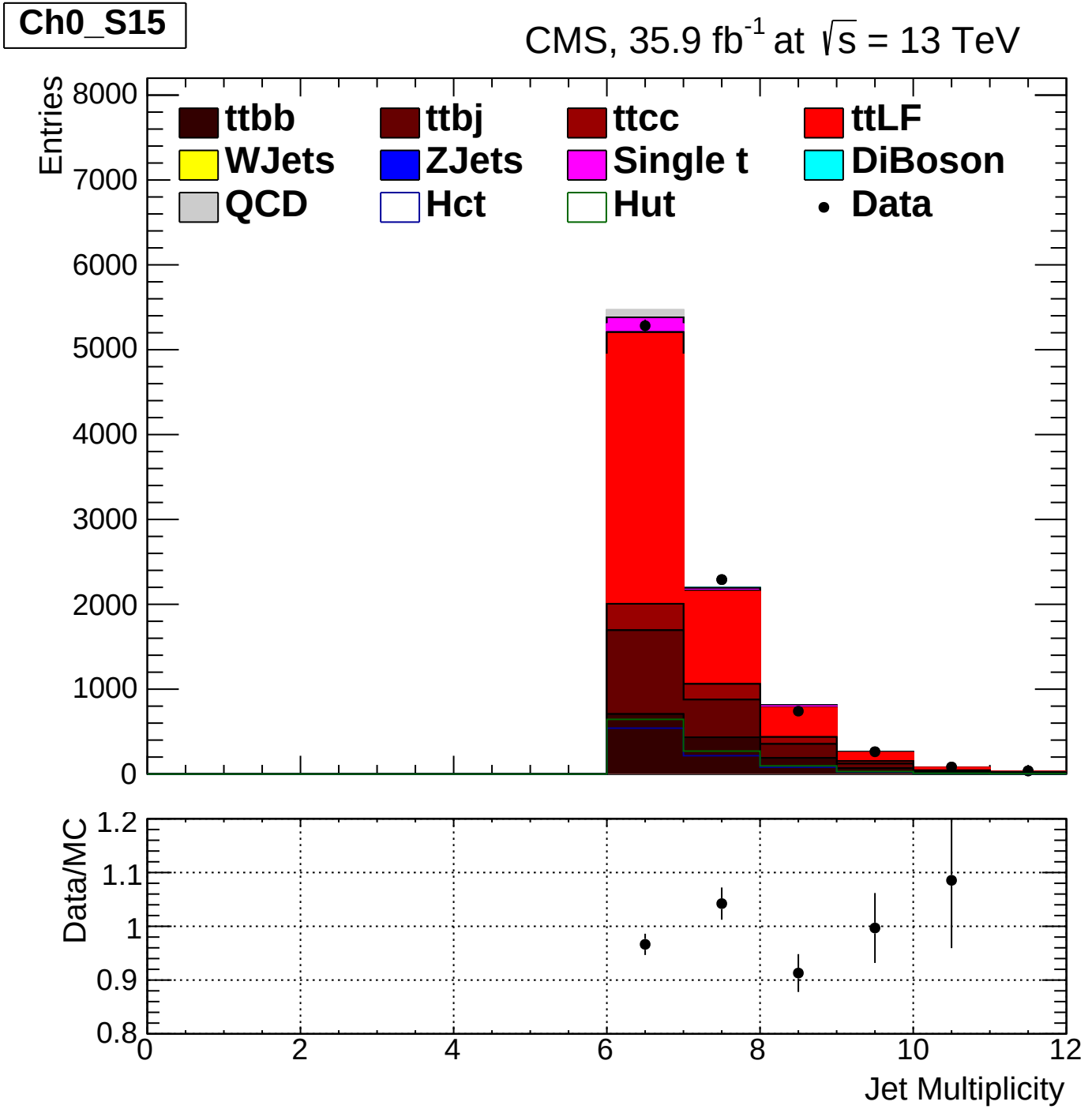

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

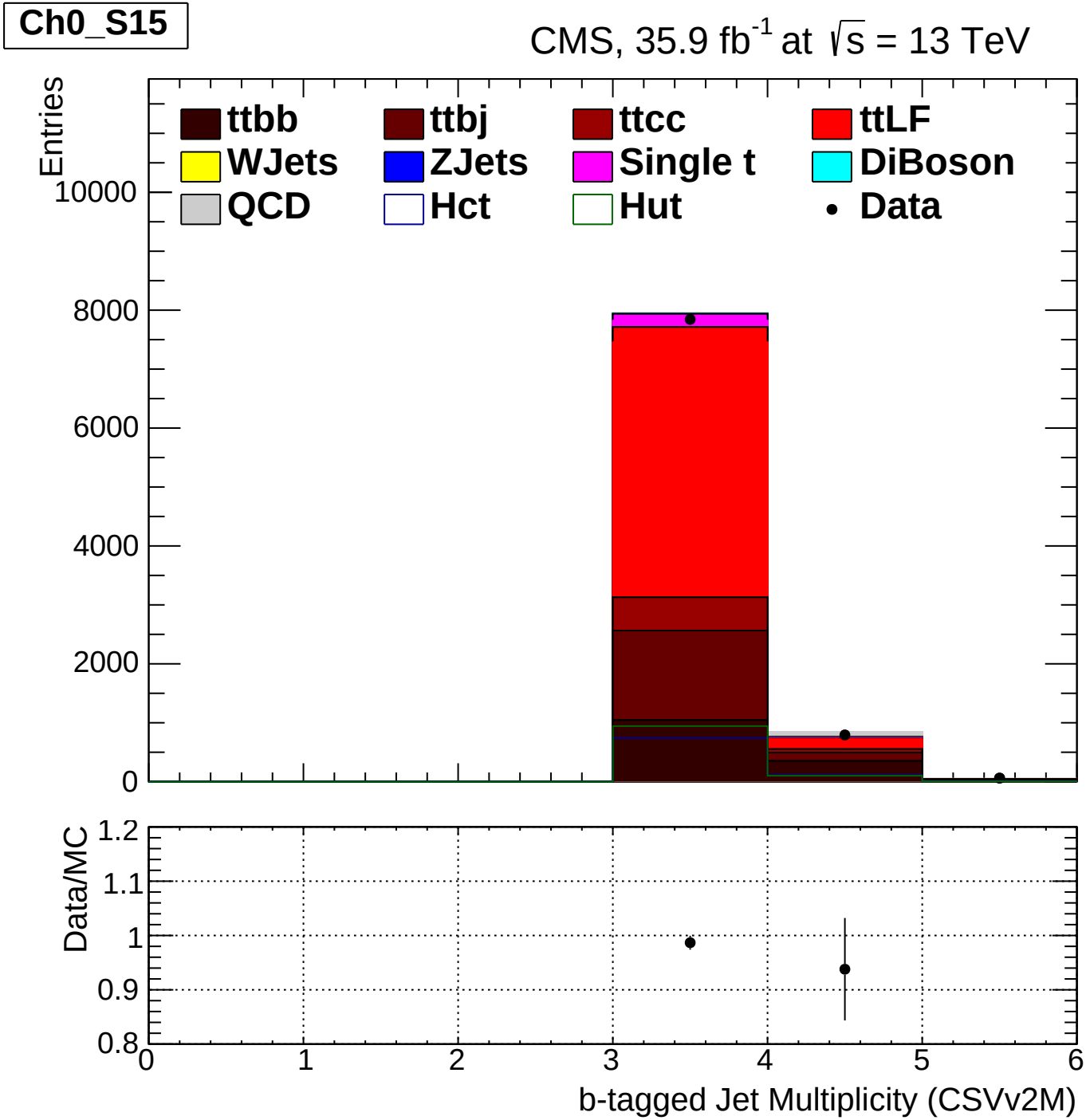

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

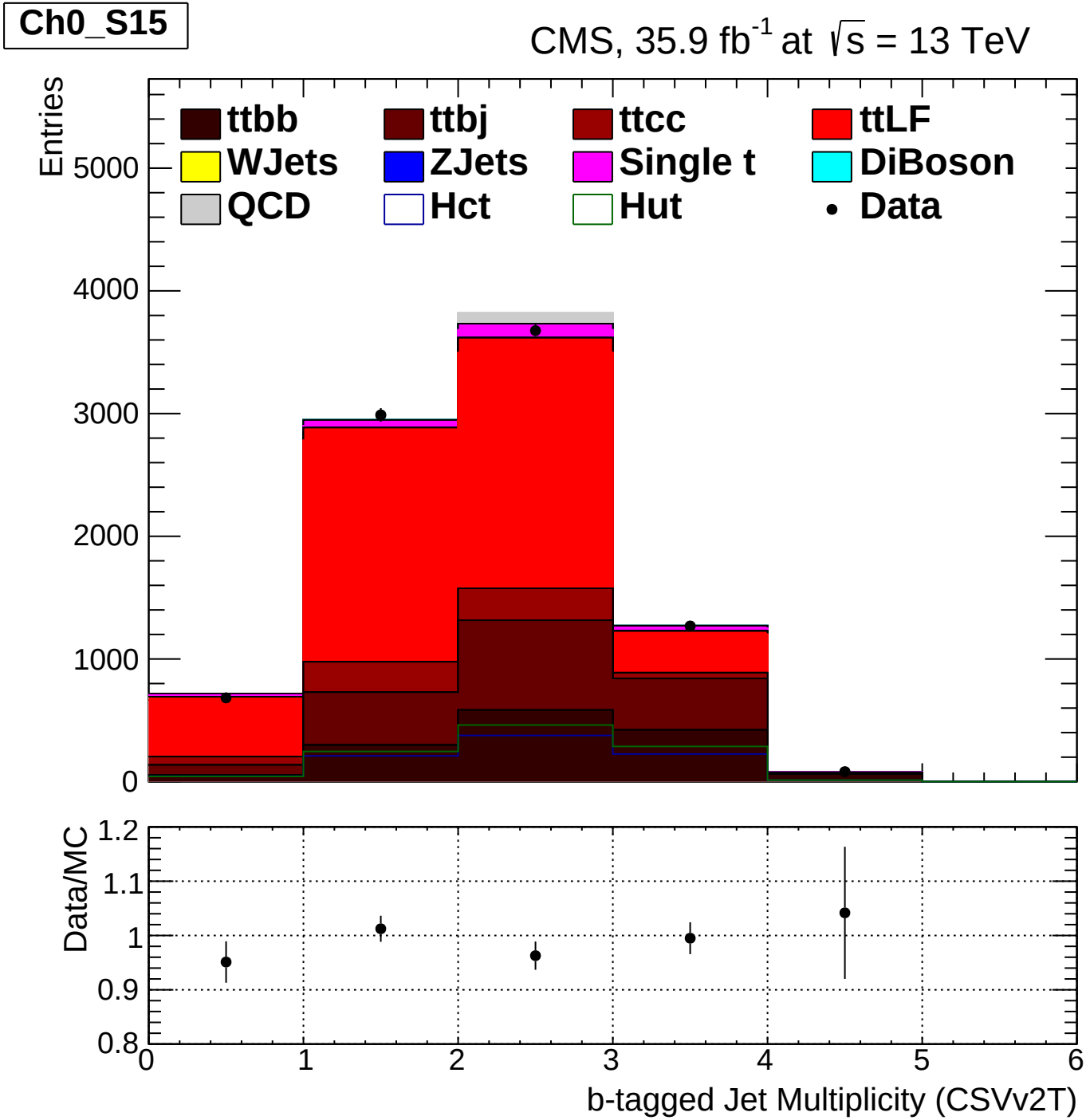

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

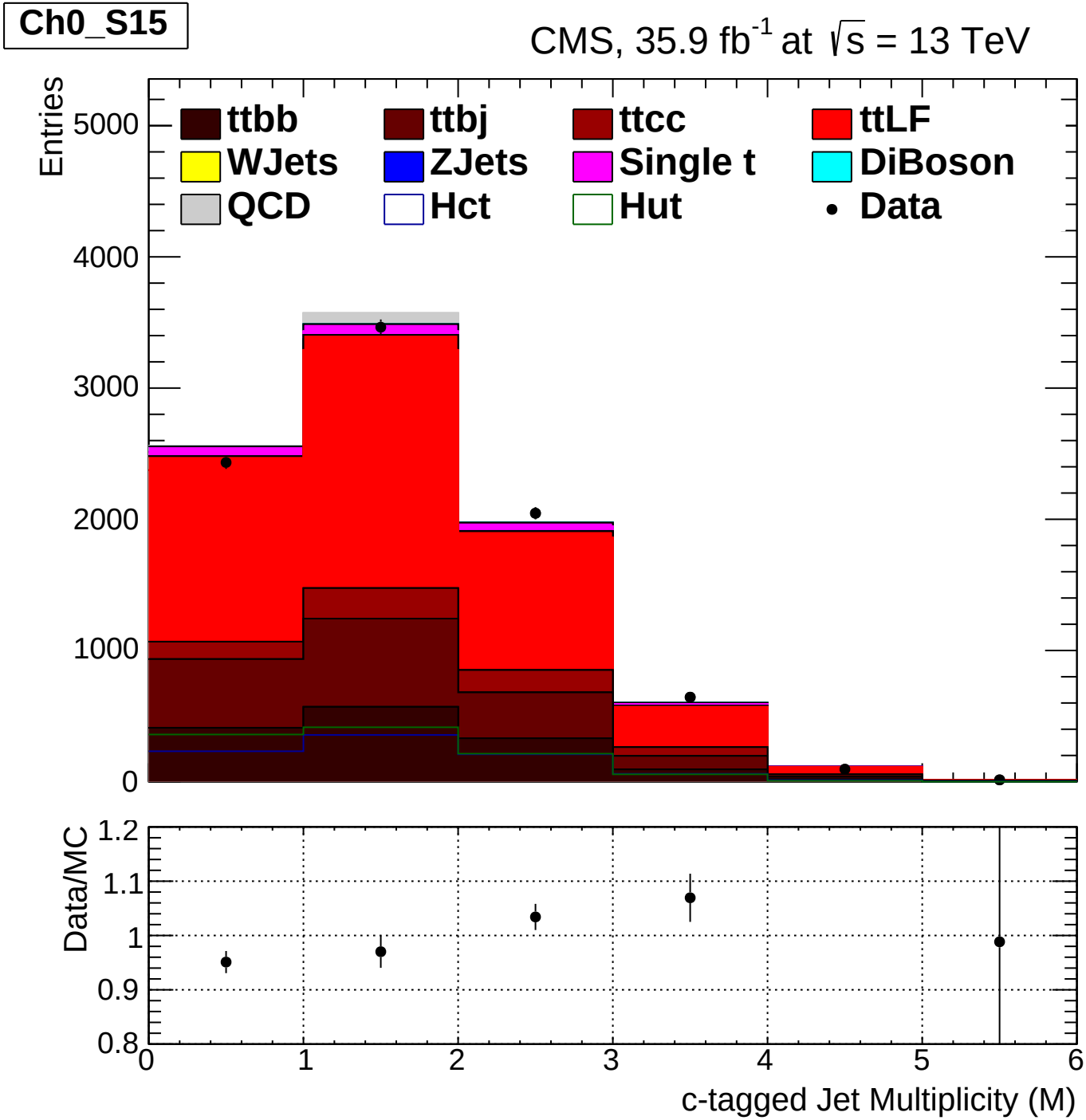

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

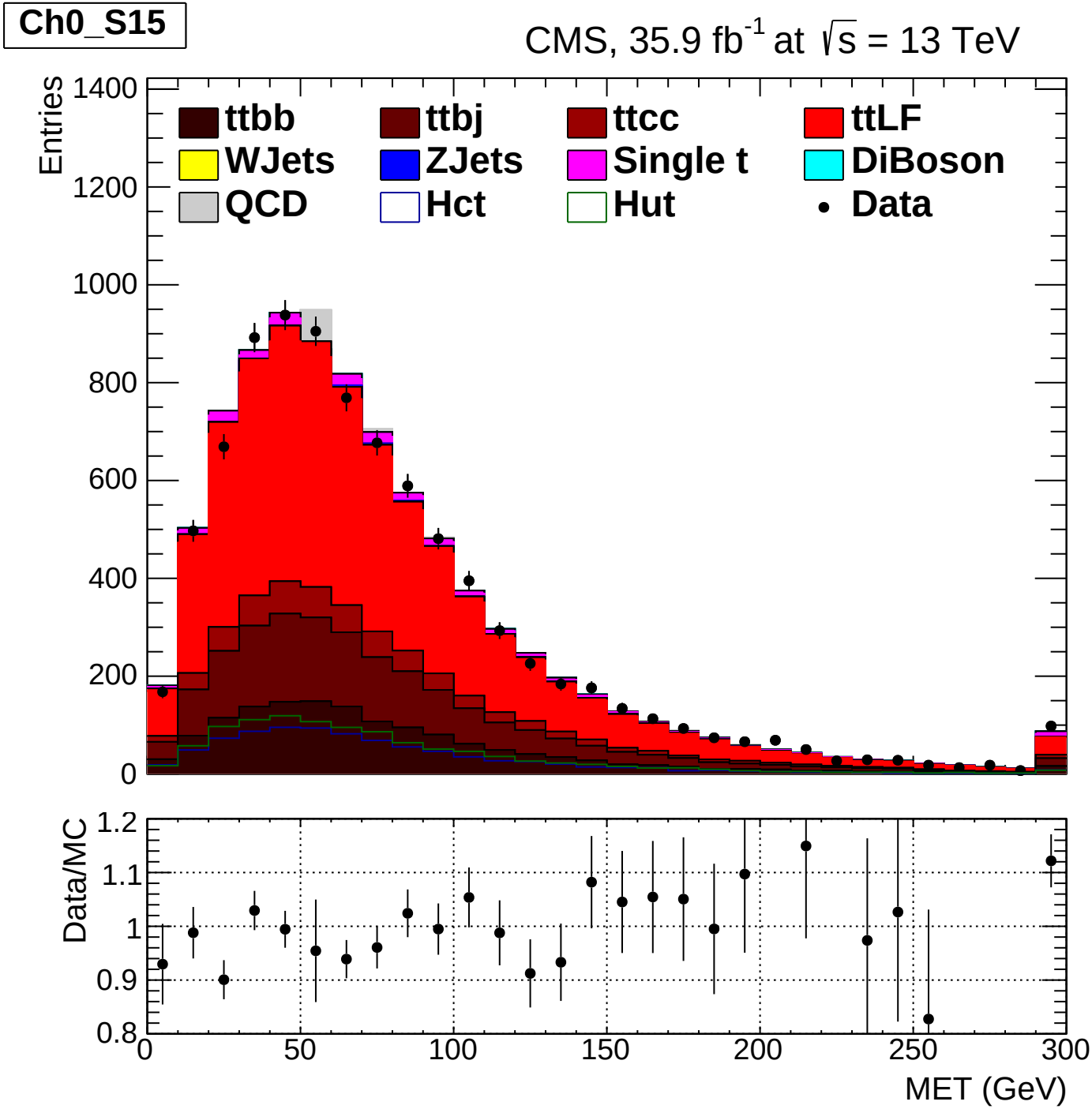

Ch0_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

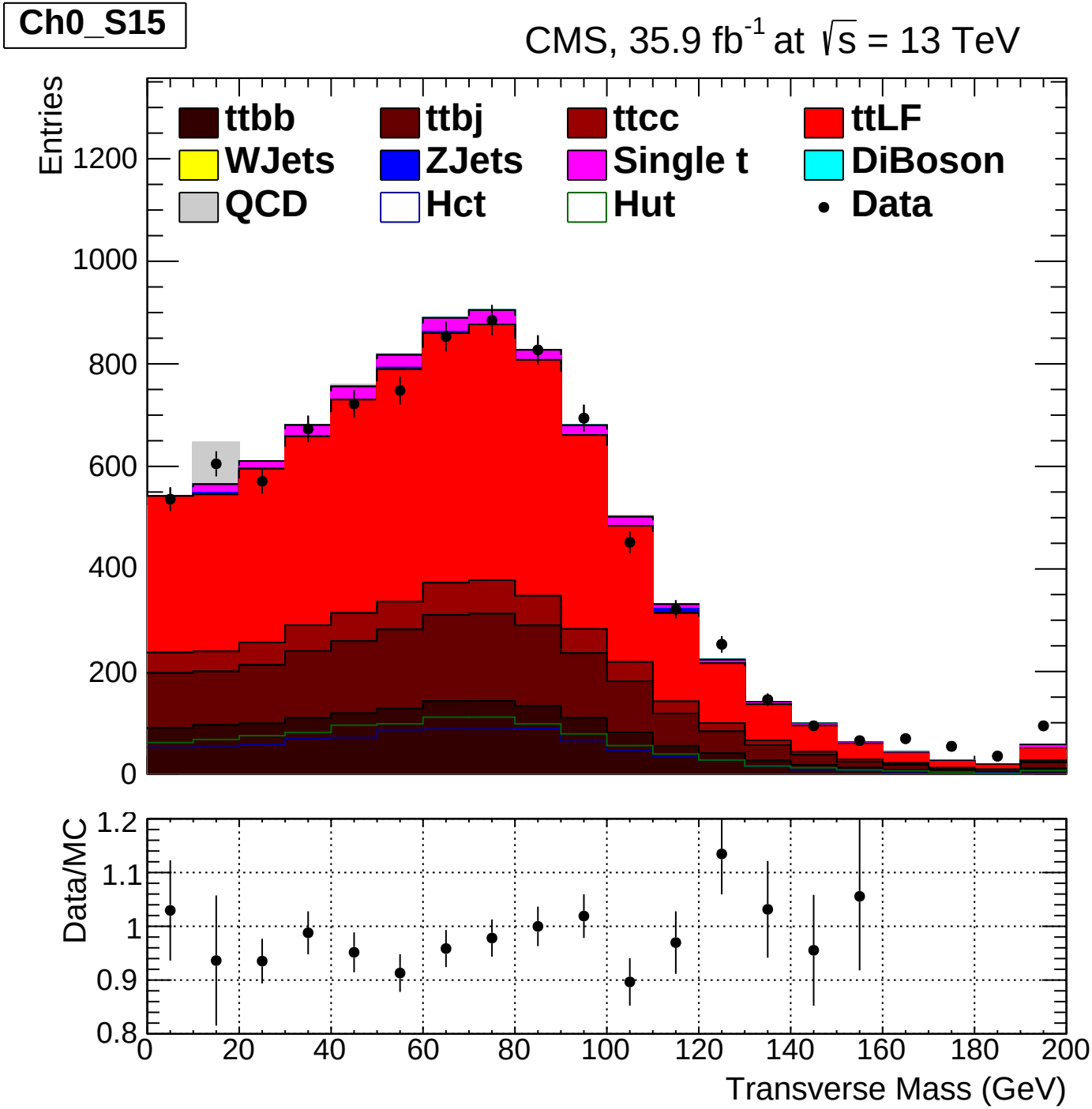

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

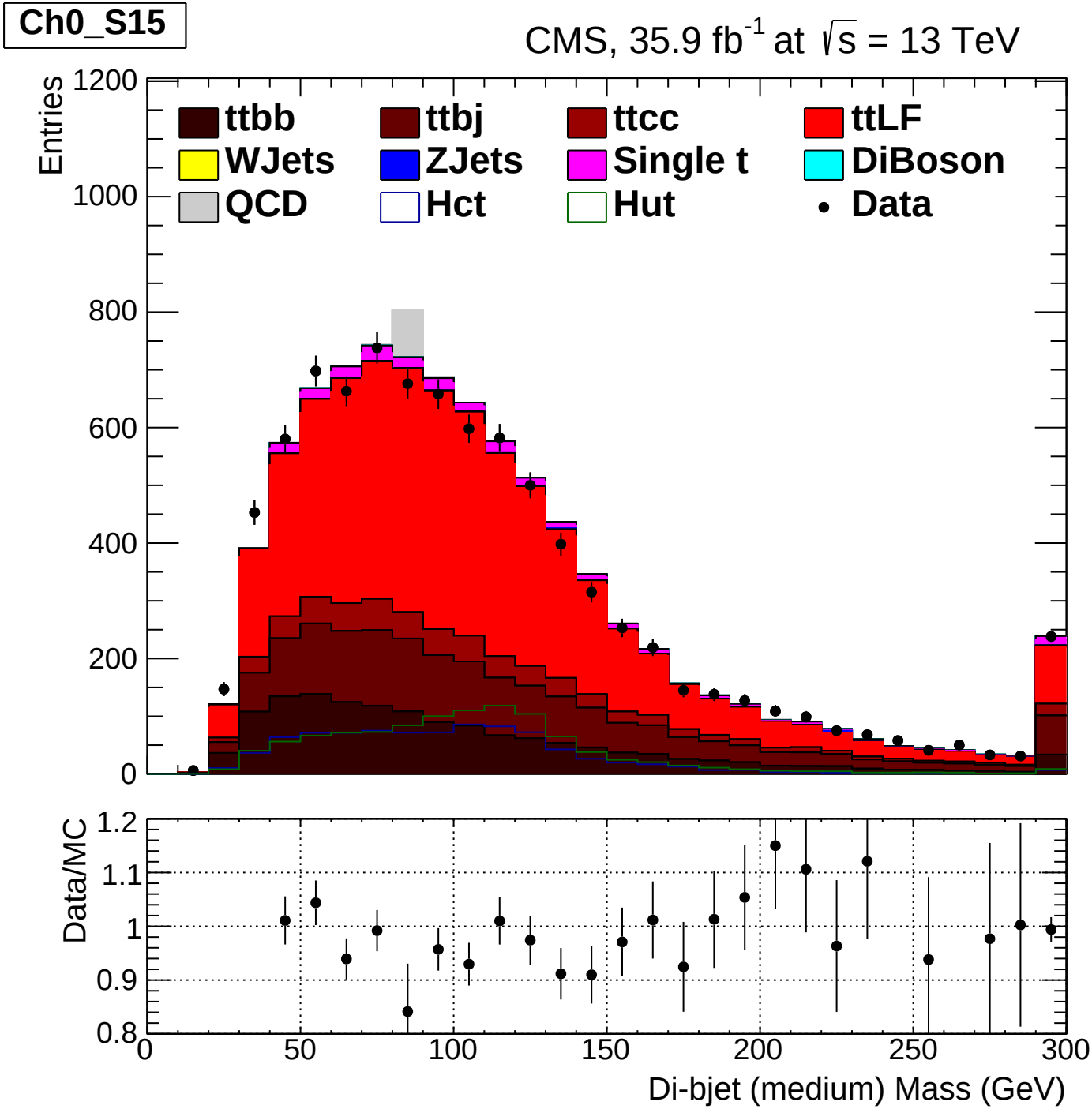

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

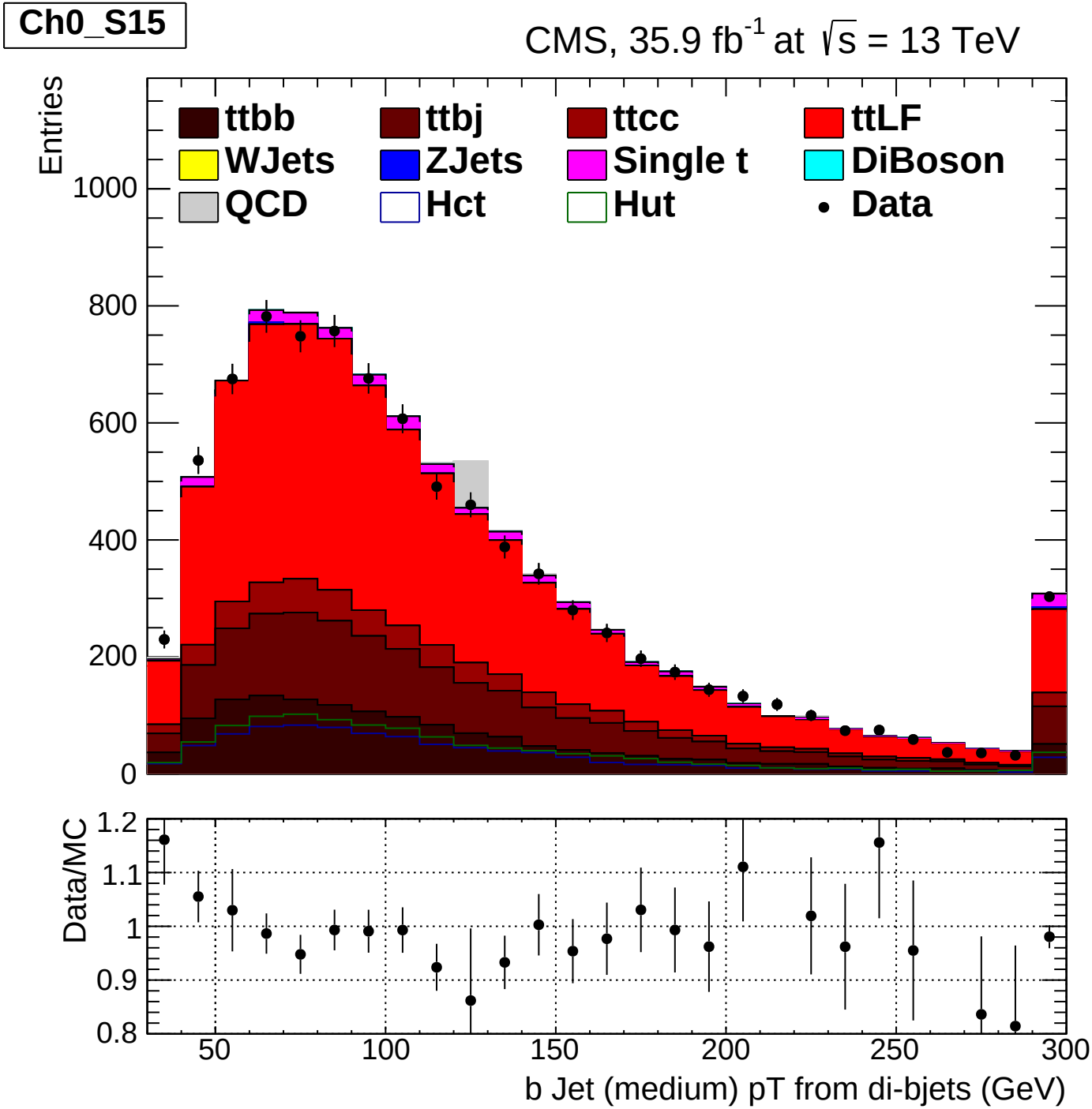

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

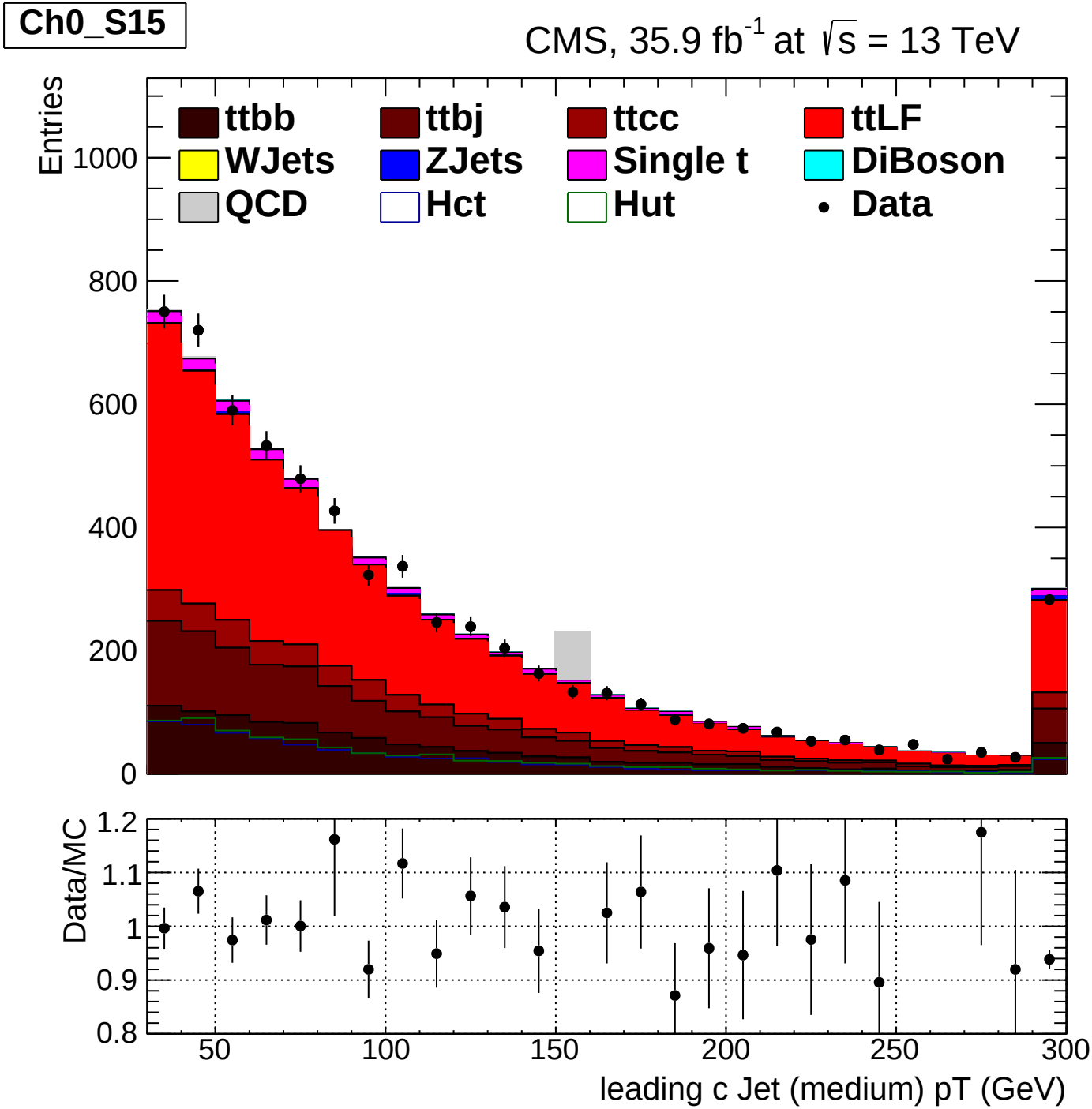

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

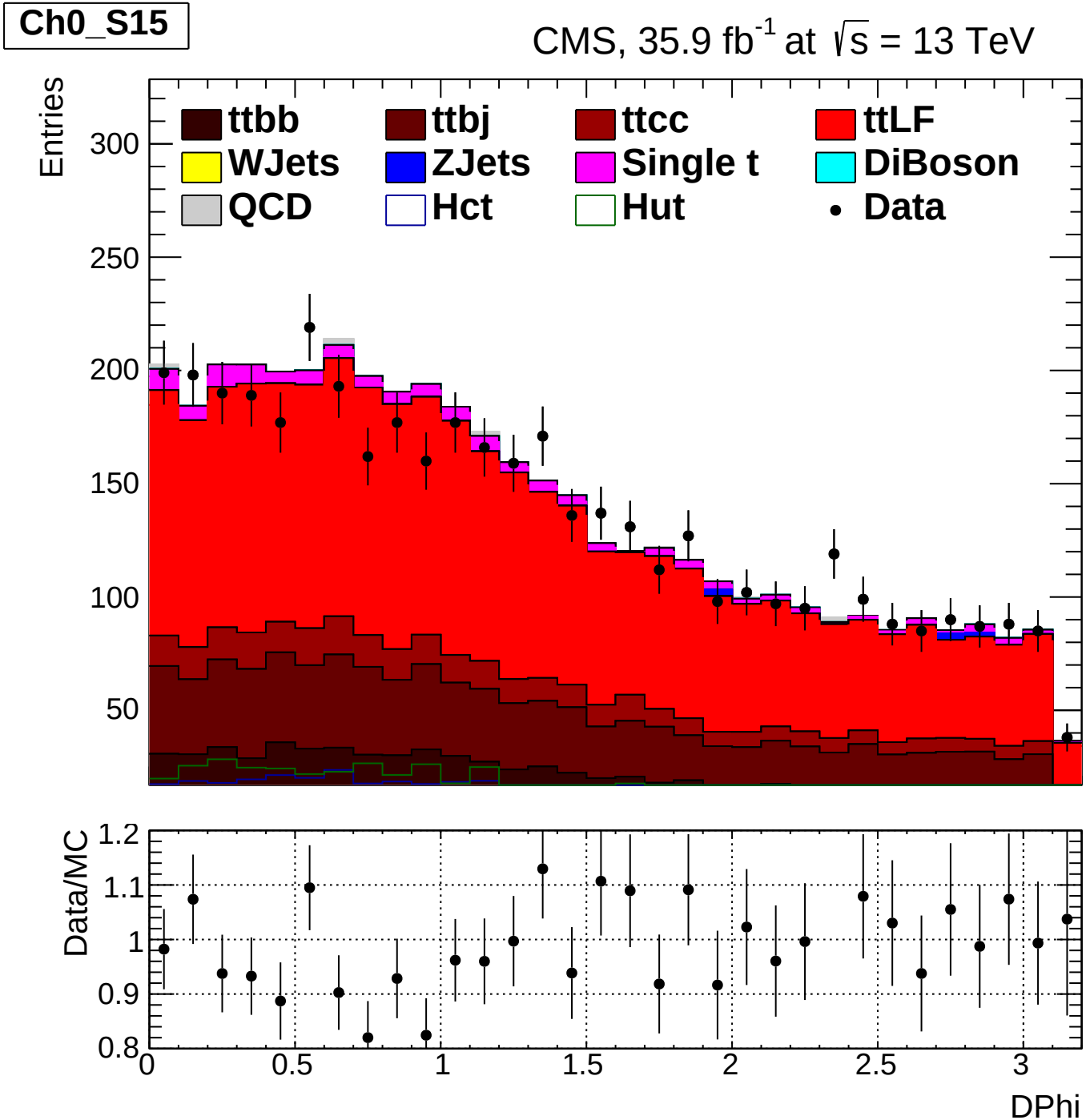

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

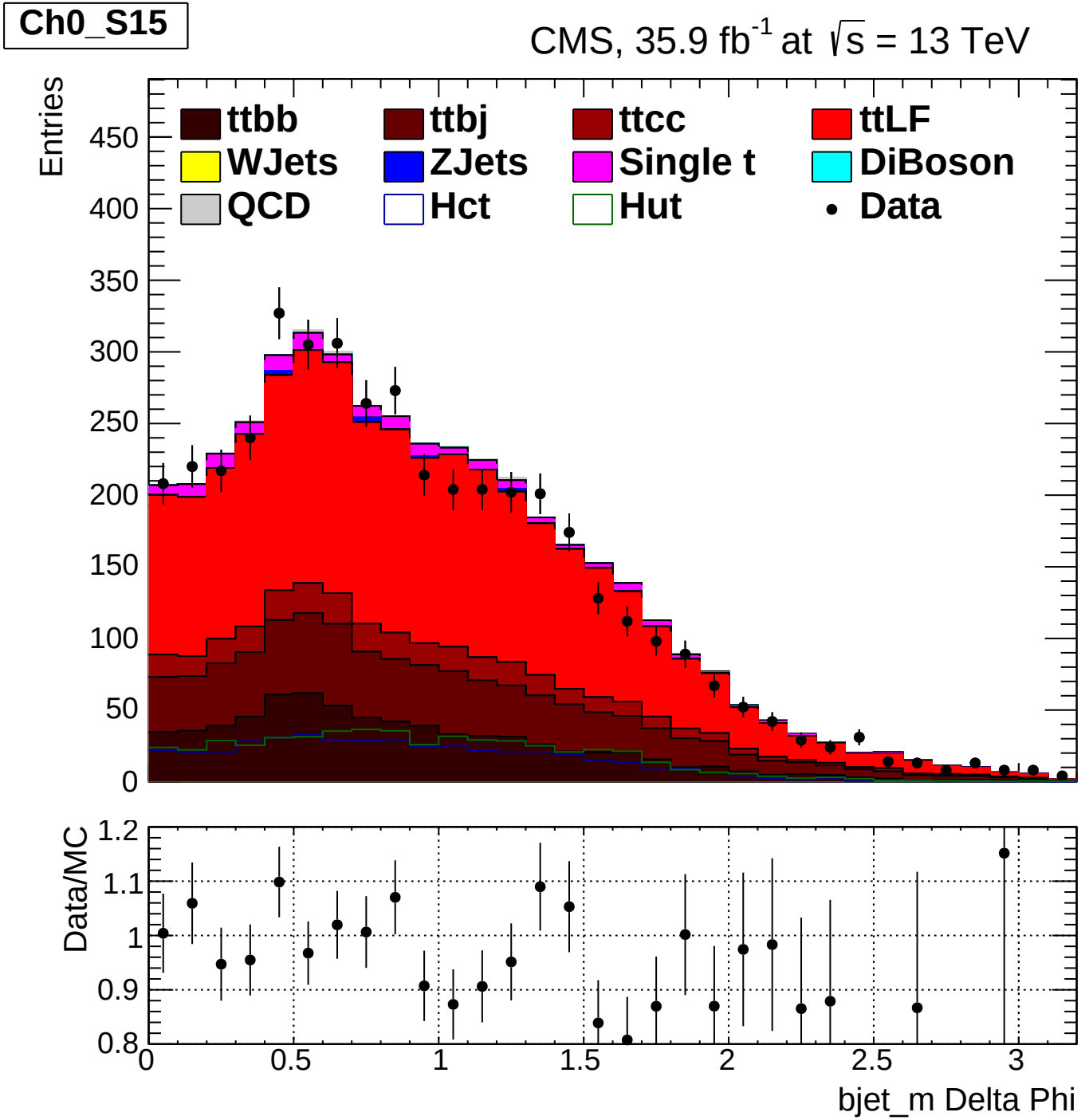

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
1200
Data/MC
0.8
0.9
1
1.1
1.2
0
20
40
60
80
100
120
140
160
180
200
Transverse Mass (GeV)

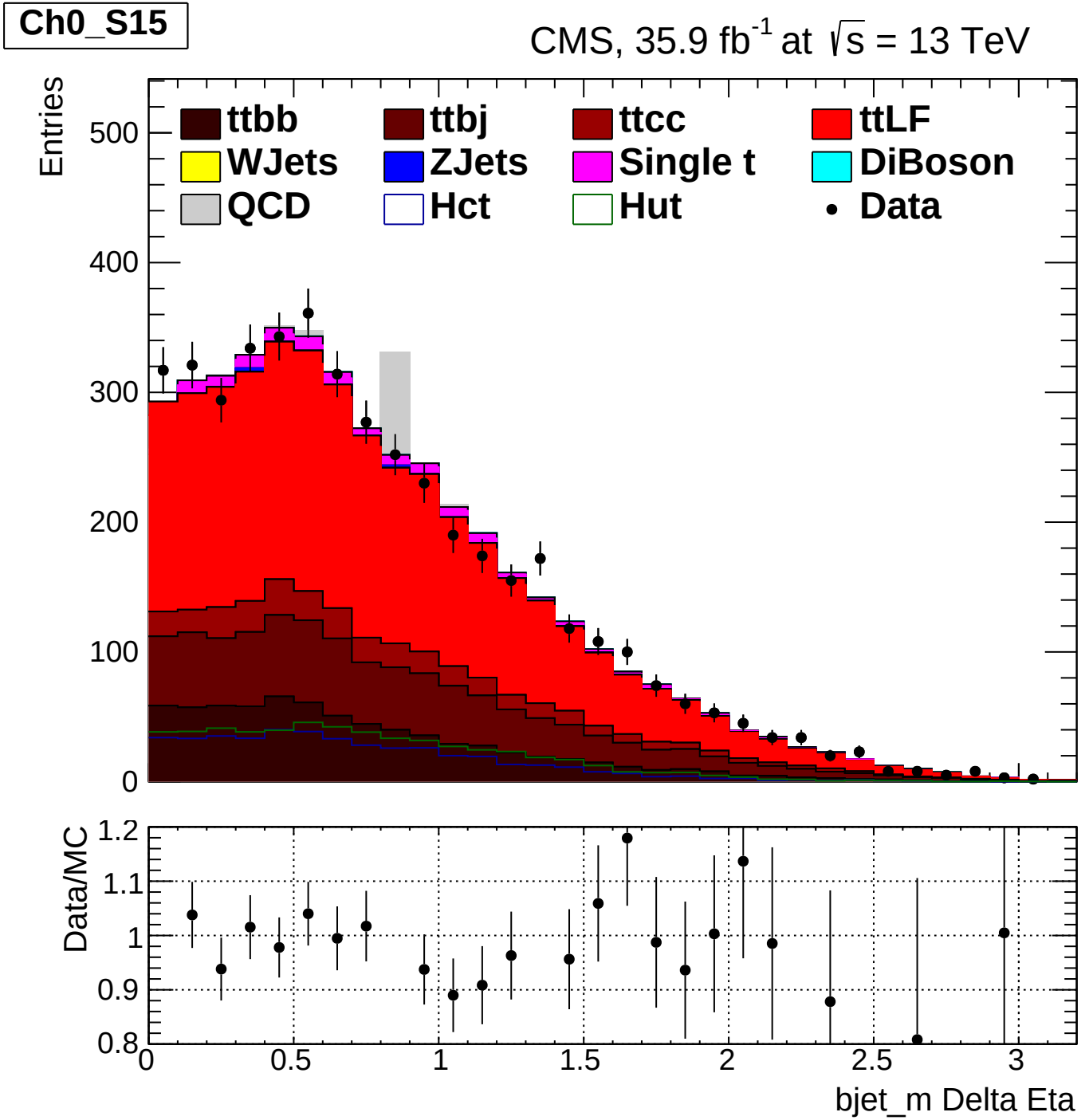

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

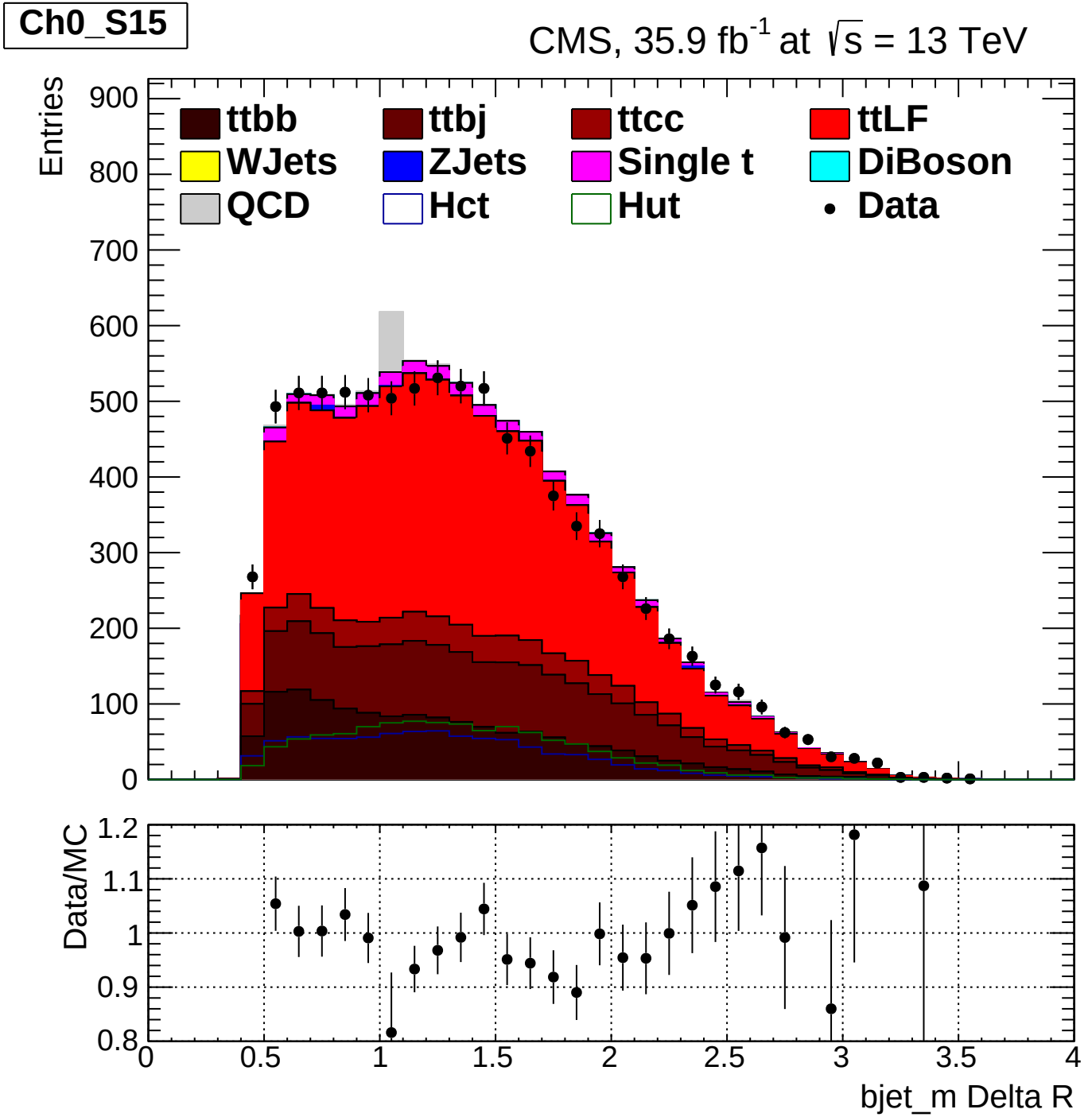

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
300
250
200
150
100
50
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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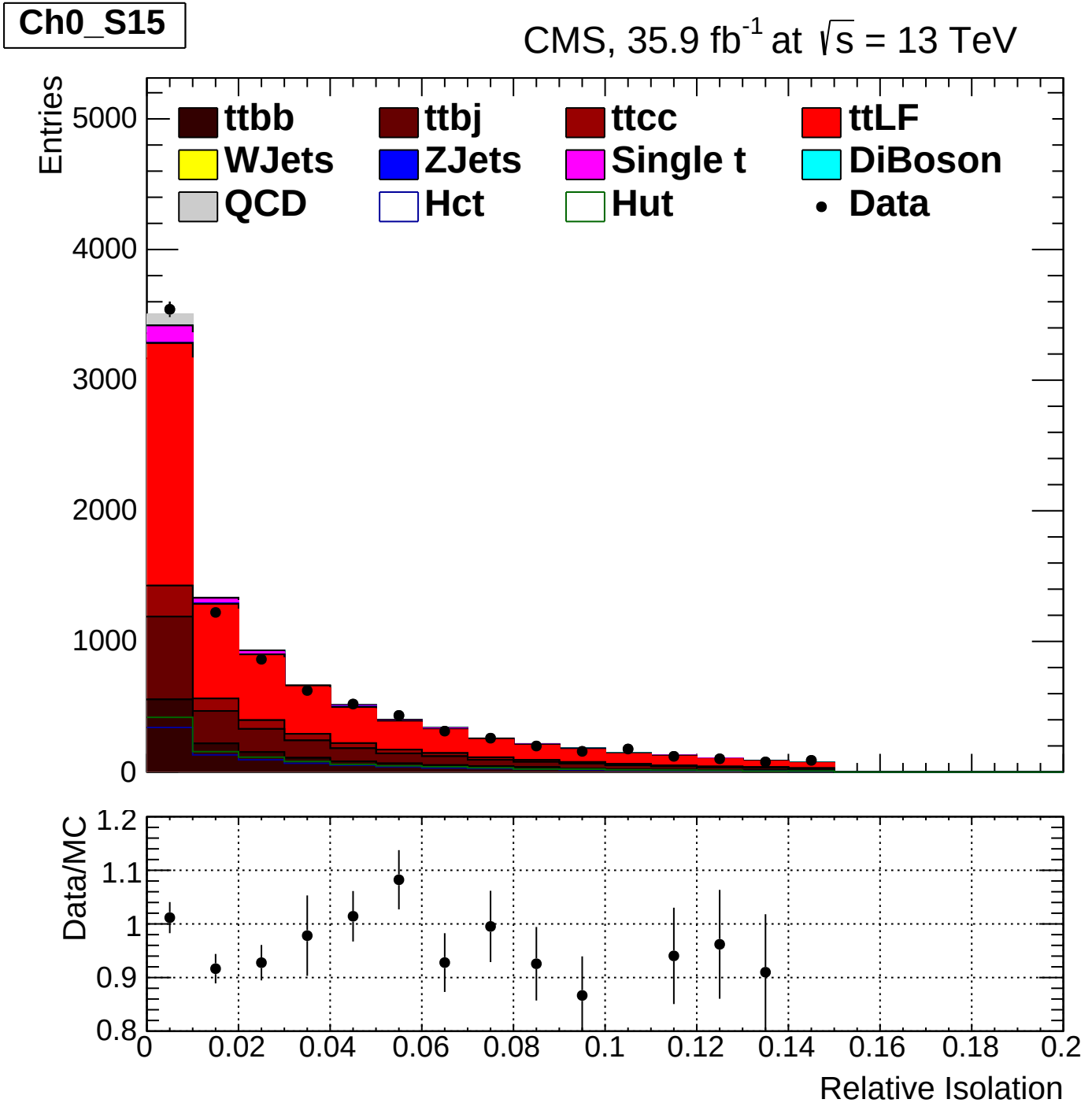
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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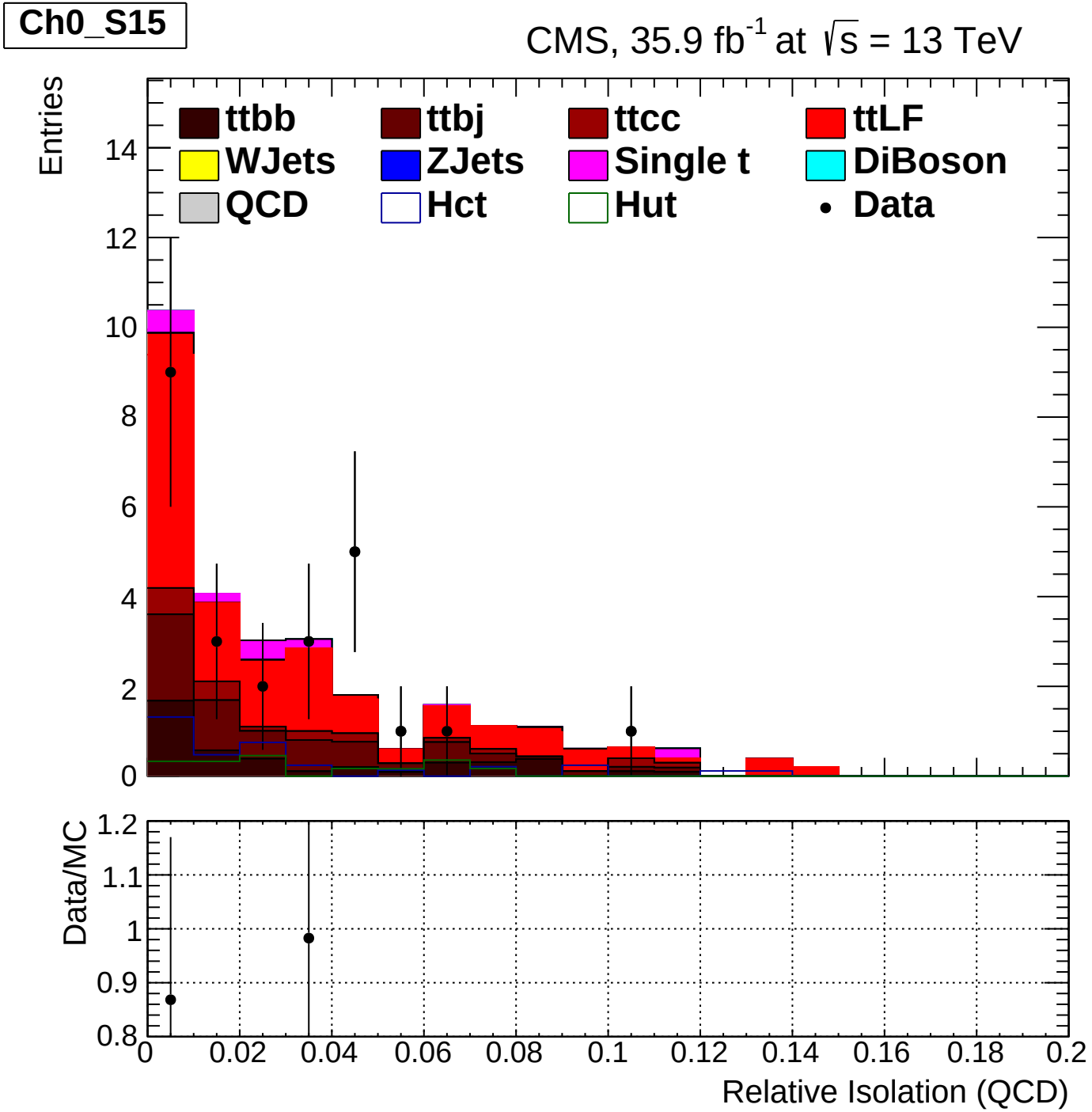
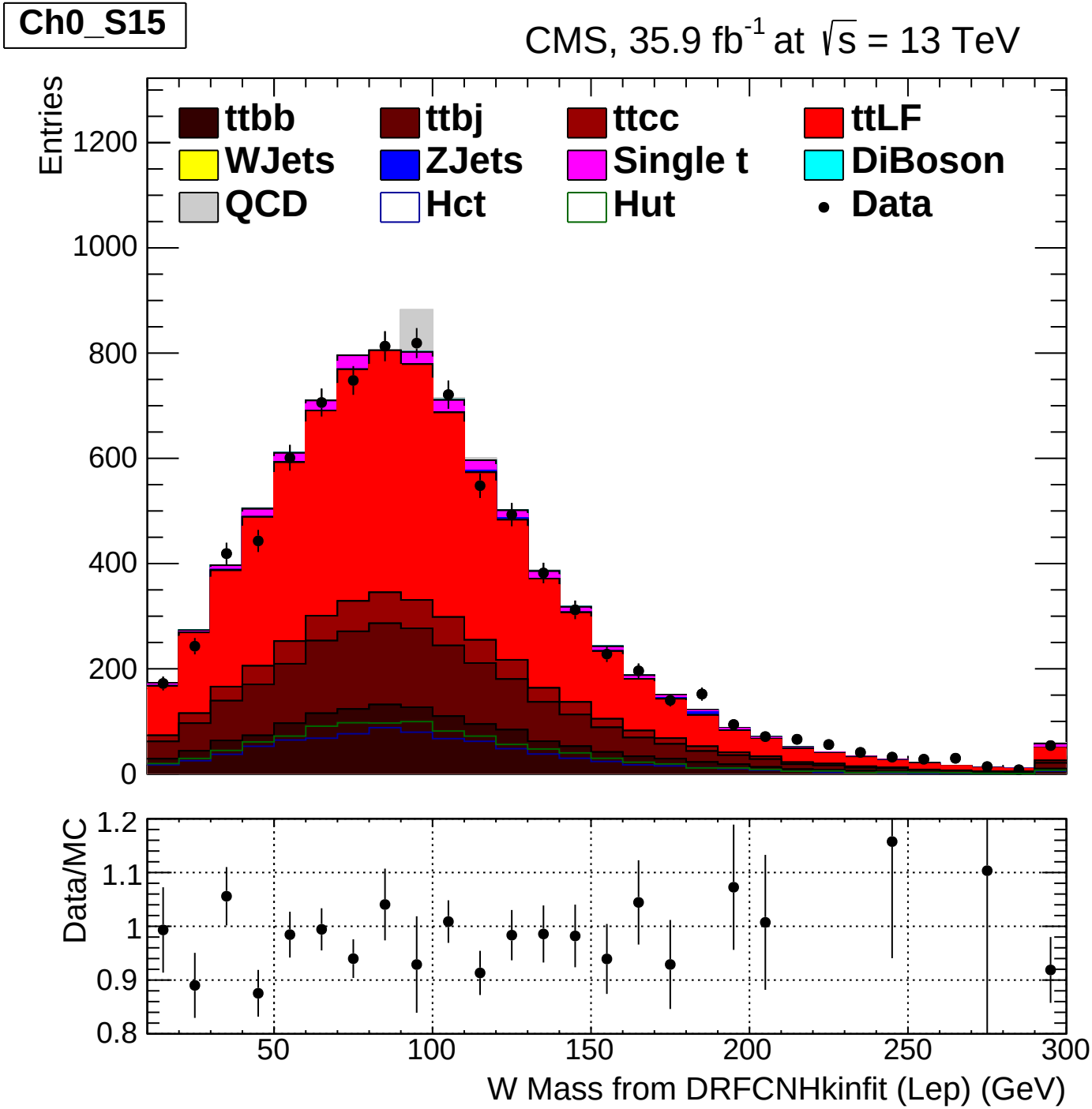
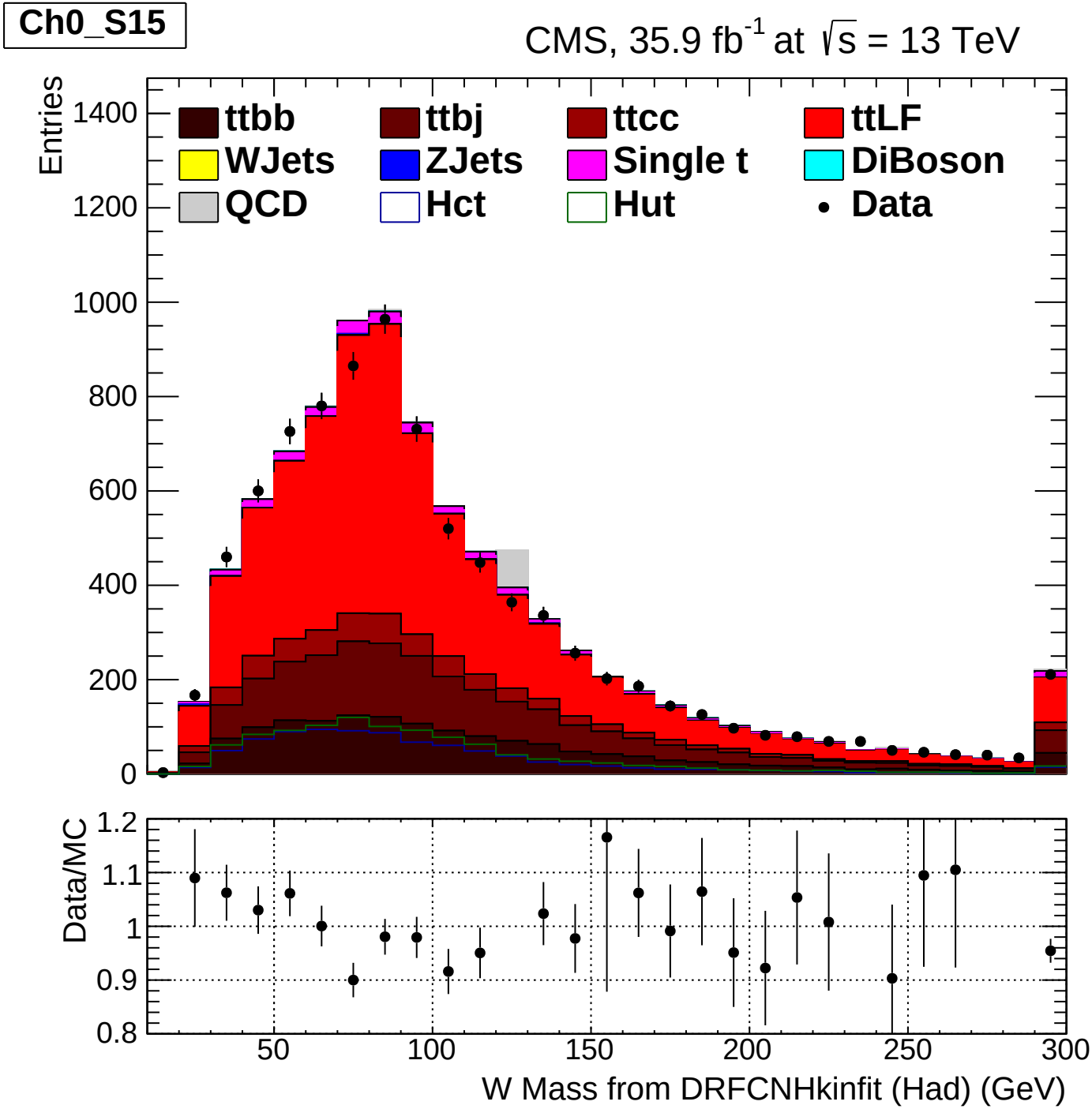
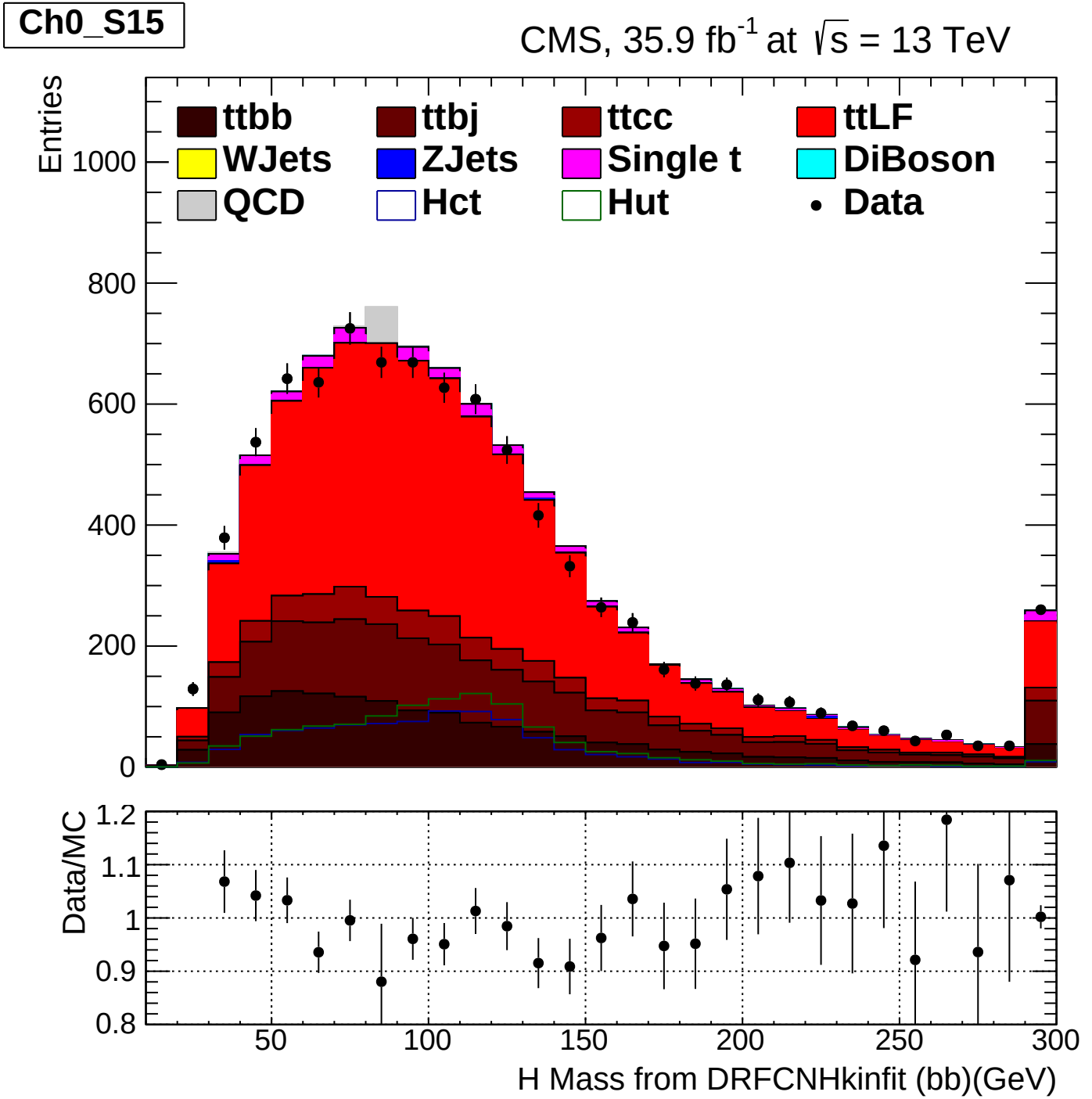
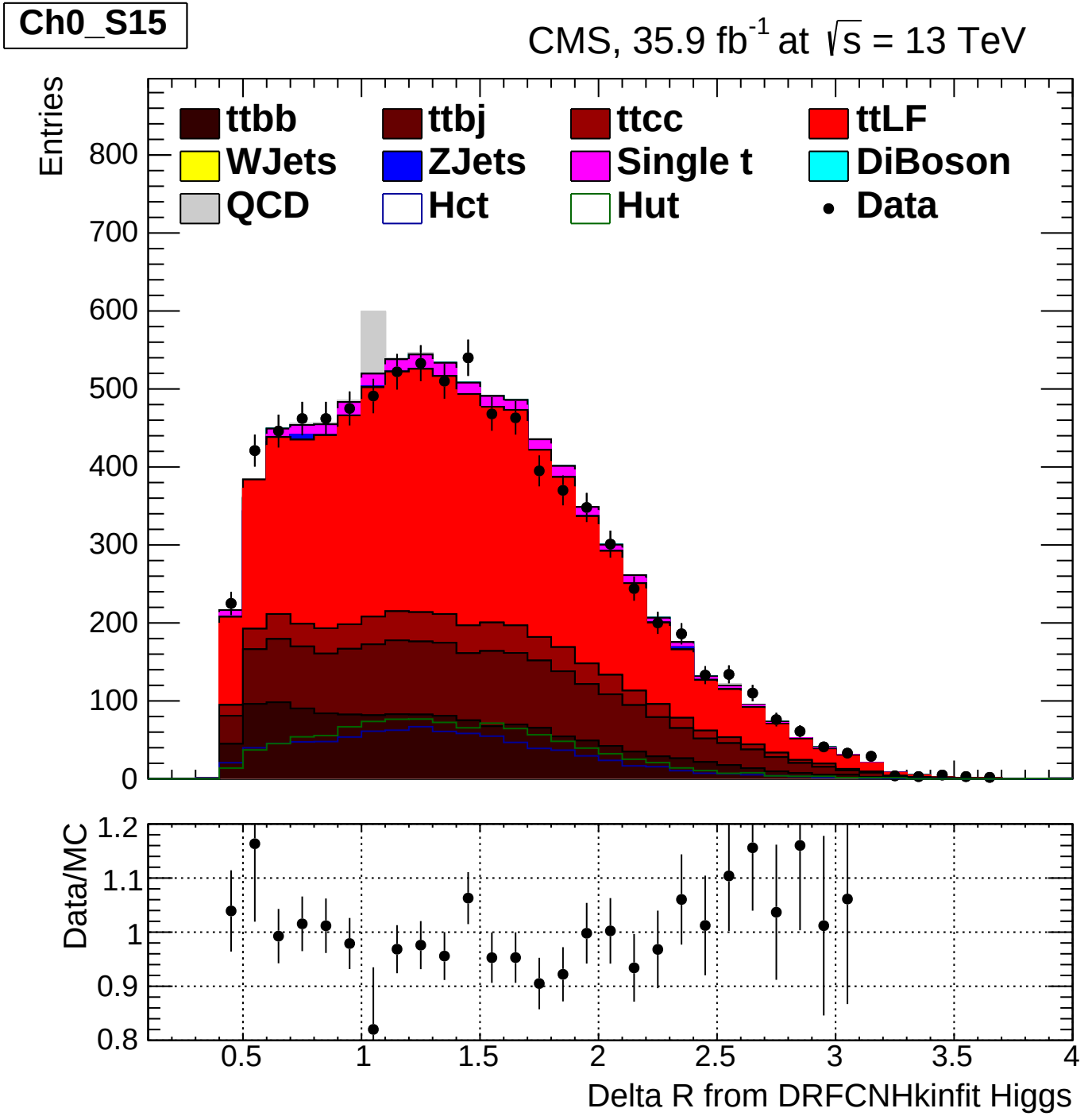
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

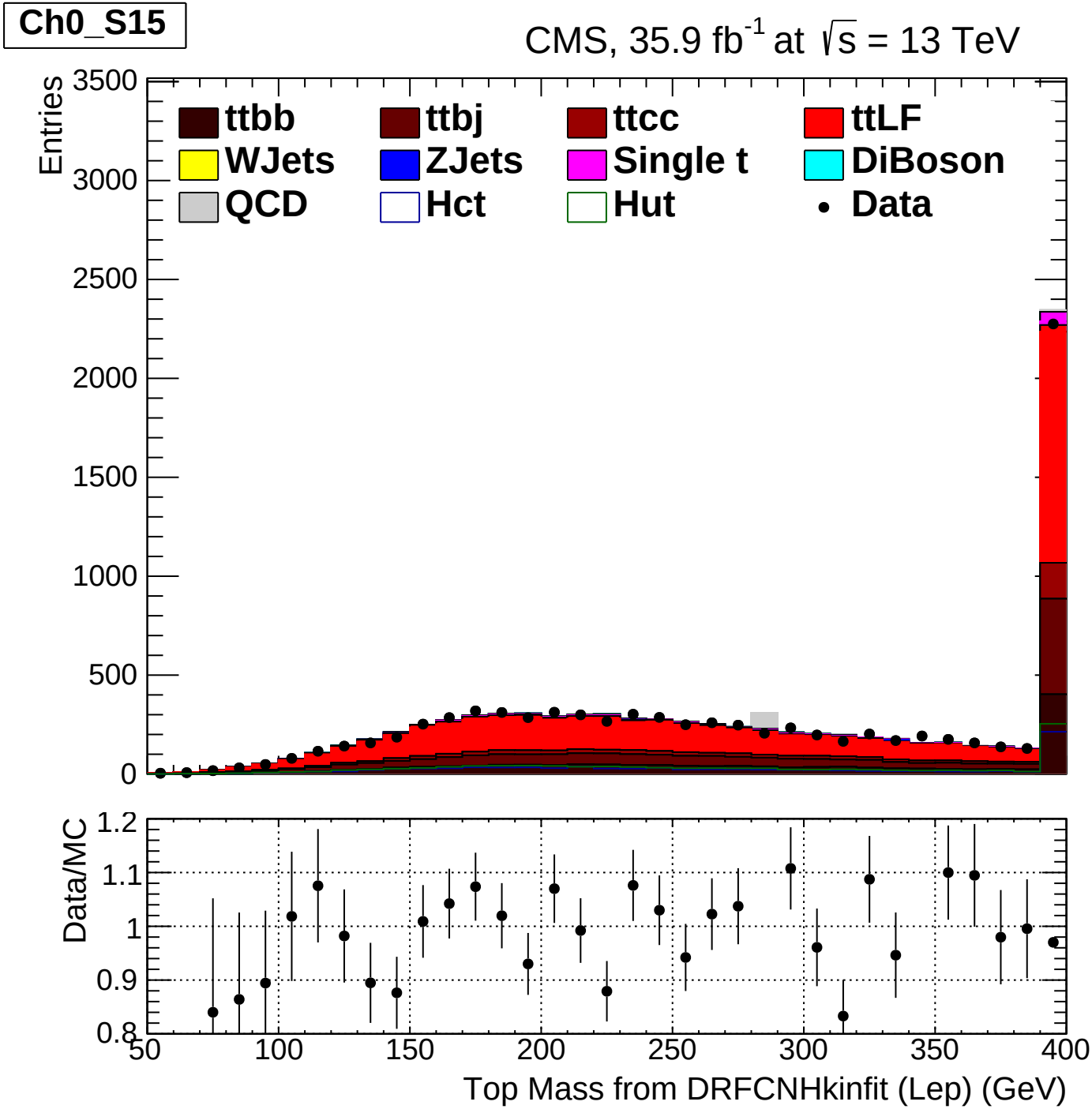

Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
1200
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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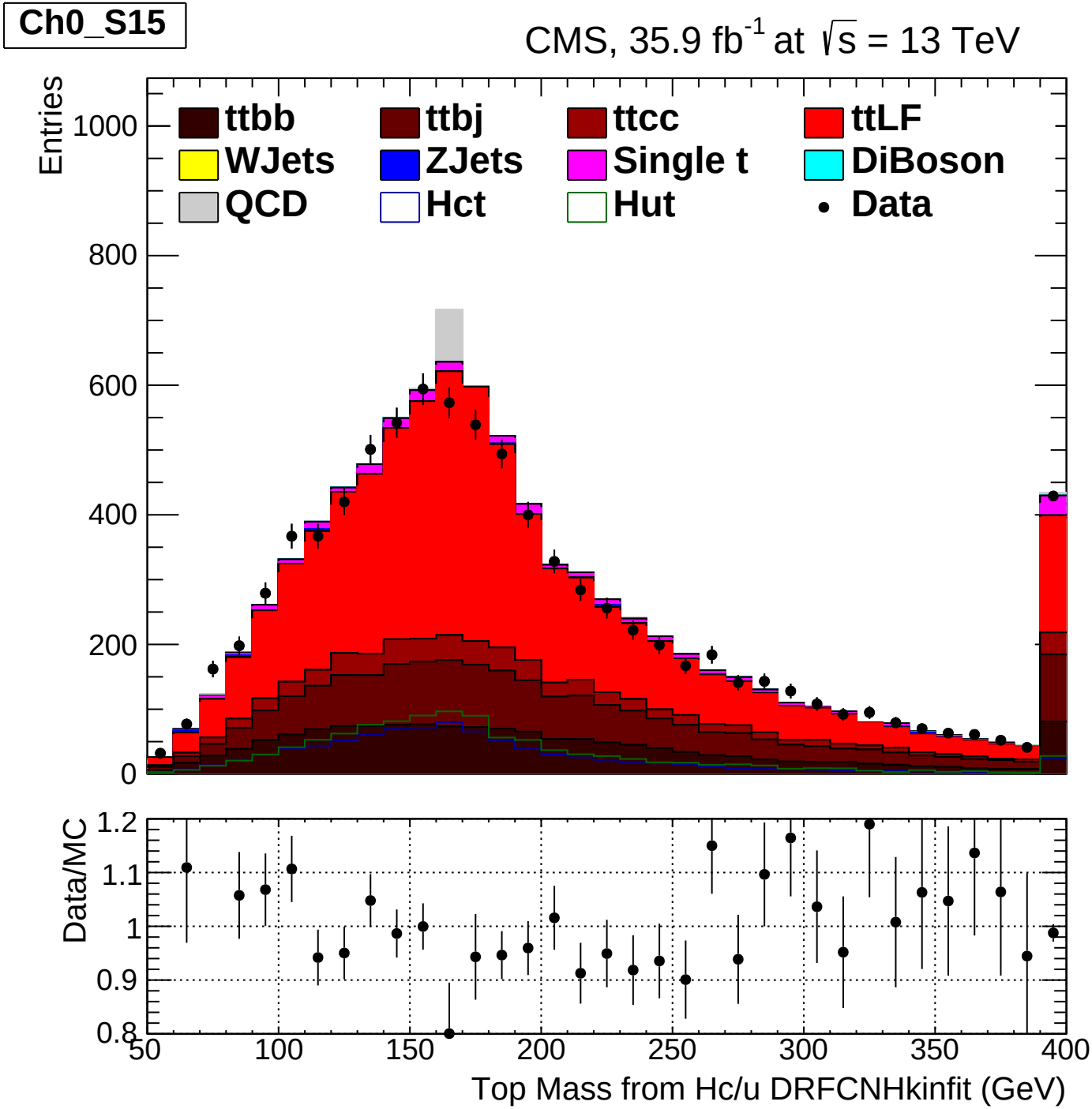
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch0_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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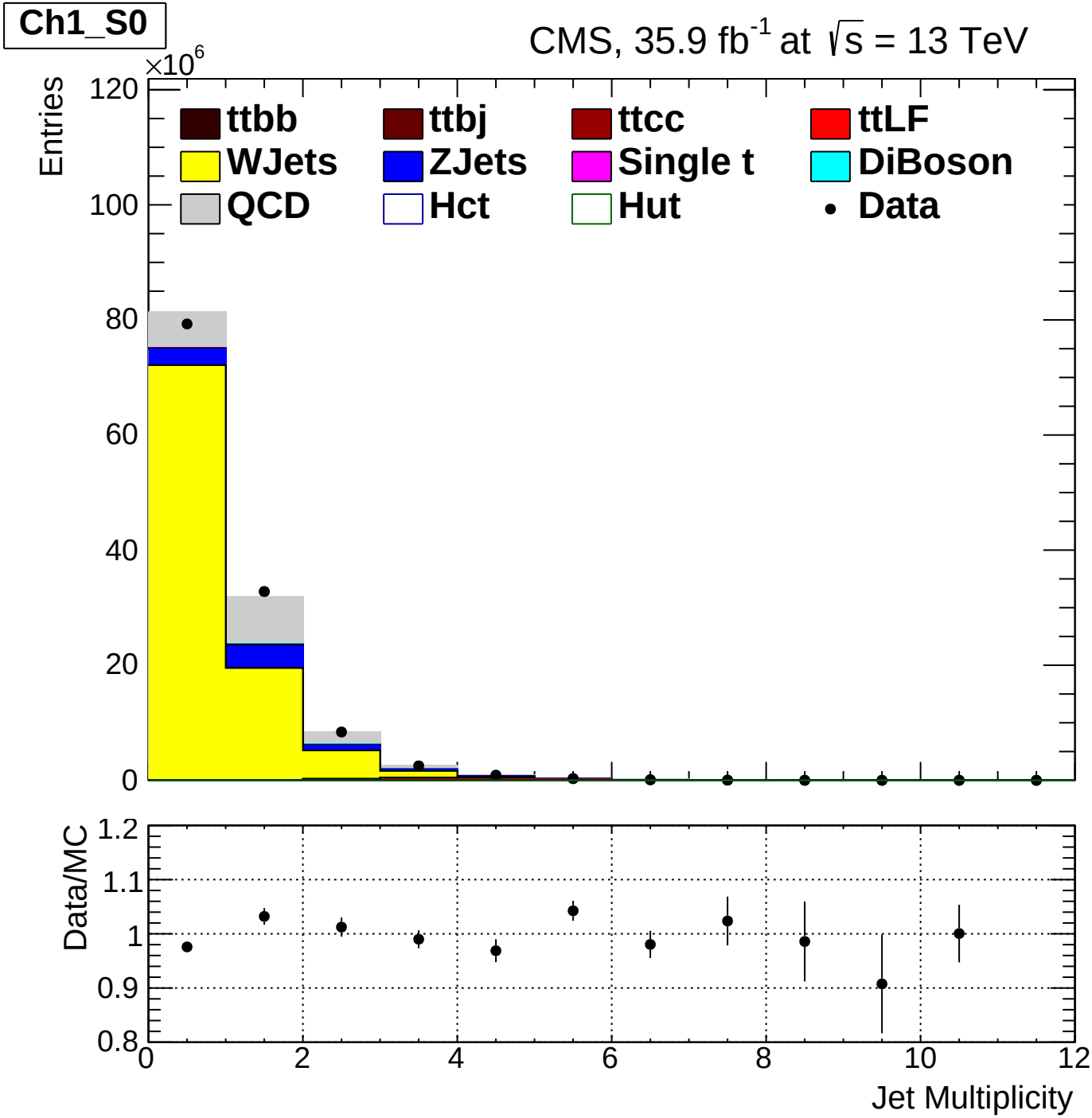
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)


Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
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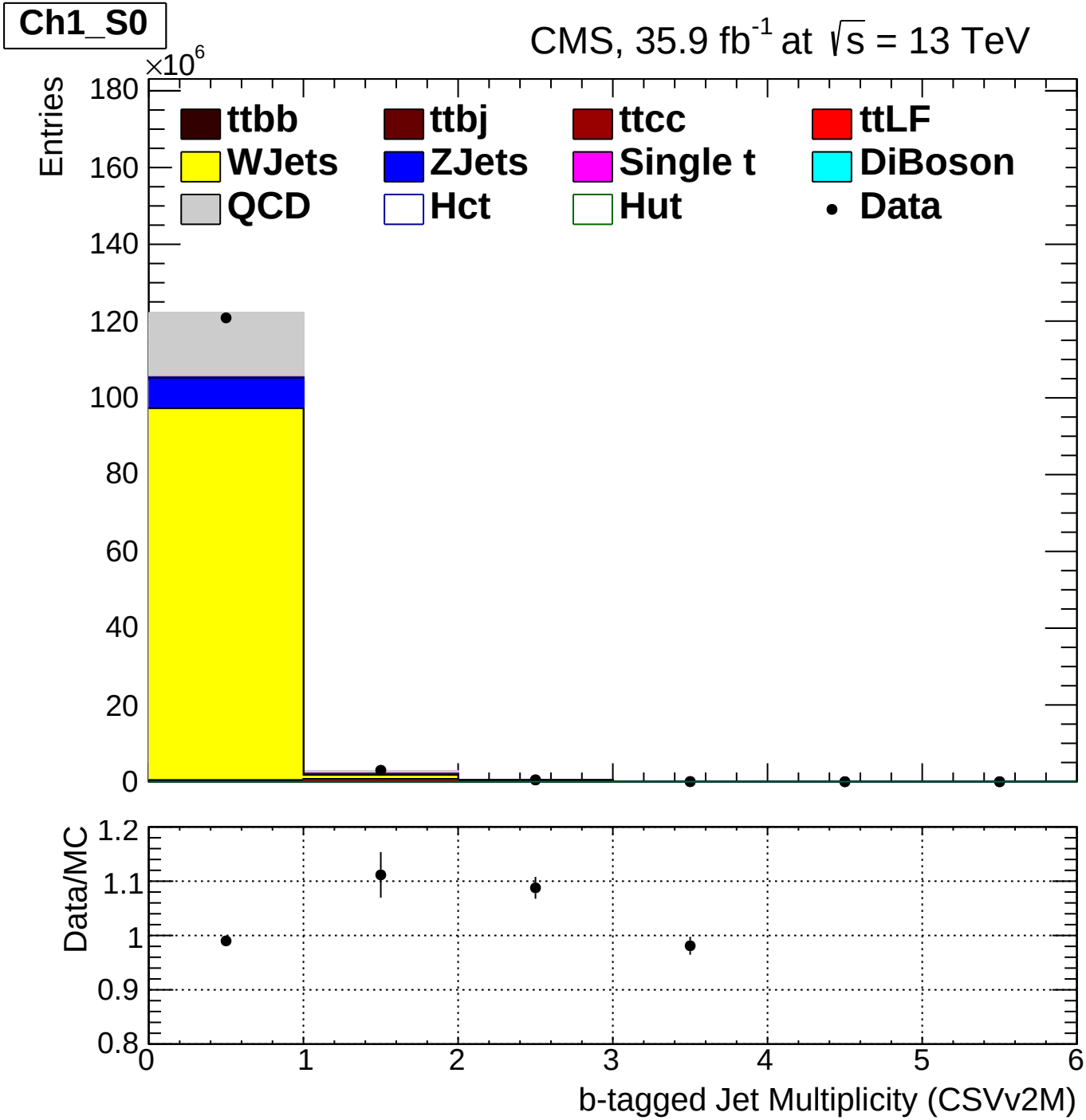
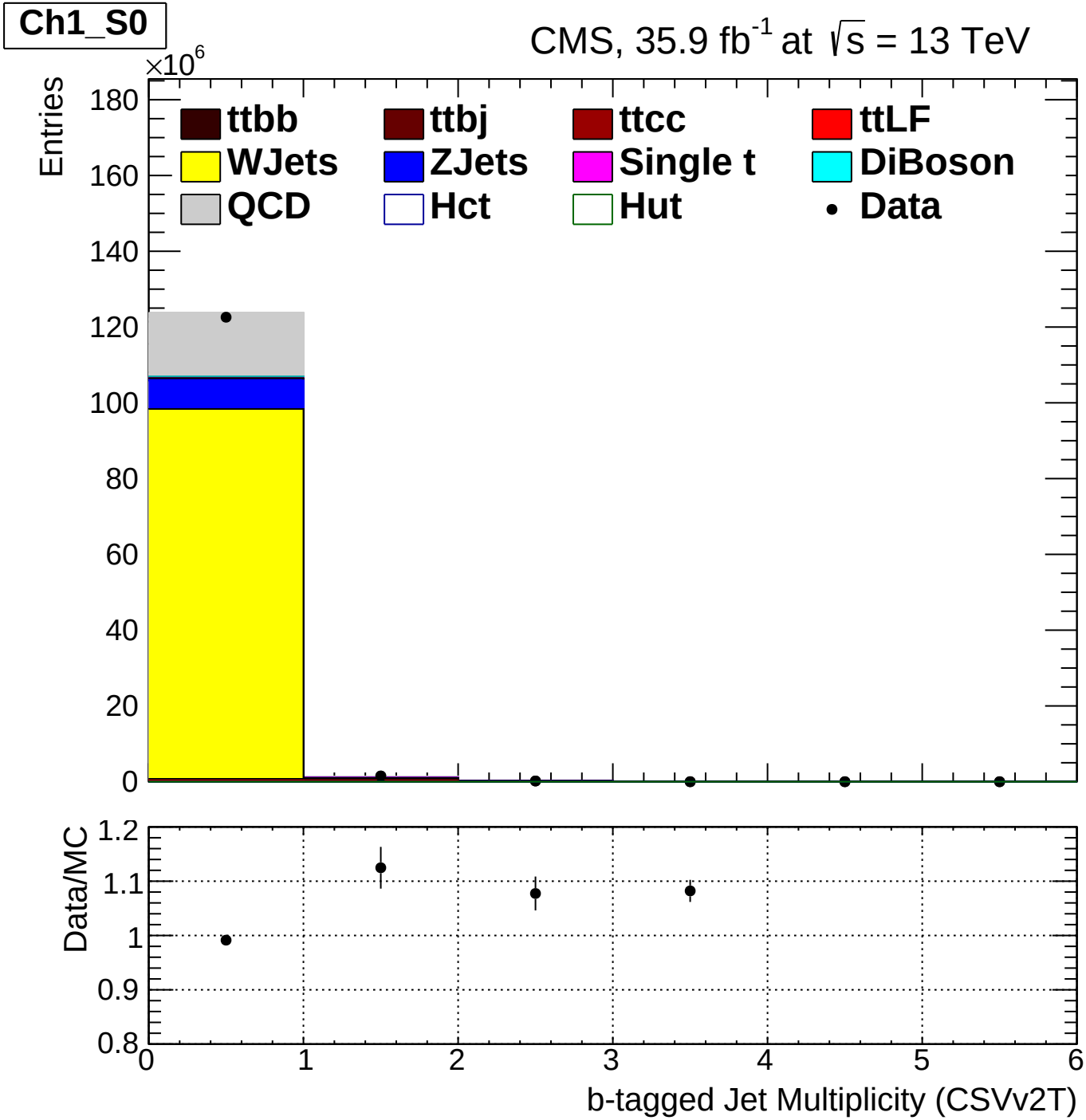
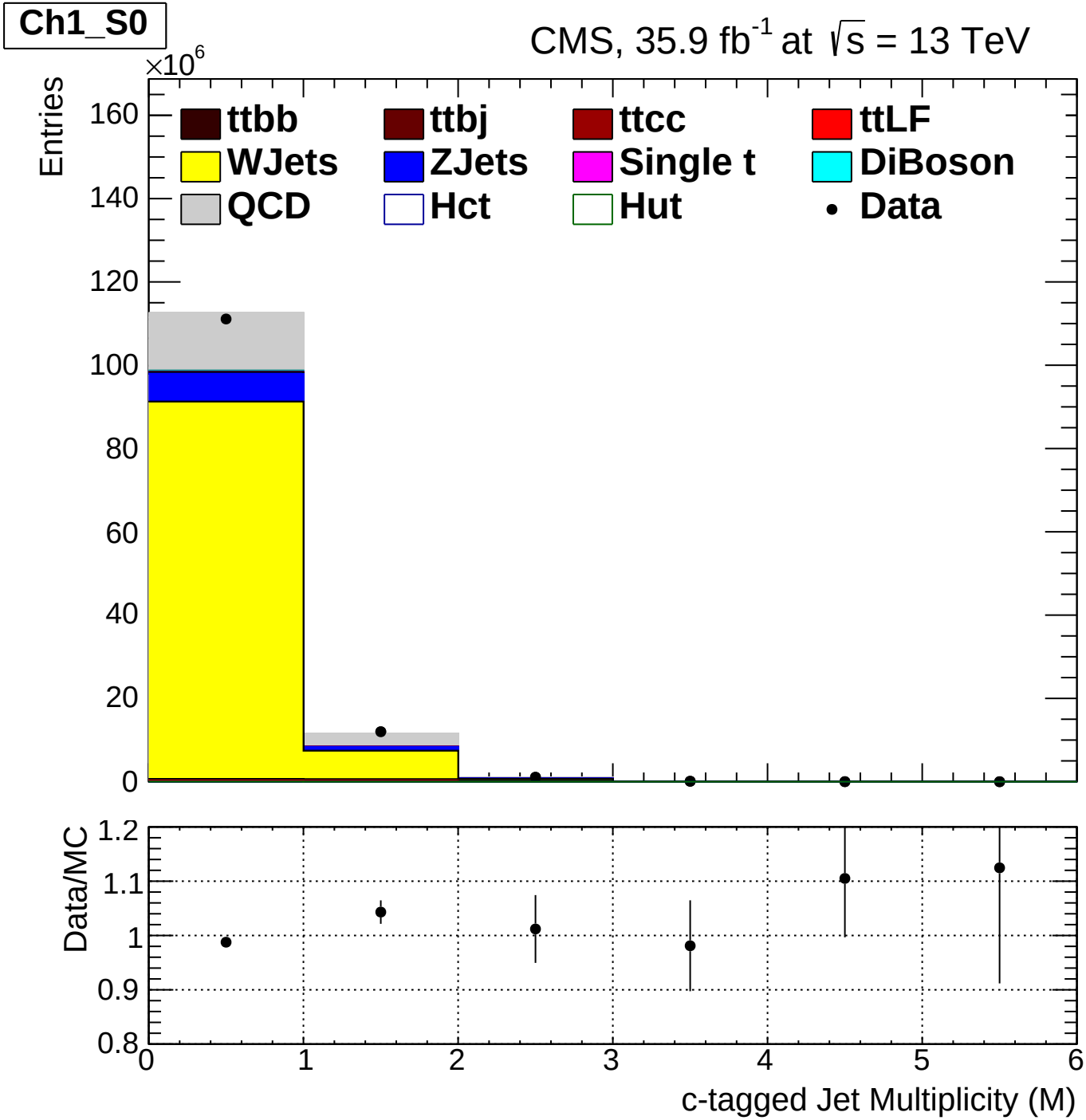
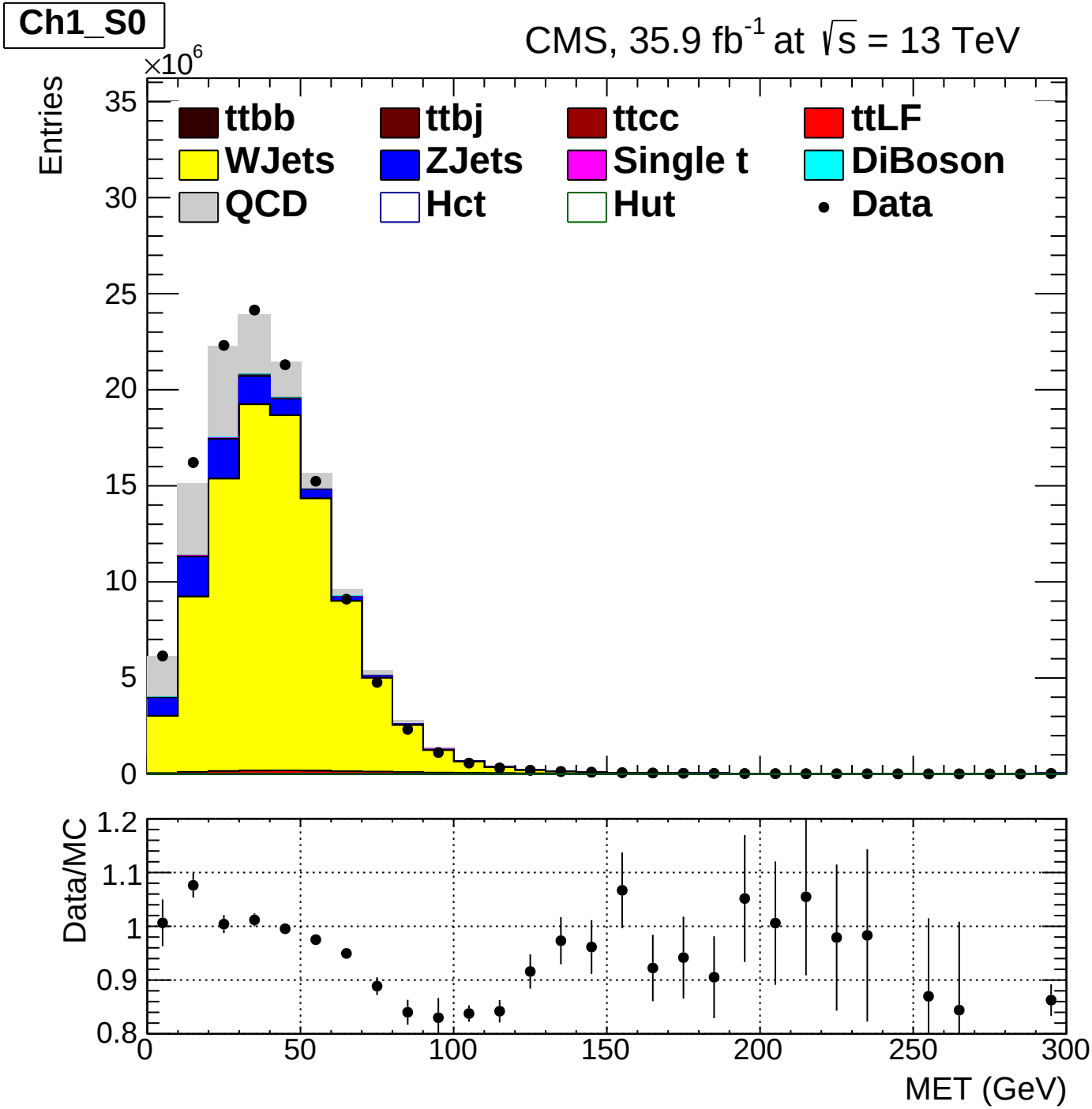
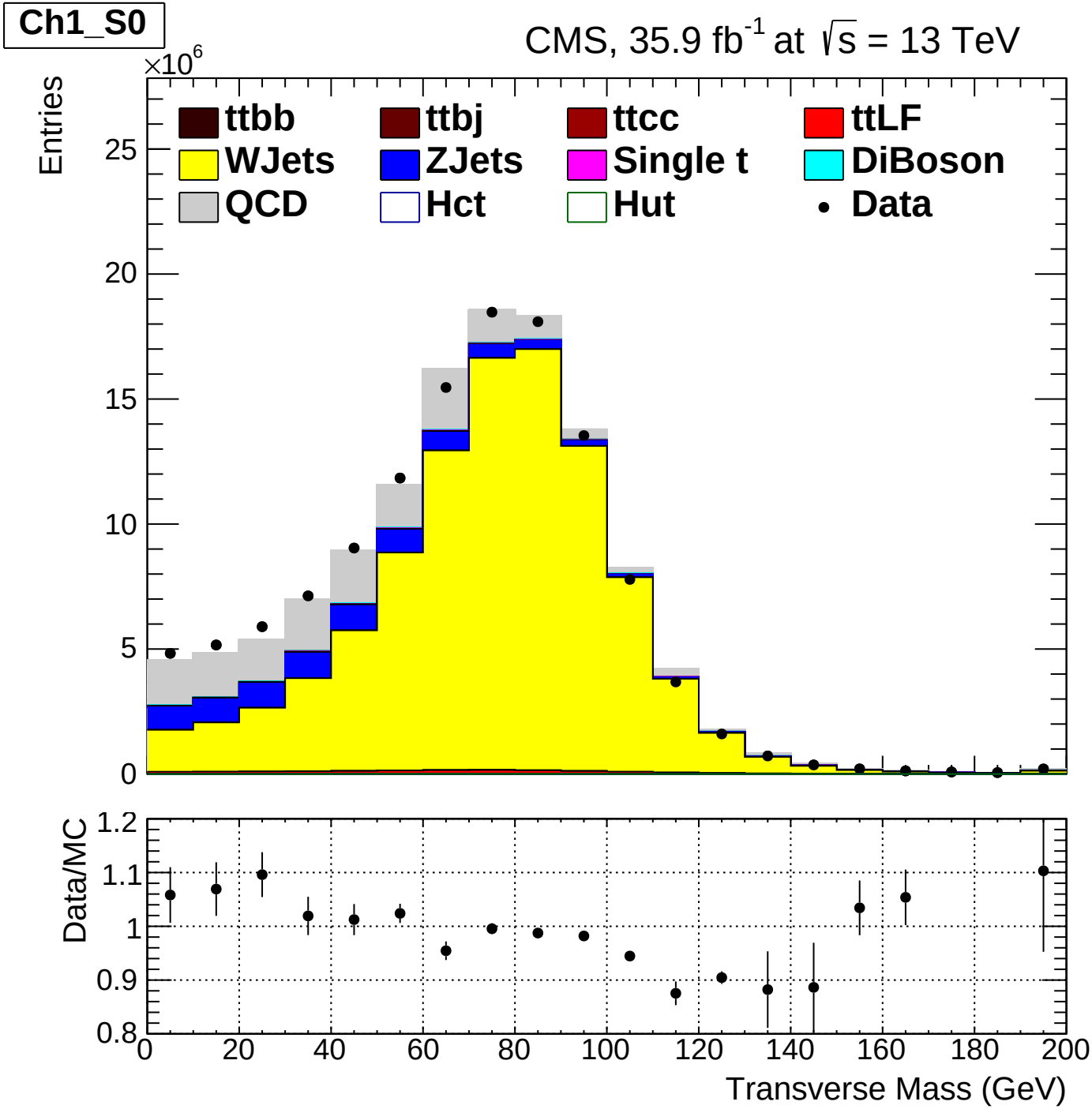
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

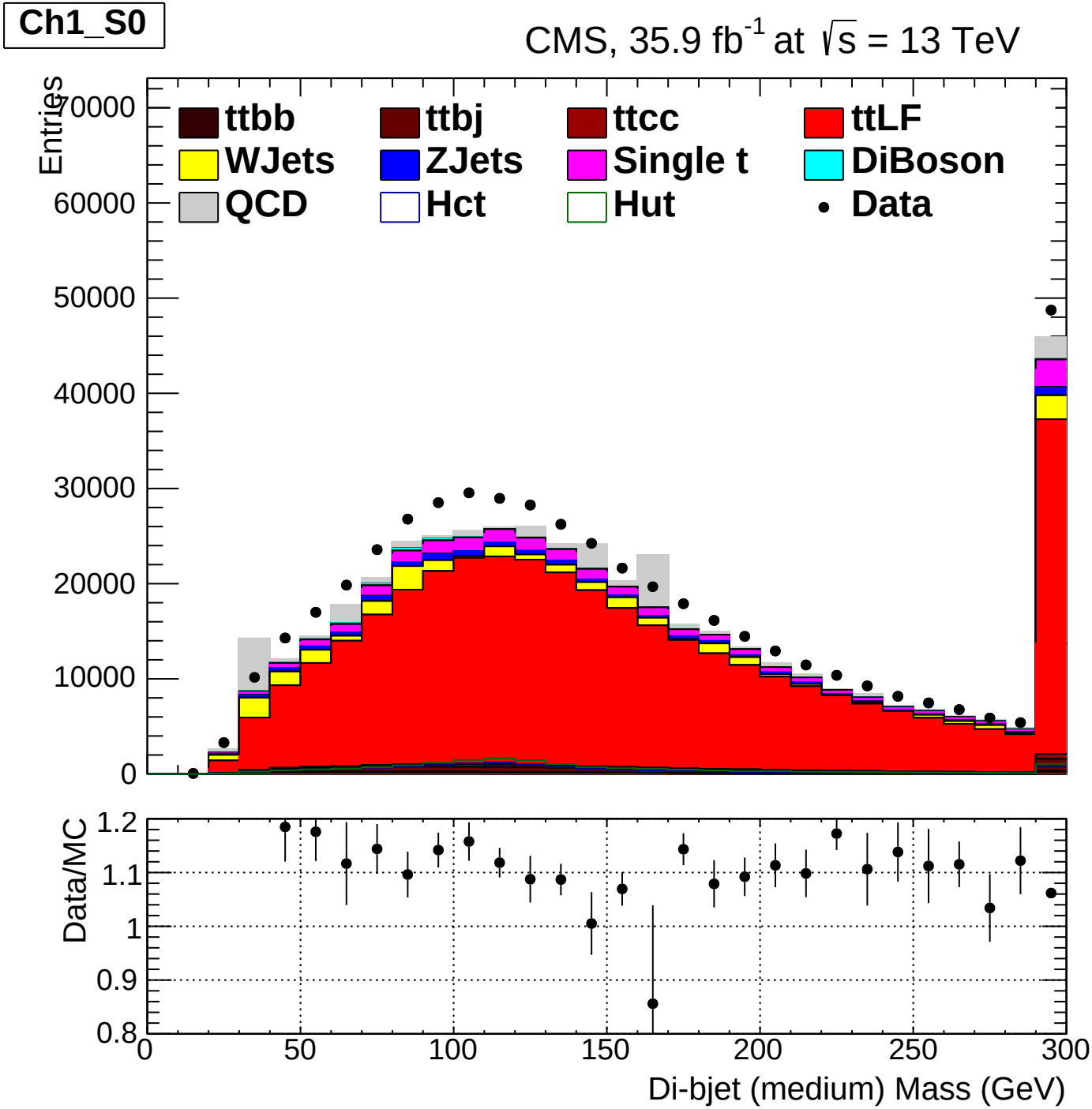

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

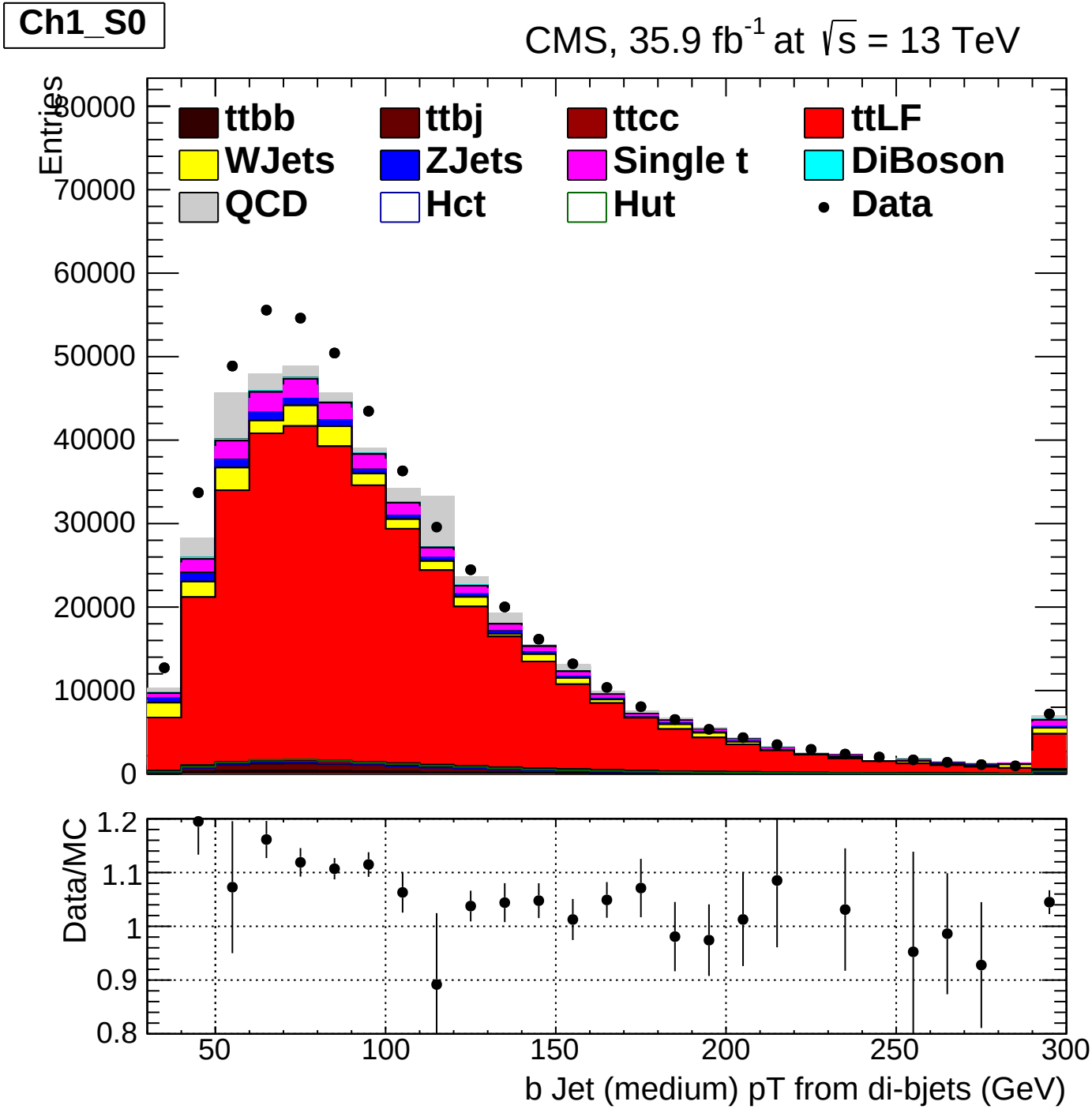

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

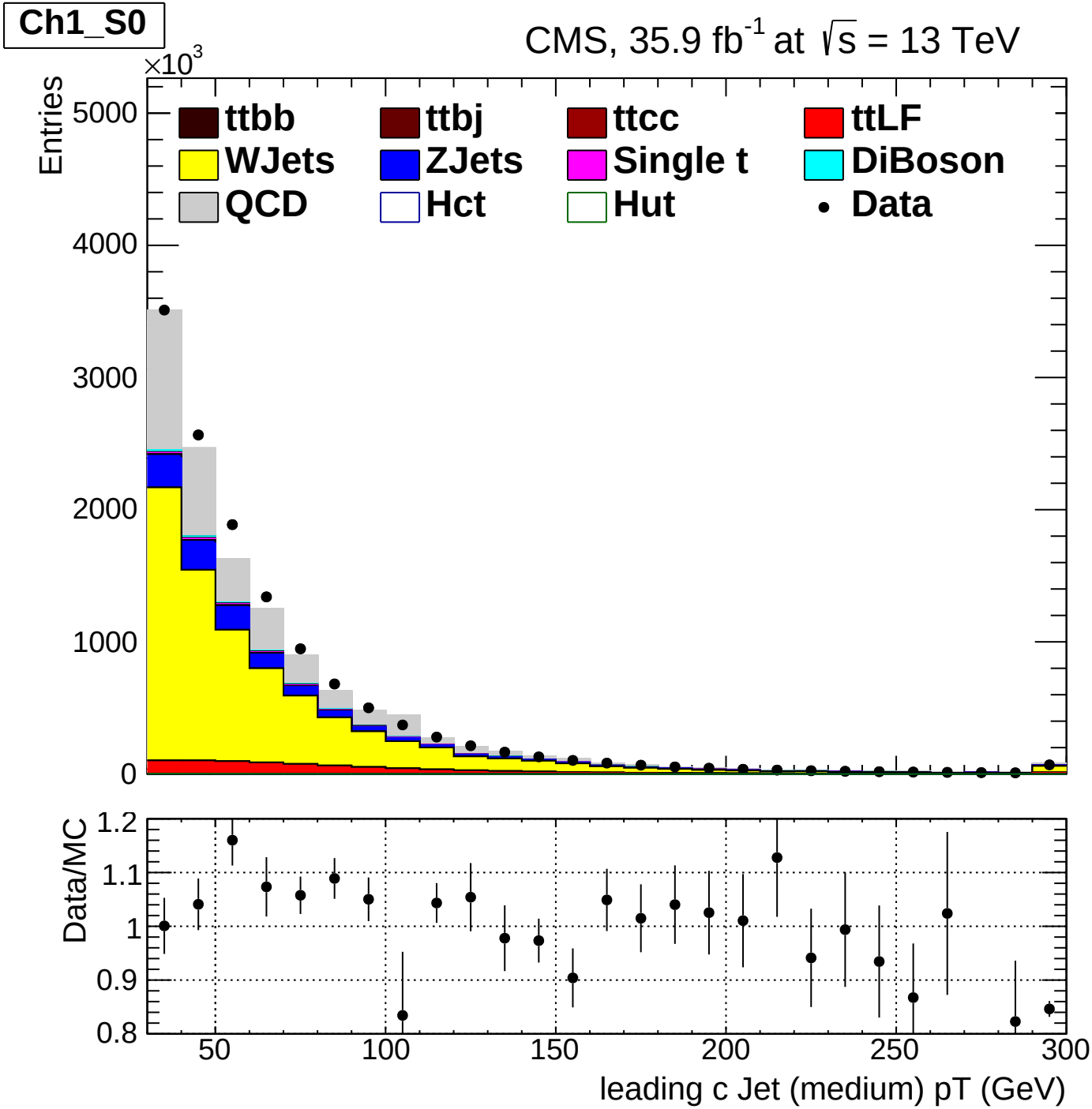

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

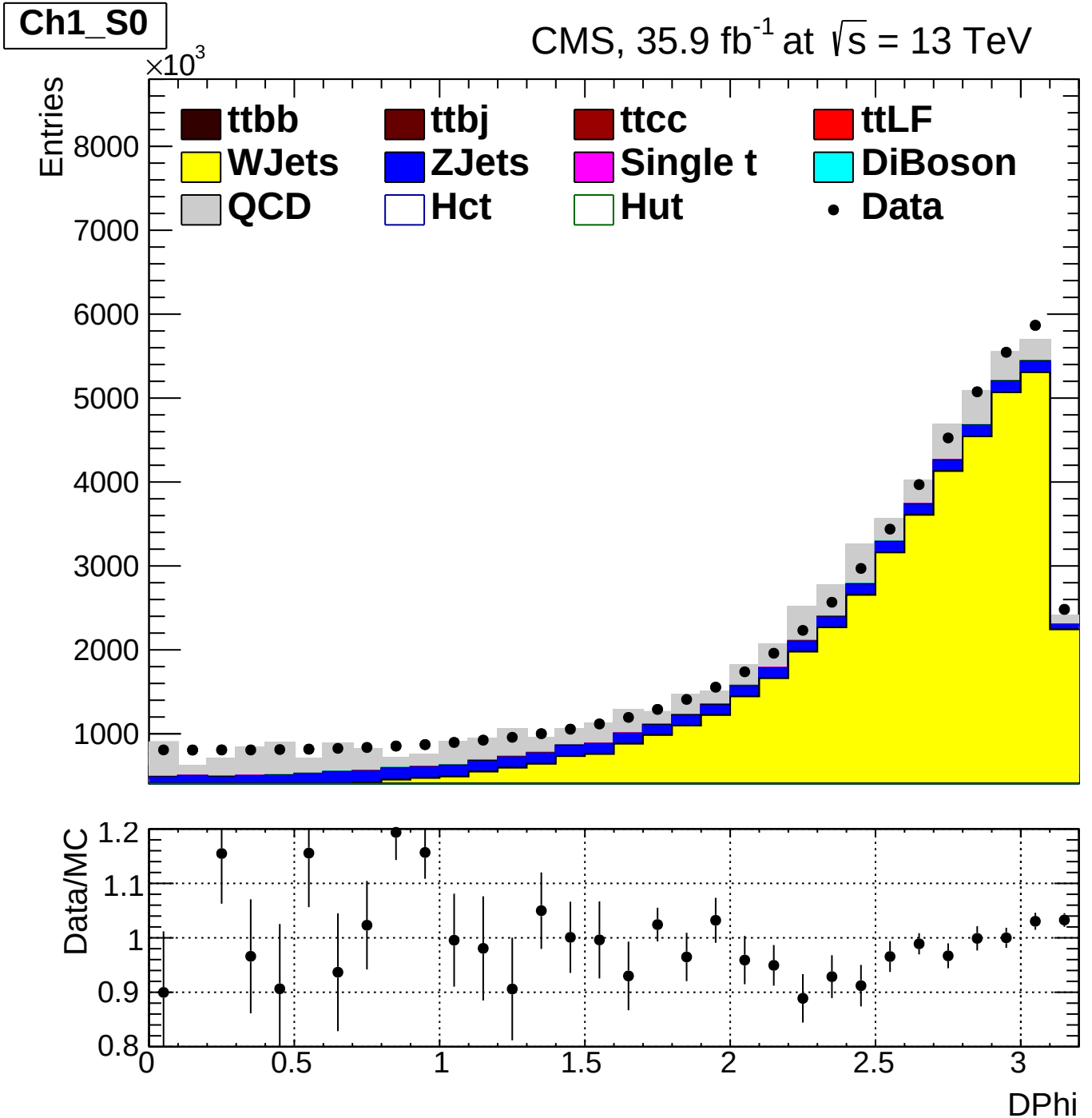

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

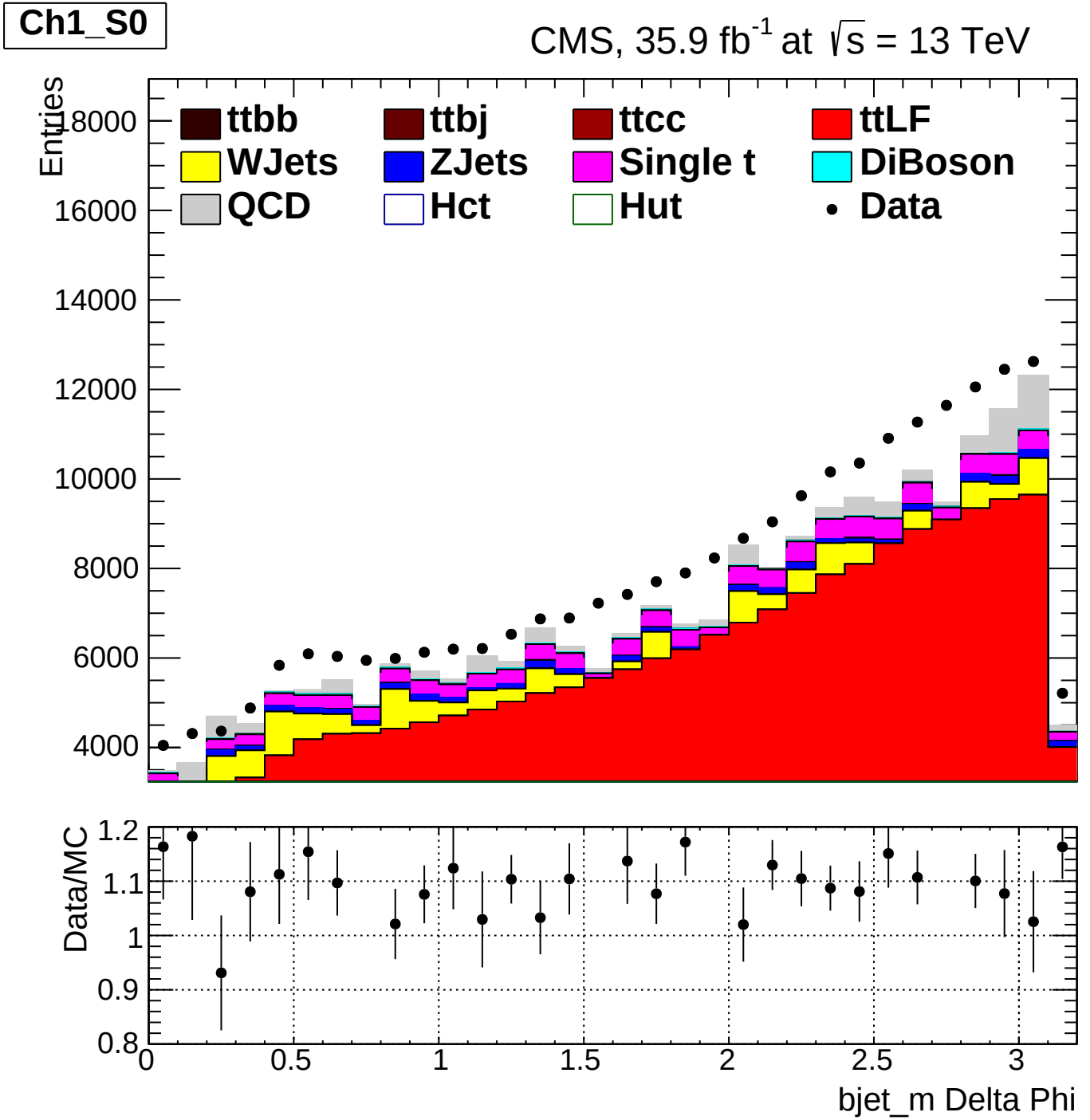

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

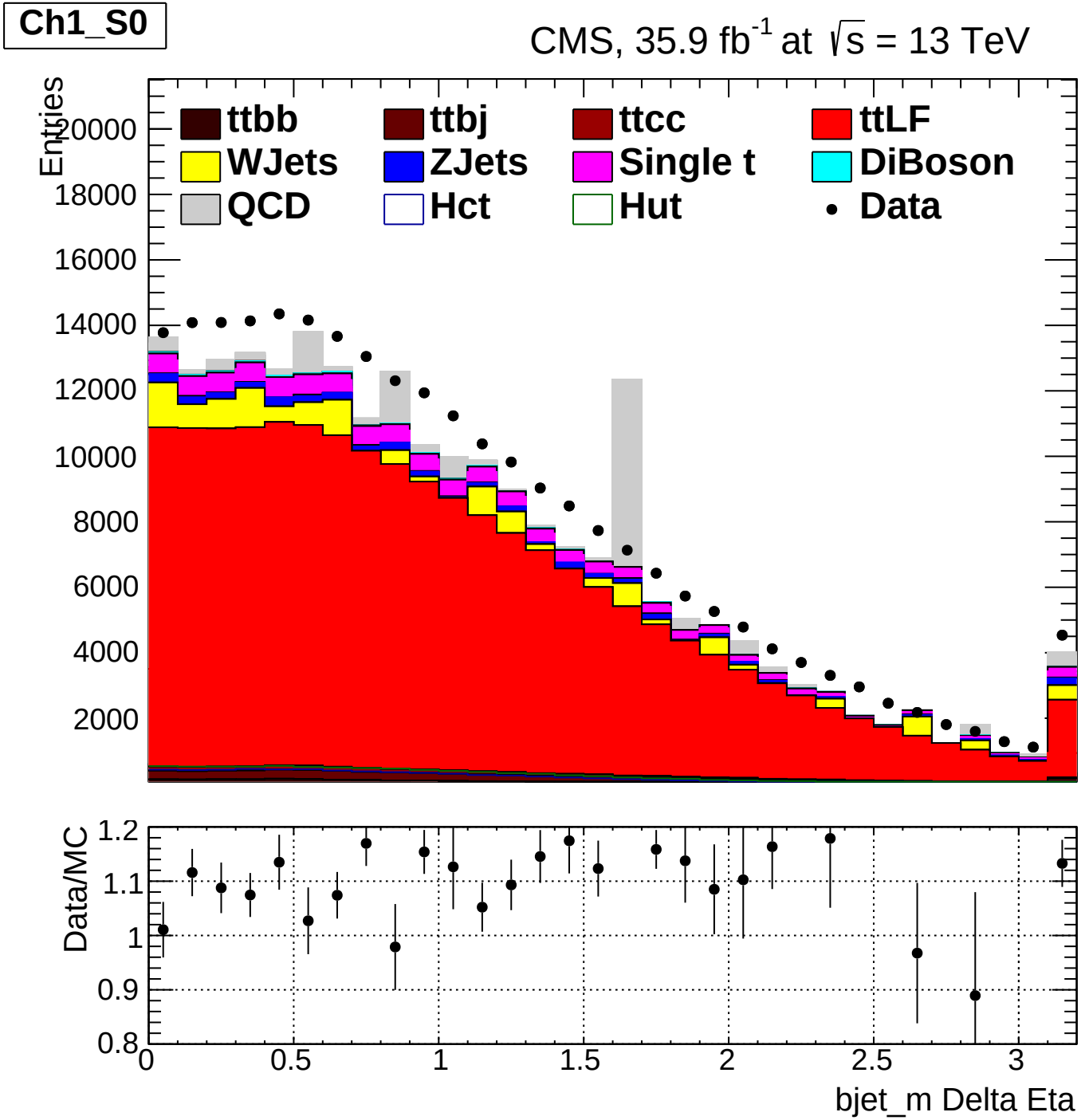

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

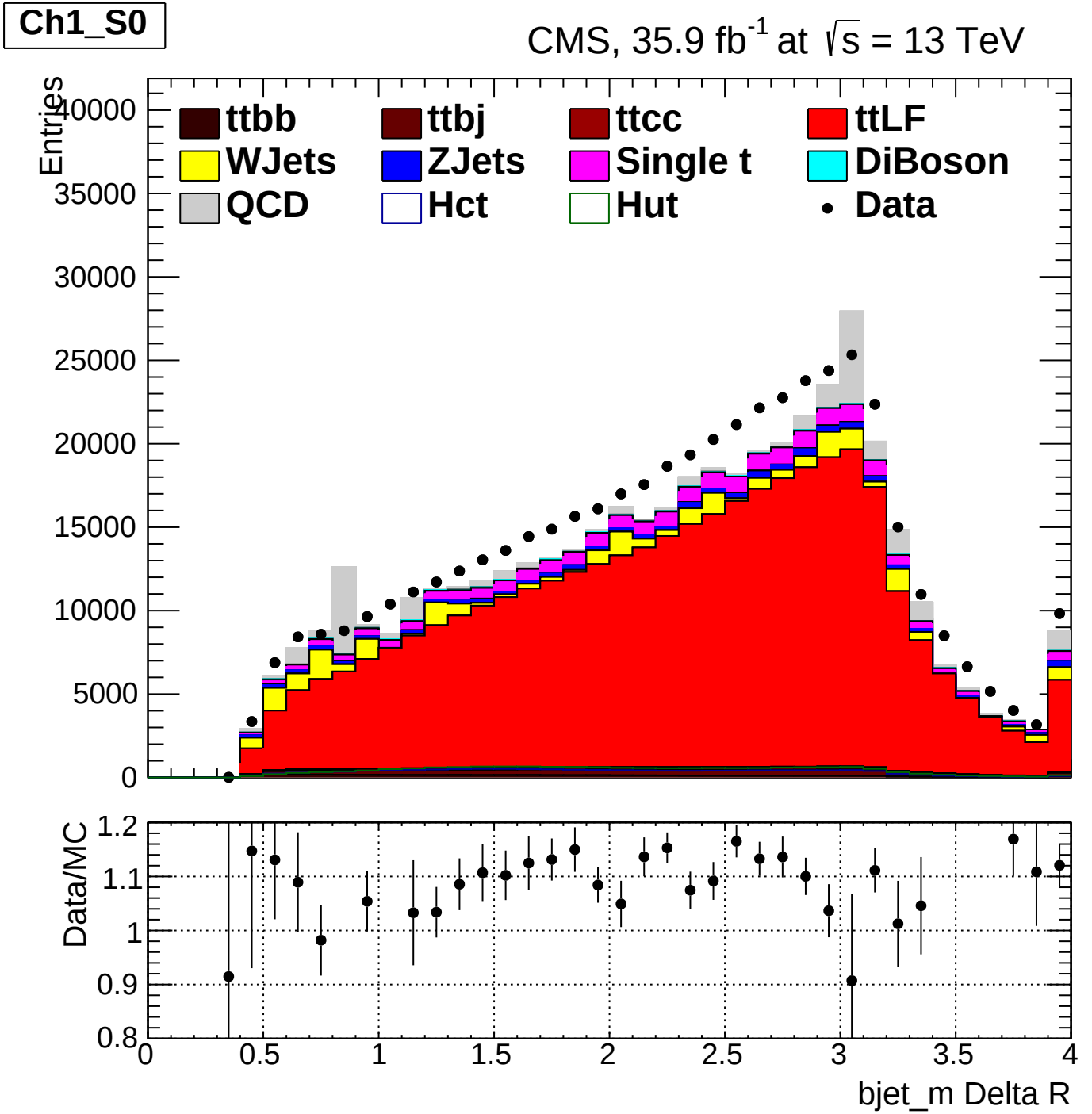

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

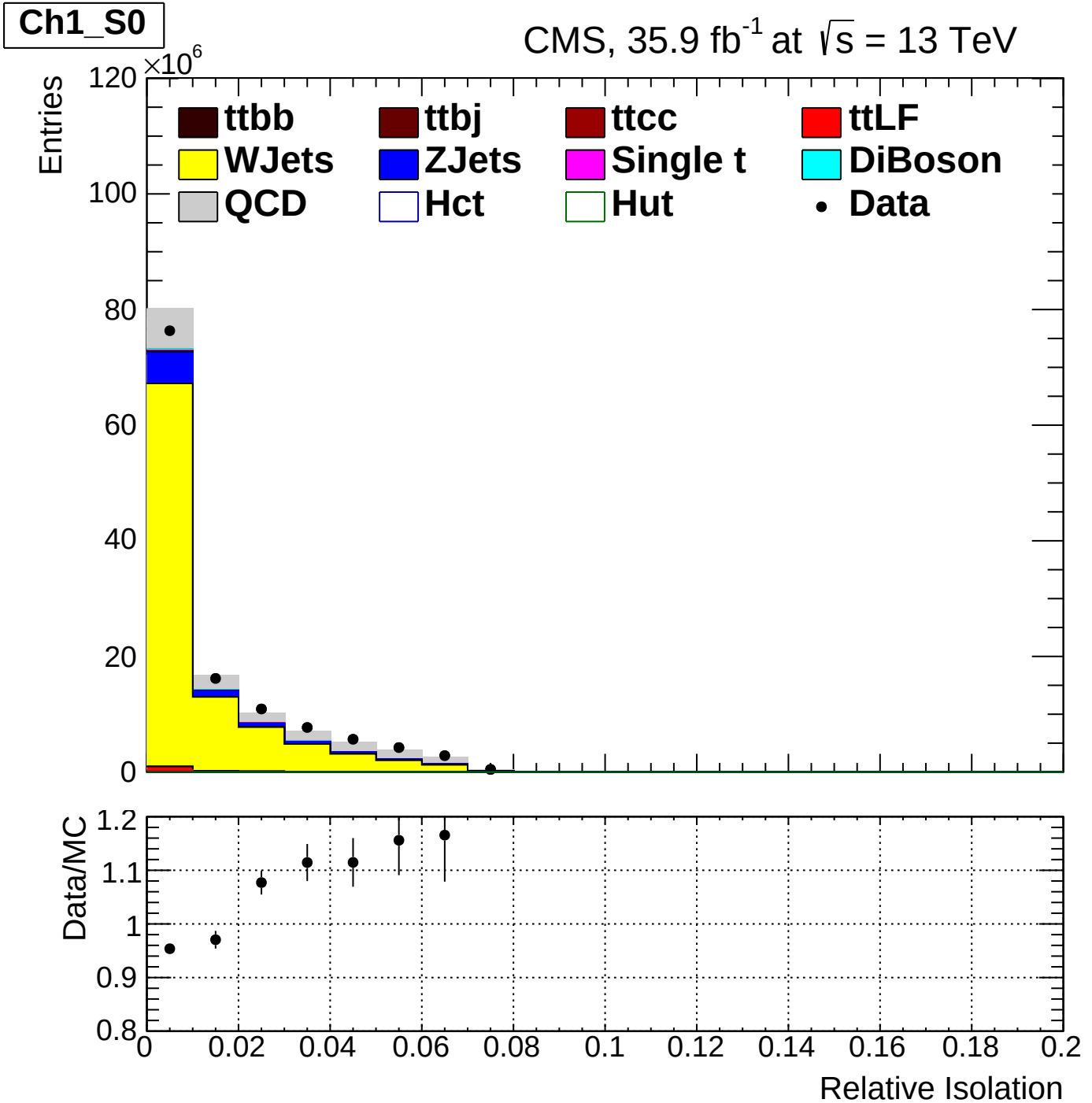

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

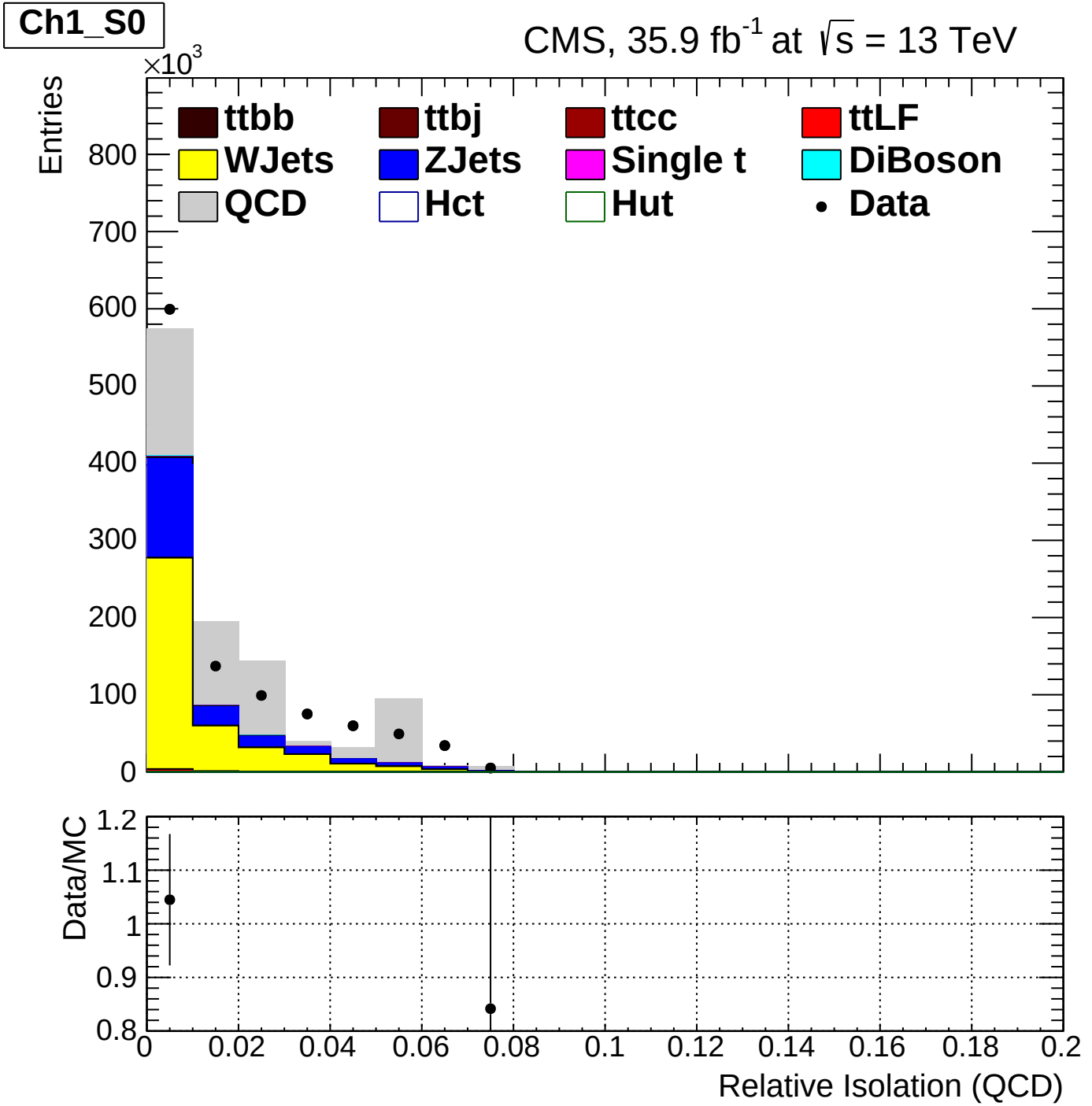

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
8000
7000
6000
5000
4000
3000
2000
1000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

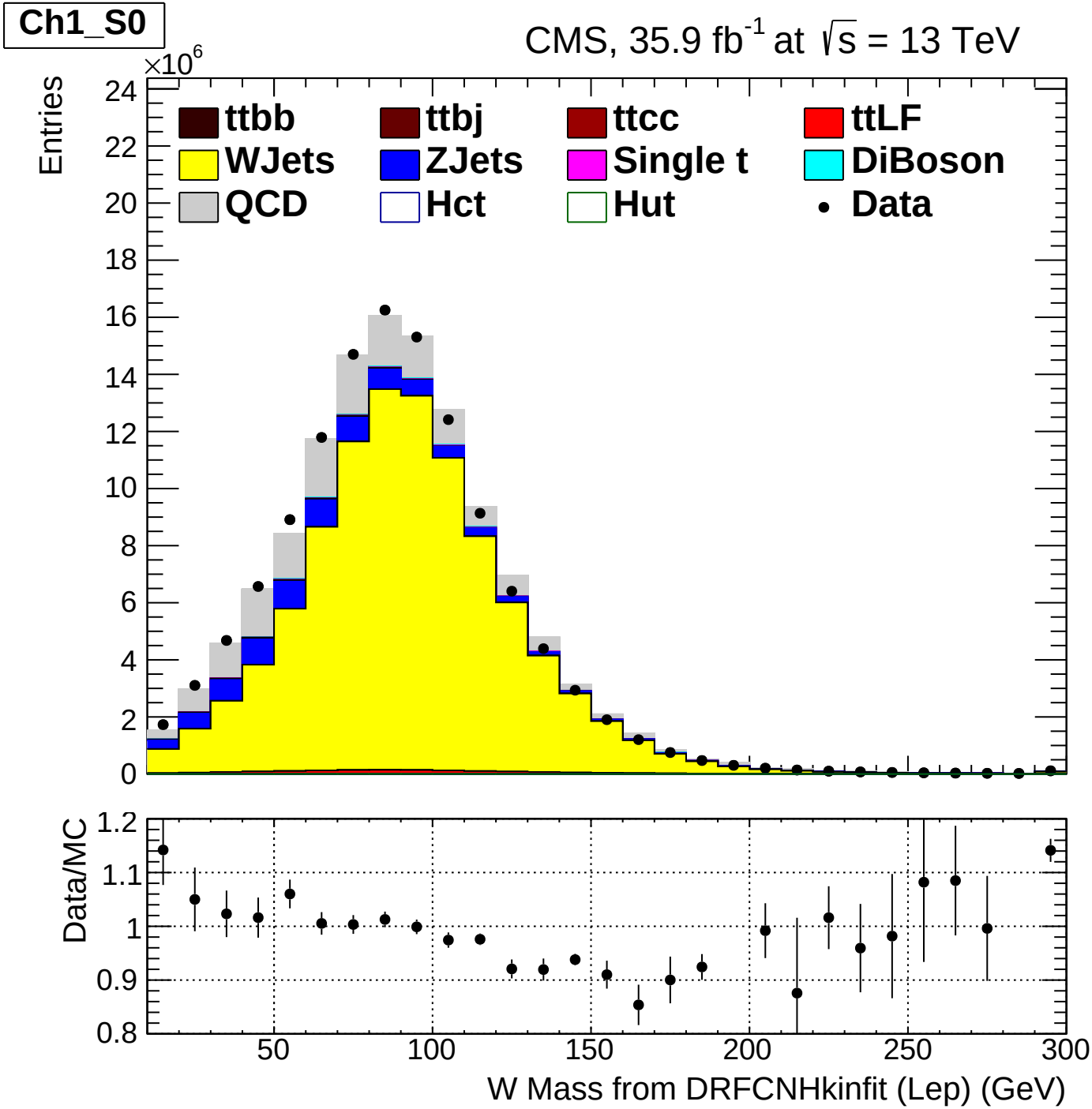

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
18000
16000
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

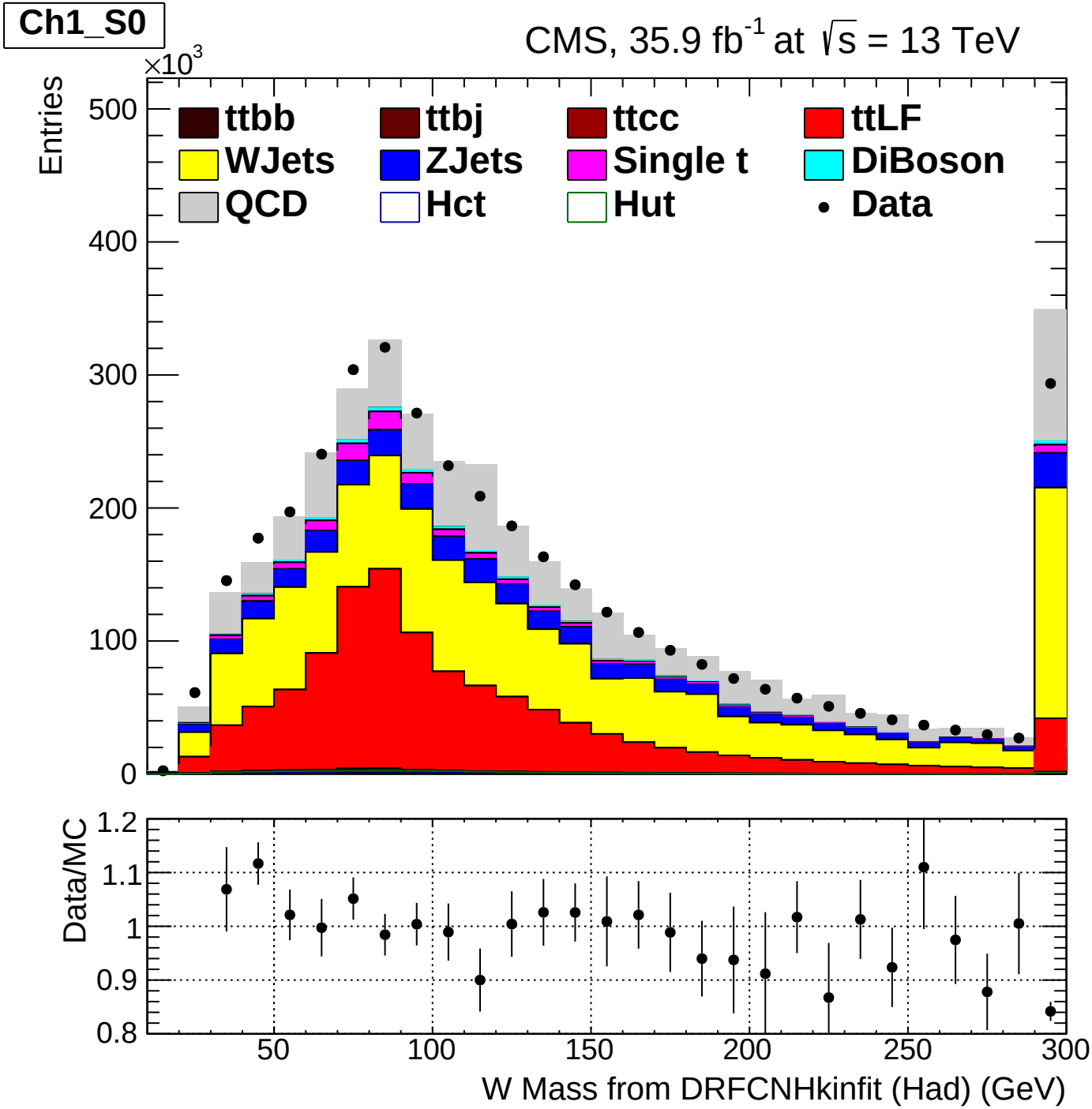

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

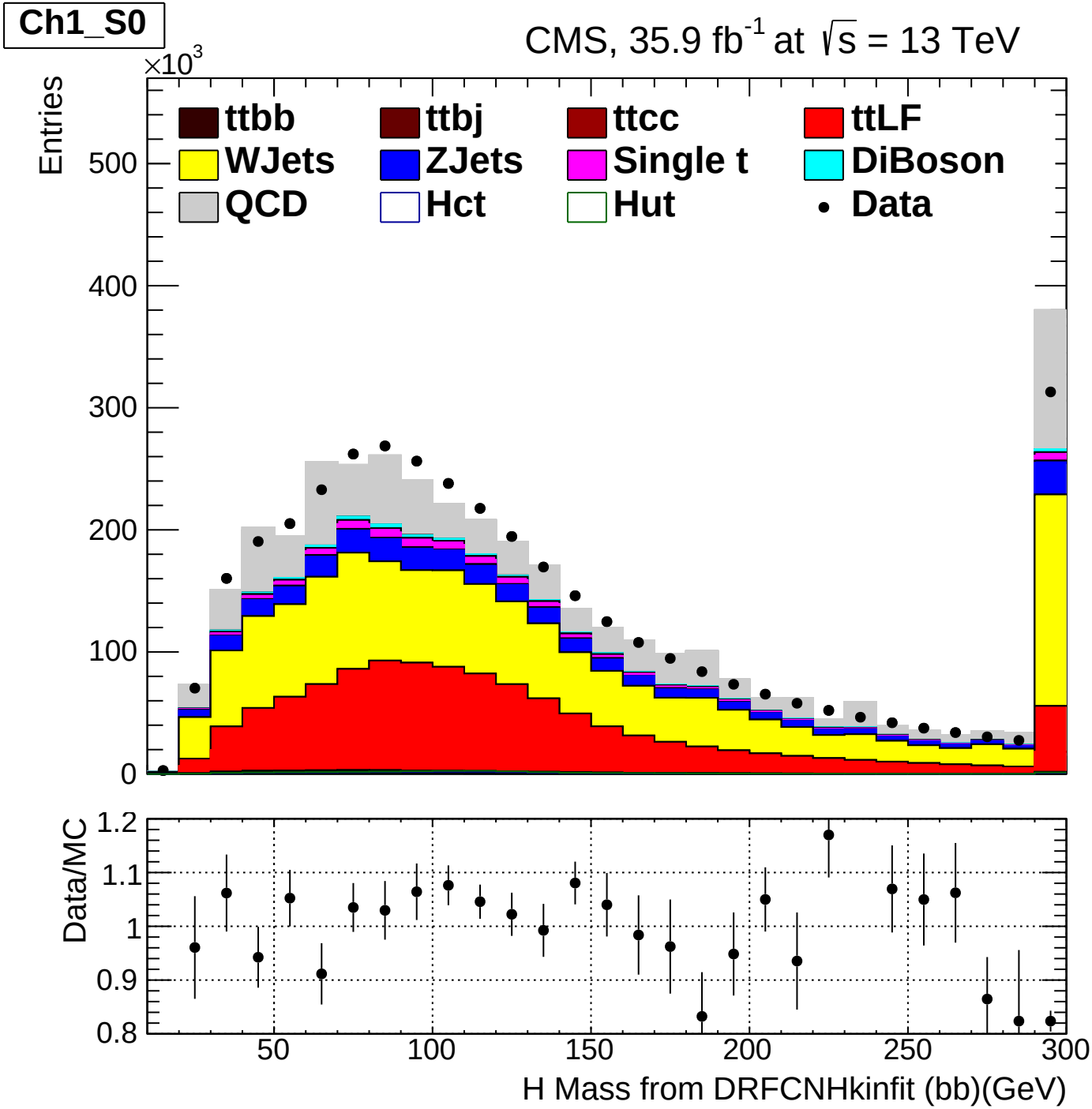

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

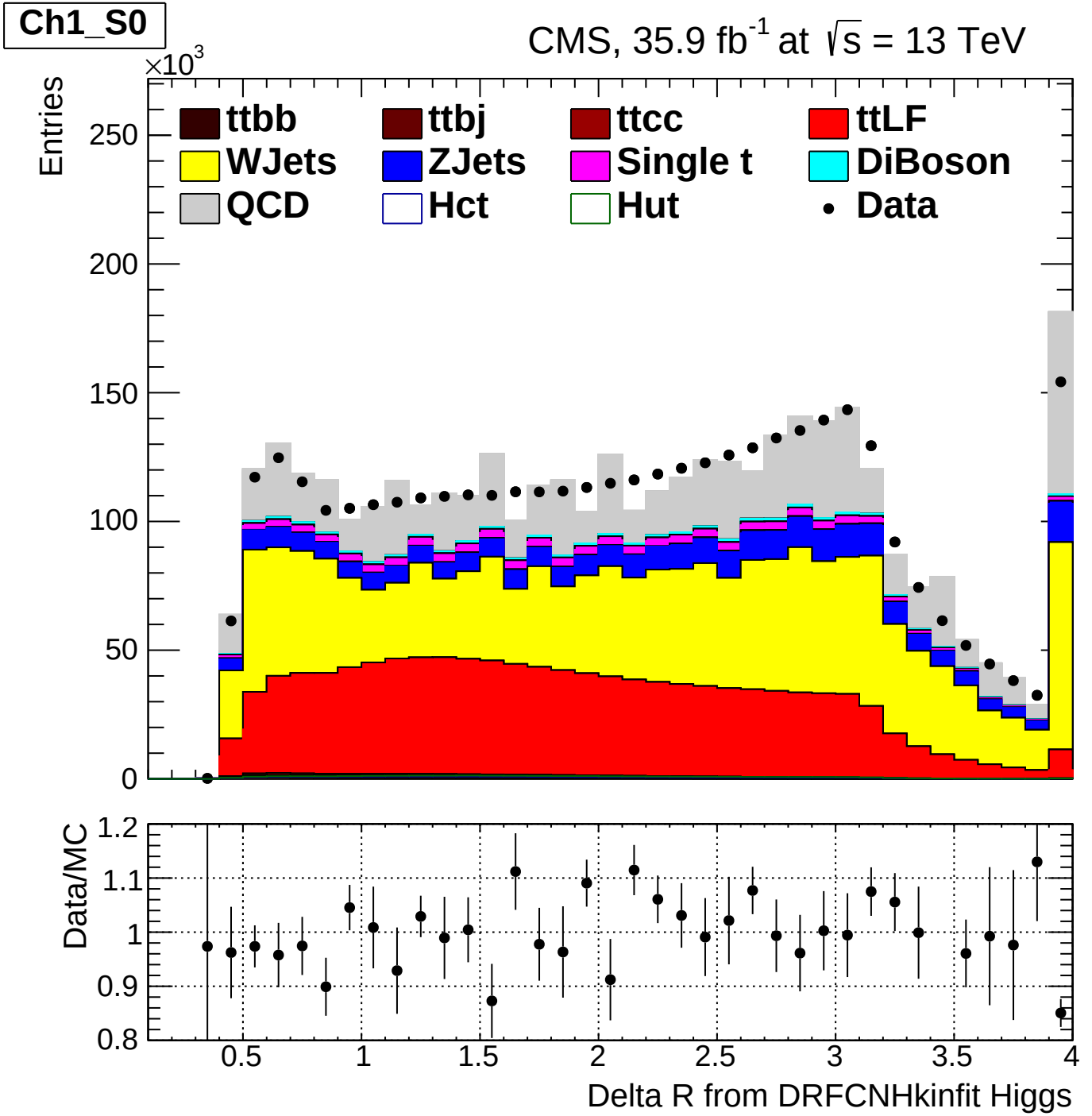

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

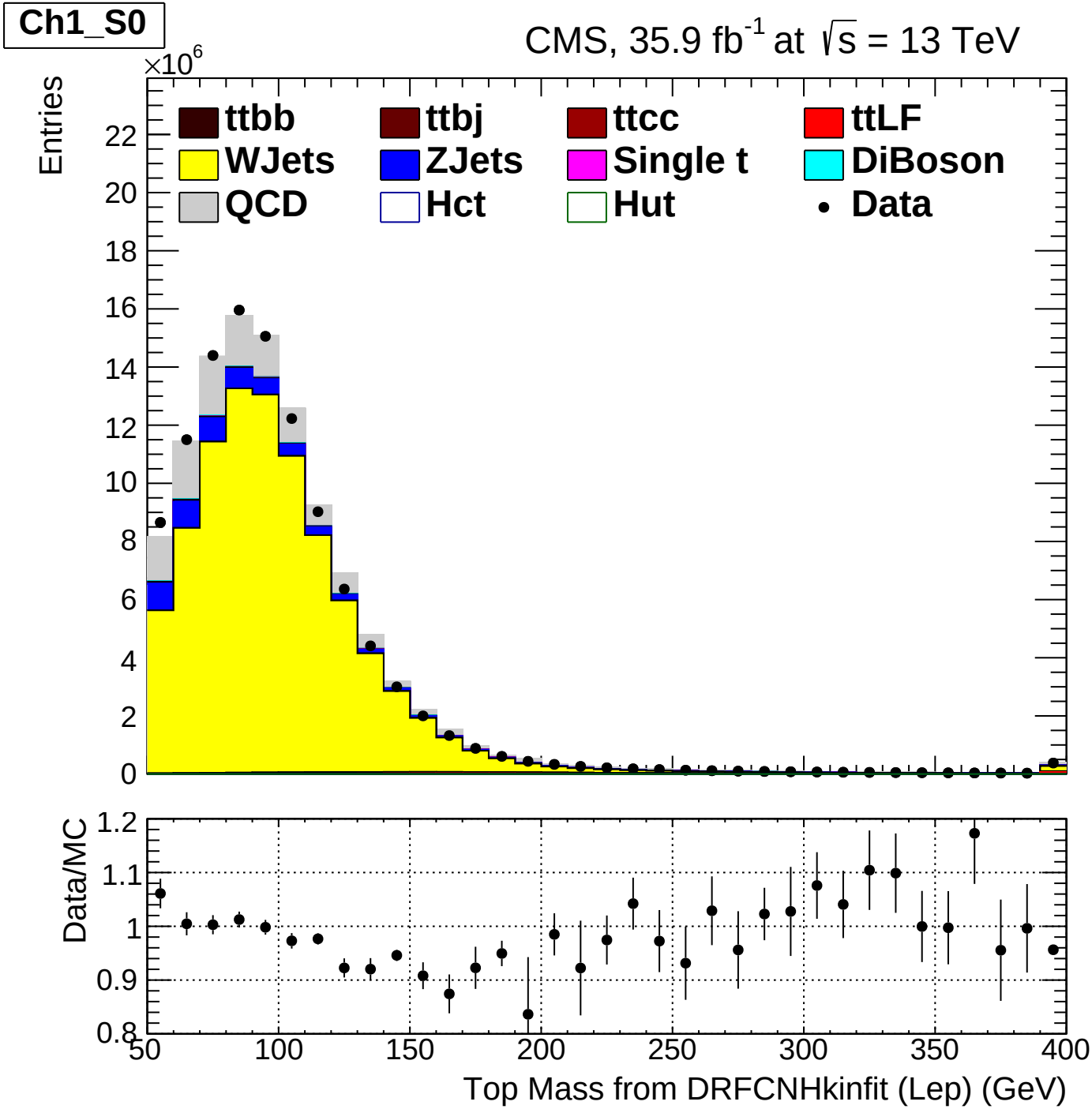

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

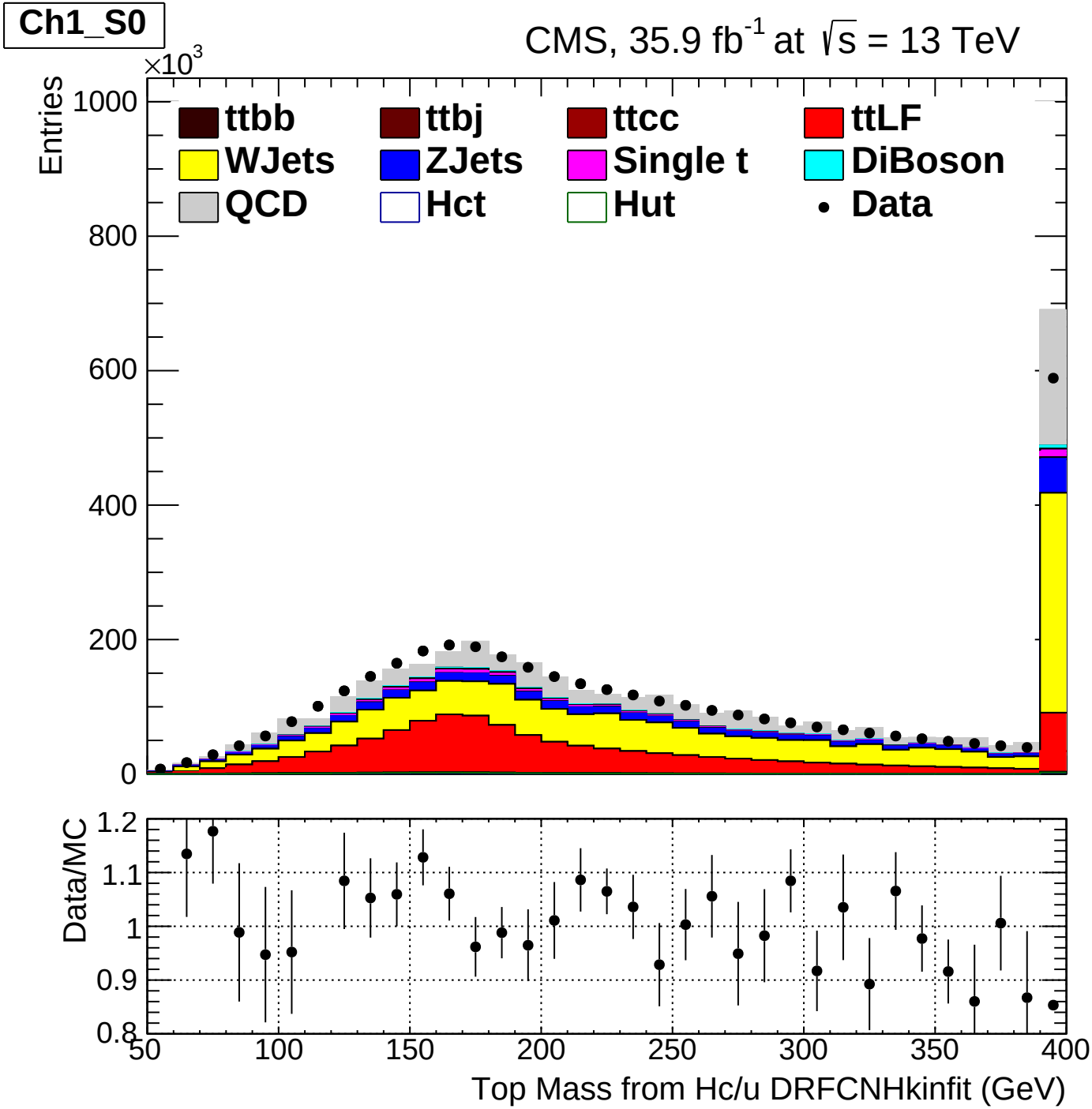

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

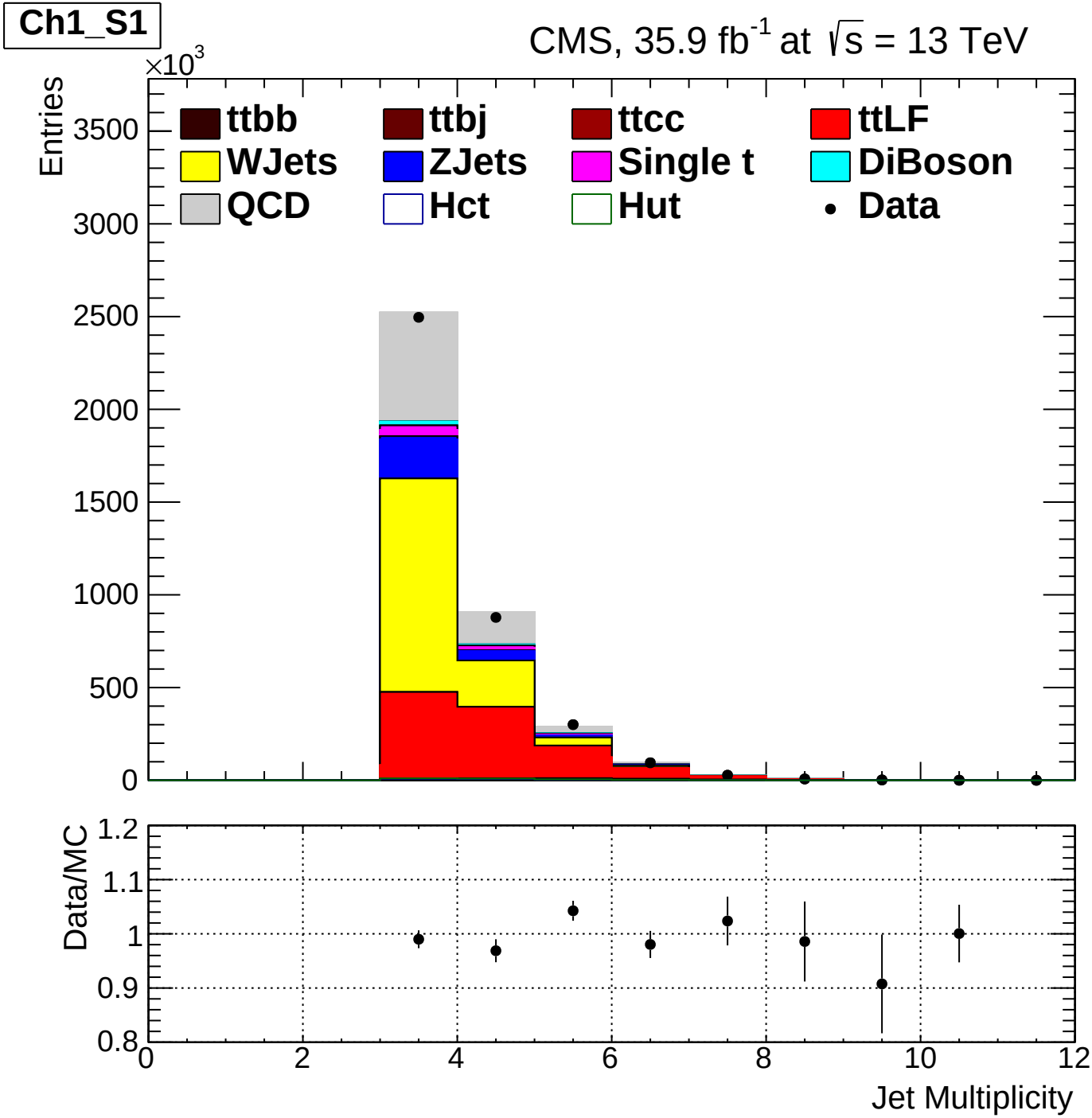

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

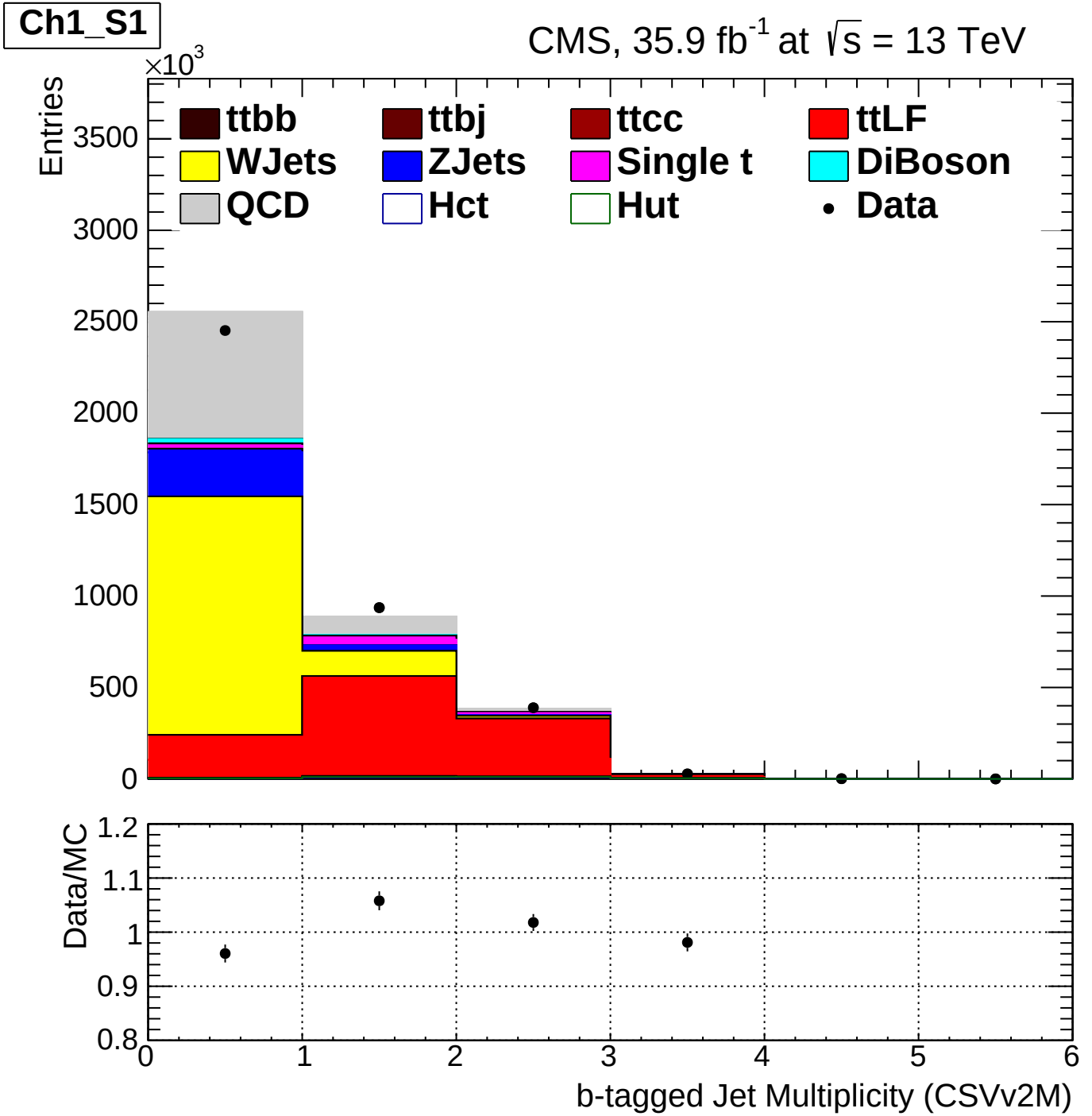

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

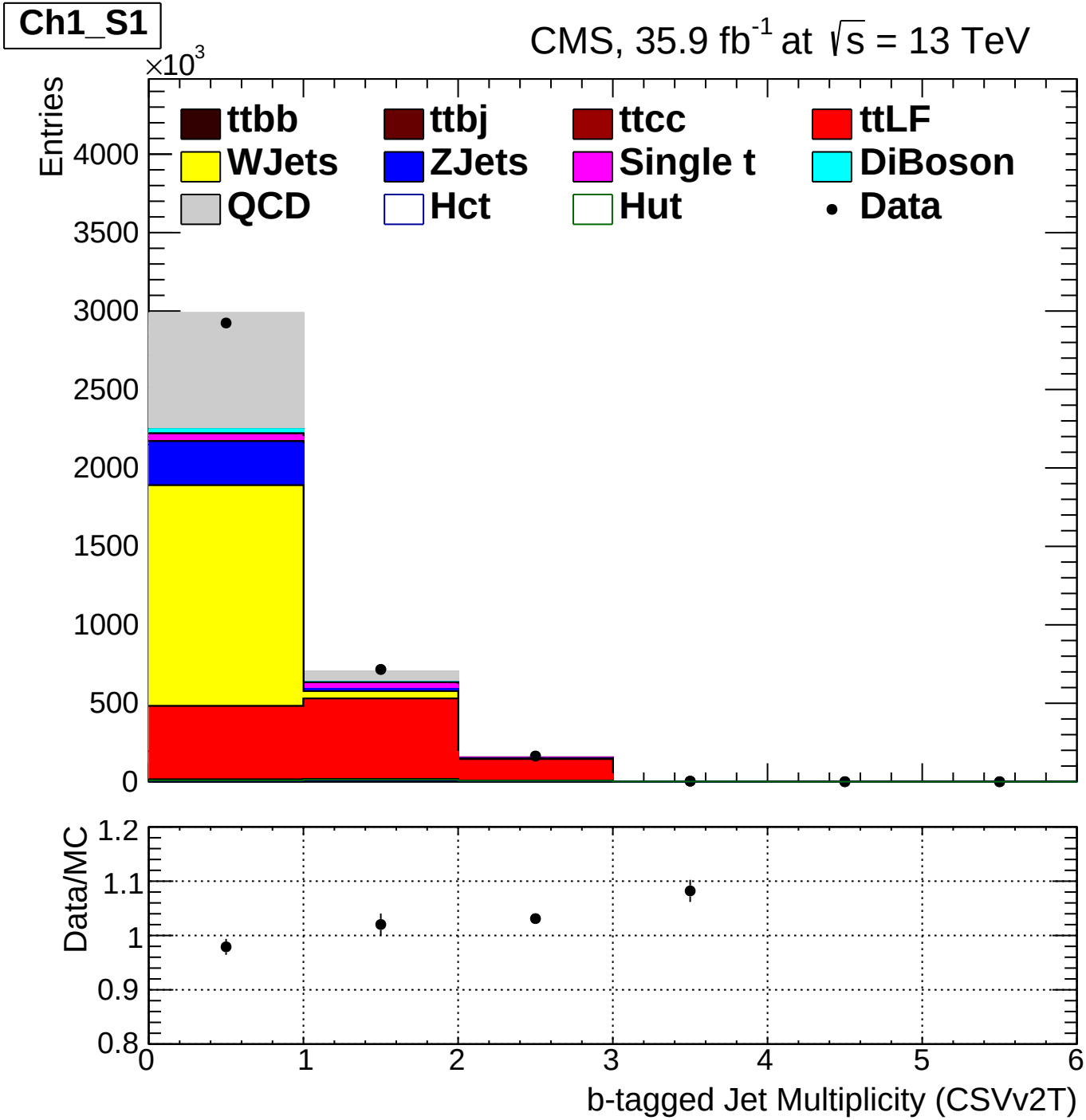

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

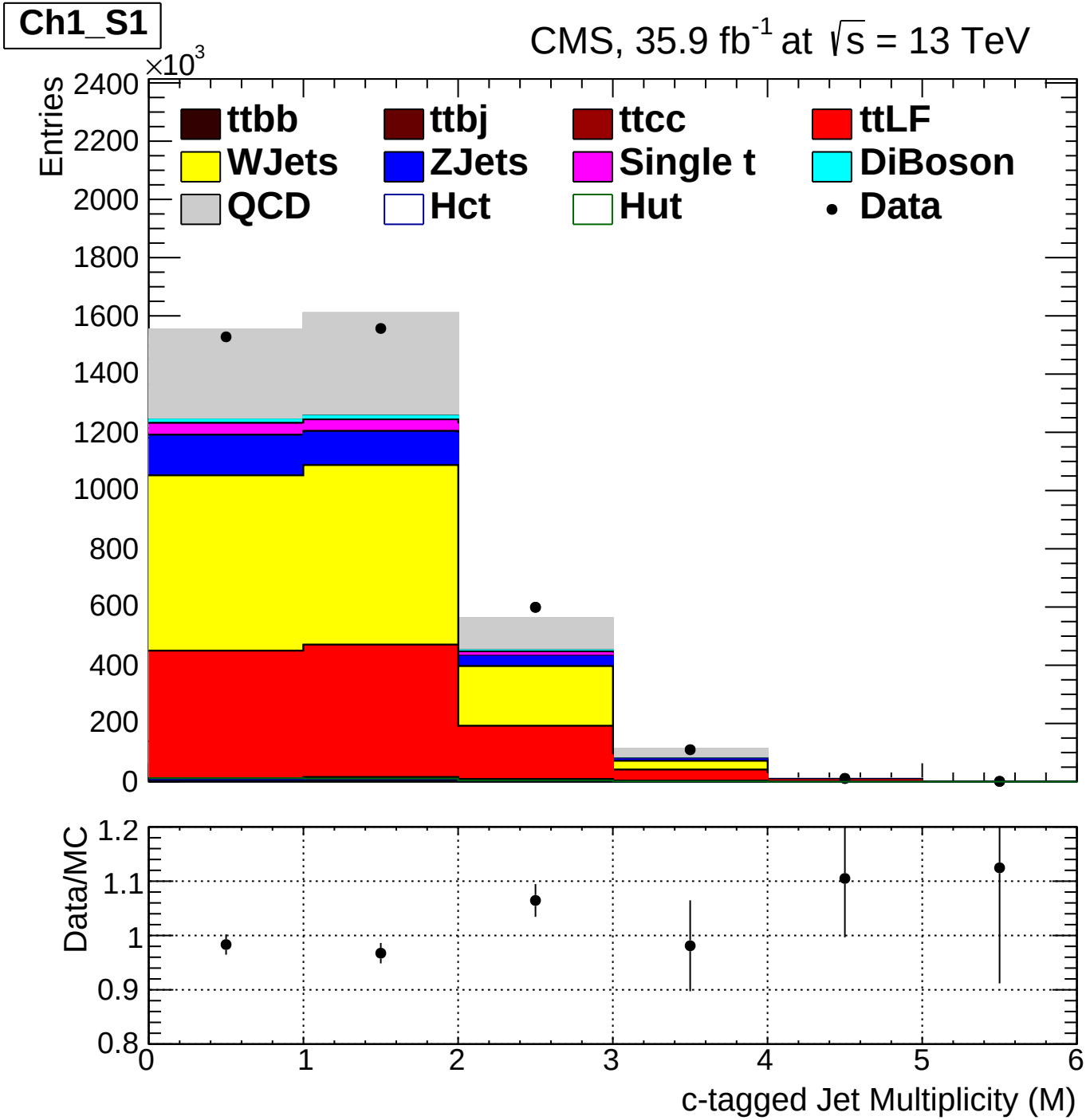

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^6
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

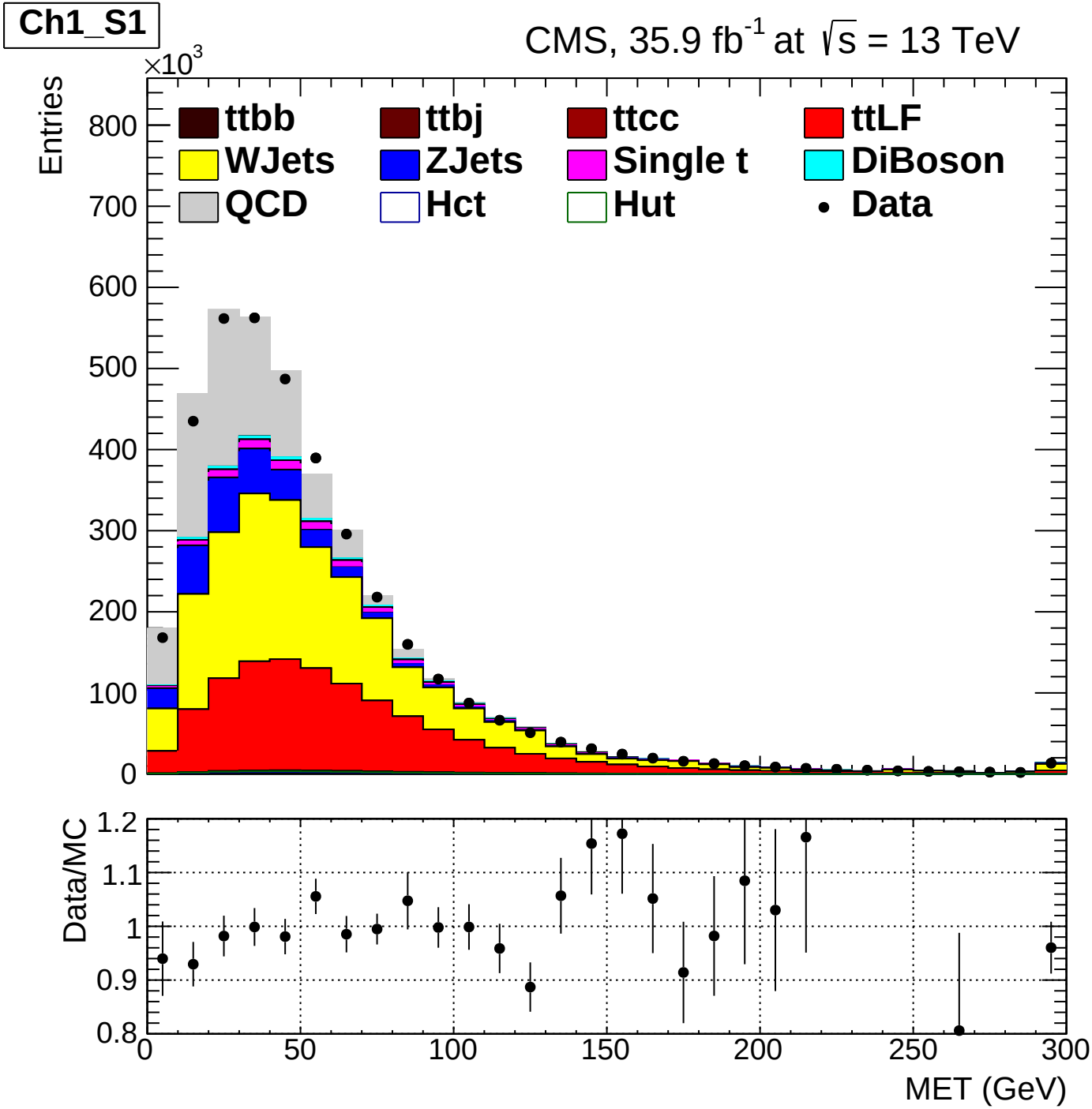

Ch1_S0
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

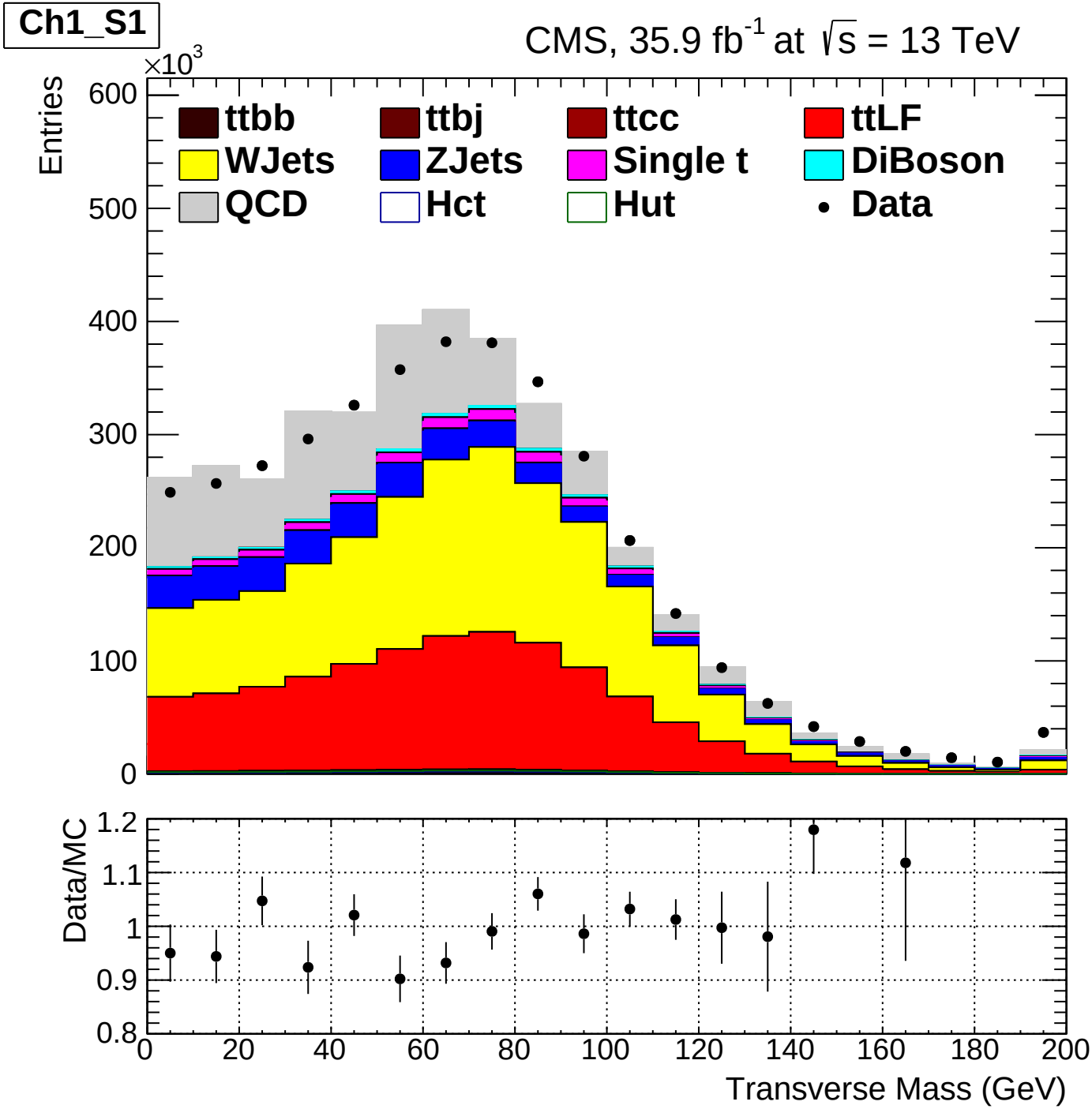

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
3500
3000
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

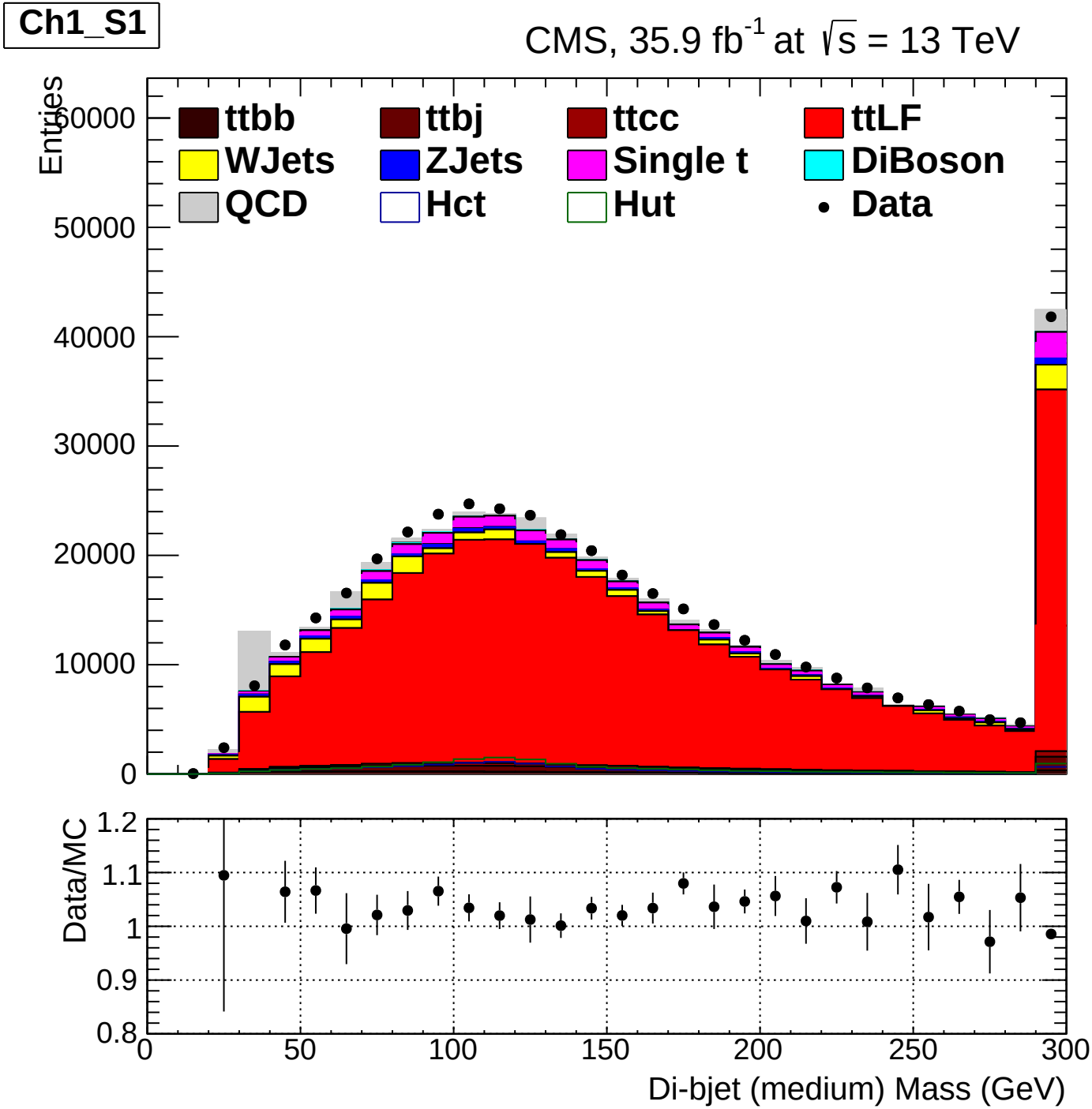

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

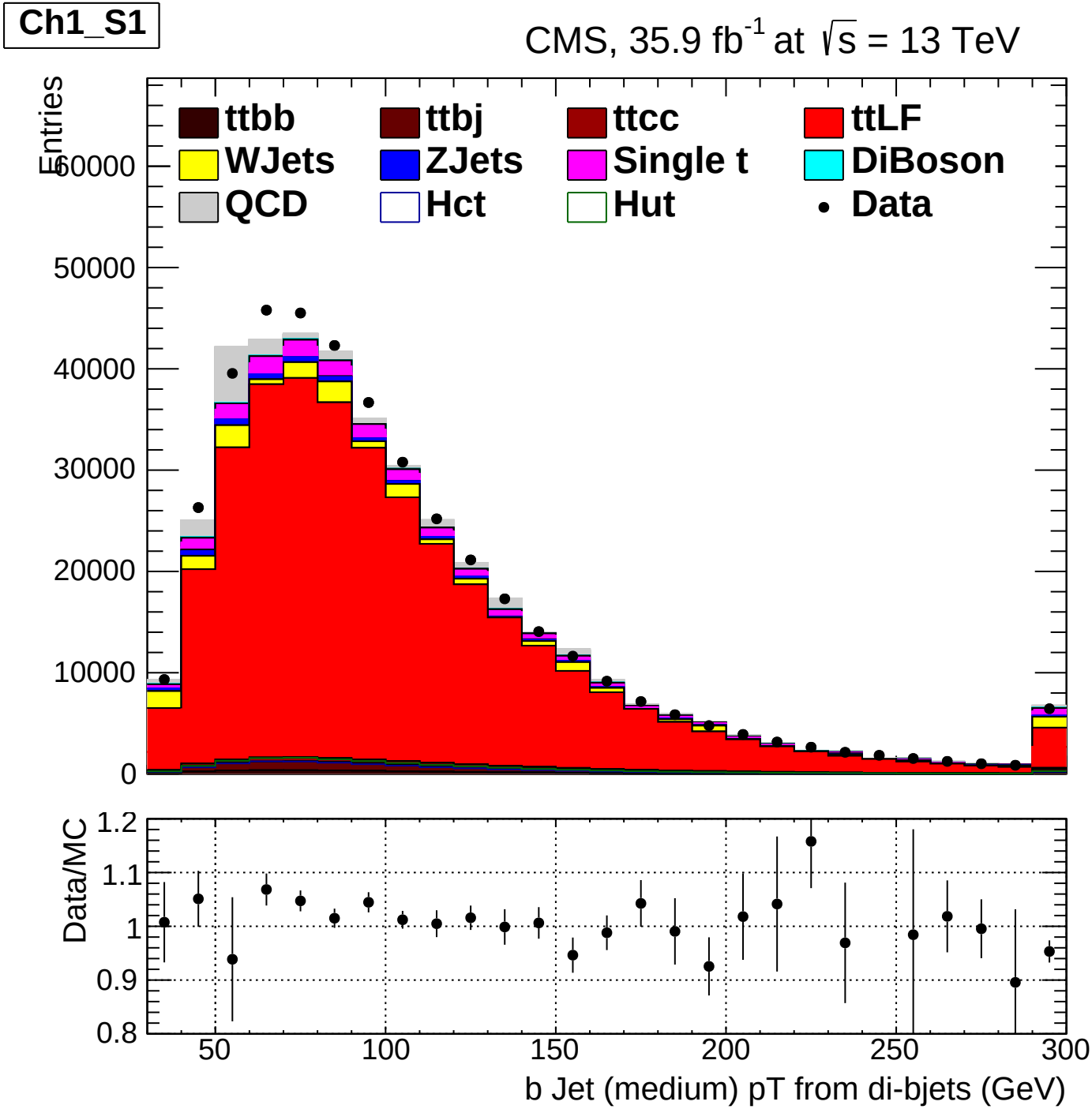

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

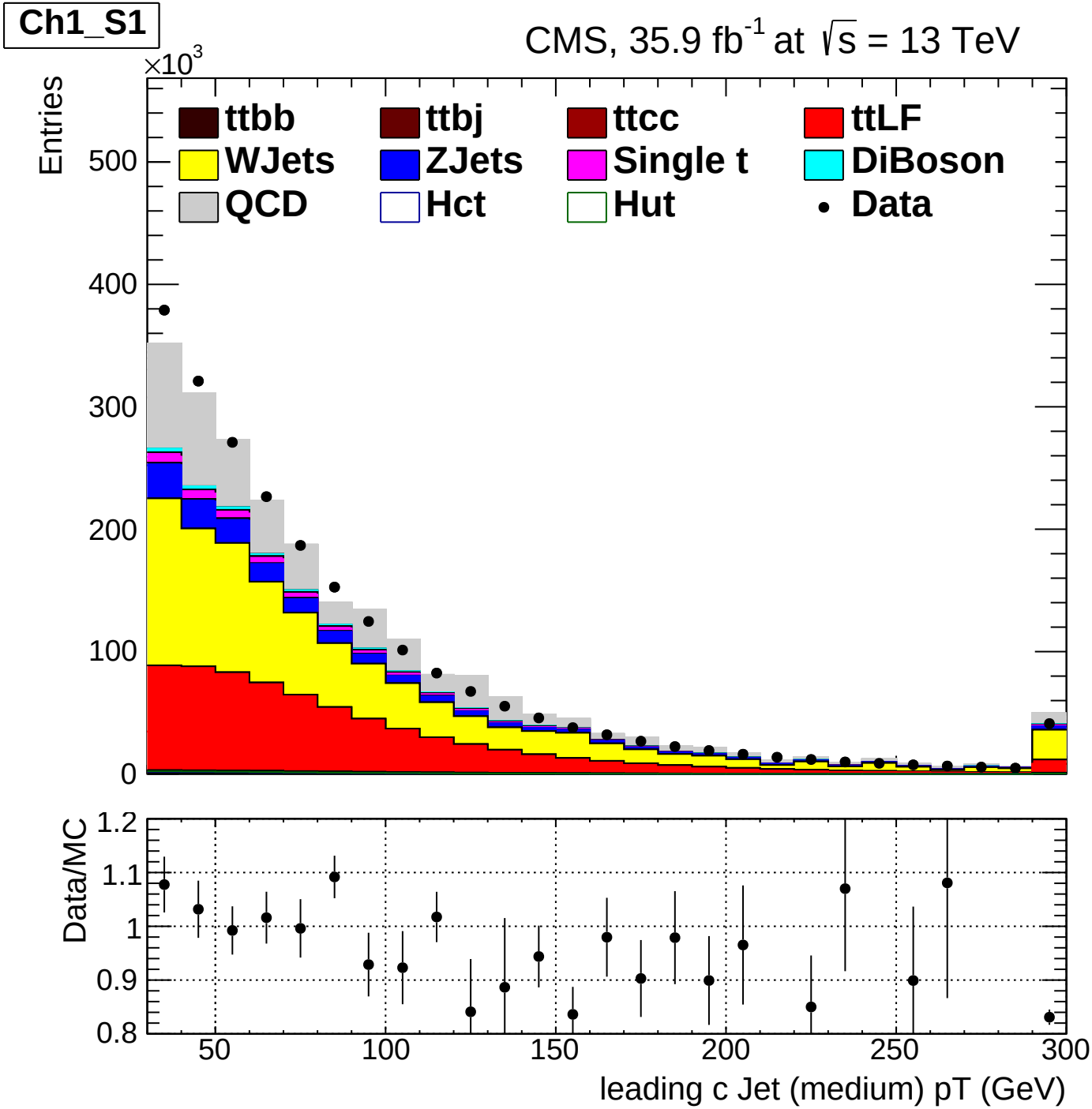

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

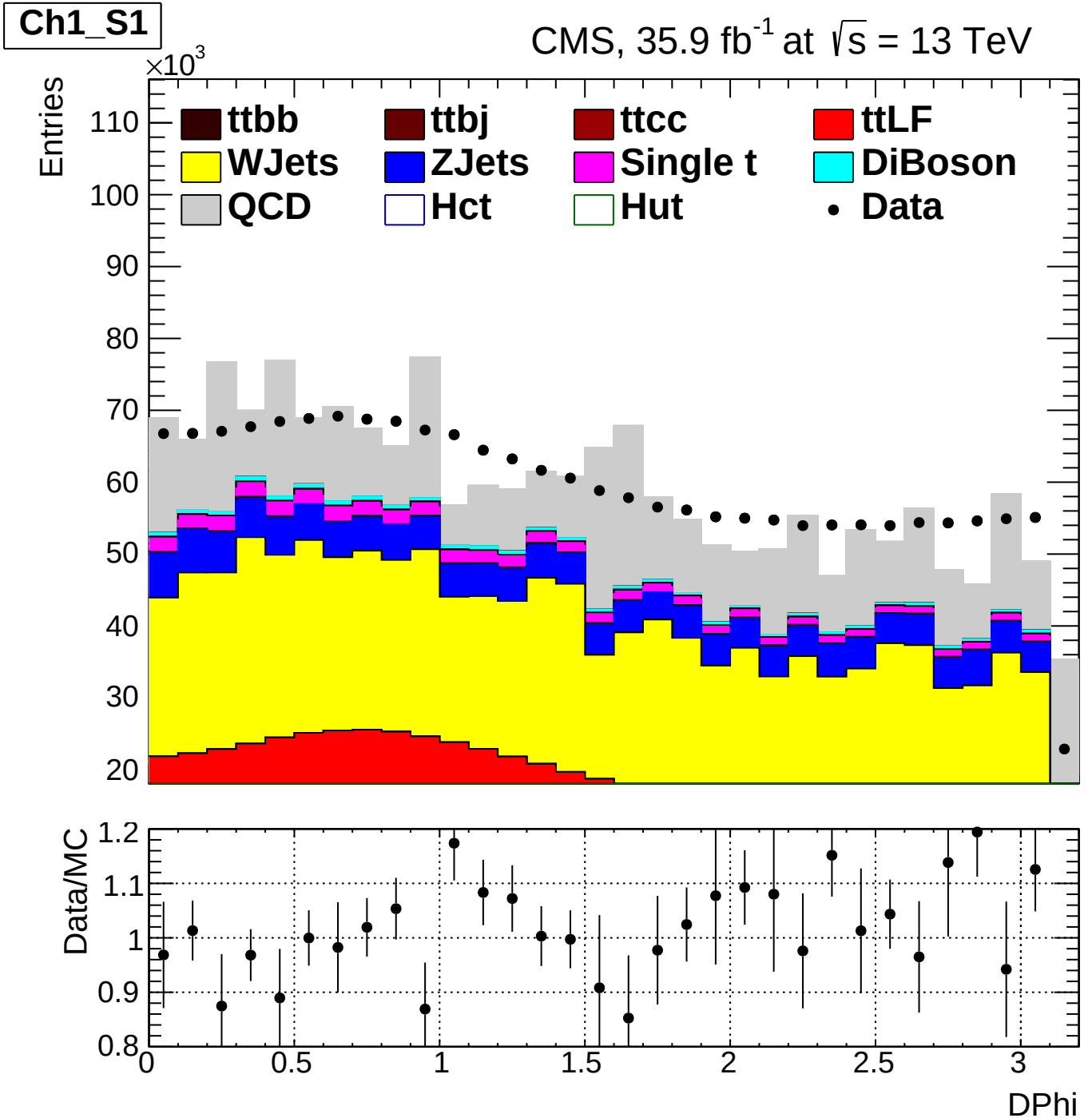

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

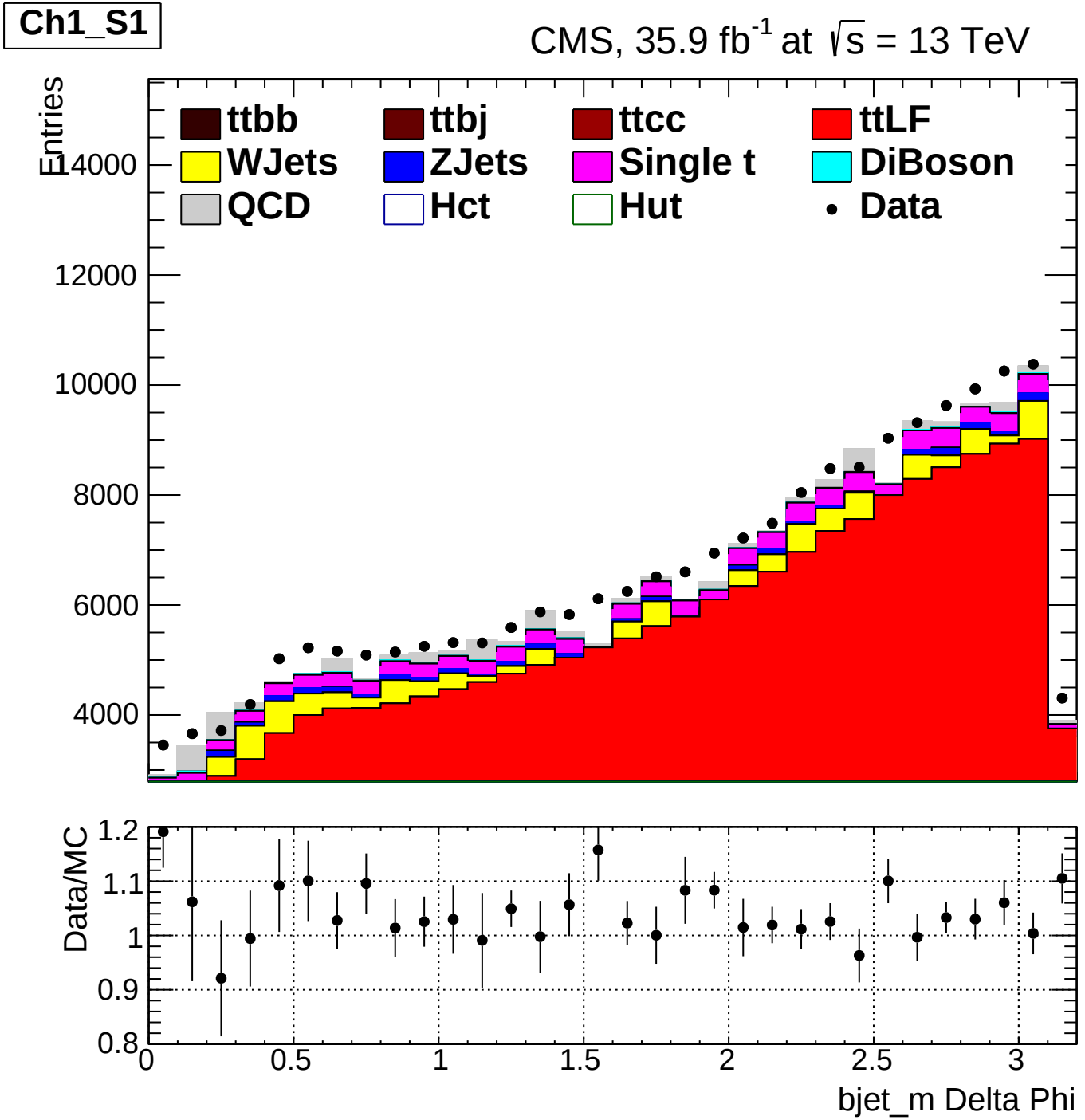

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

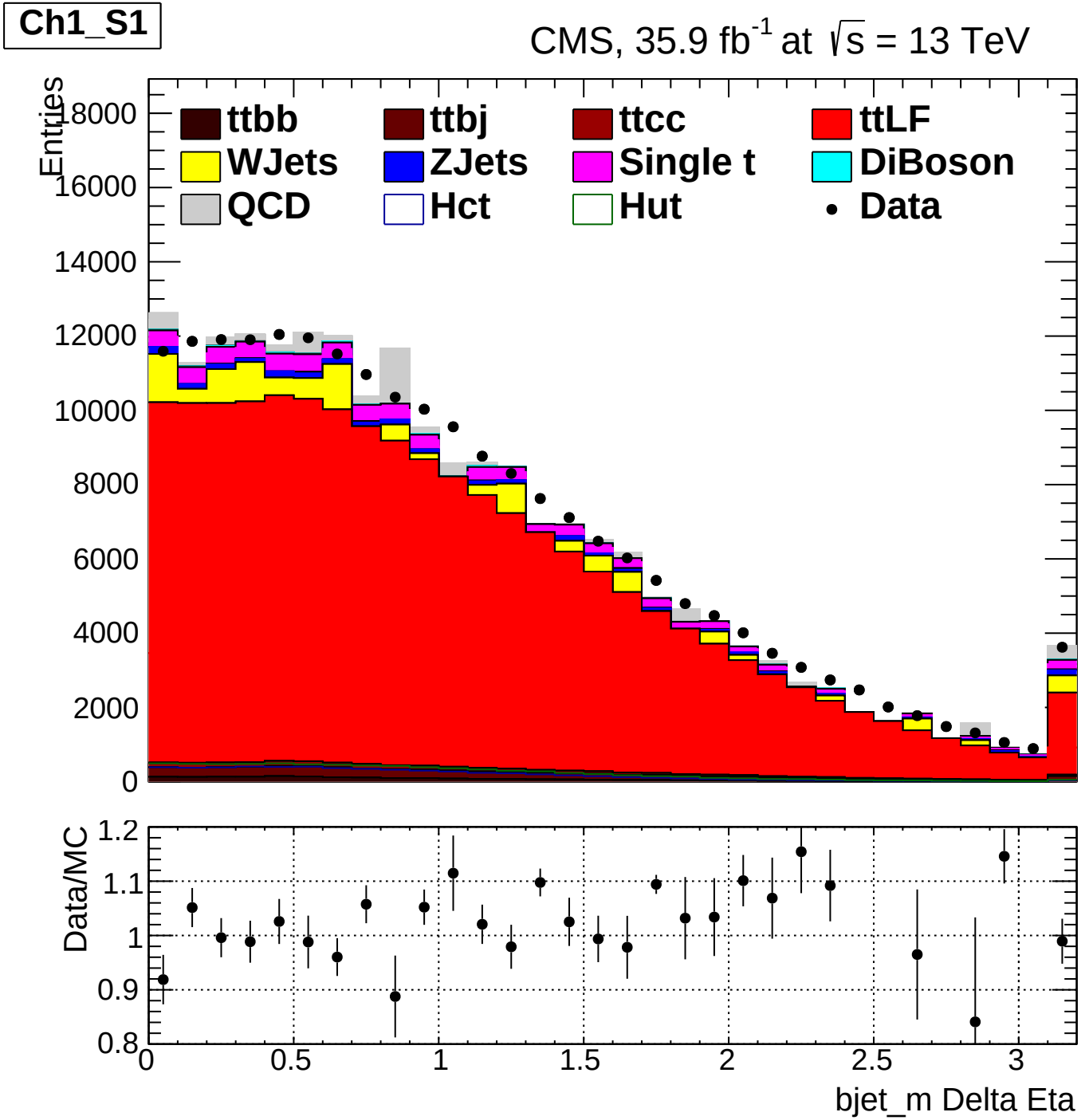

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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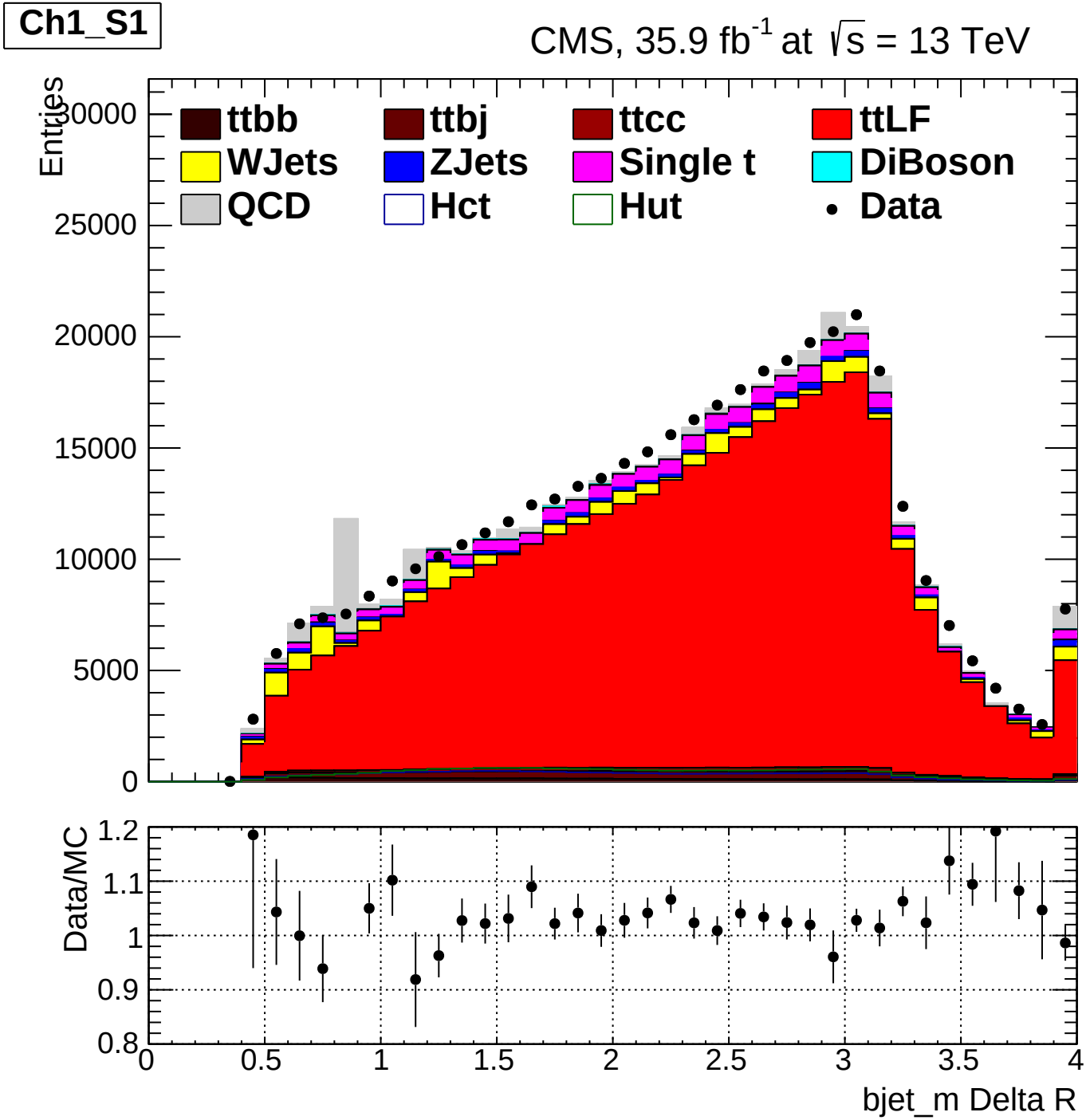
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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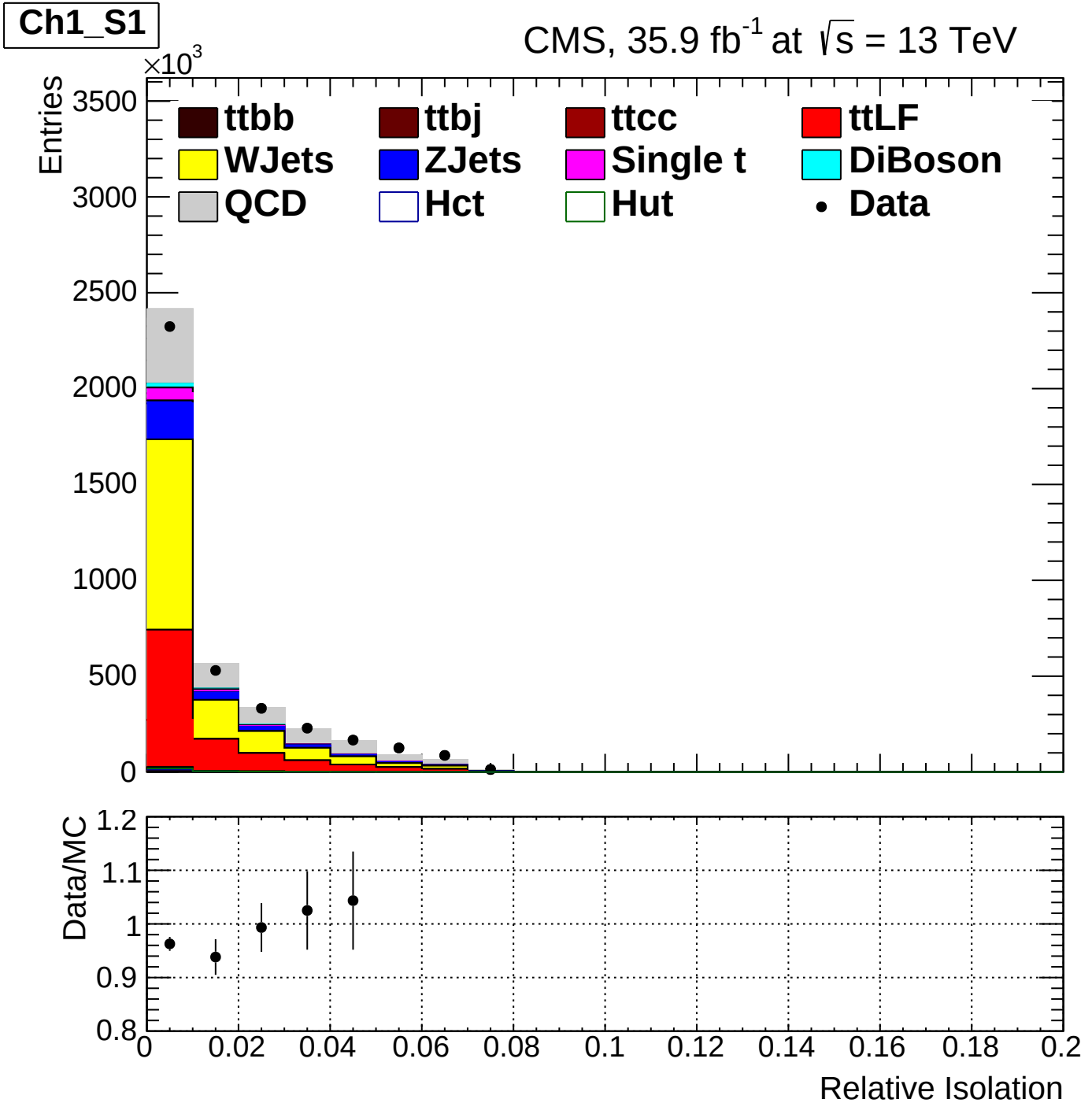
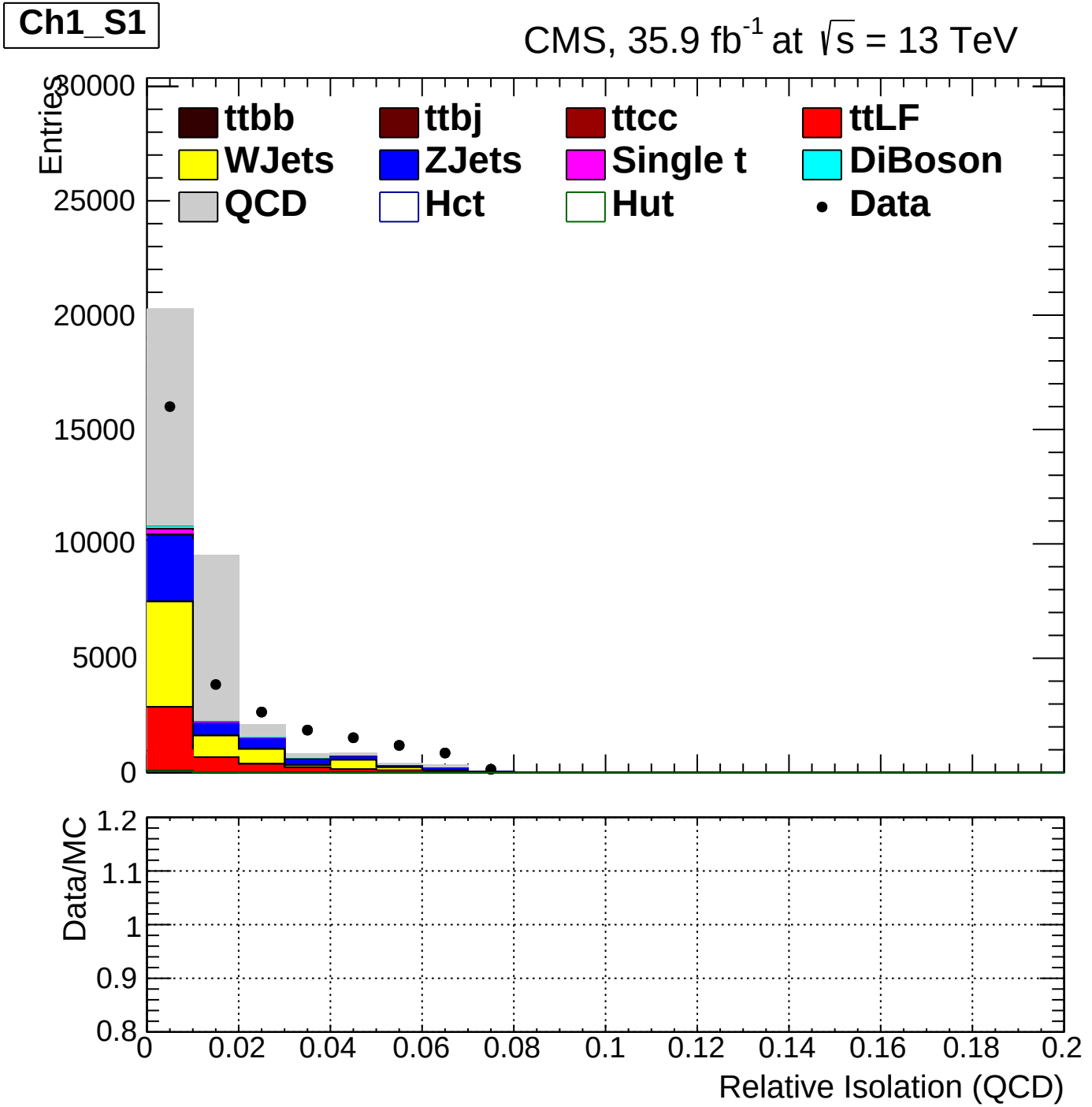
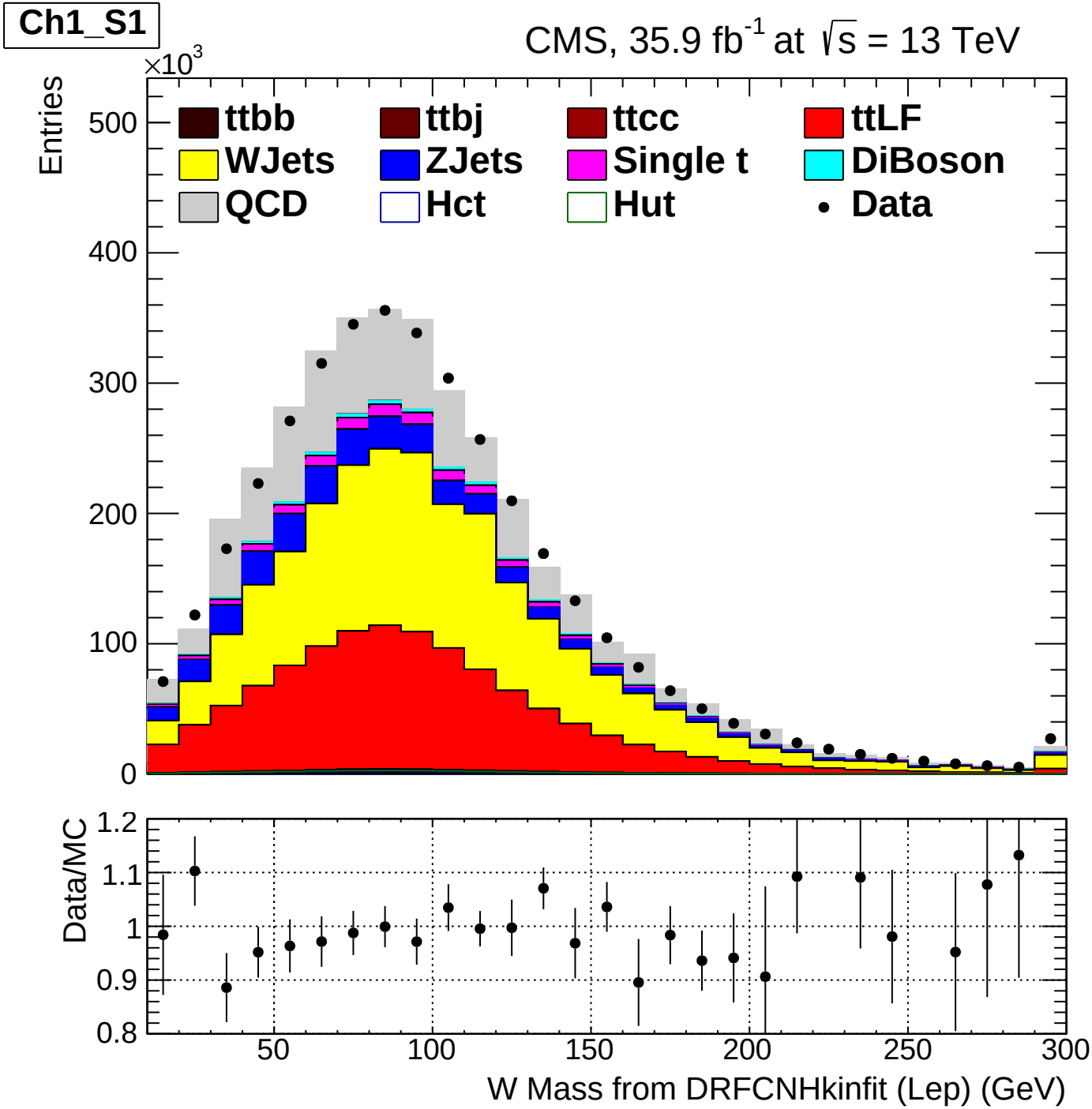
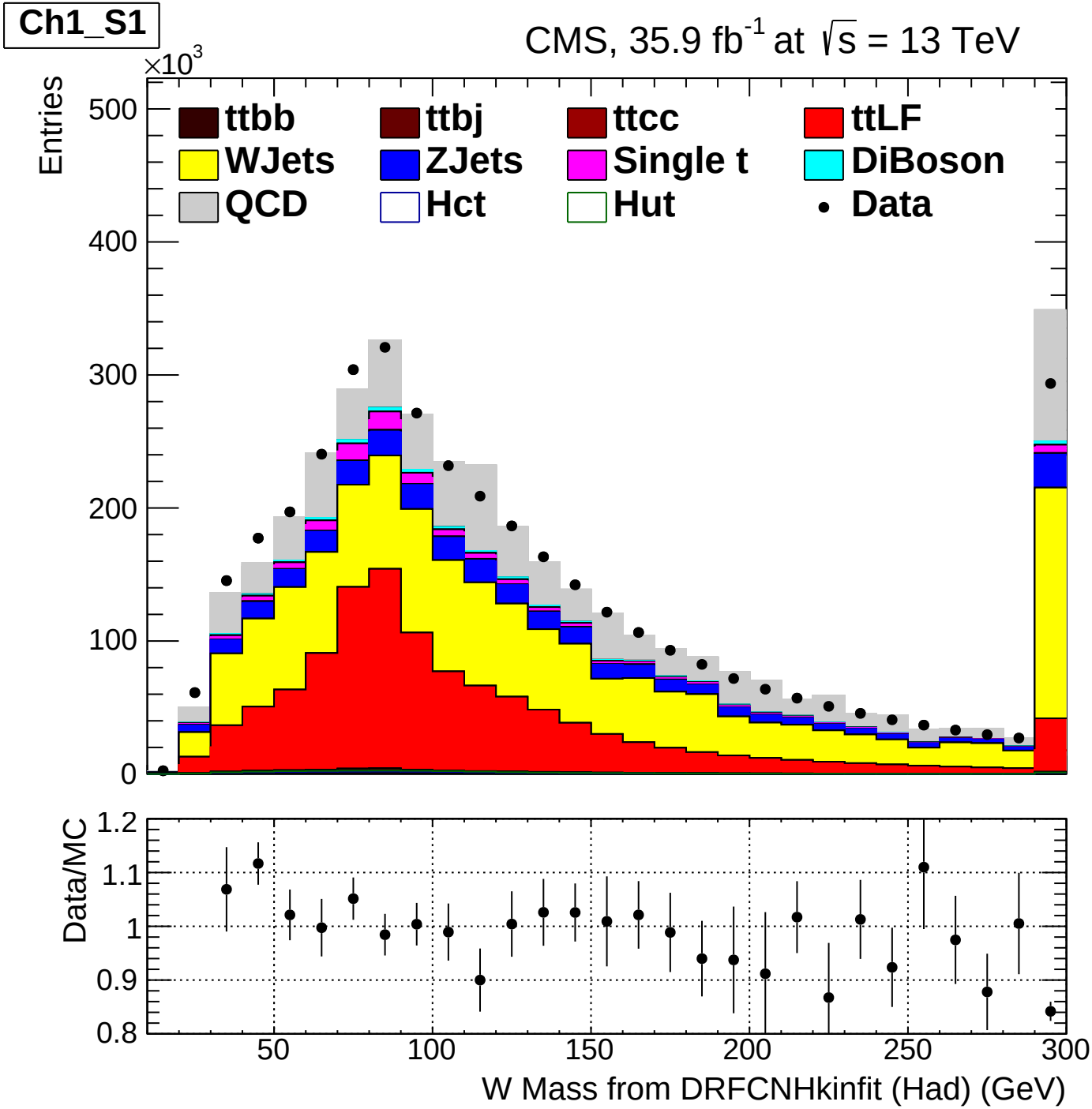
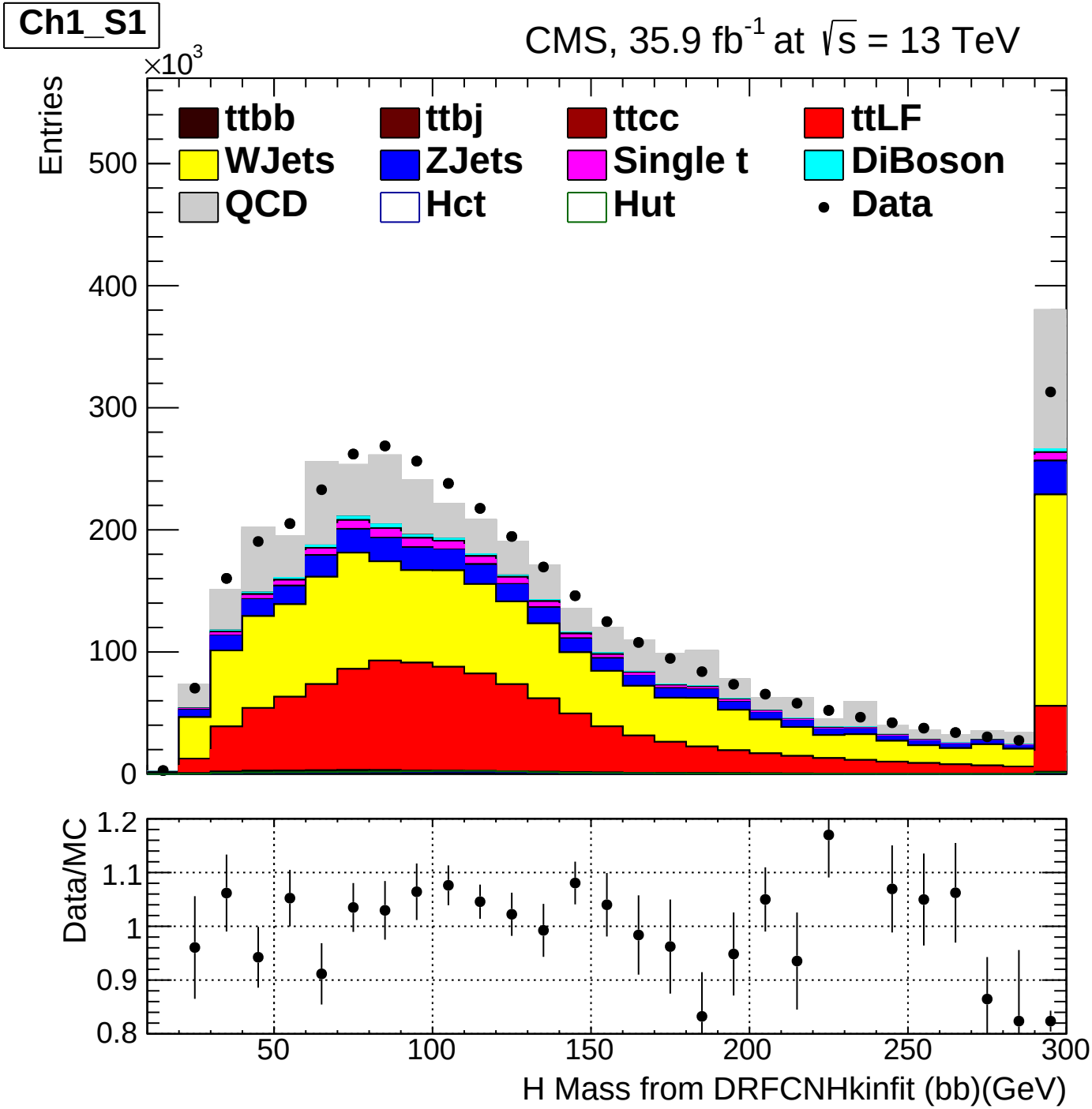
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

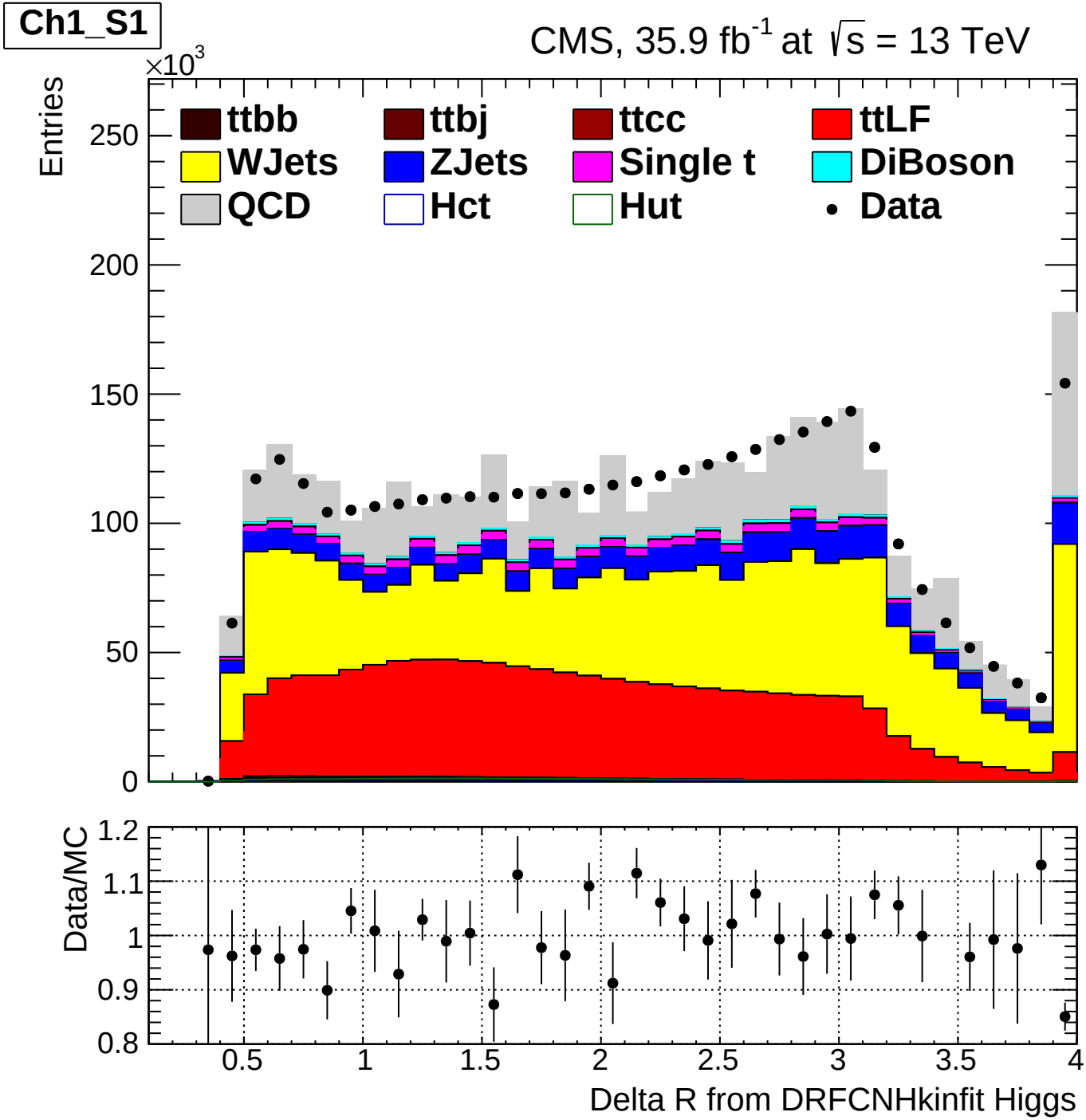

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

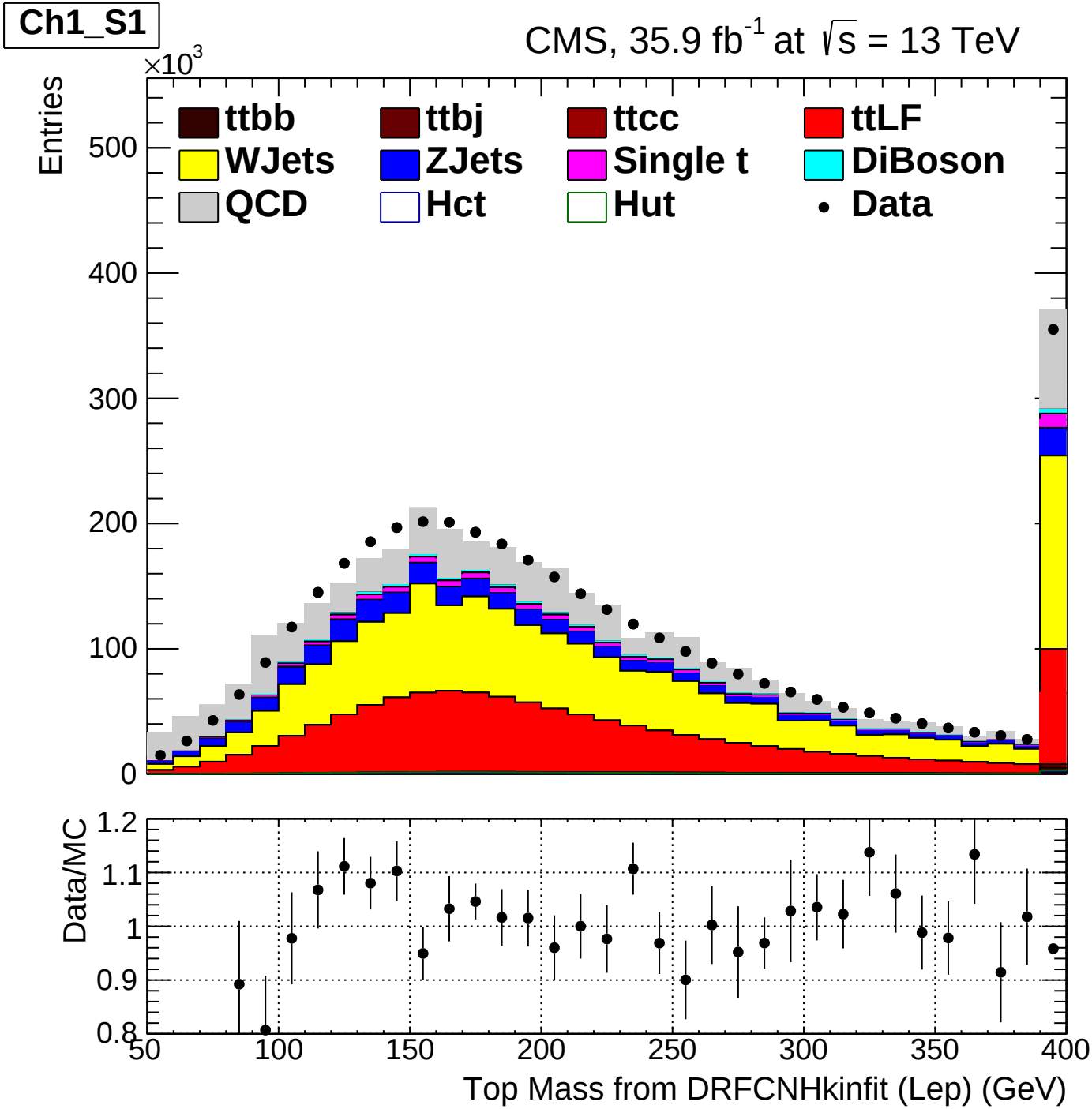

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation (QCD)

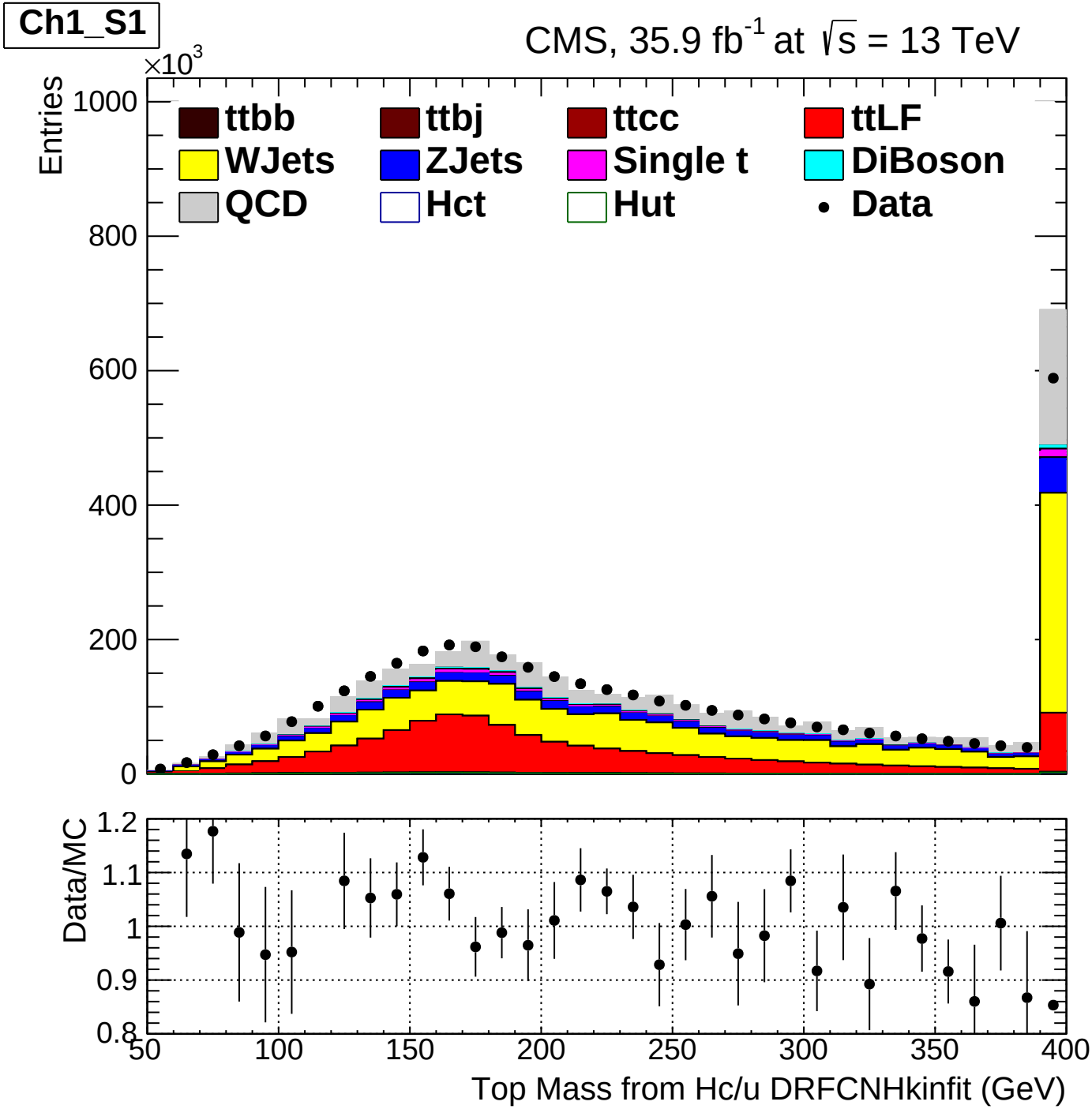

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

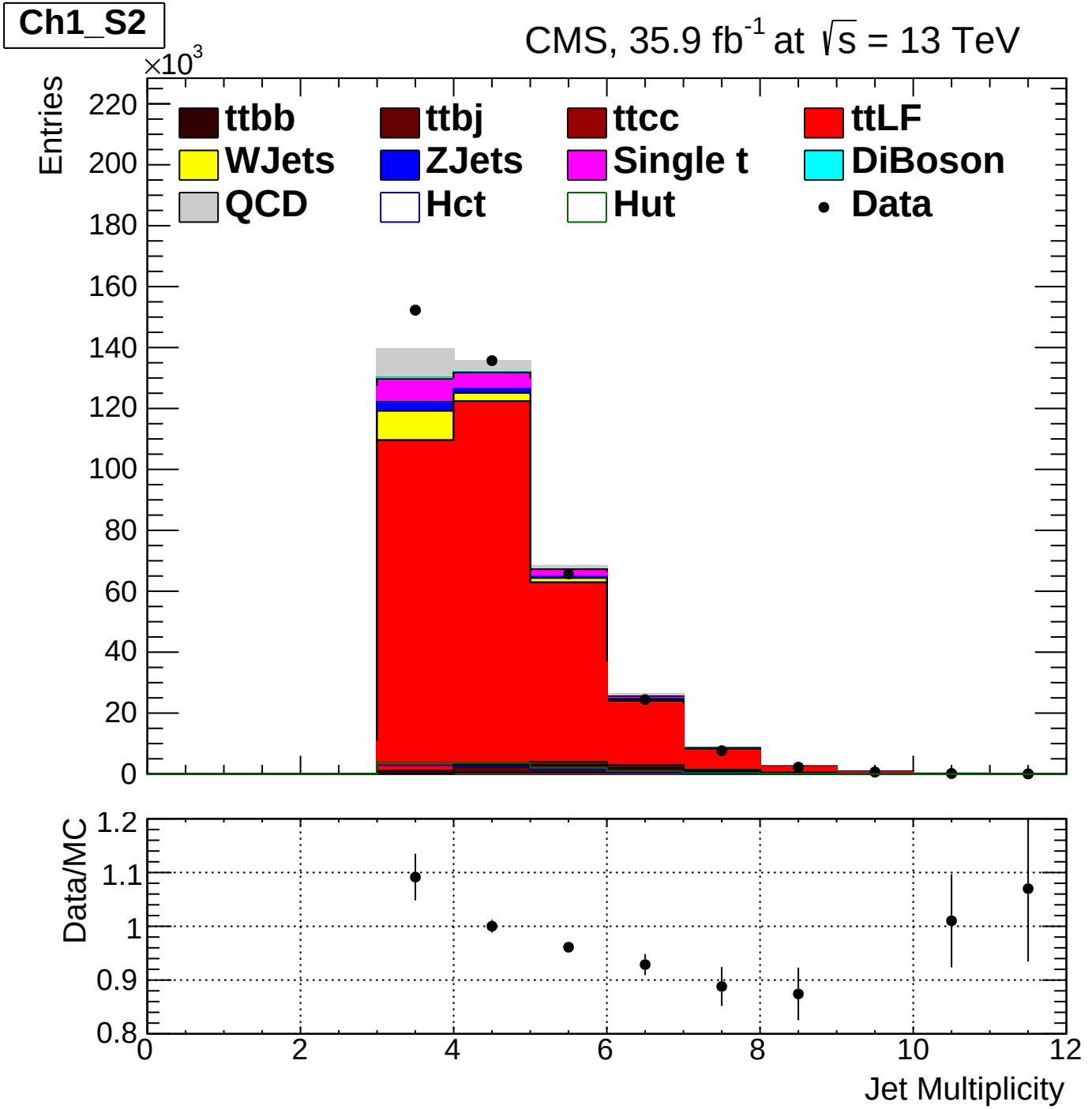

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

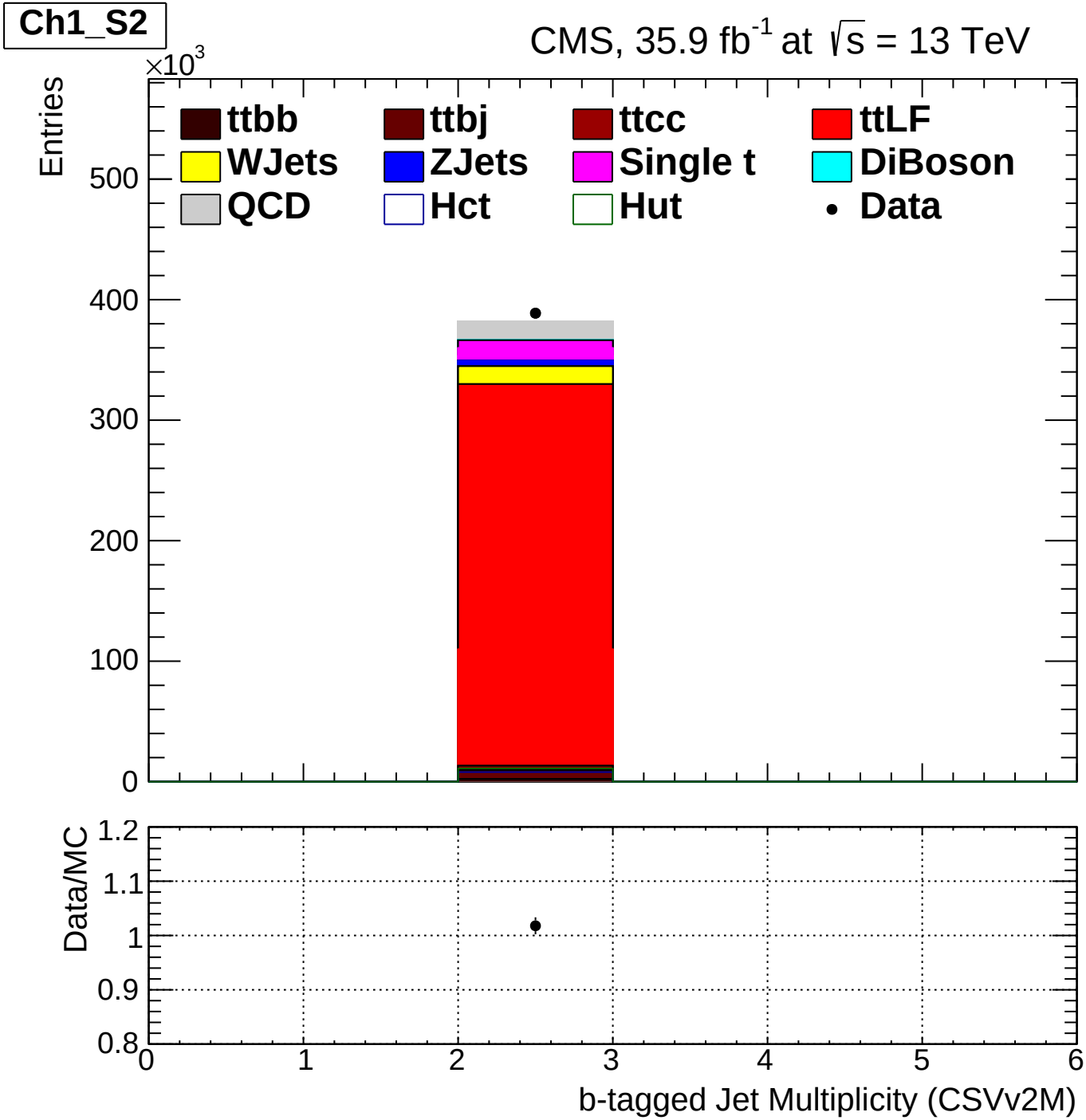

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

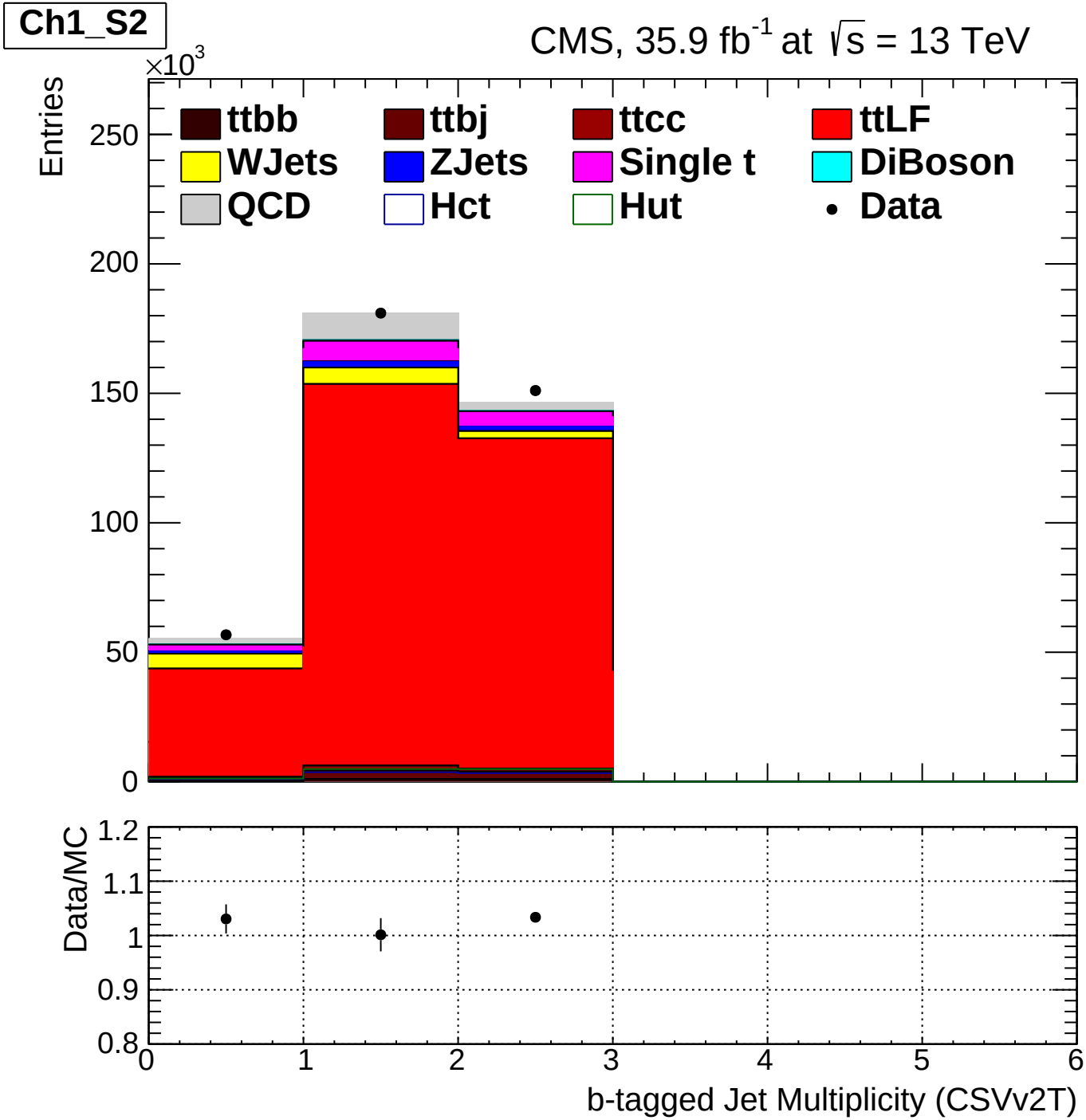

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

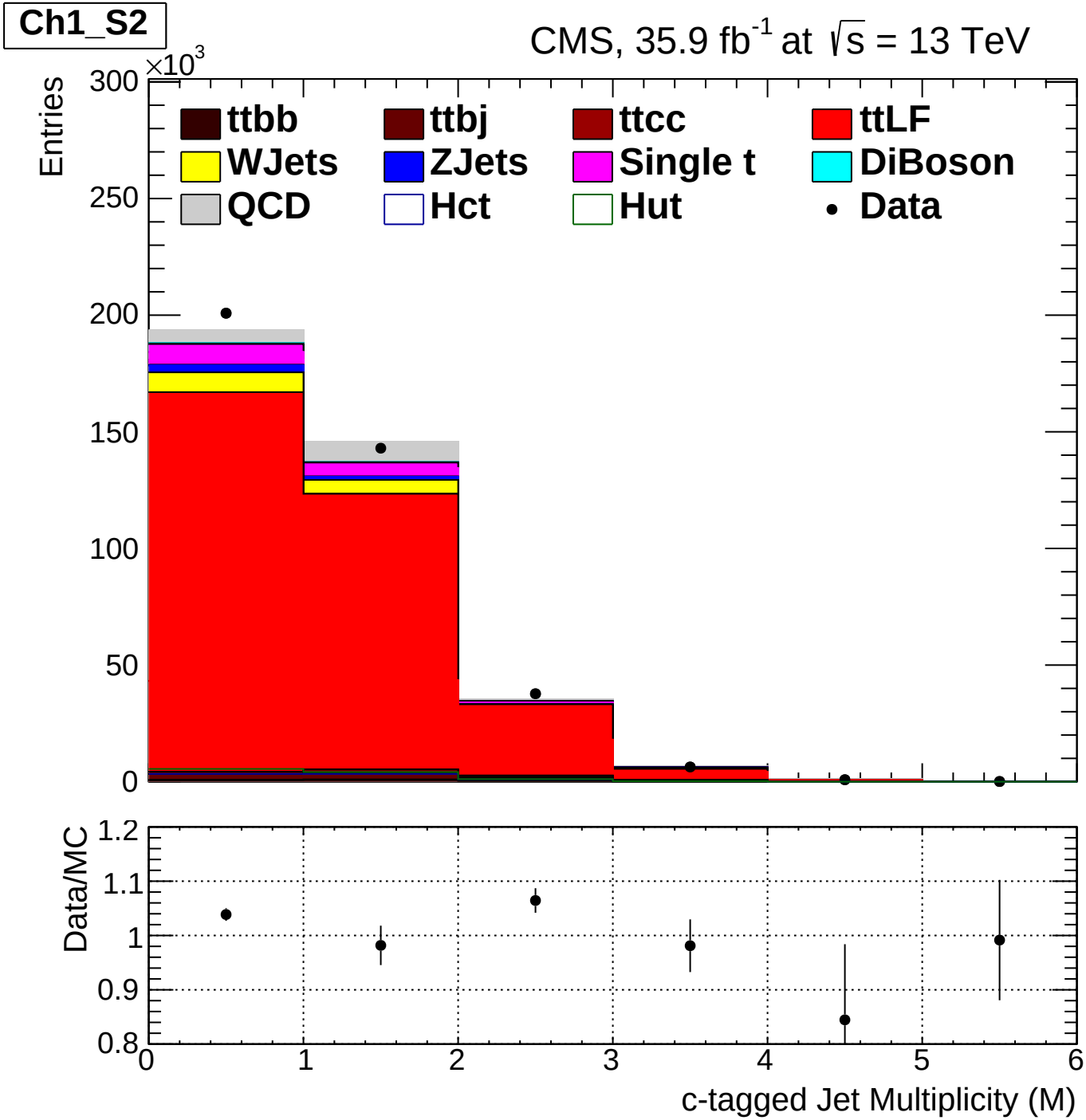

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

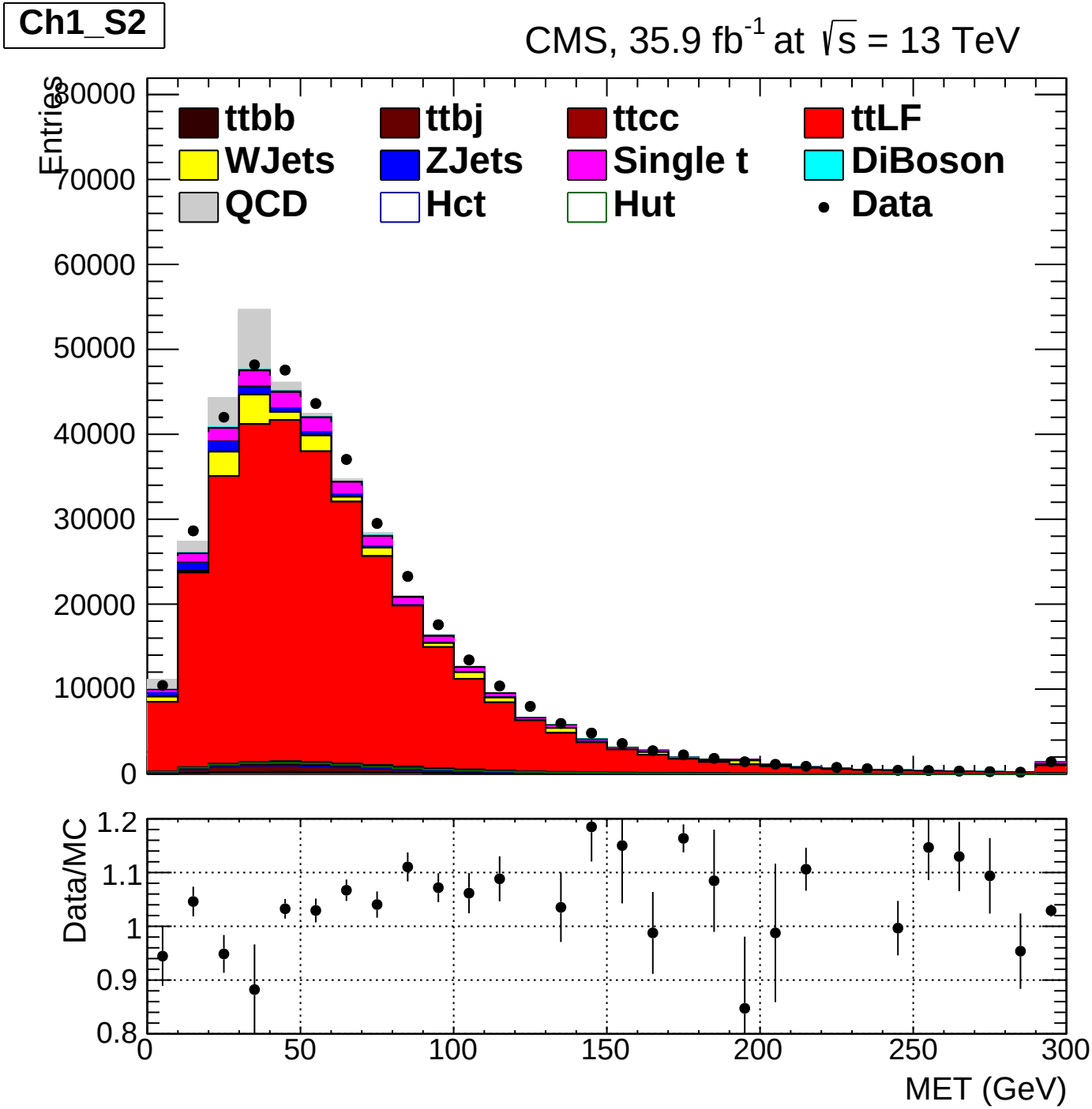

Ch1_S1
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

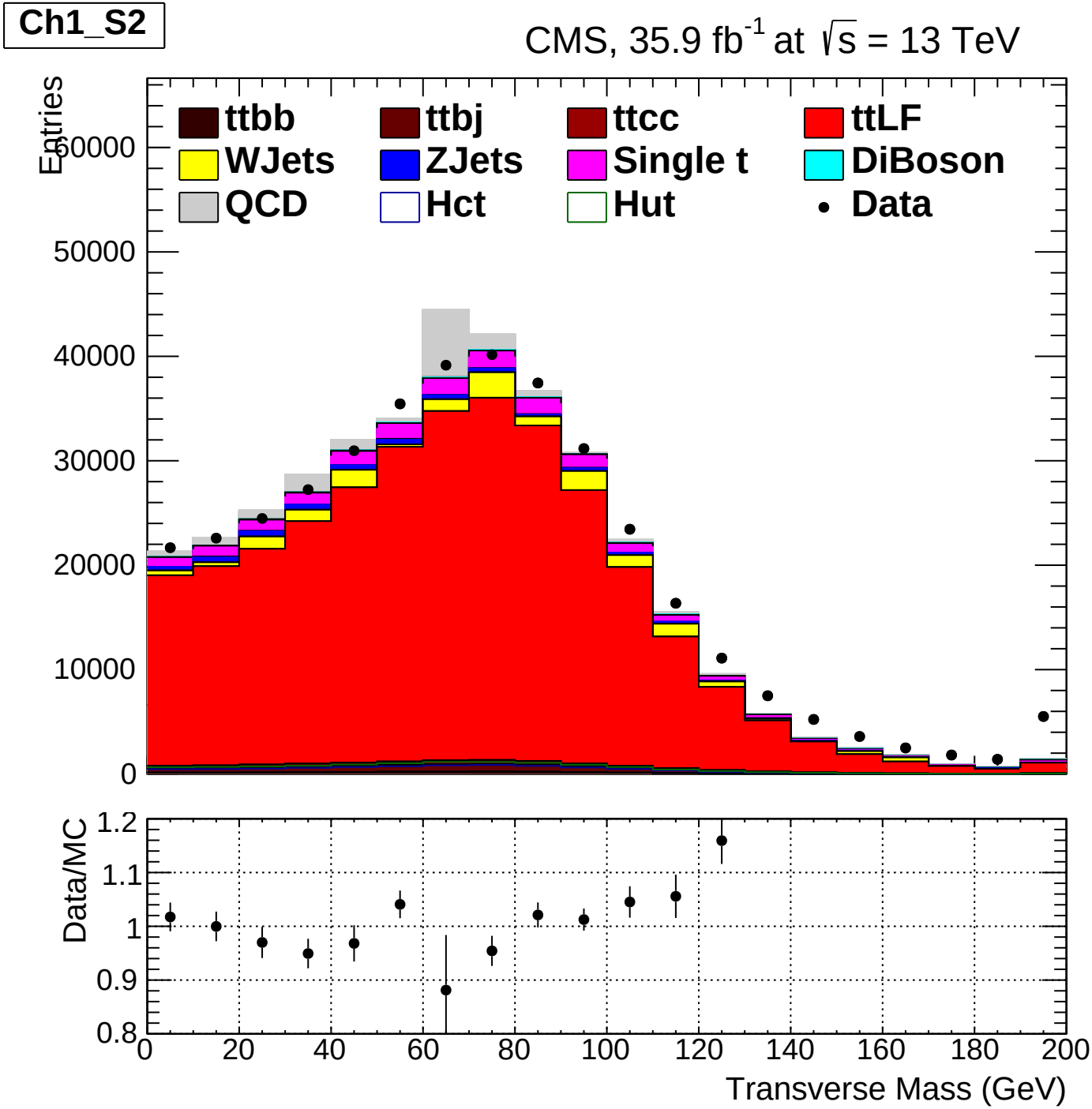

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

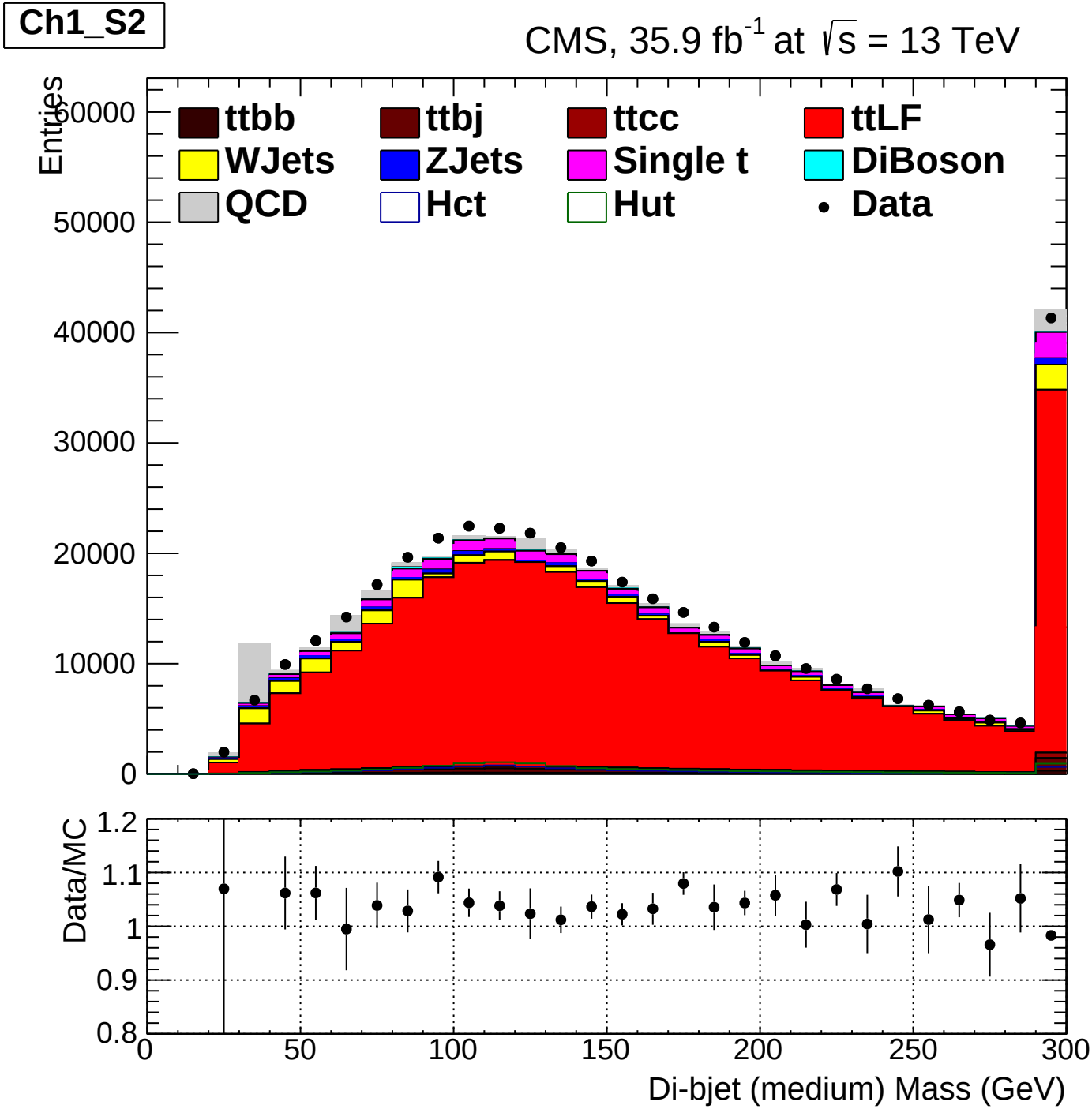

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

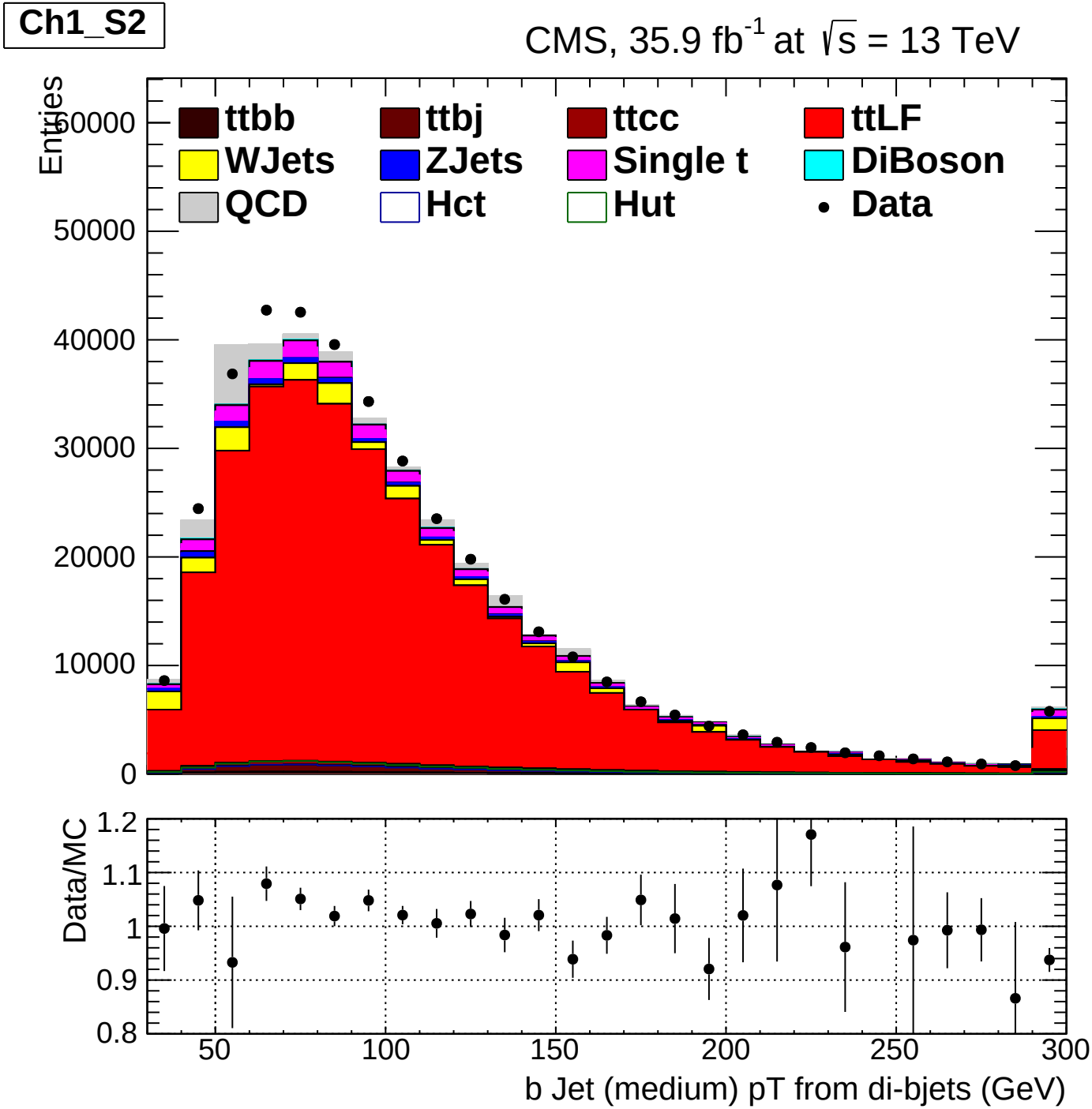

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

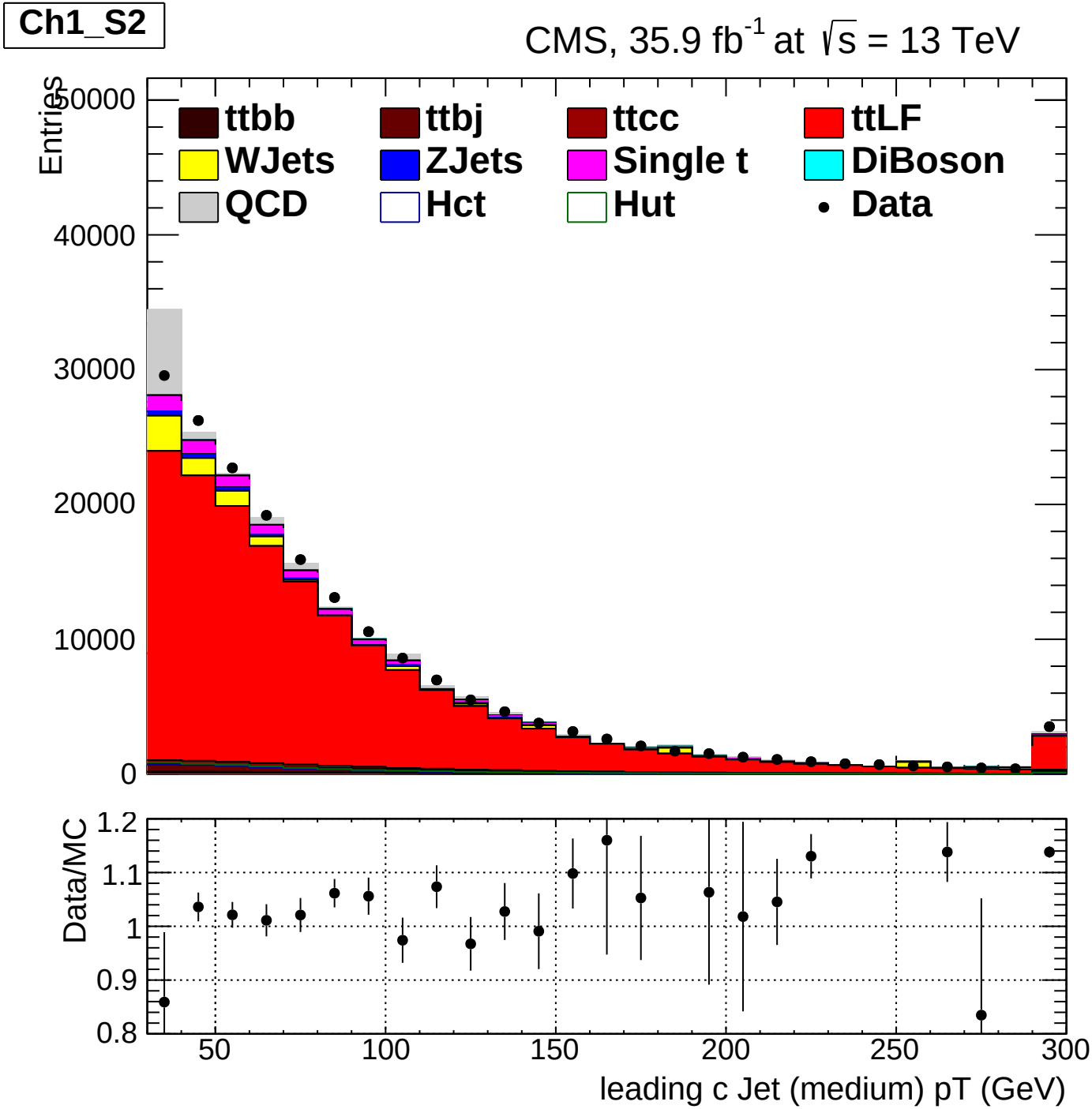

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

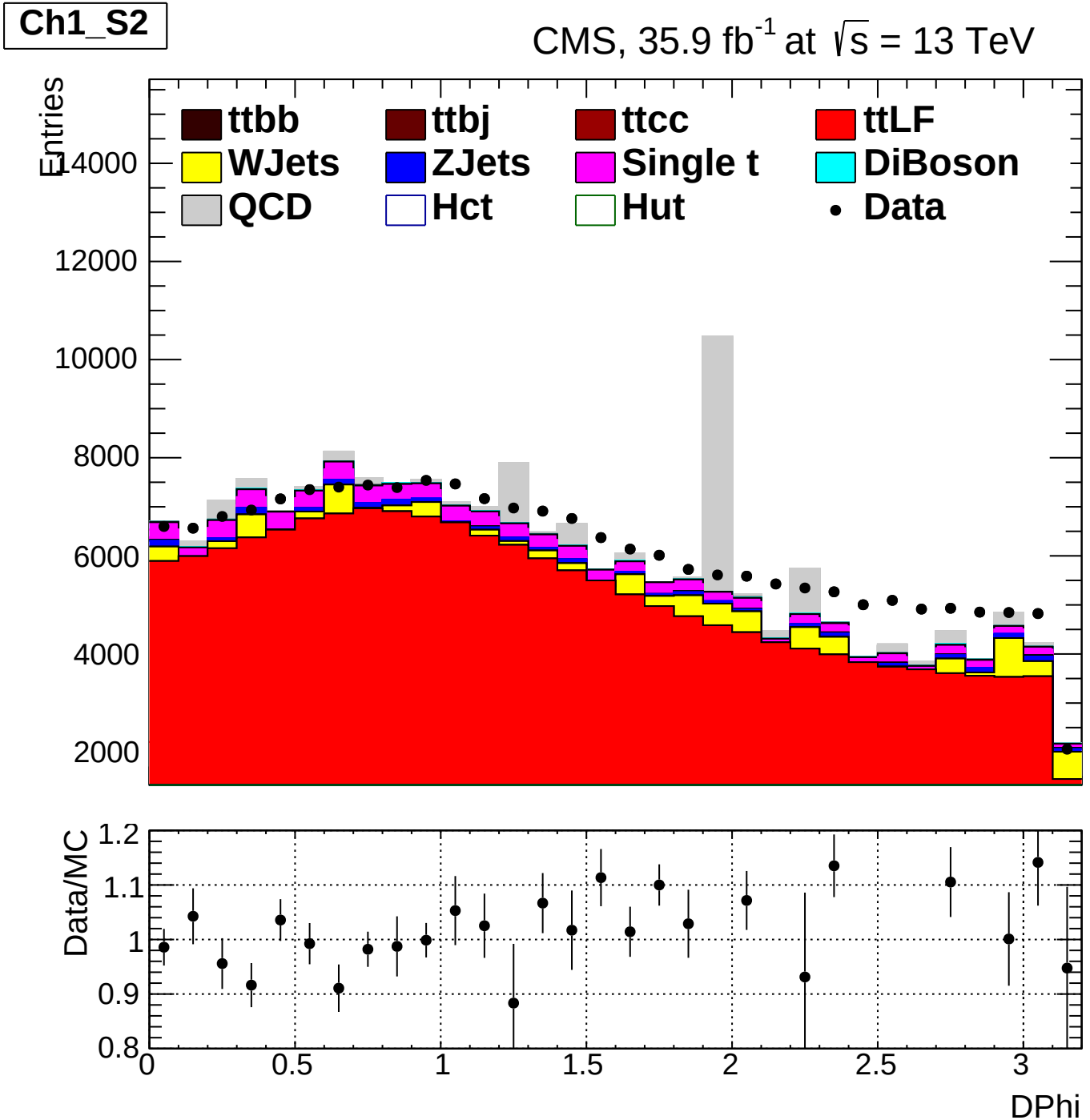

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

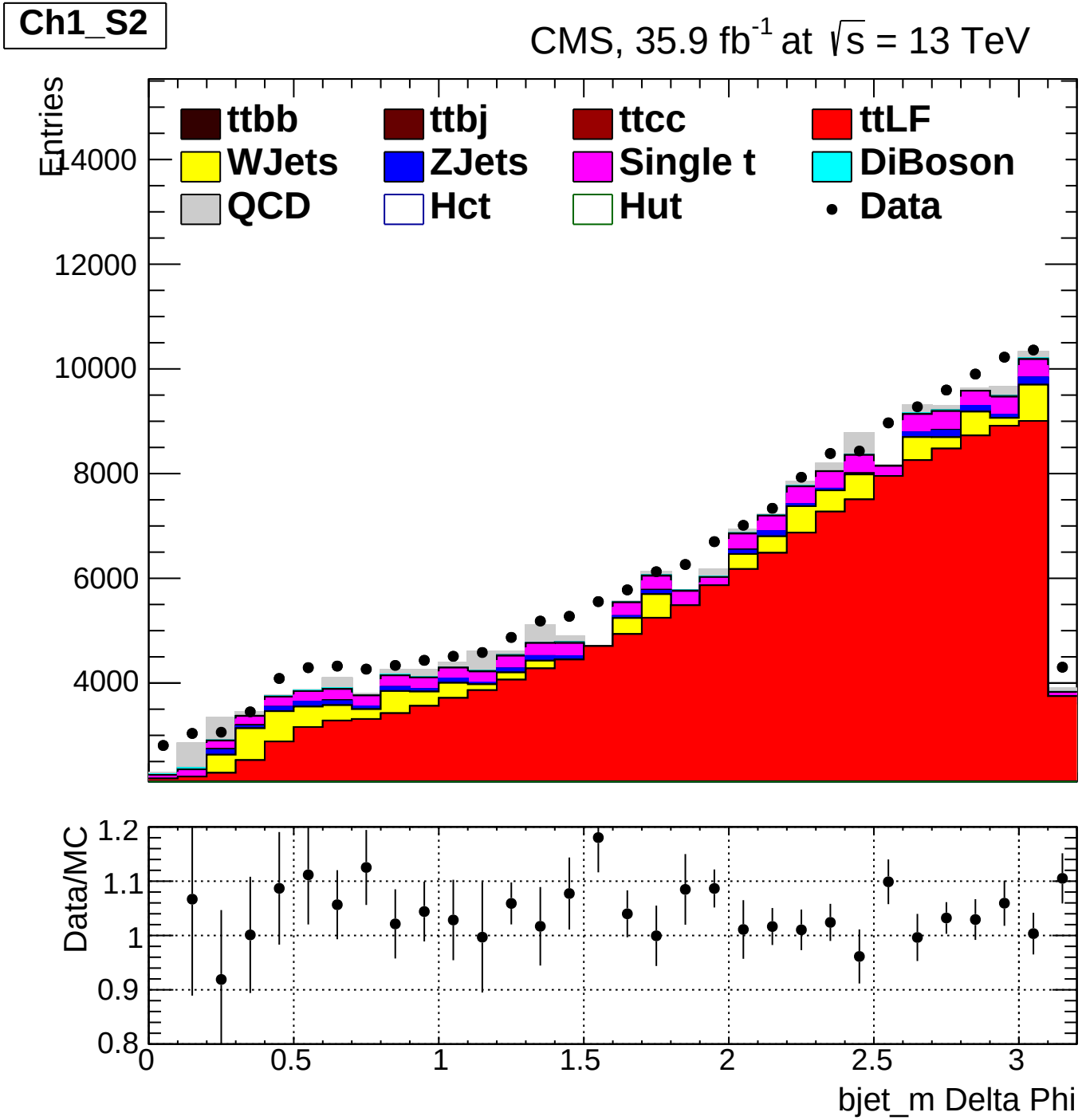

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

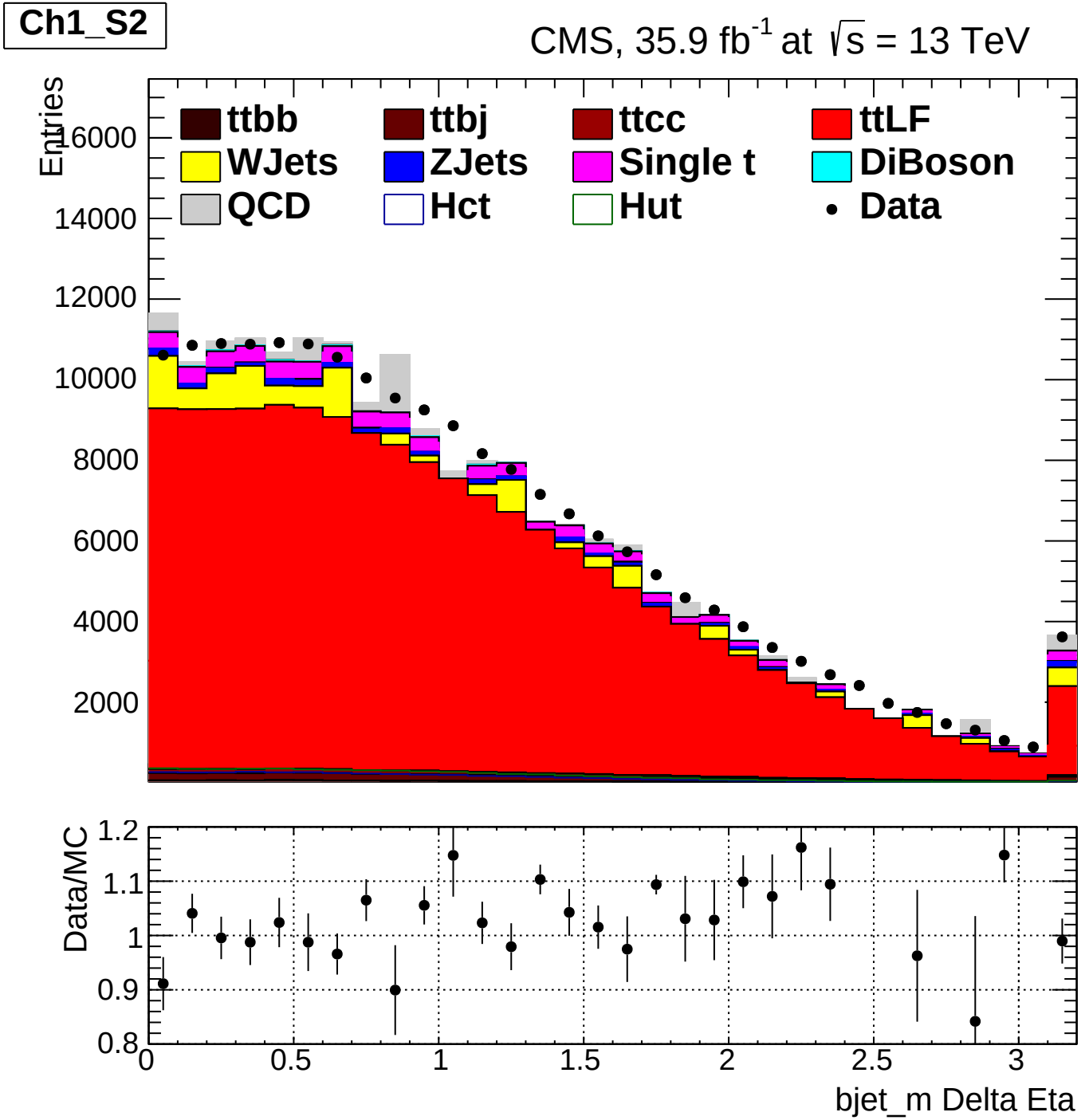

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

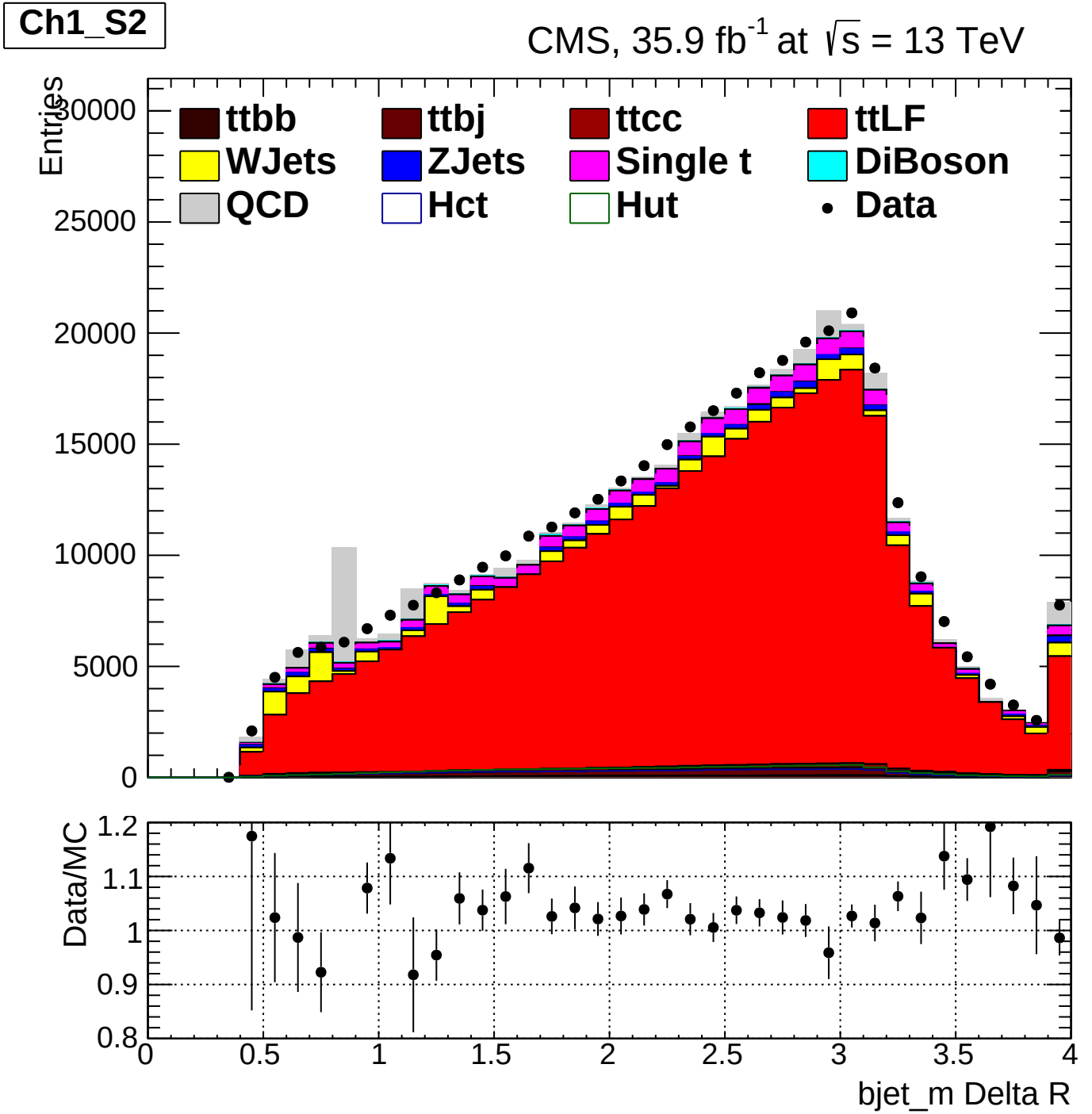

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

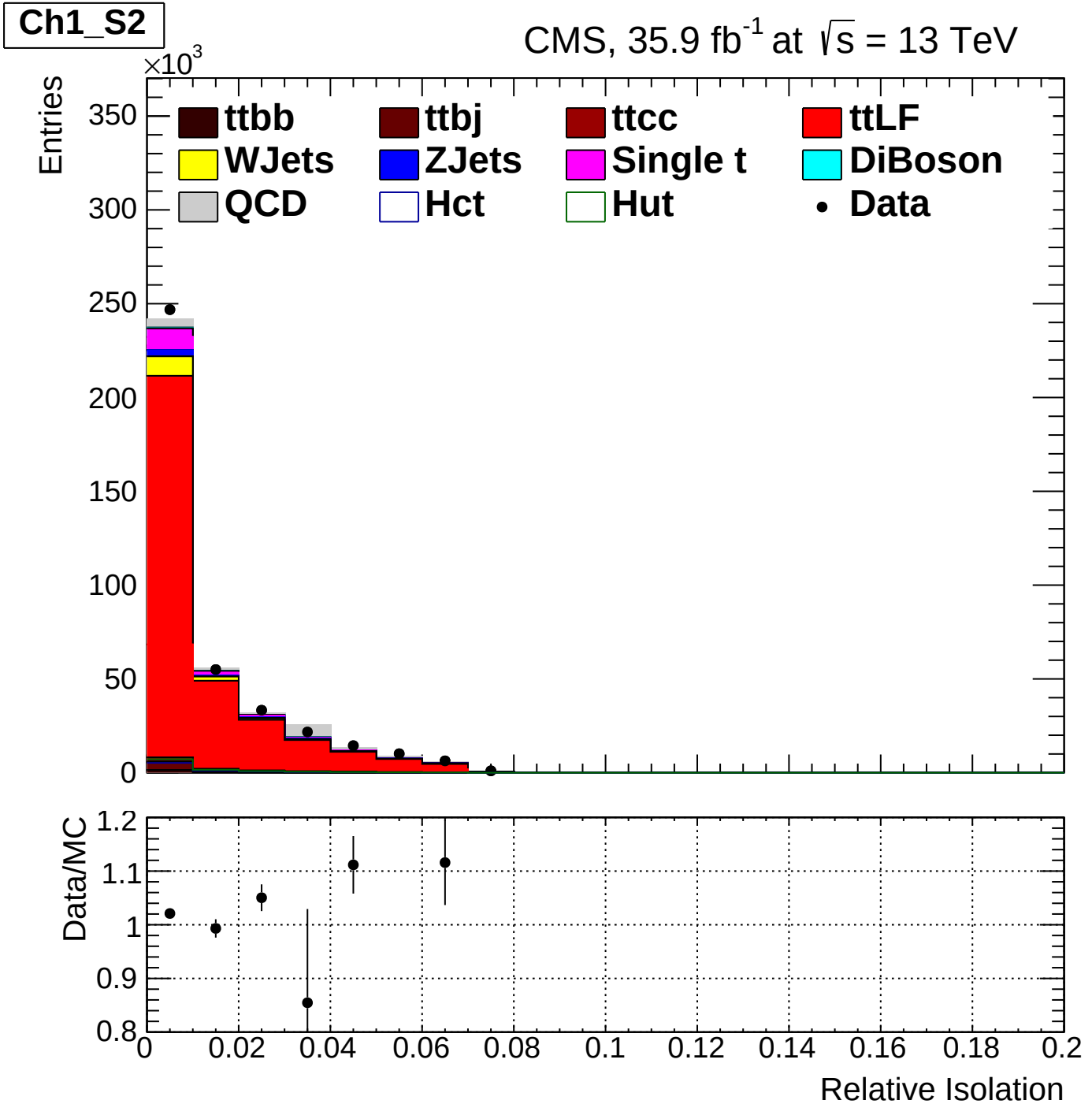

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

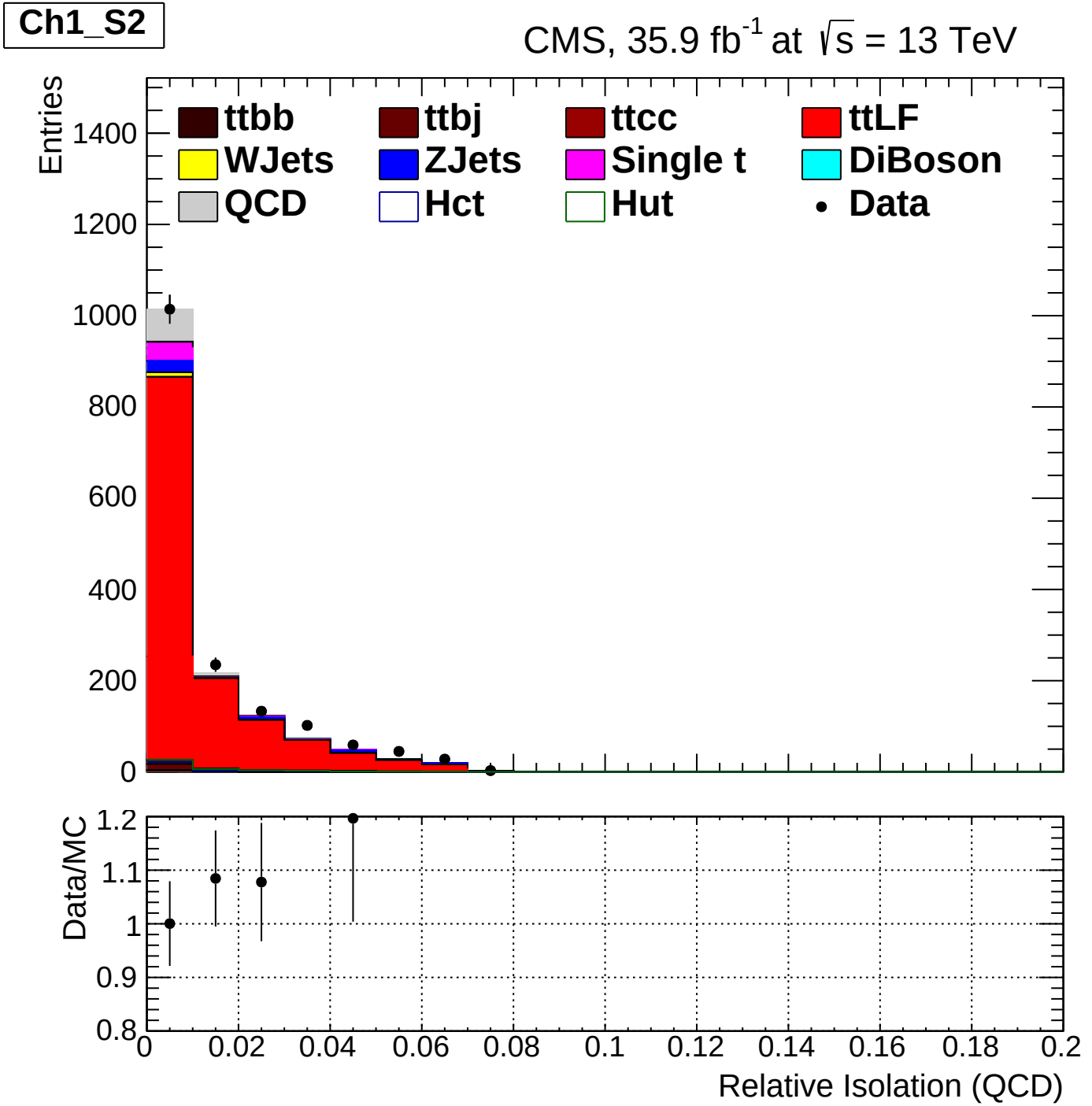

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
14000
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

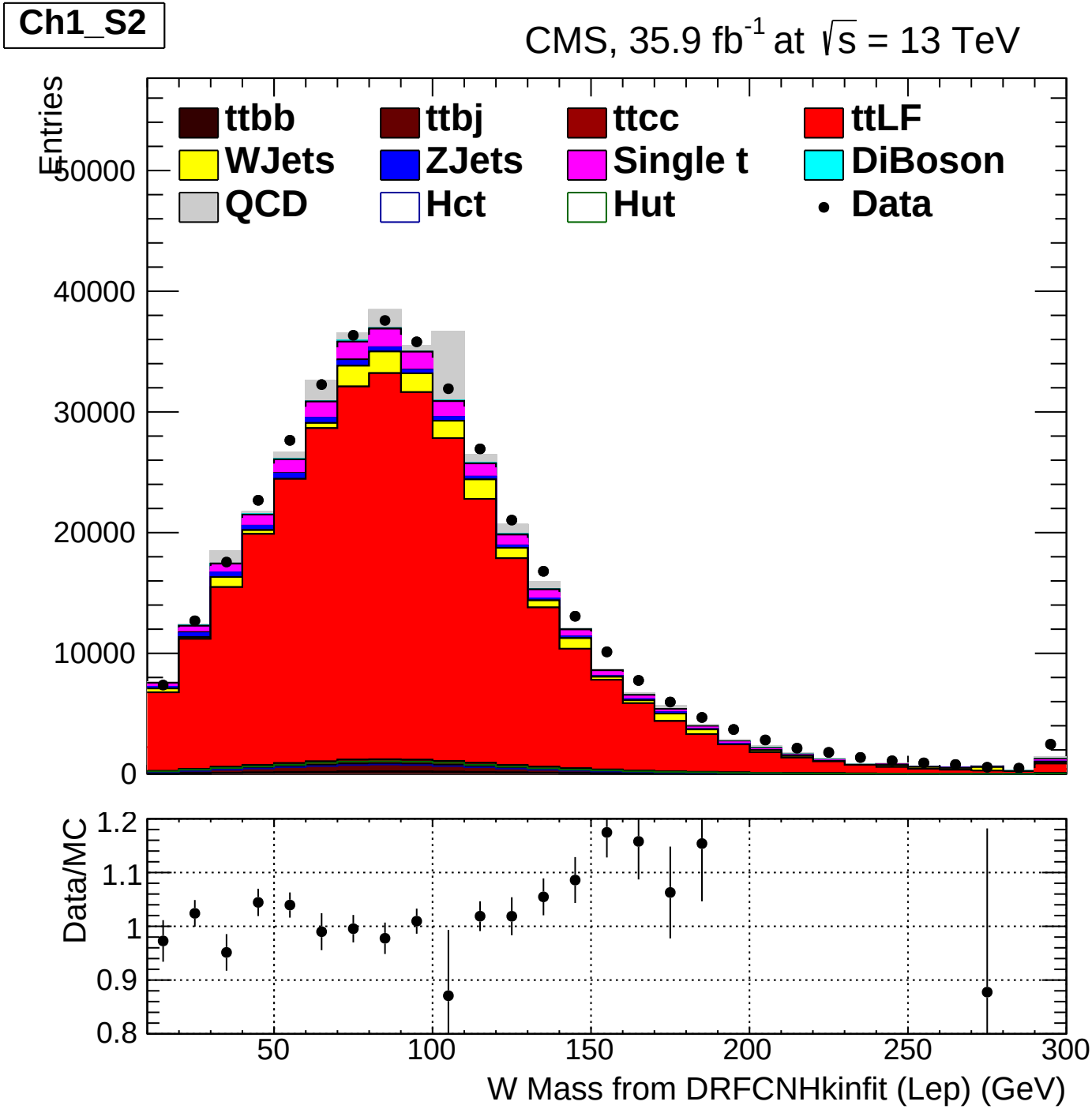

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

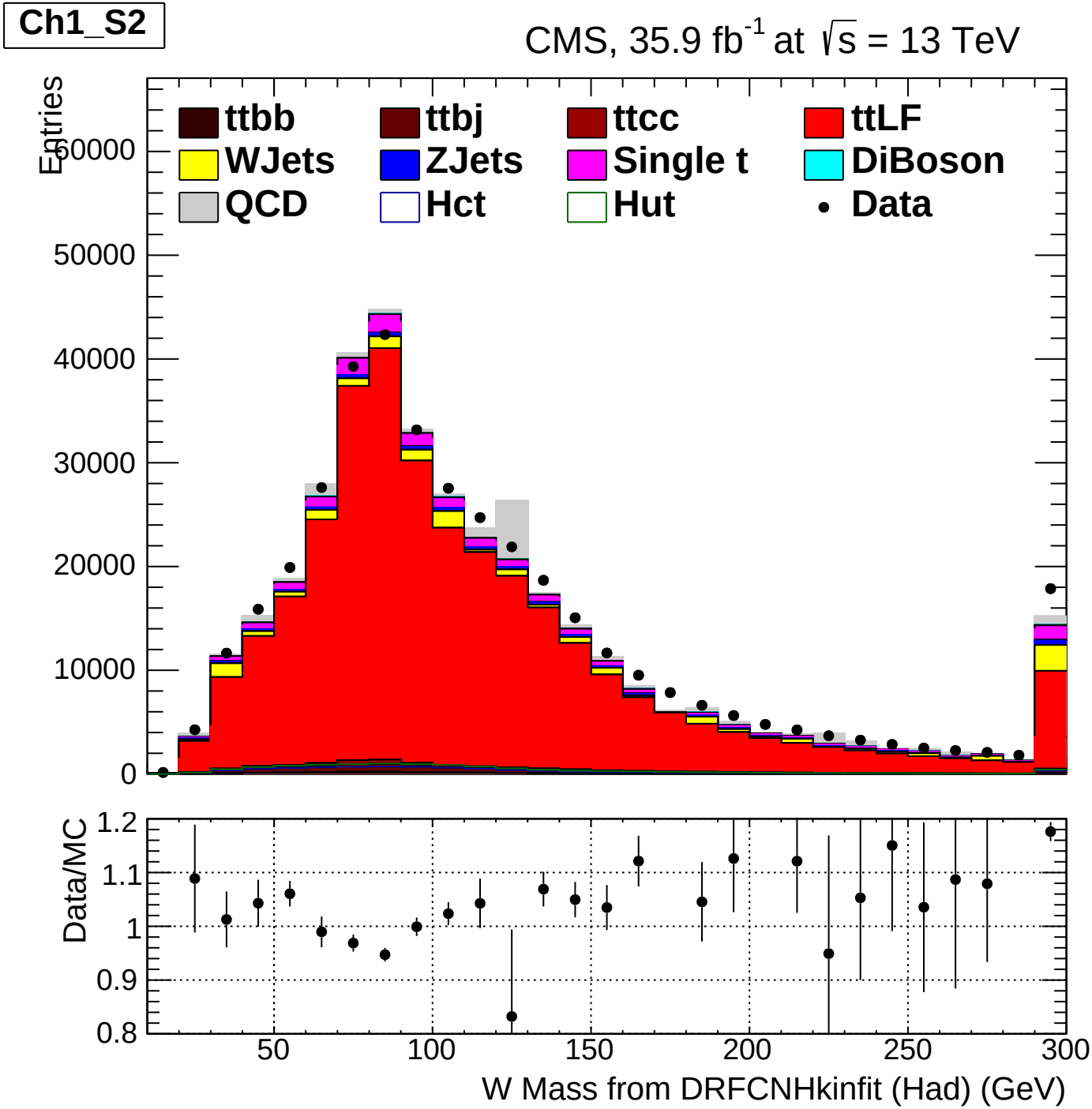

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
16000
14000
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

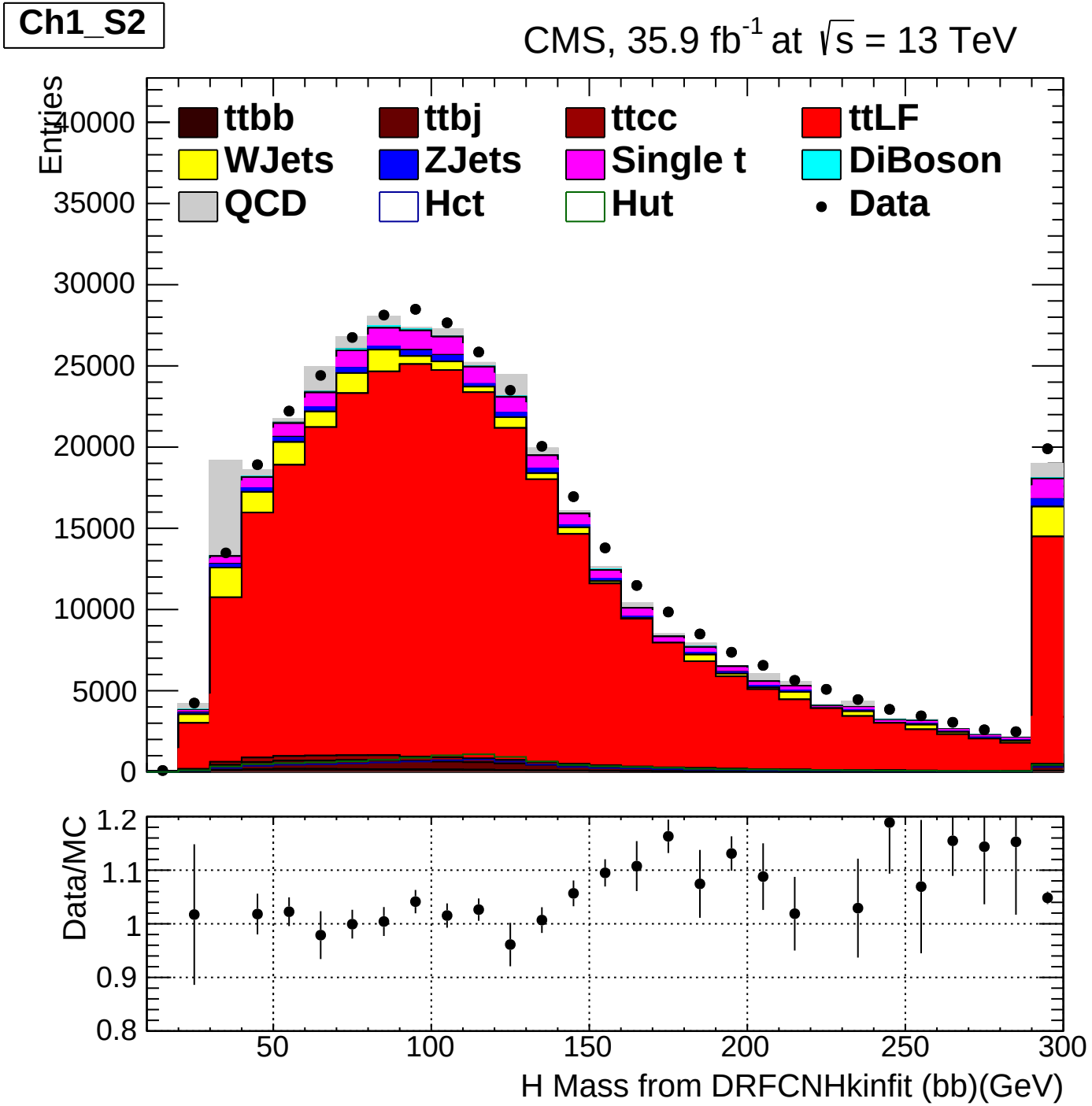

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

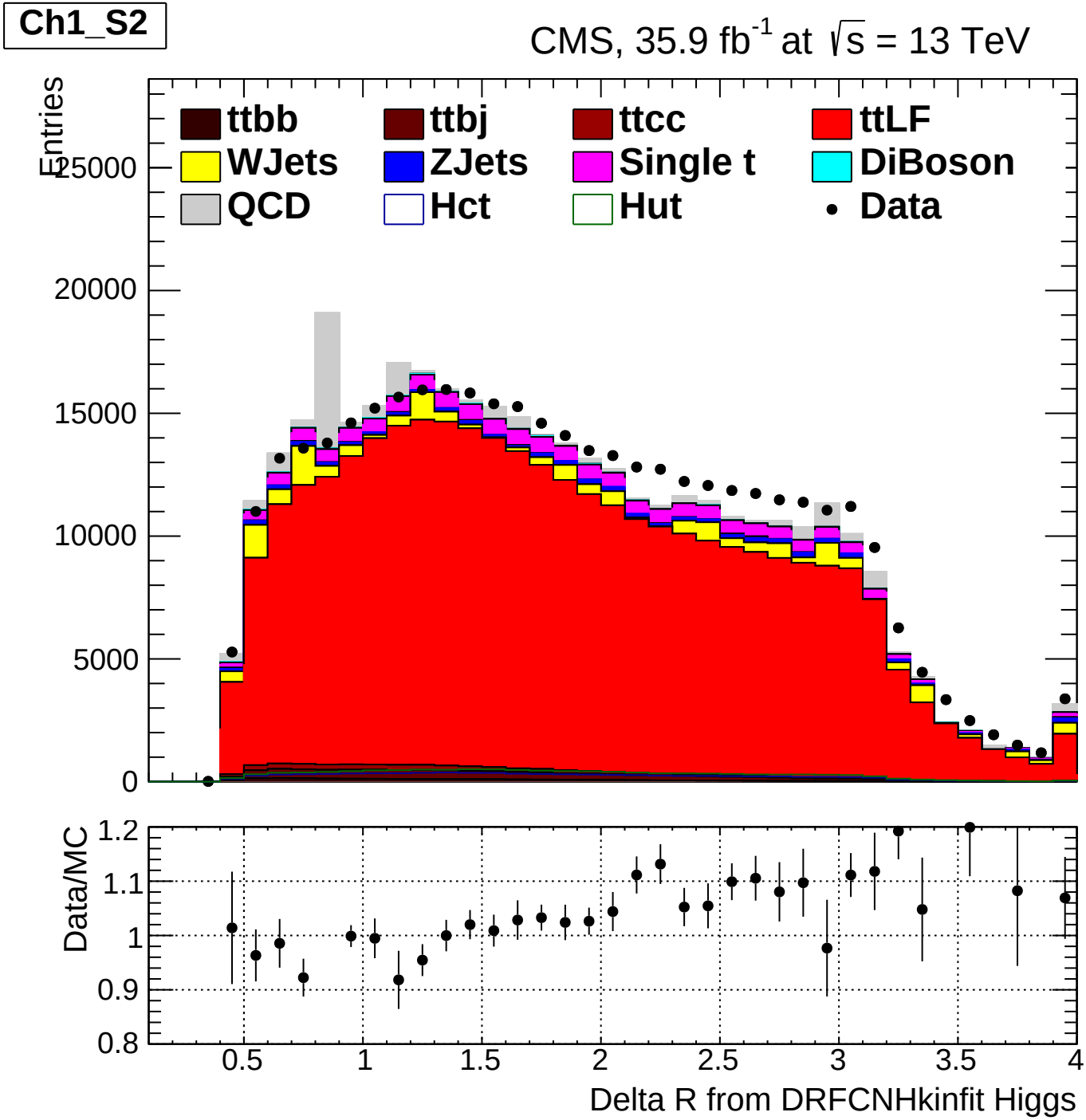

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

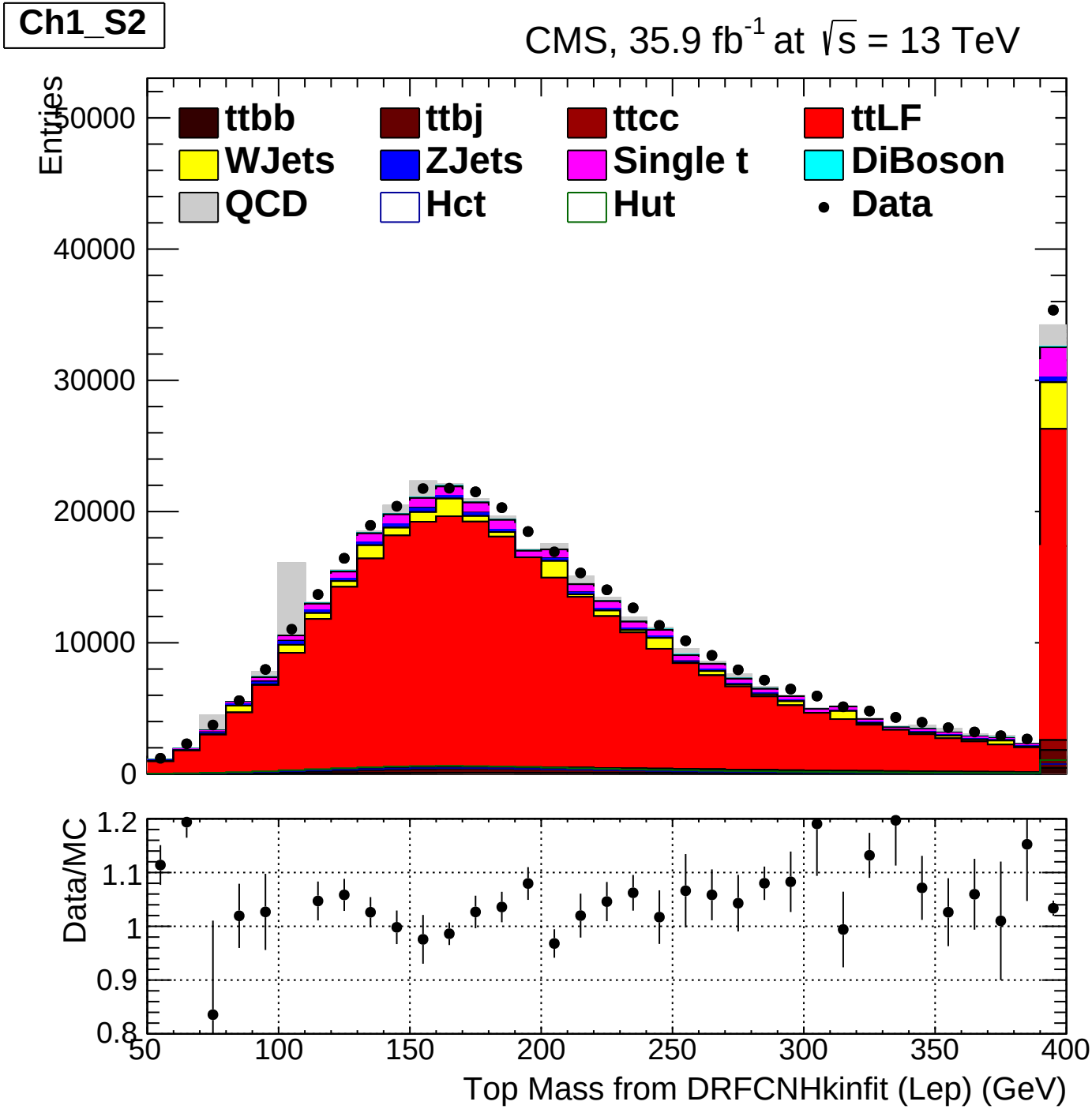

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

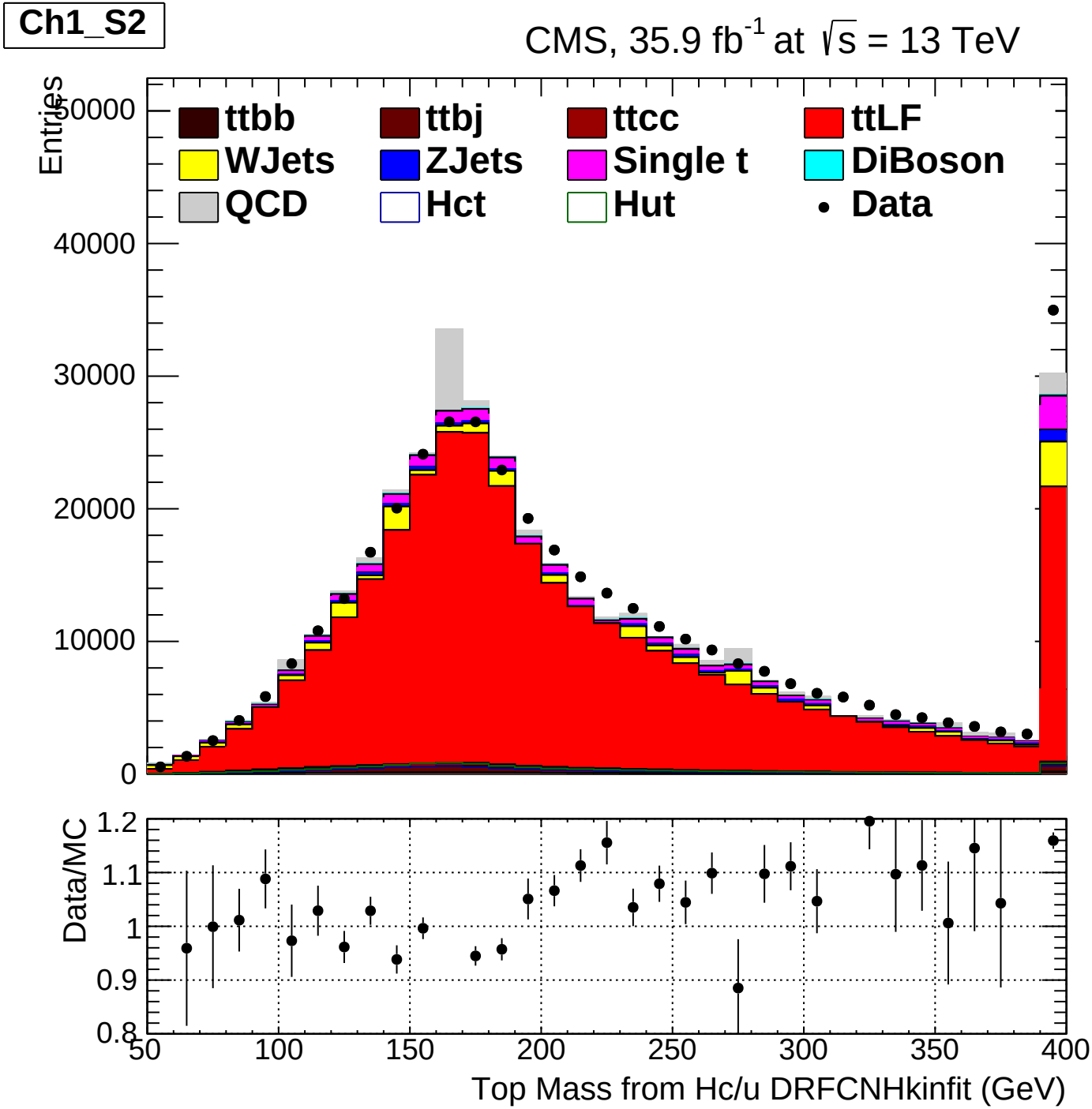

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)

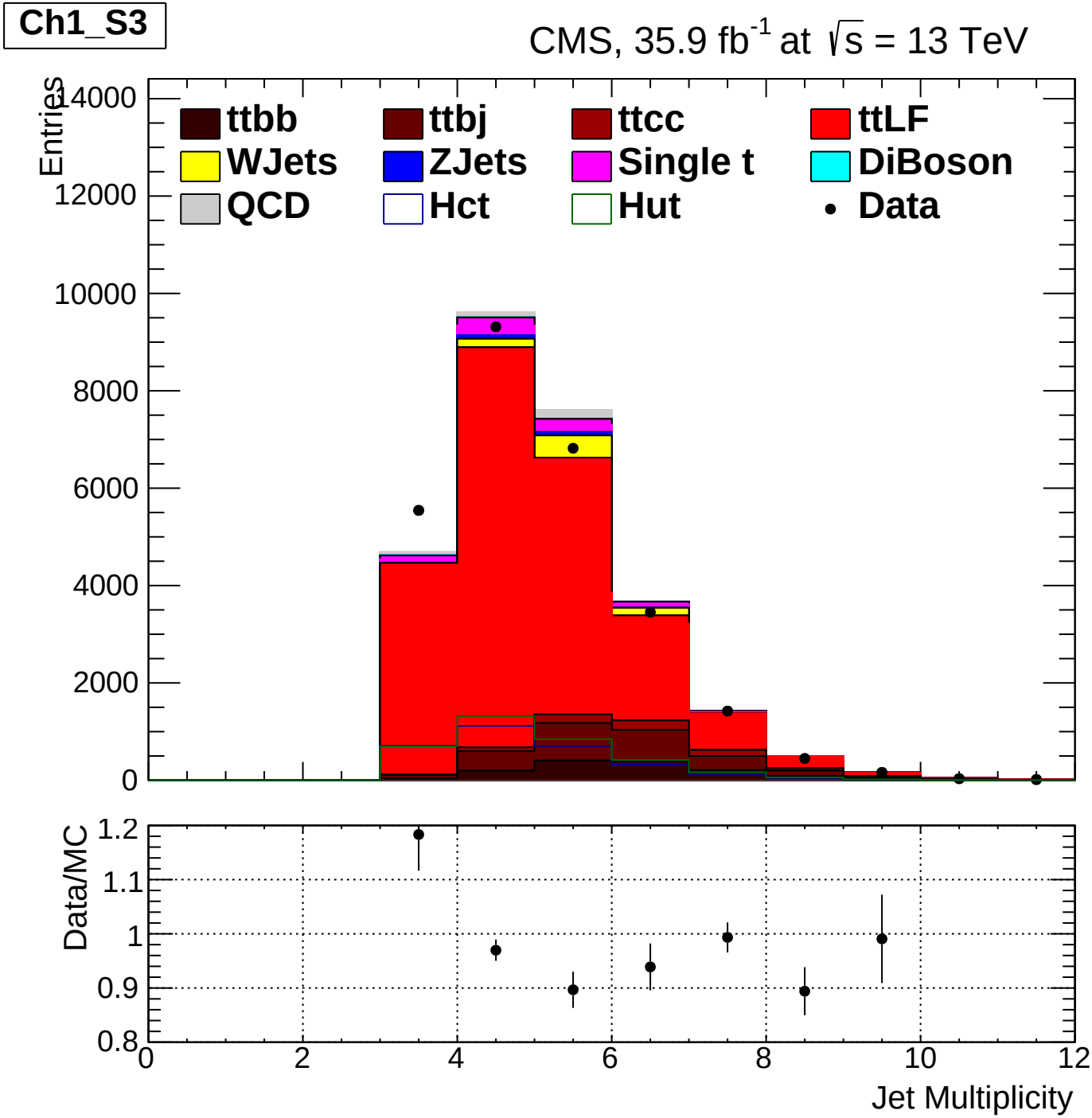

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

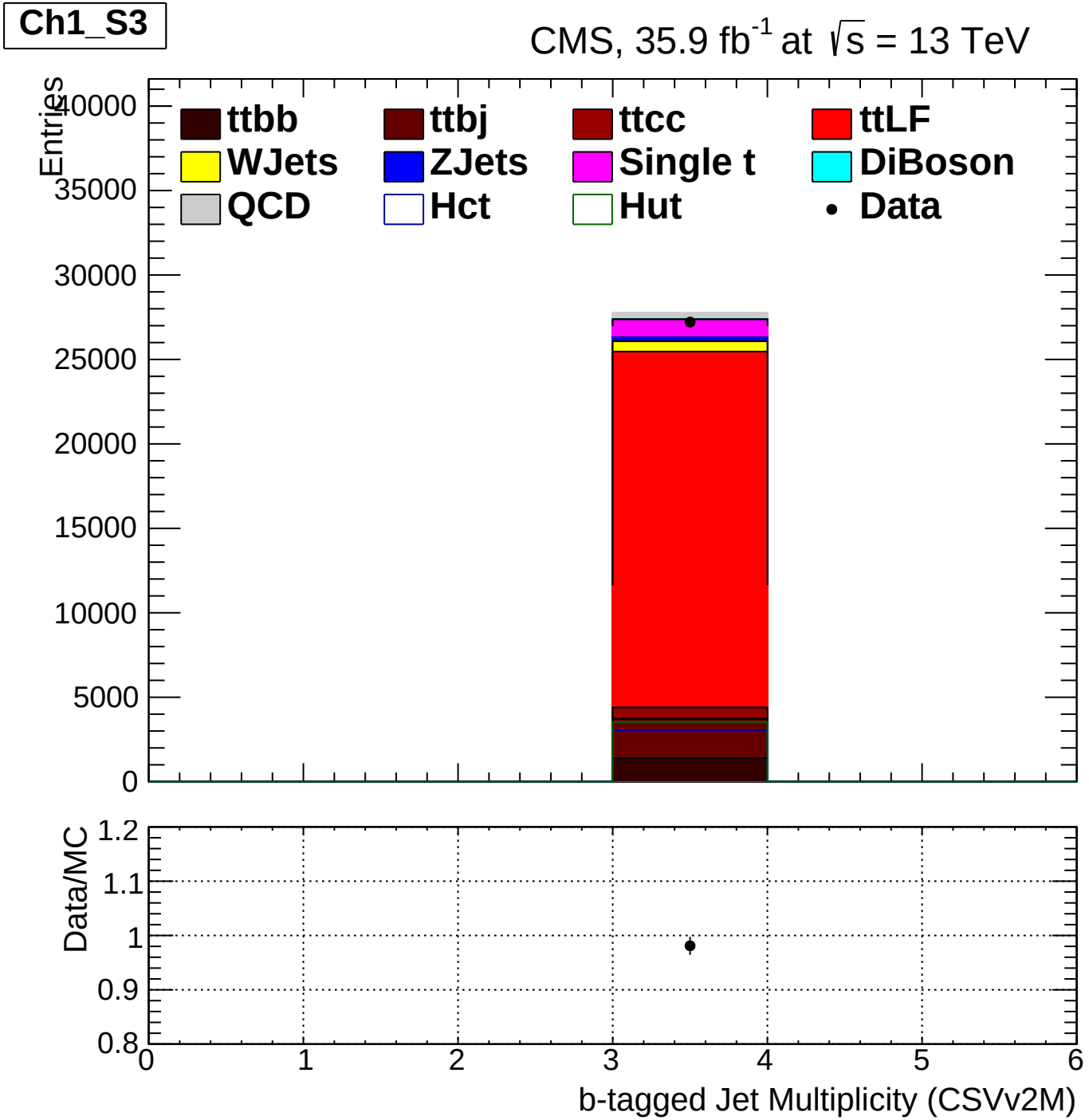

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

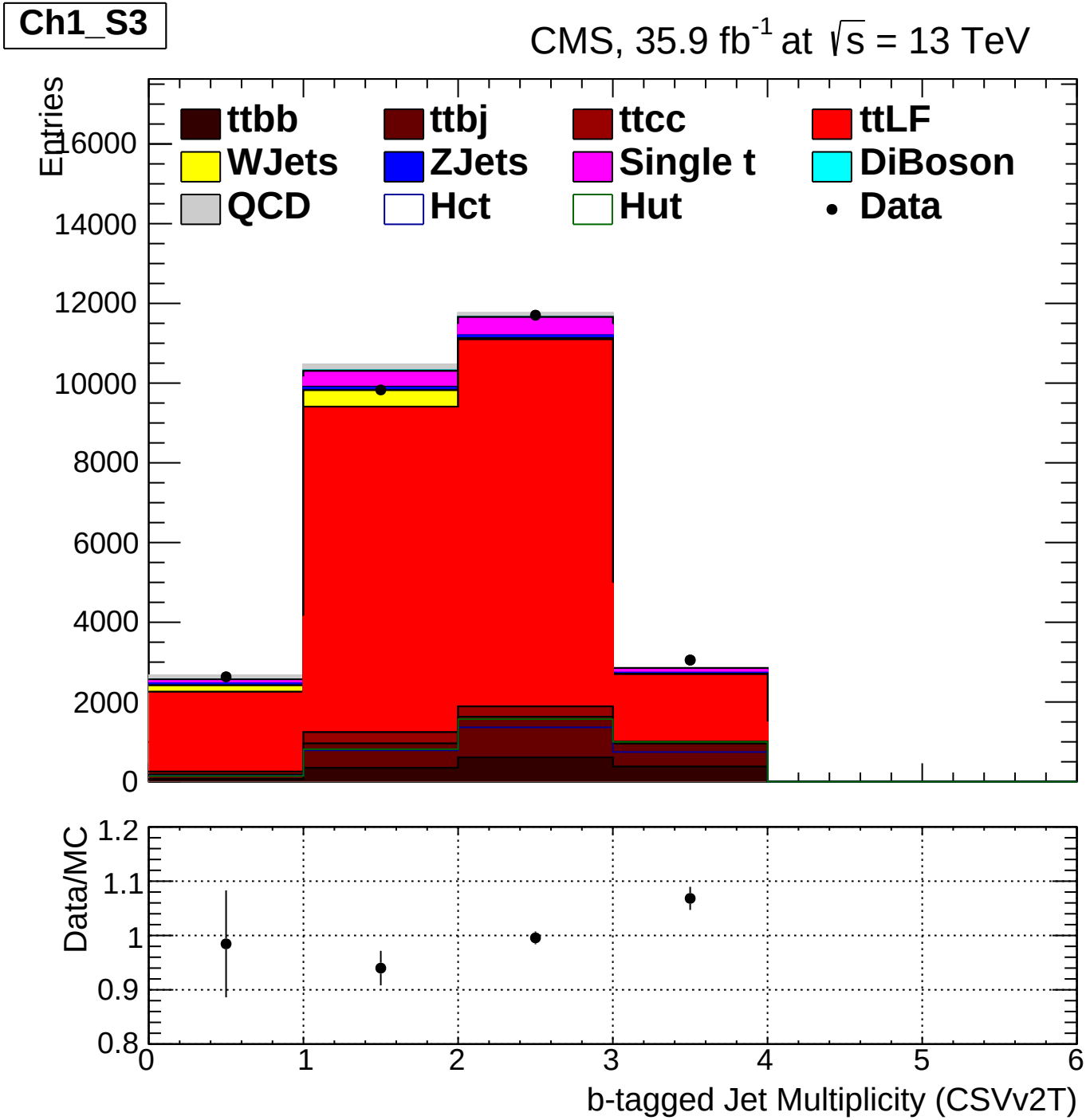

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0.5
1
1.5
2
2.5
3
3.5
4
Delta R from DRFCNHkinfit Higgs

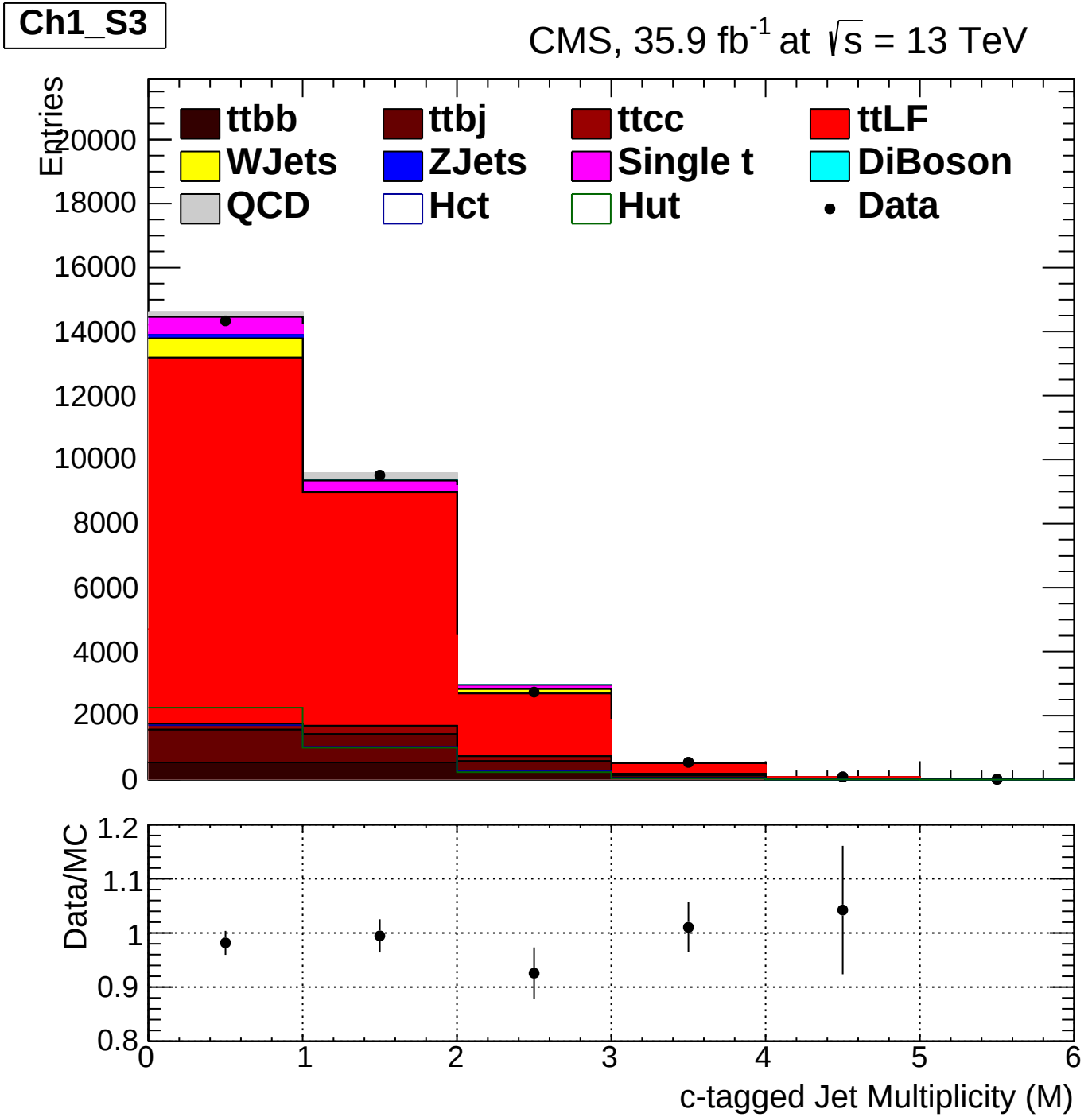

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

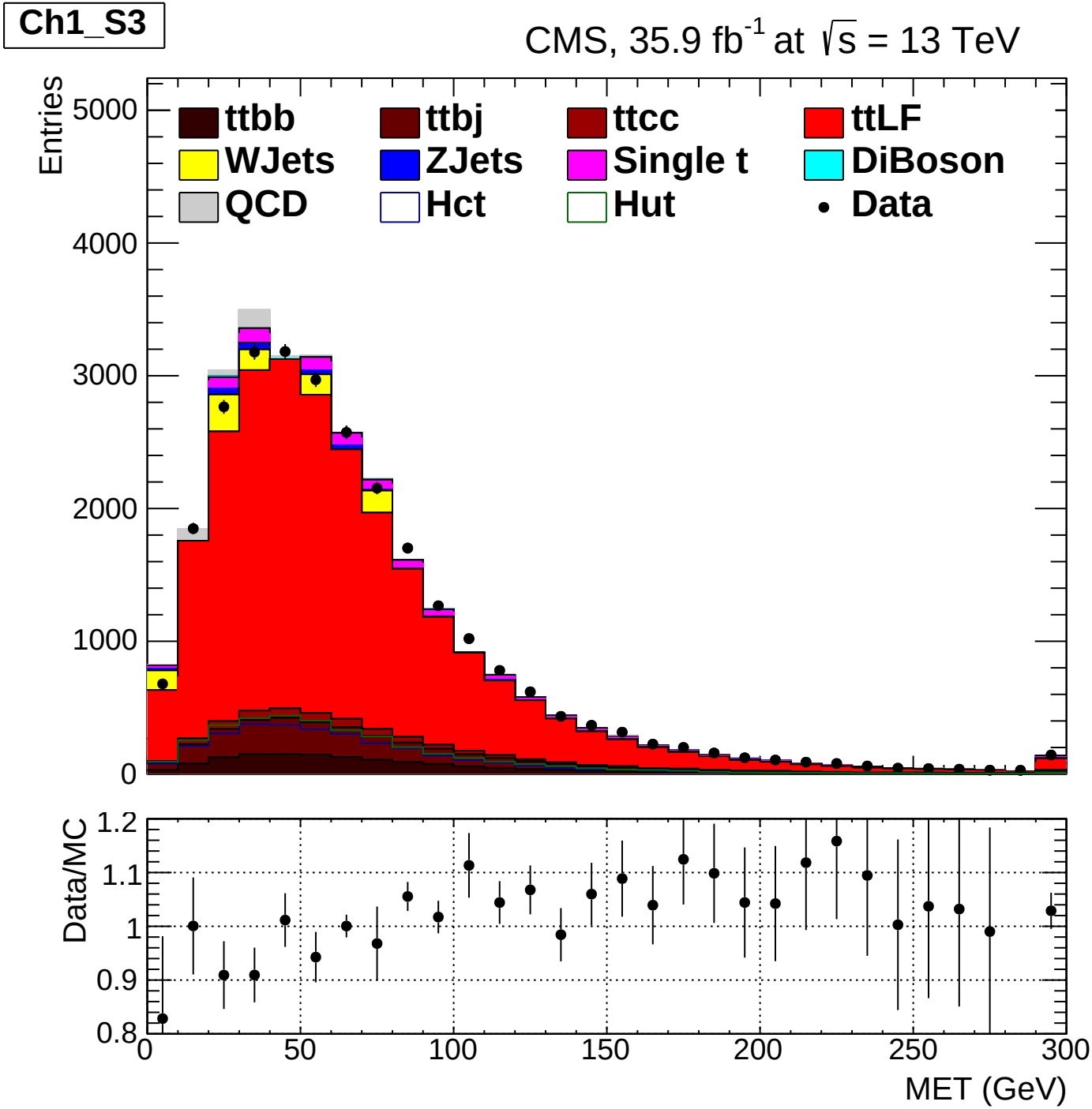

Ch1_S2
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from Hc/u DRFCNHkinfit (GeV)

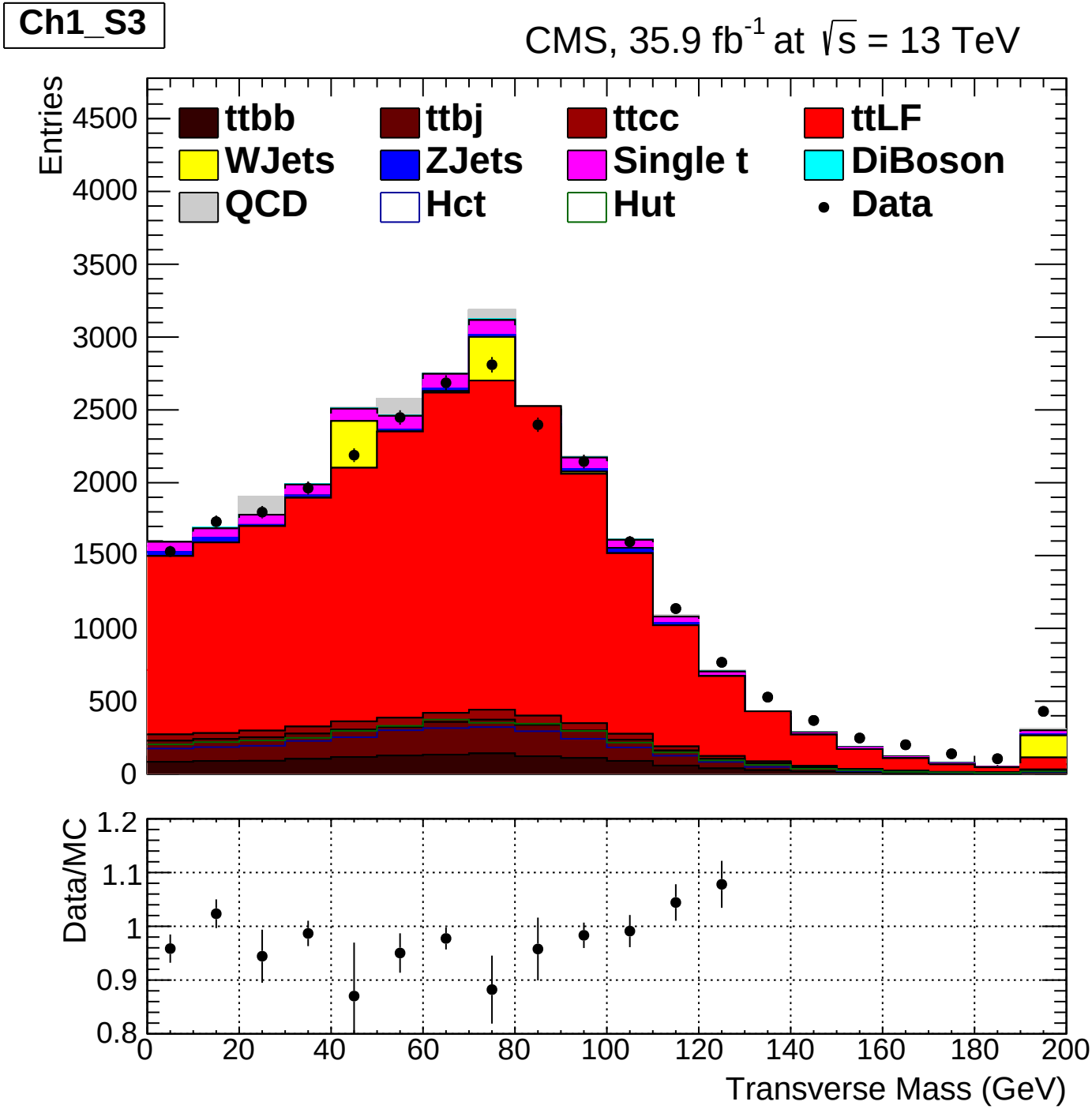

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

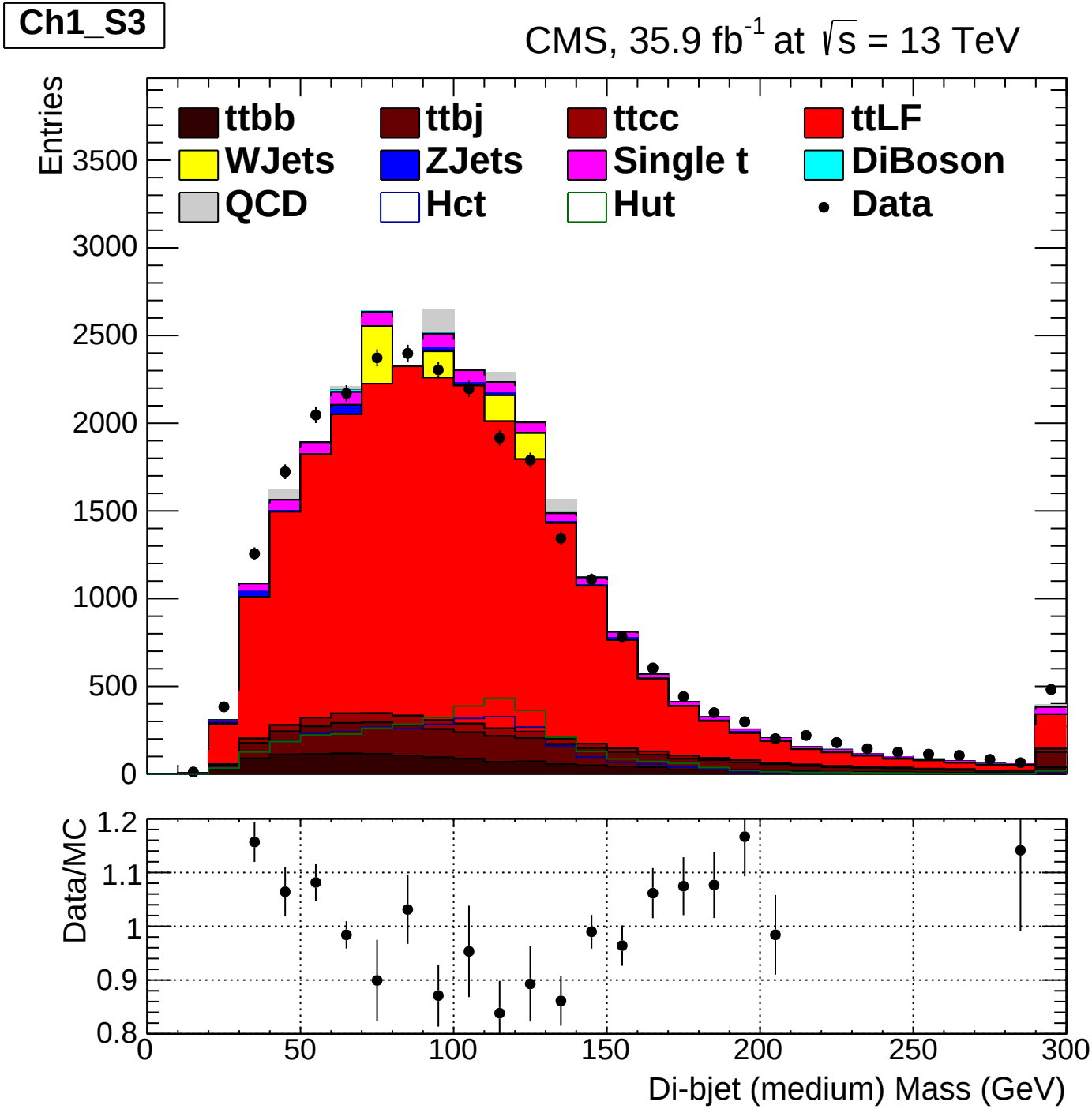

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

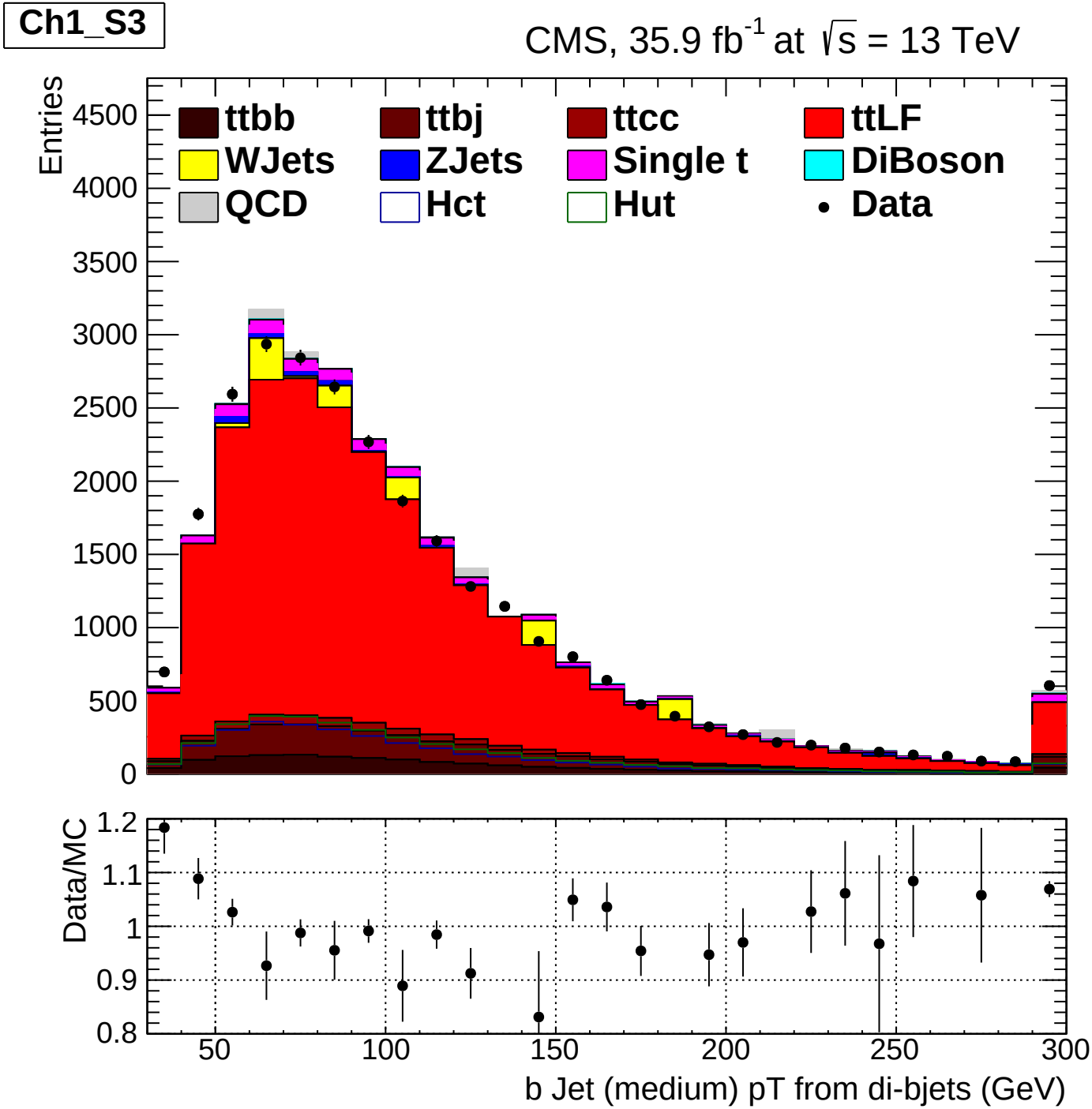

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
12000
14000
16000
Data/MC
0.8
0.9
1
1.1
1.2
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

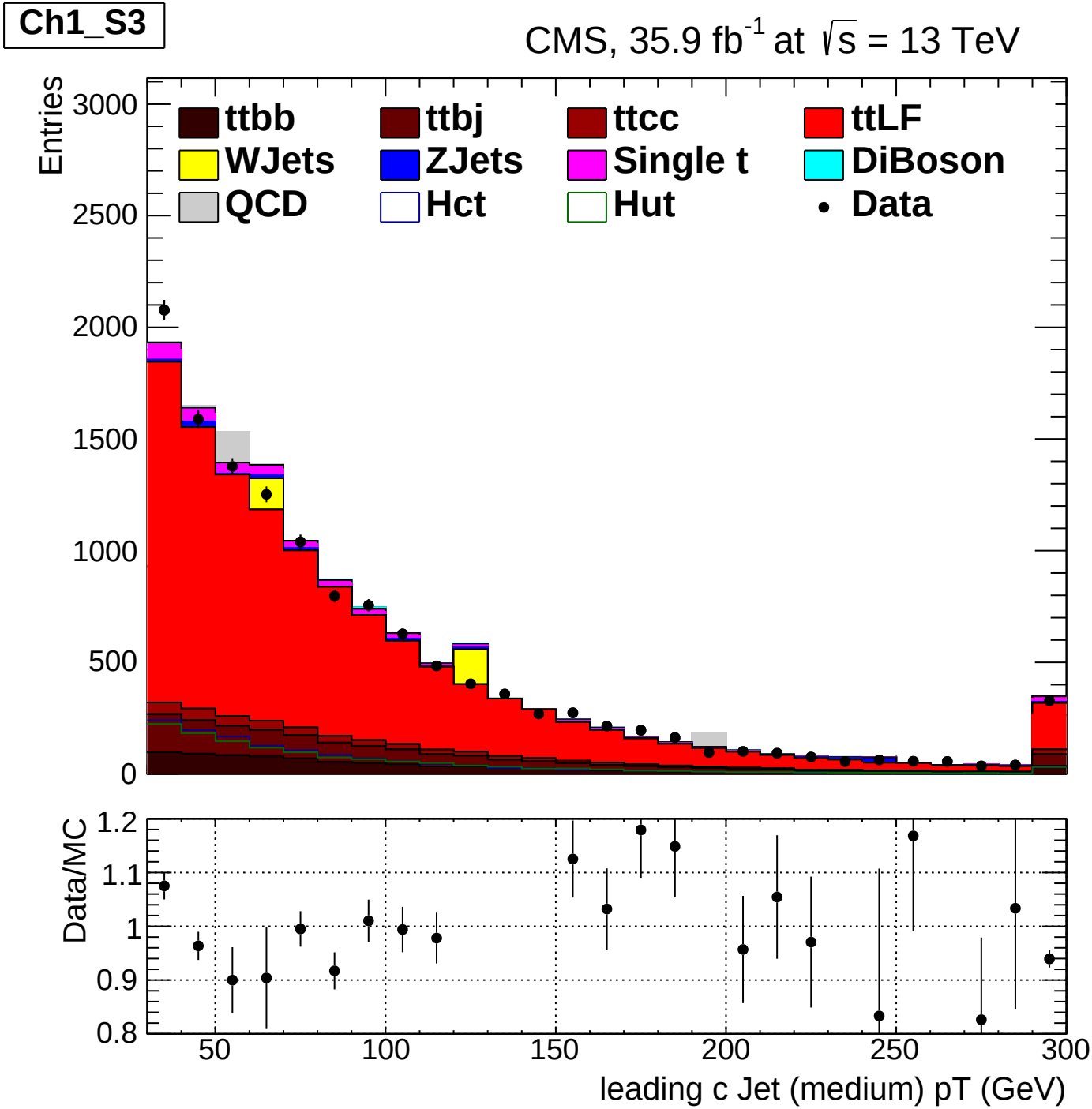

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

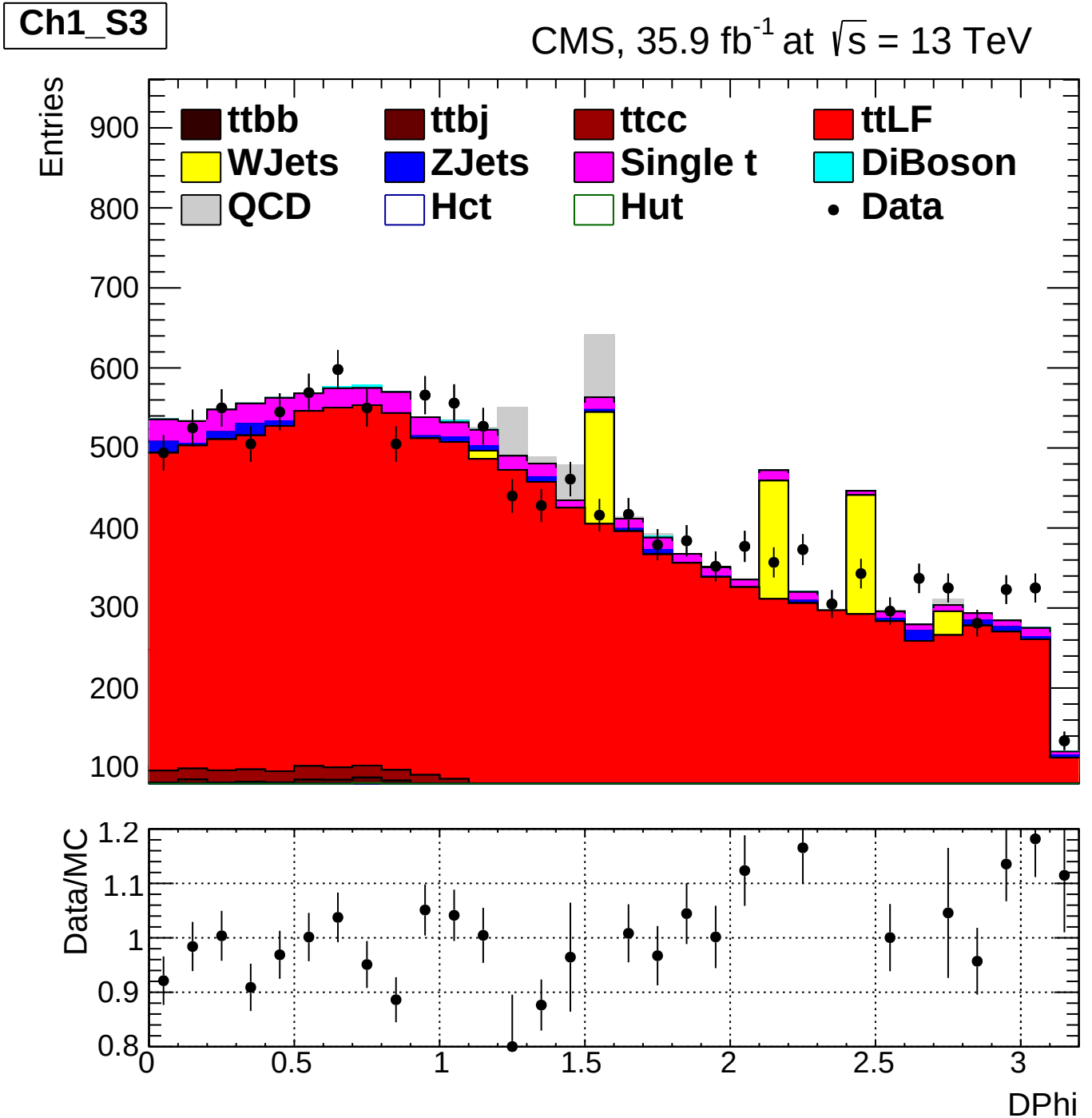

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

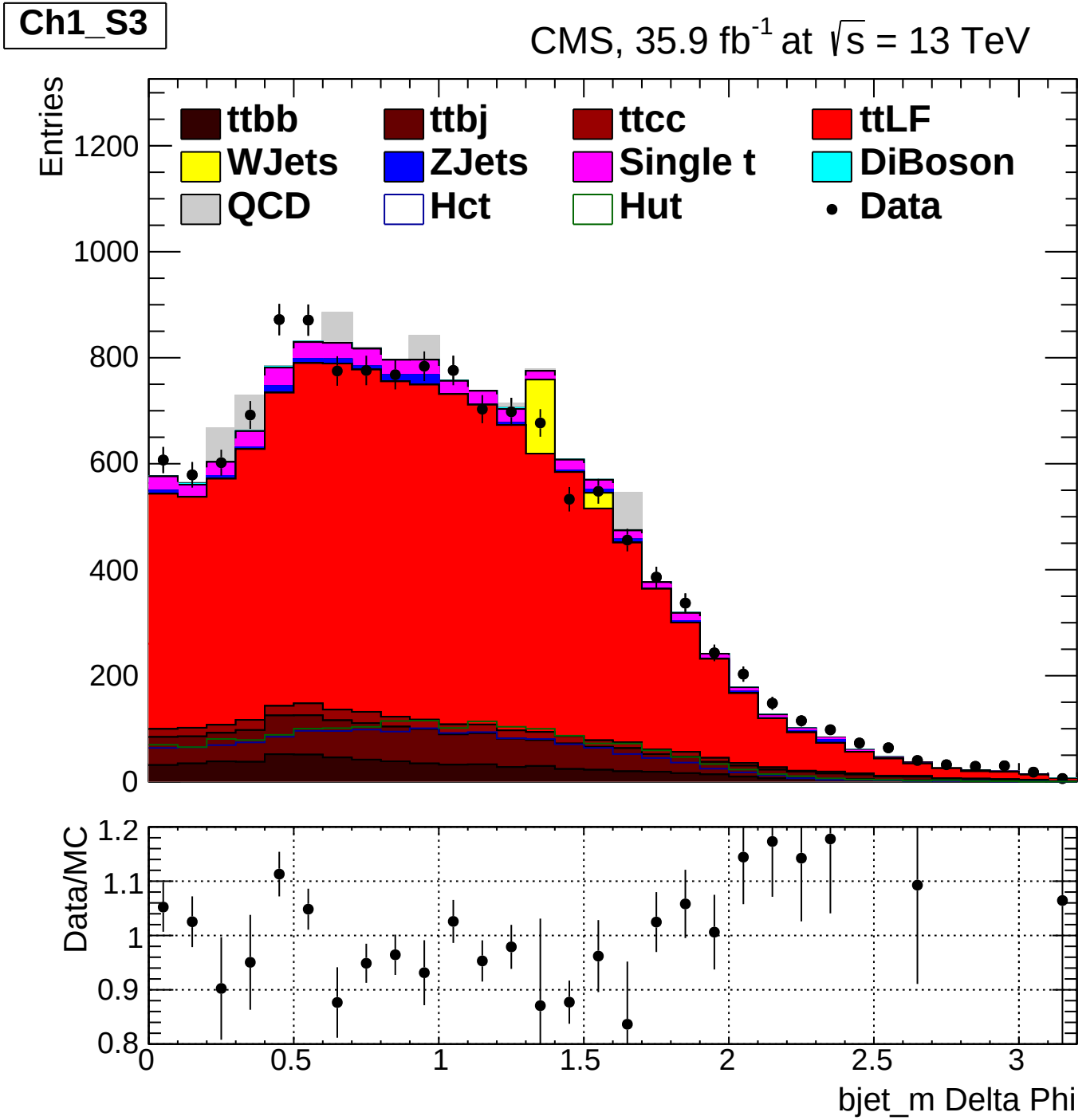

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

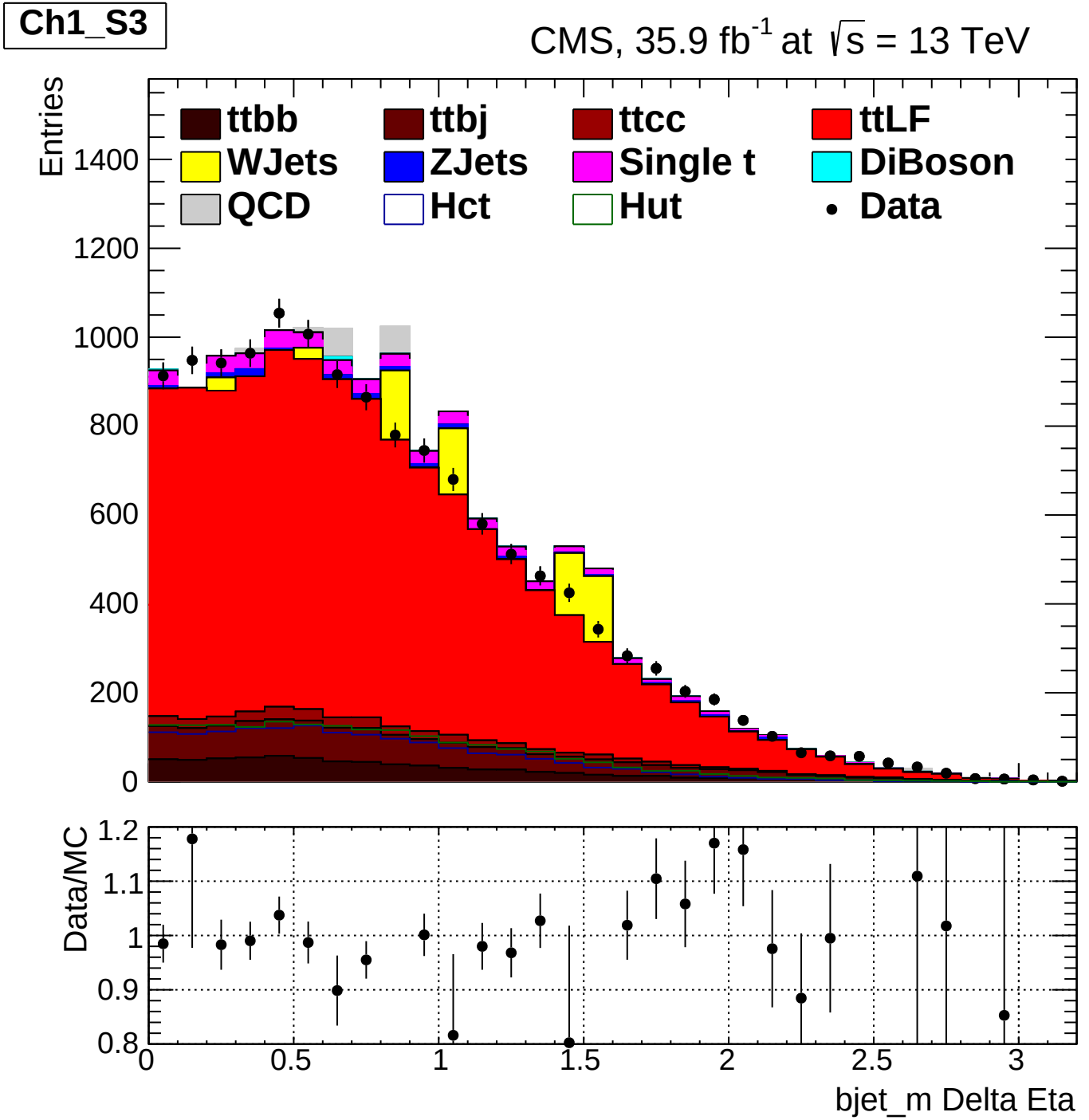

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

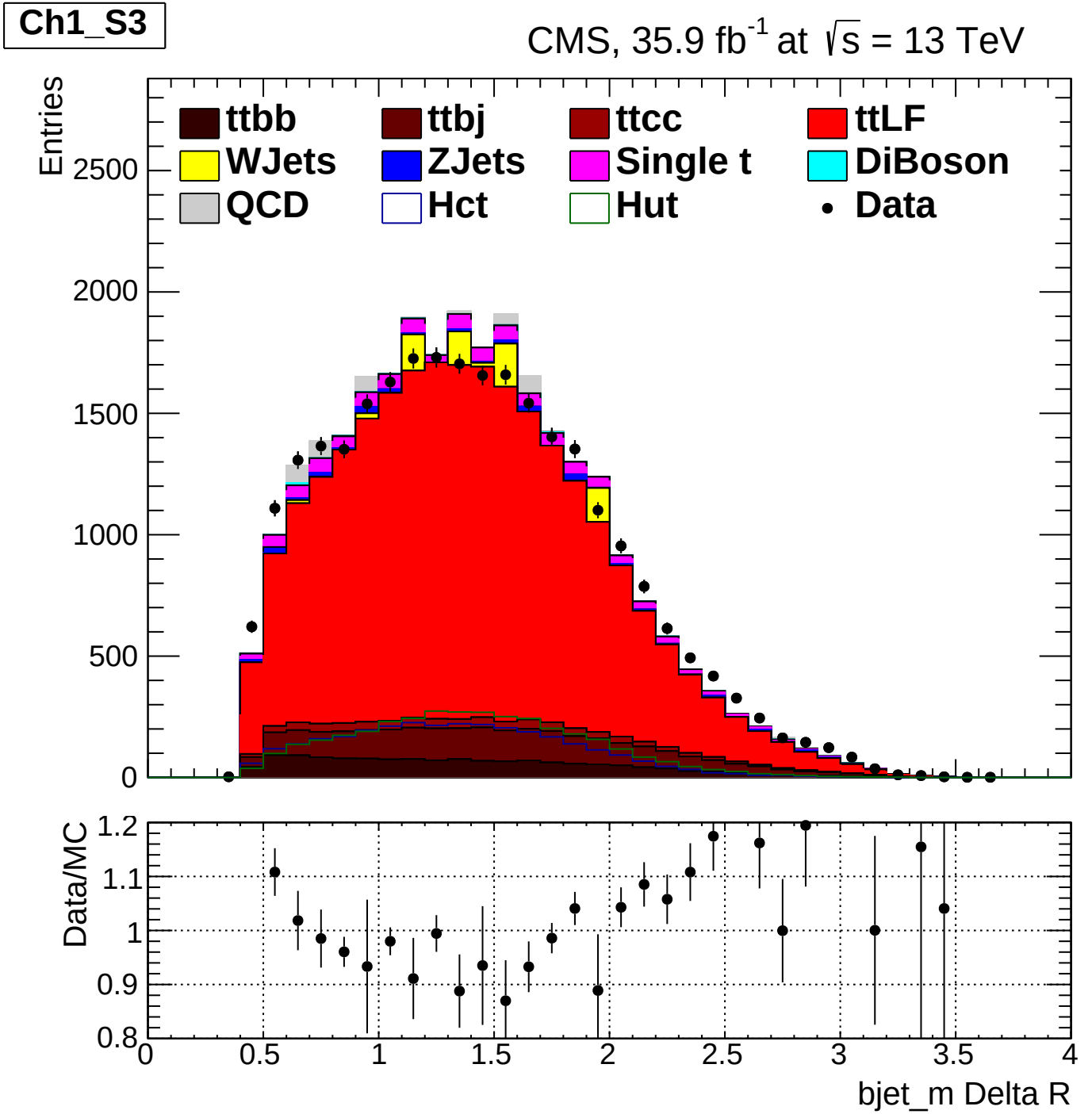

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

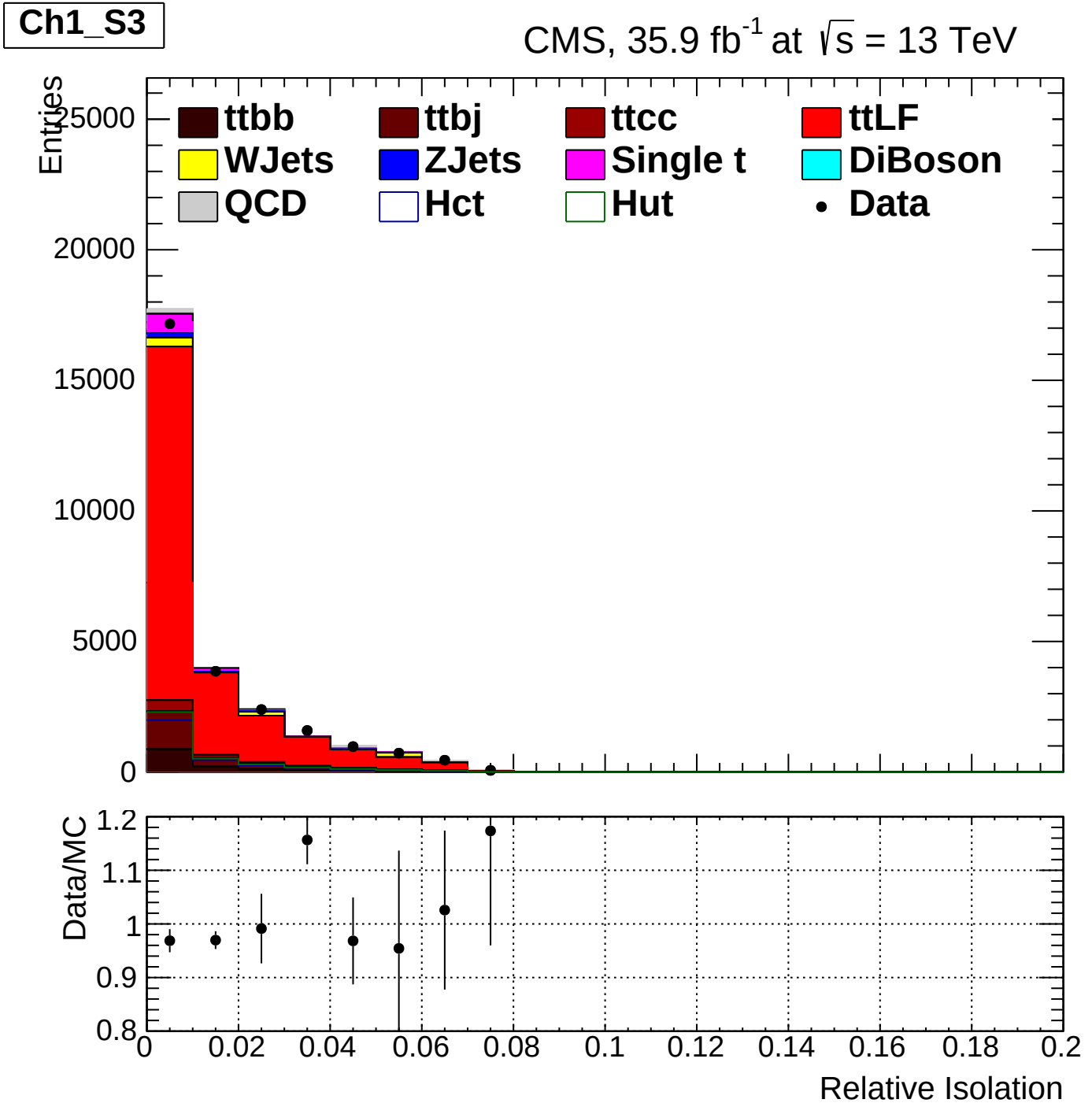

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

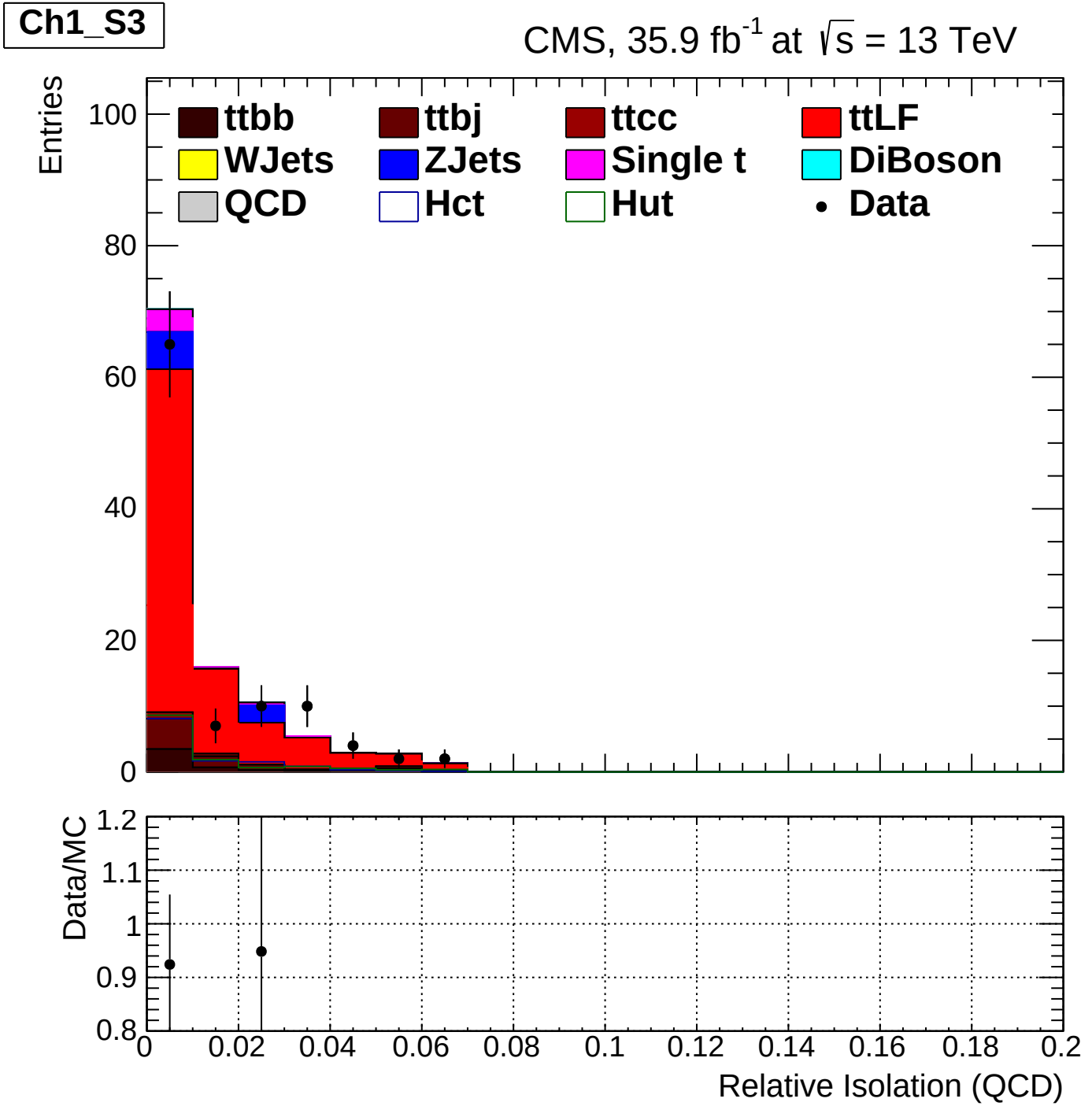

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi

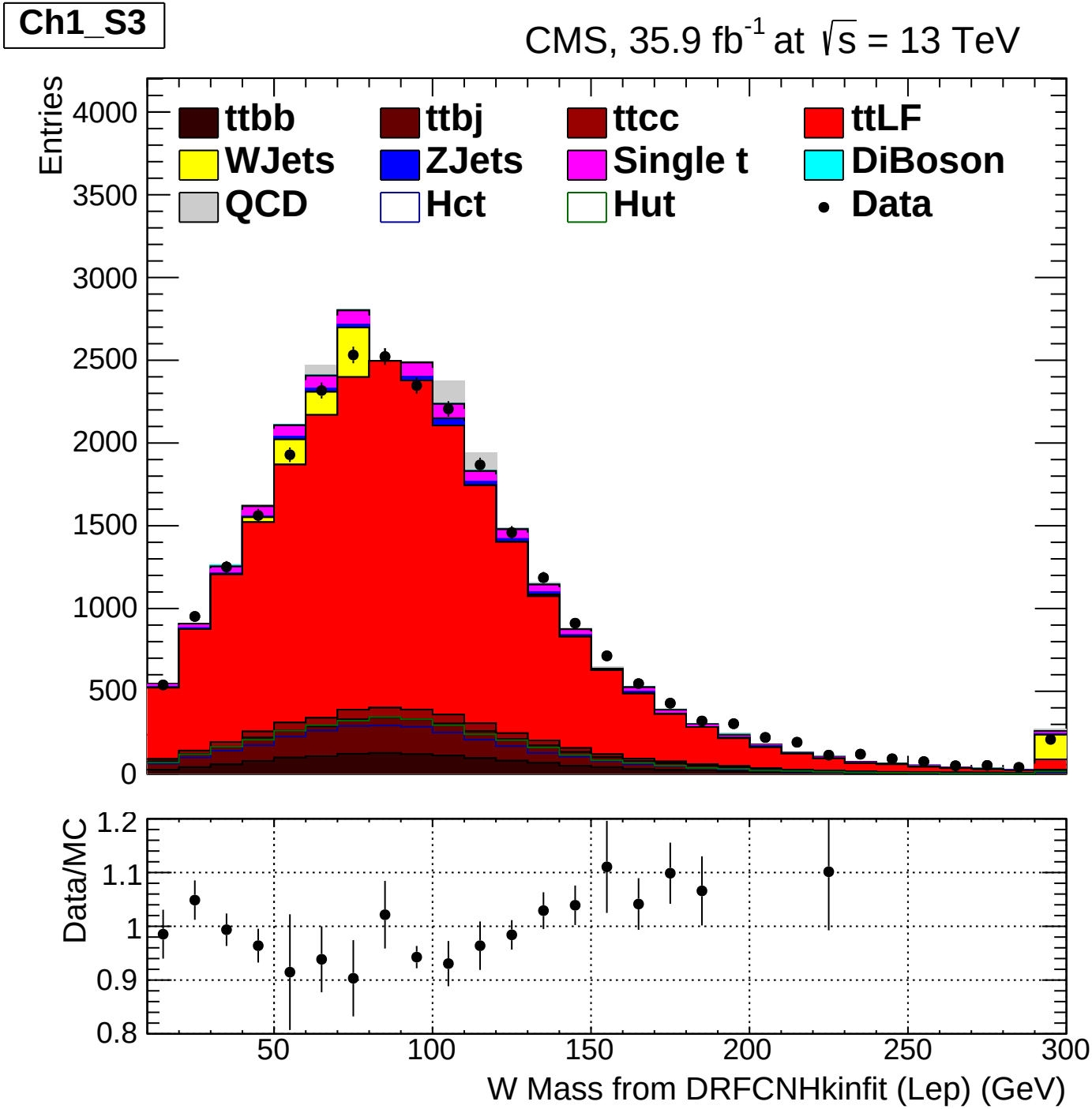

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

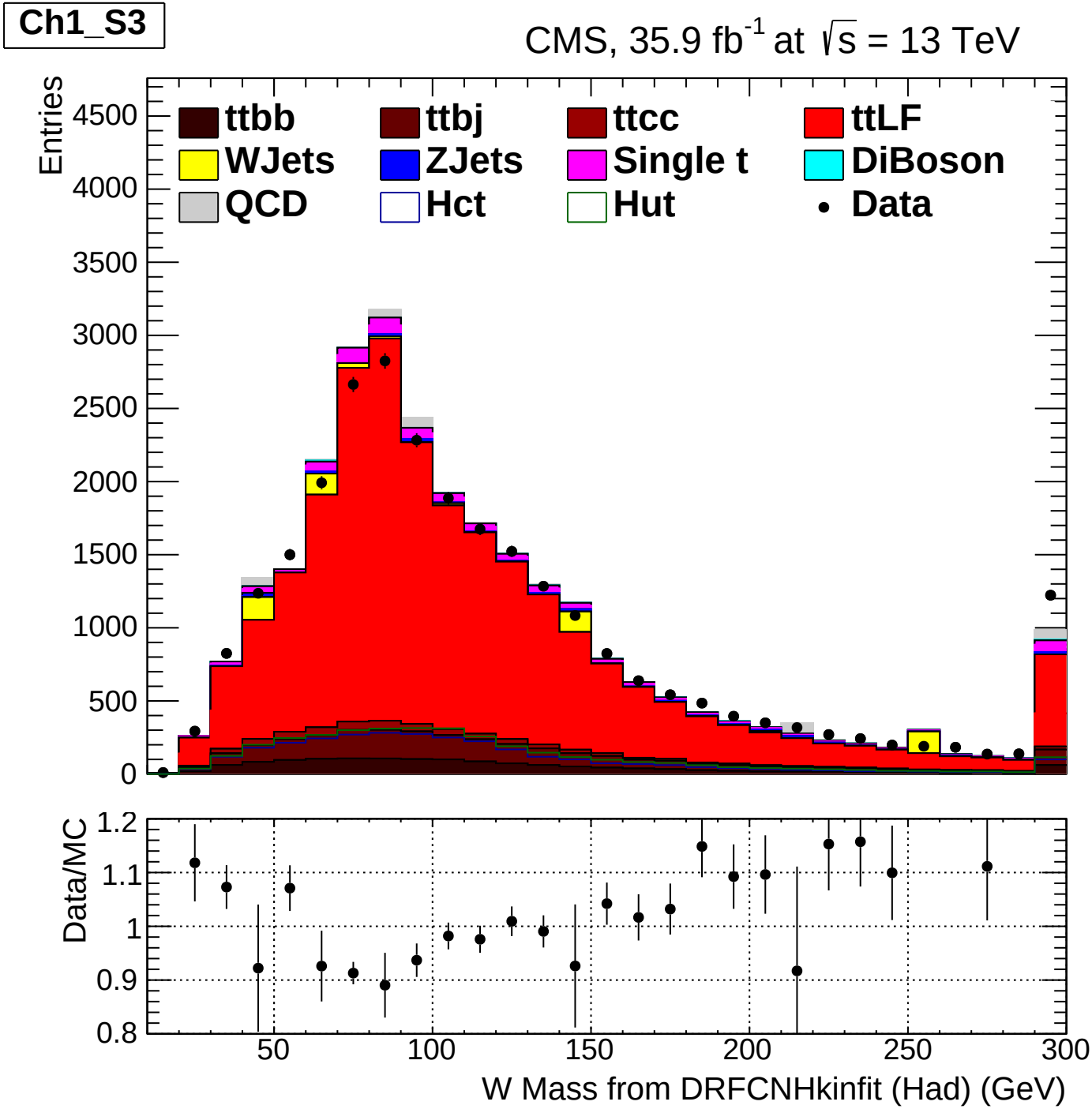

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

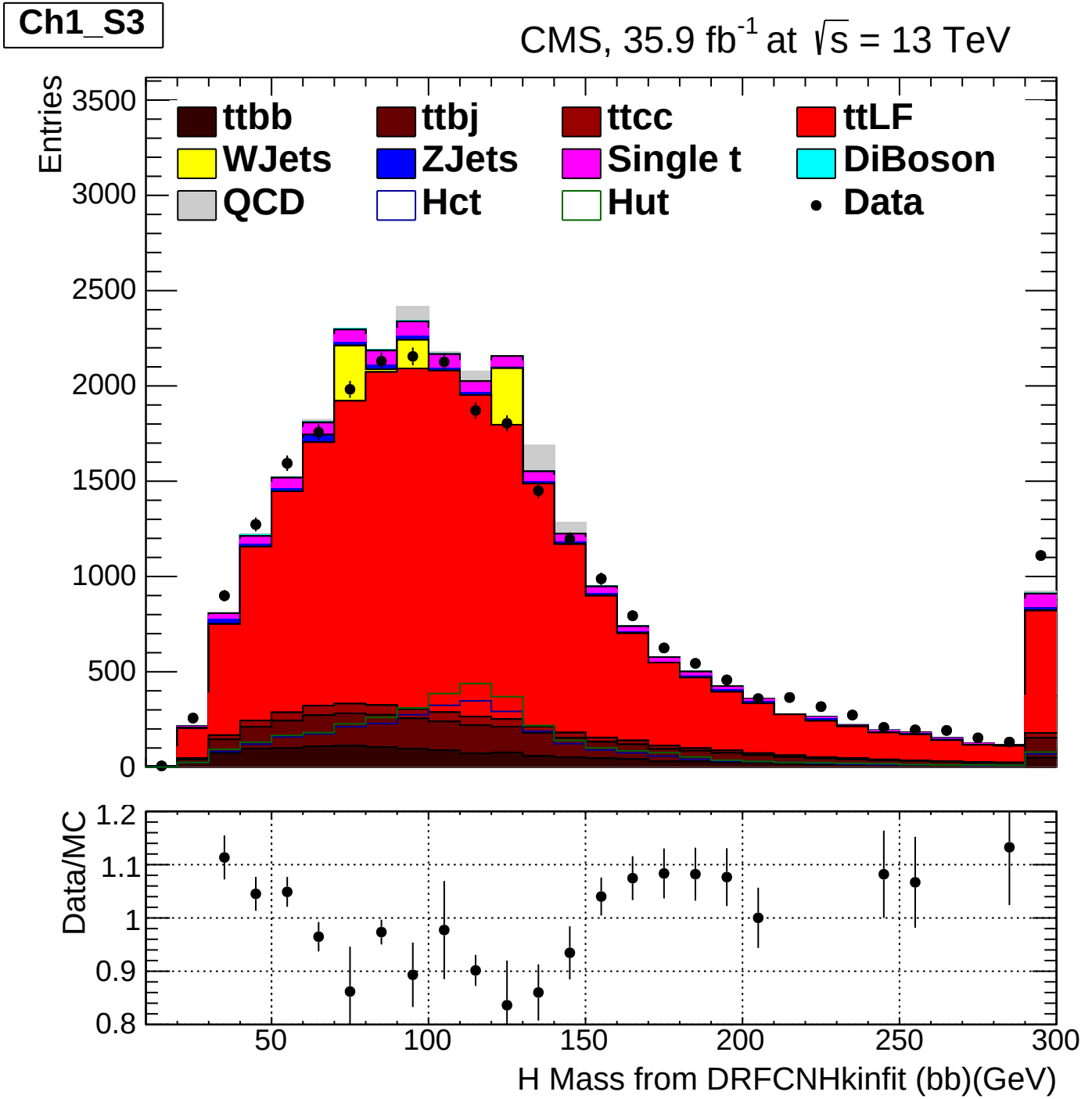

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

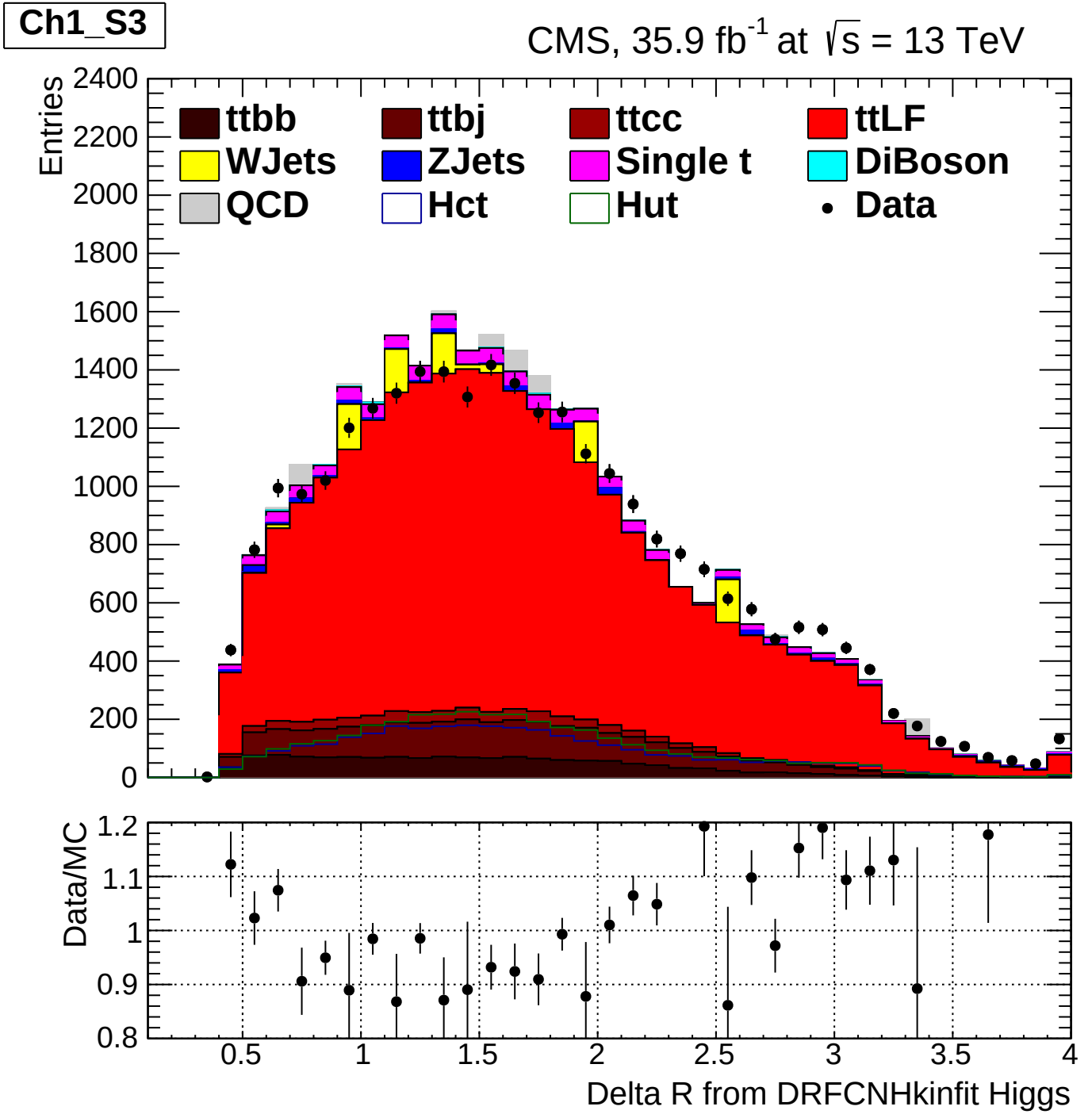

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

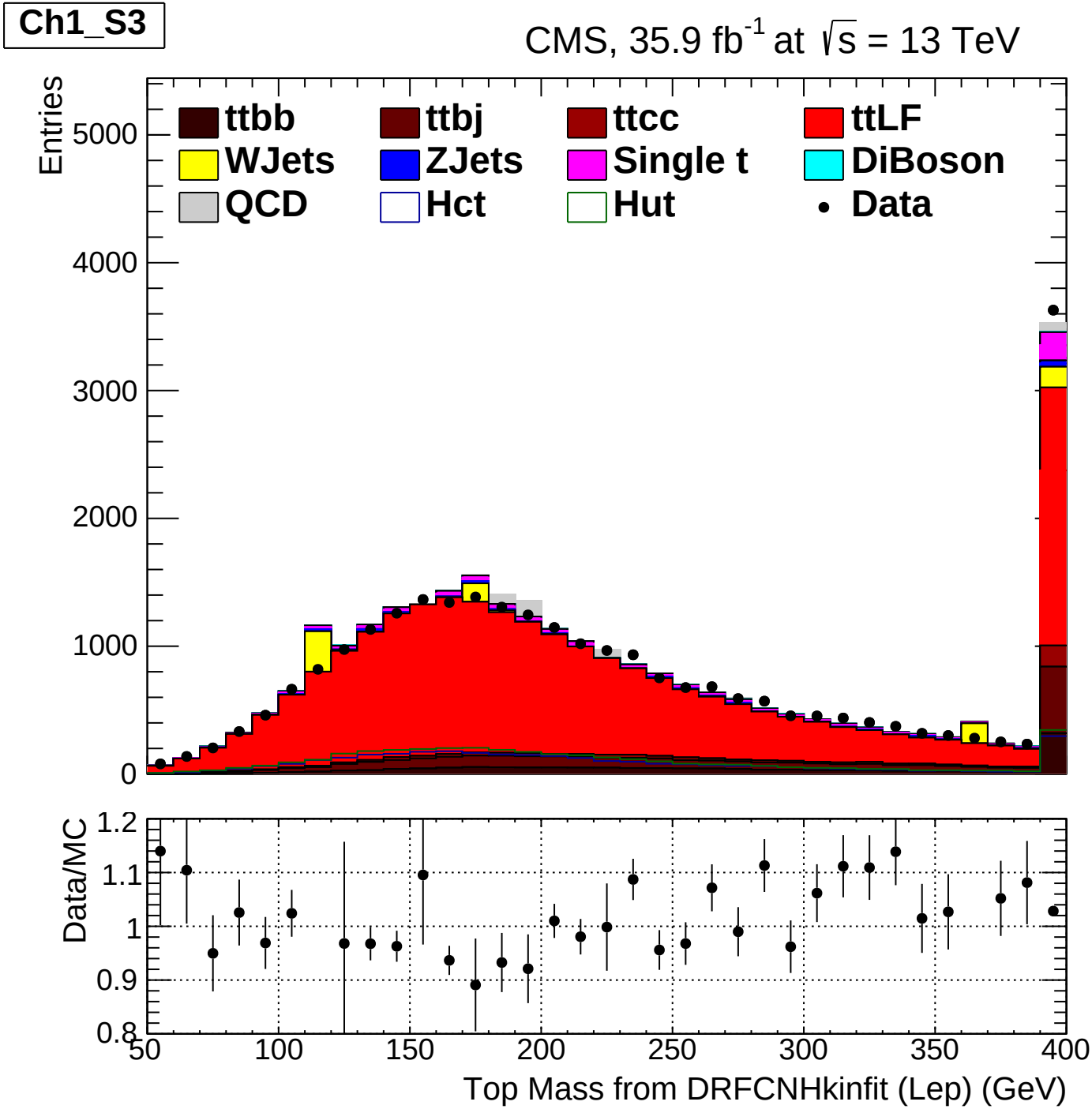

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

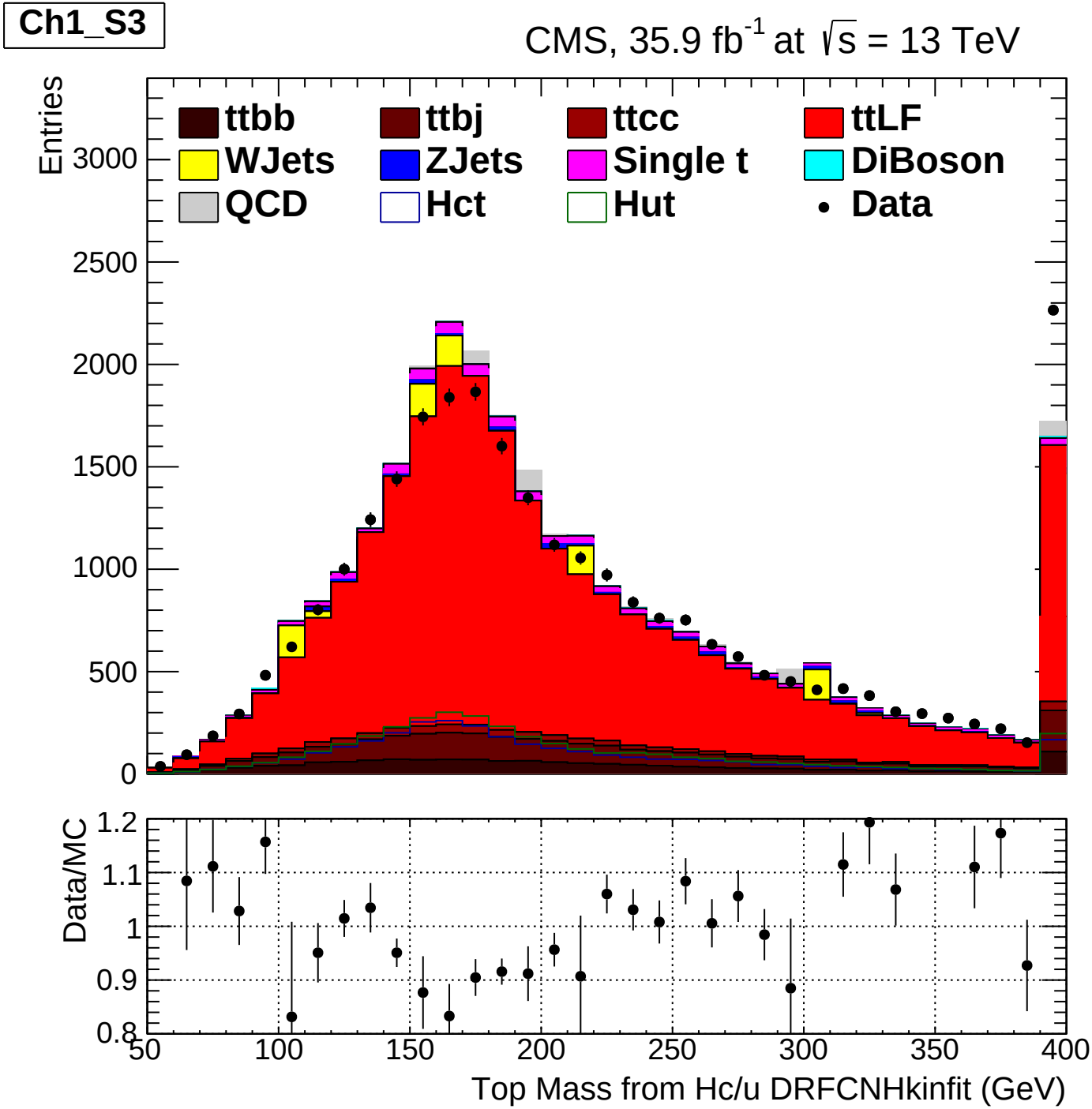

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

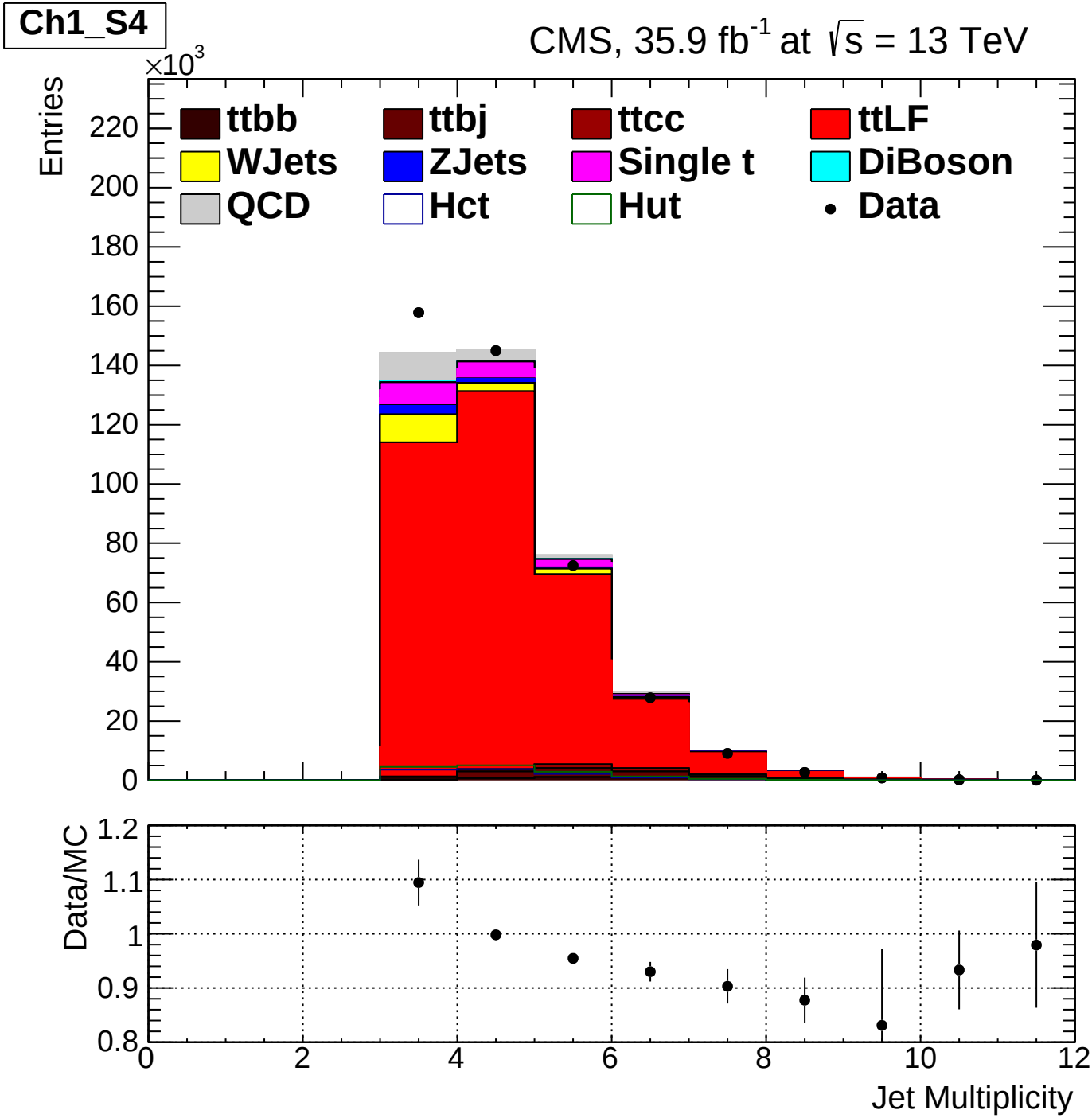

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

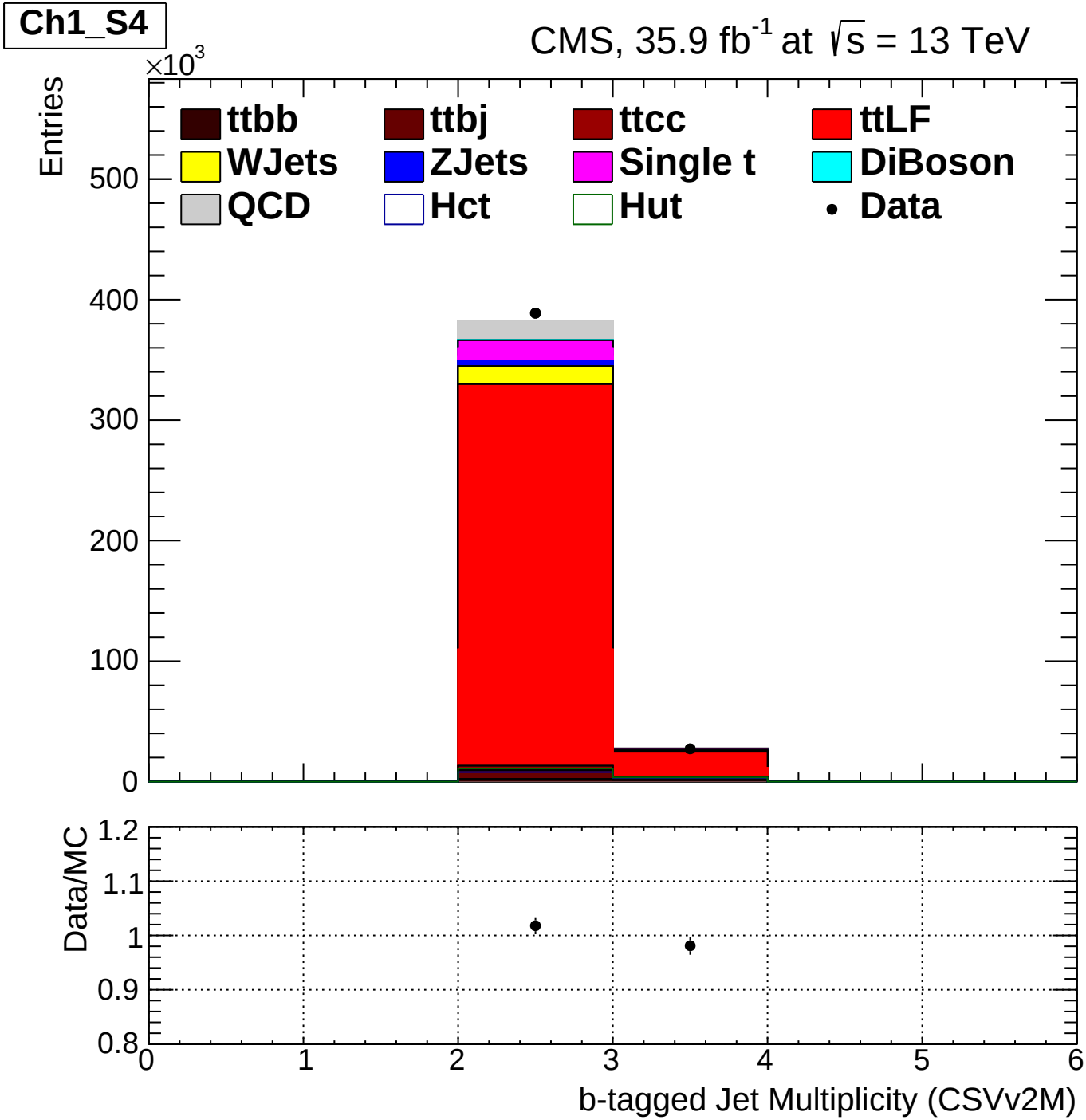

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

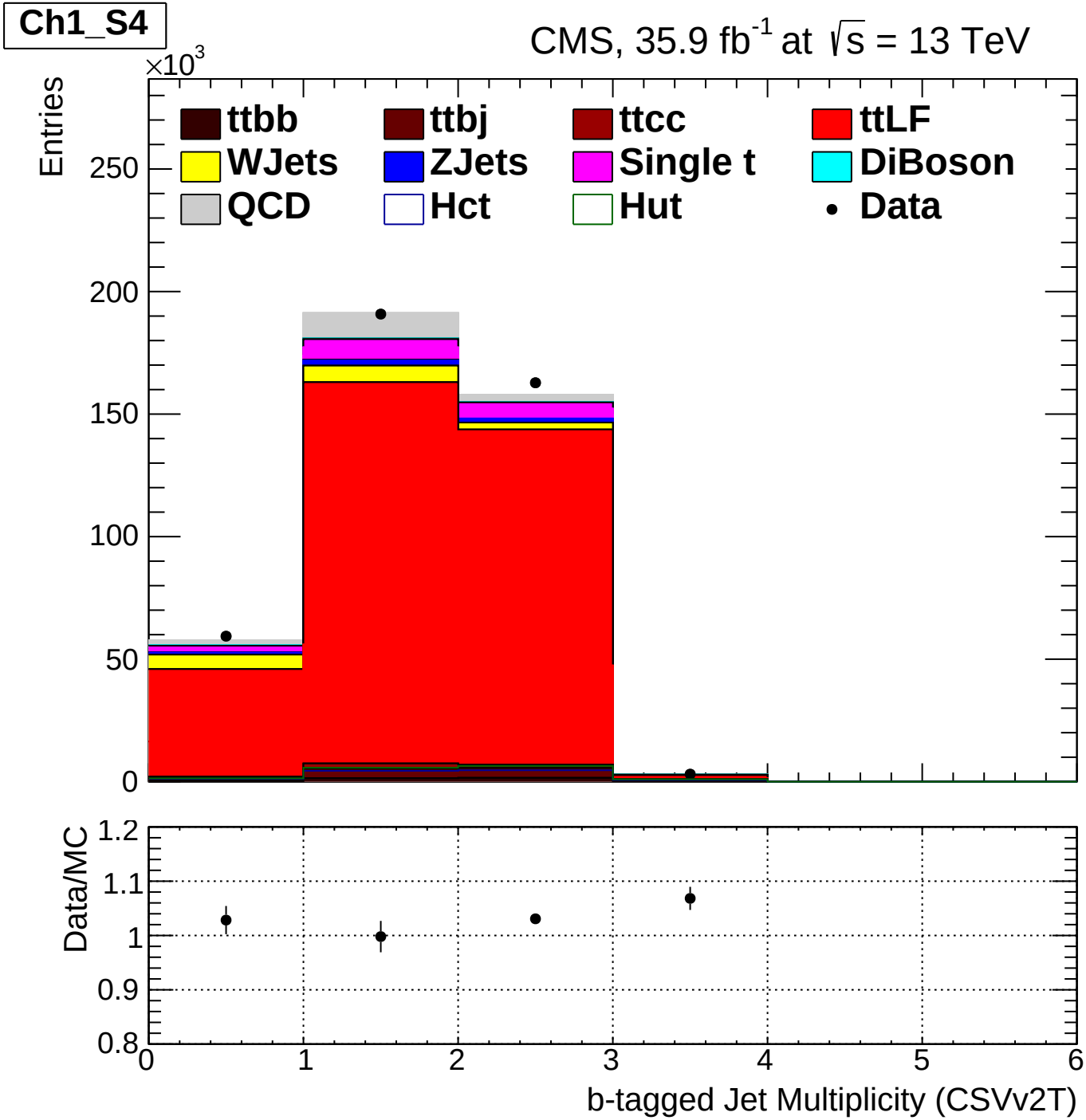

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

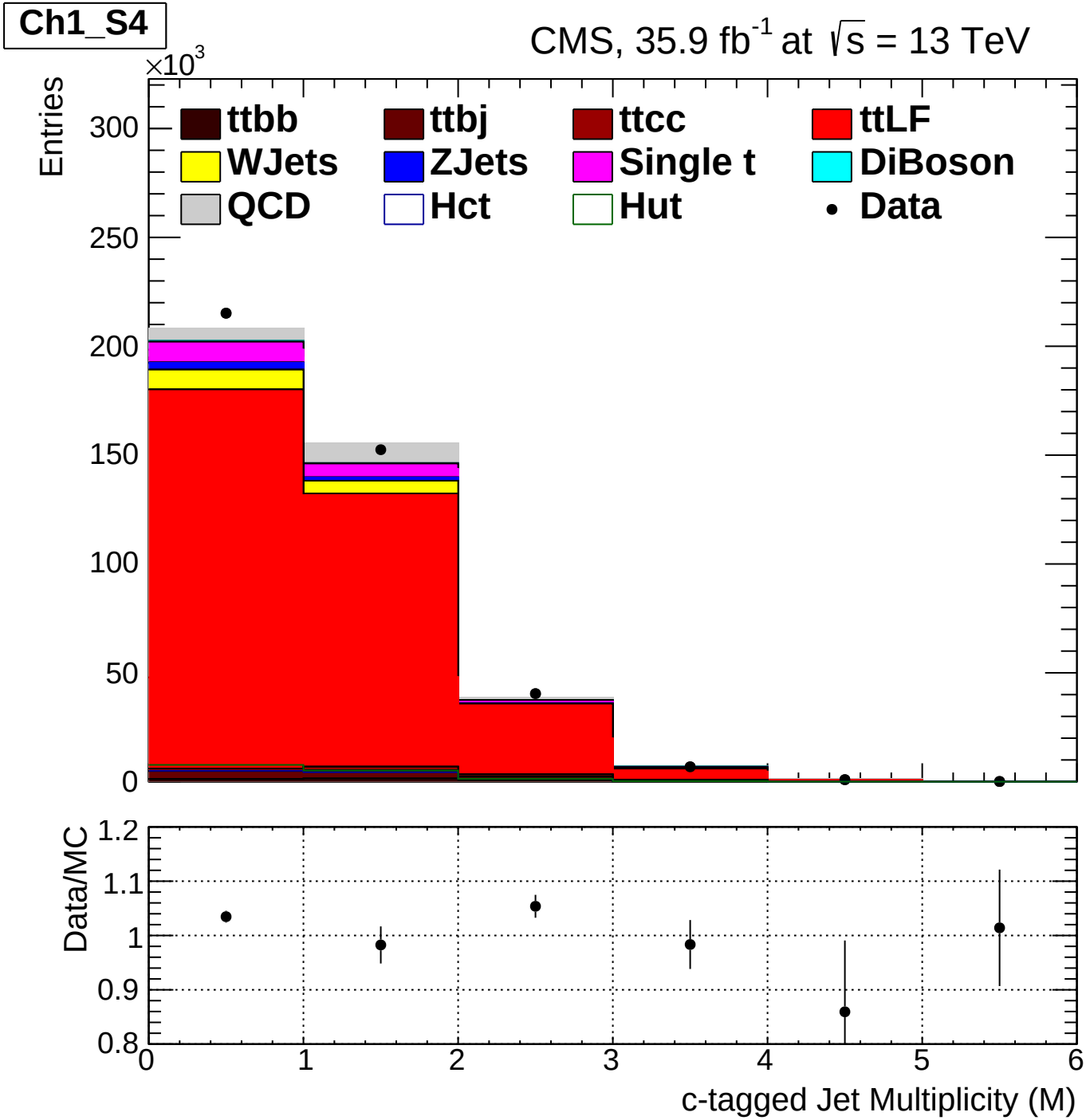

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

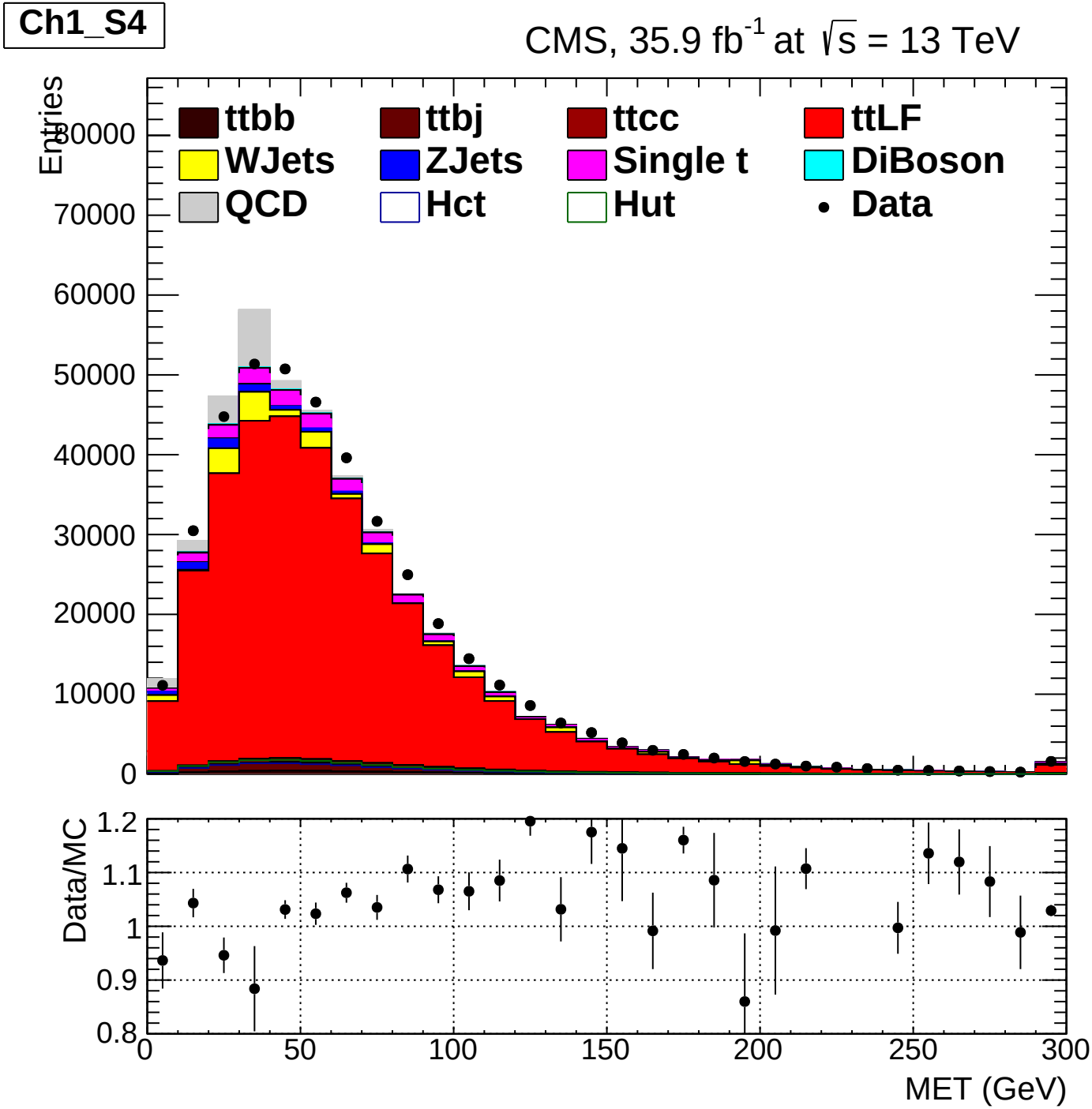

Ch1_S3
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

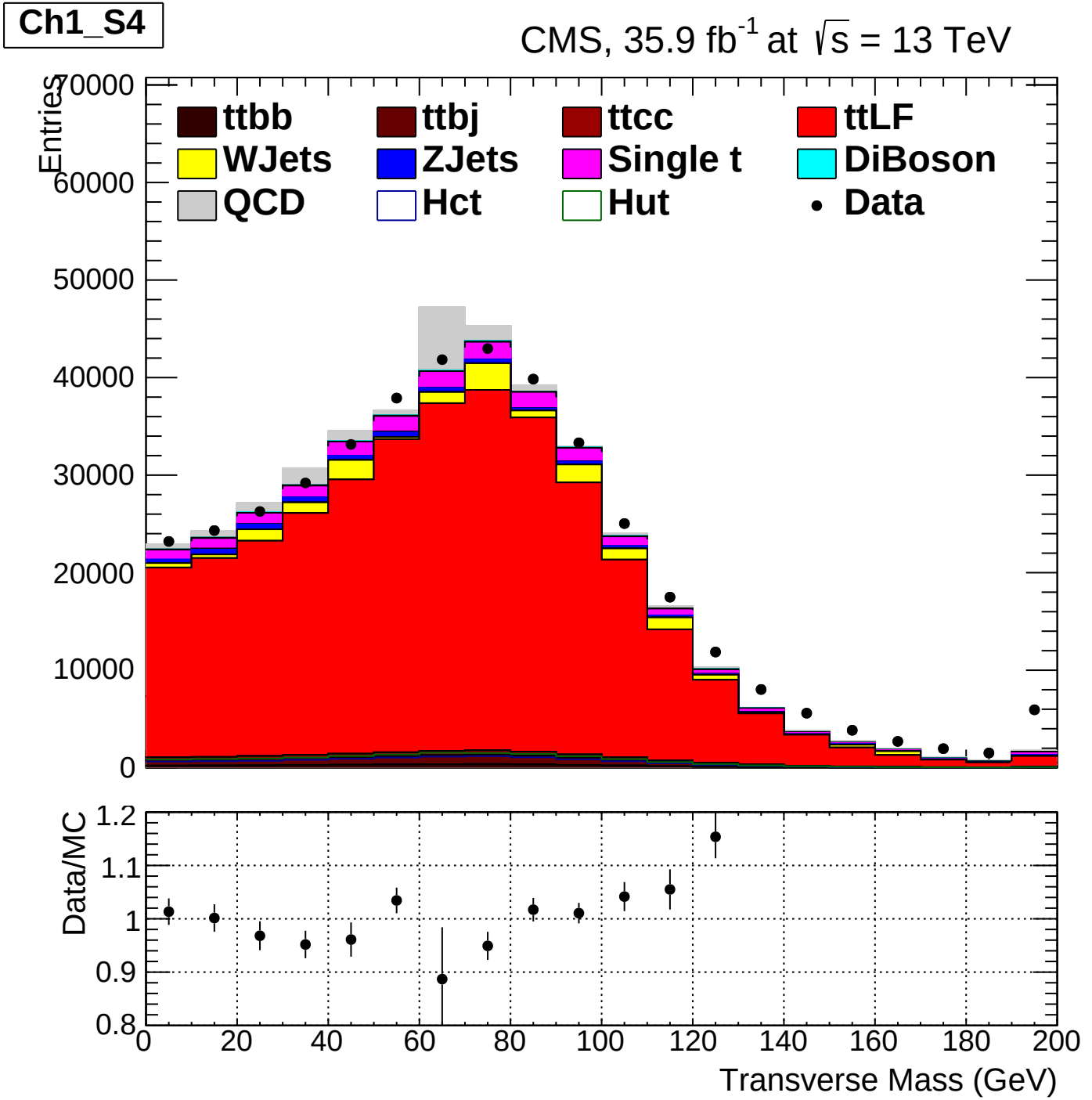

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

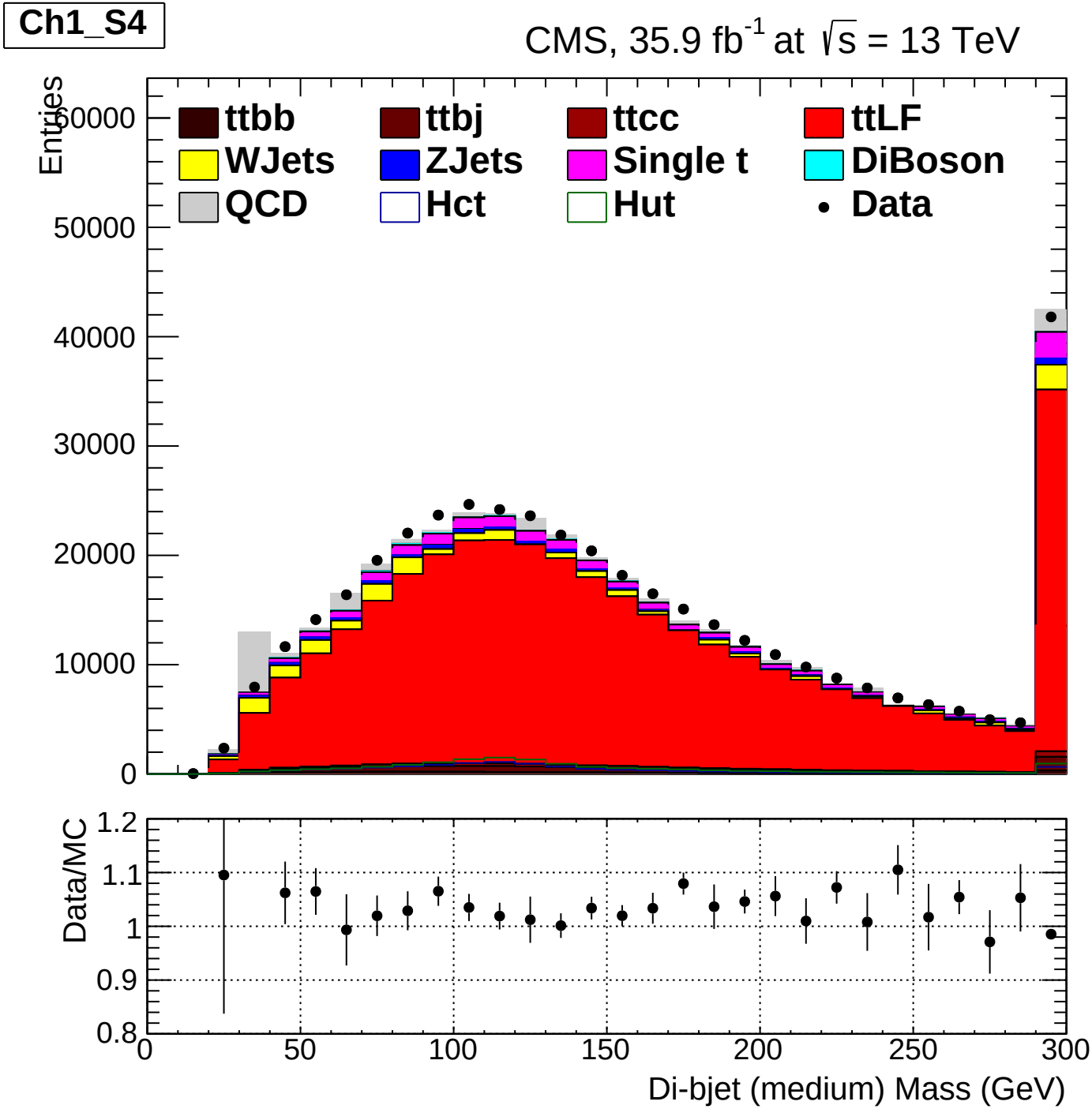

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

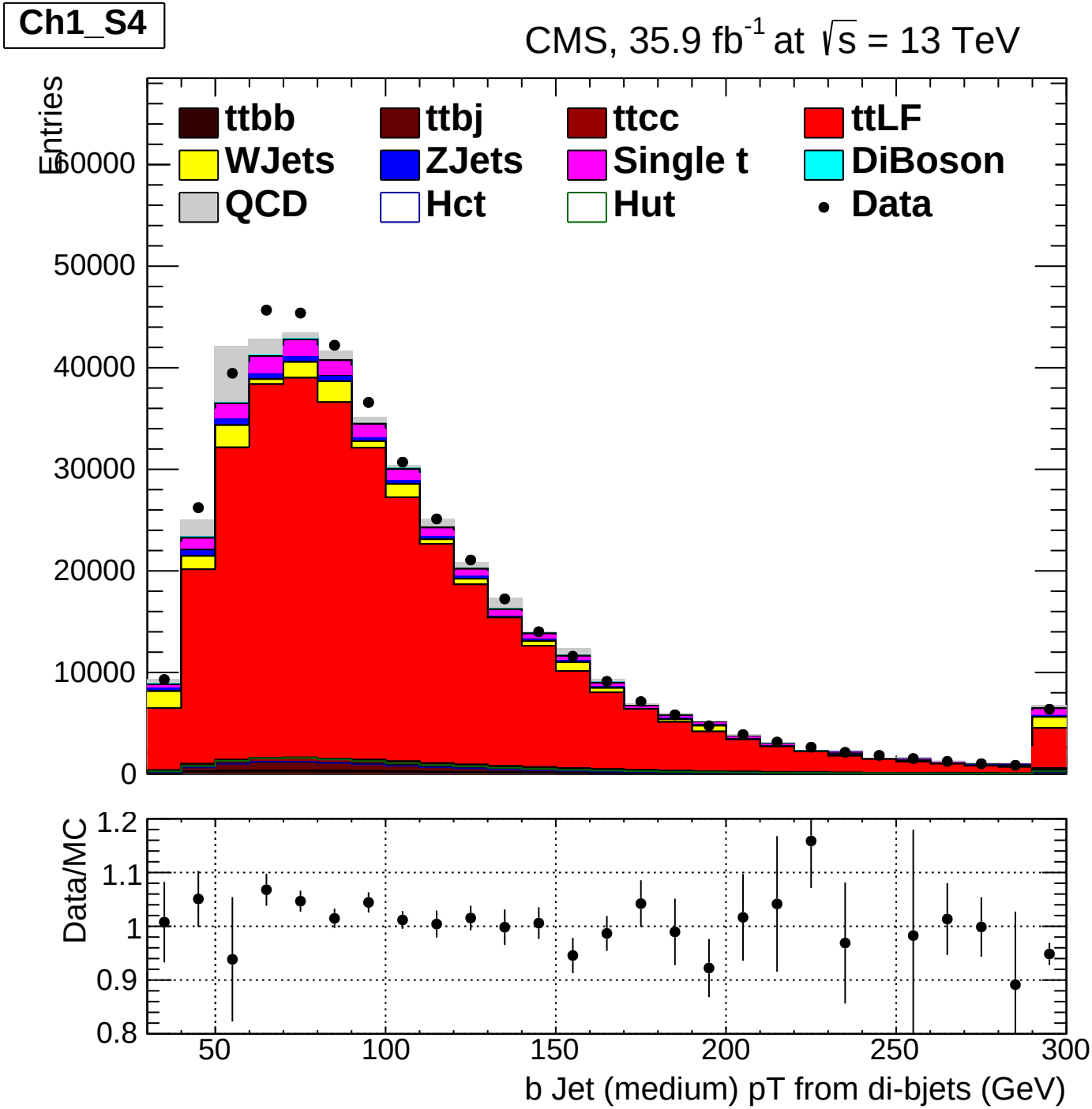

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

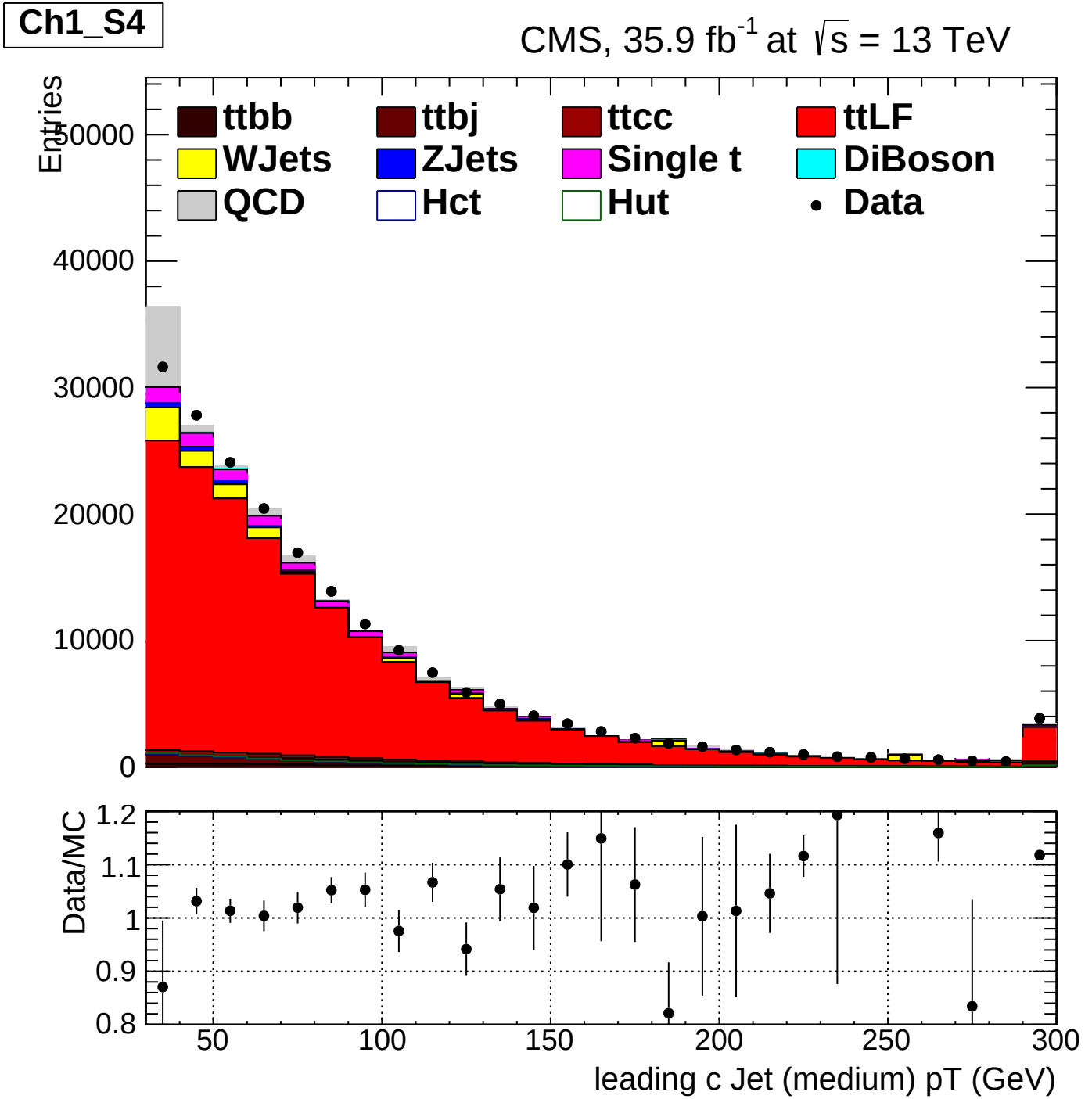

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

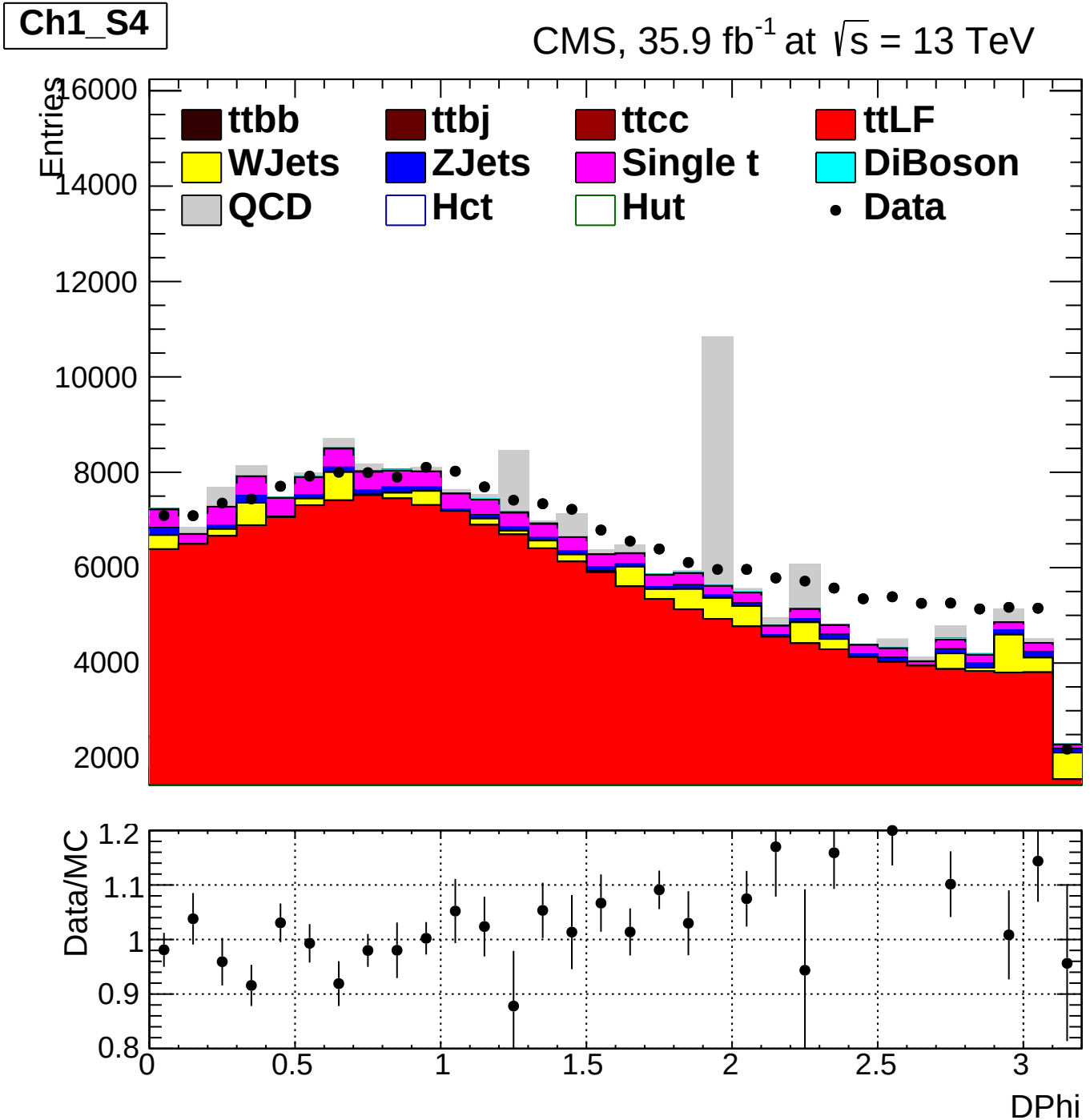

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
80000
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
MET (GeV)

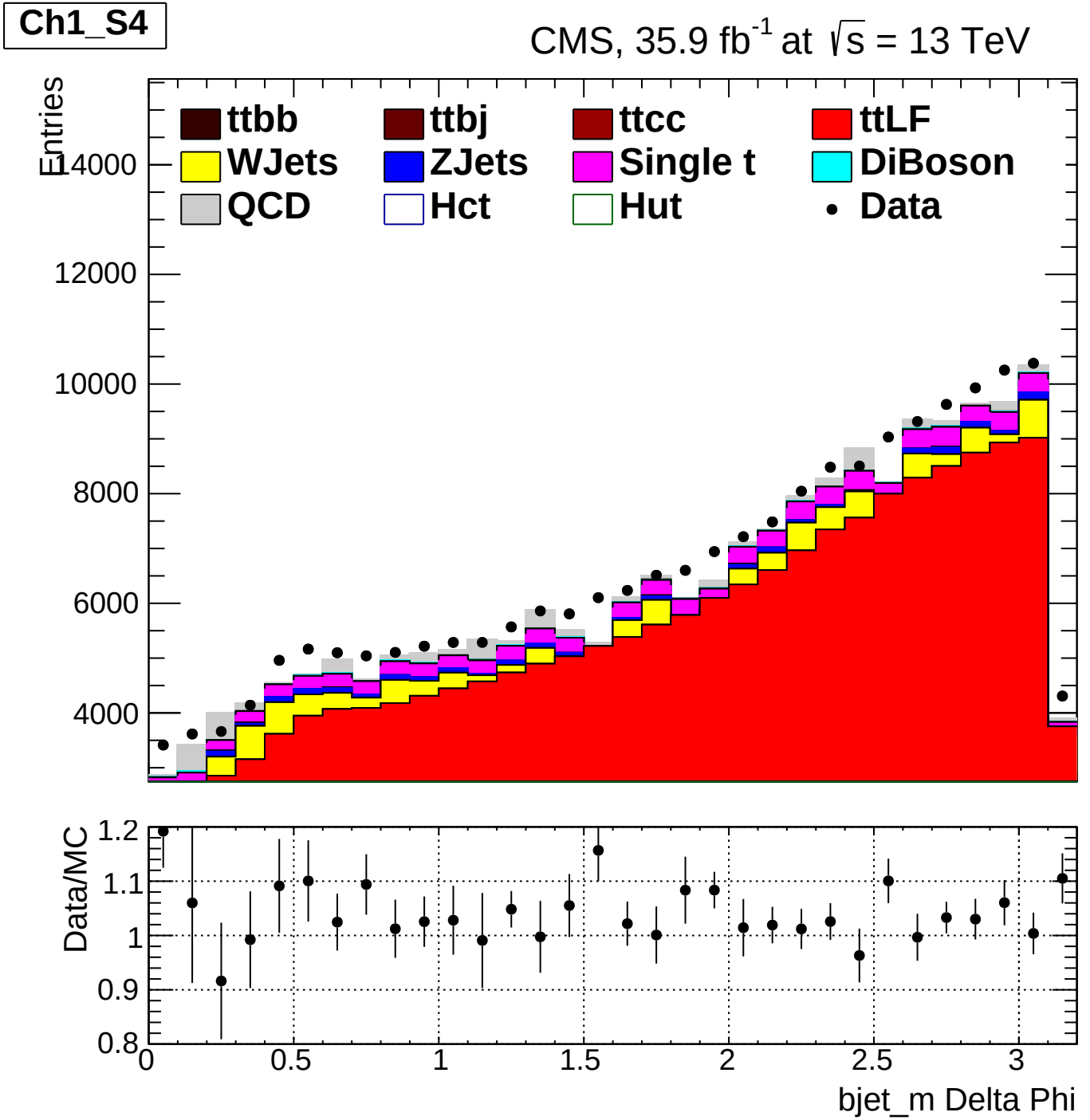

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

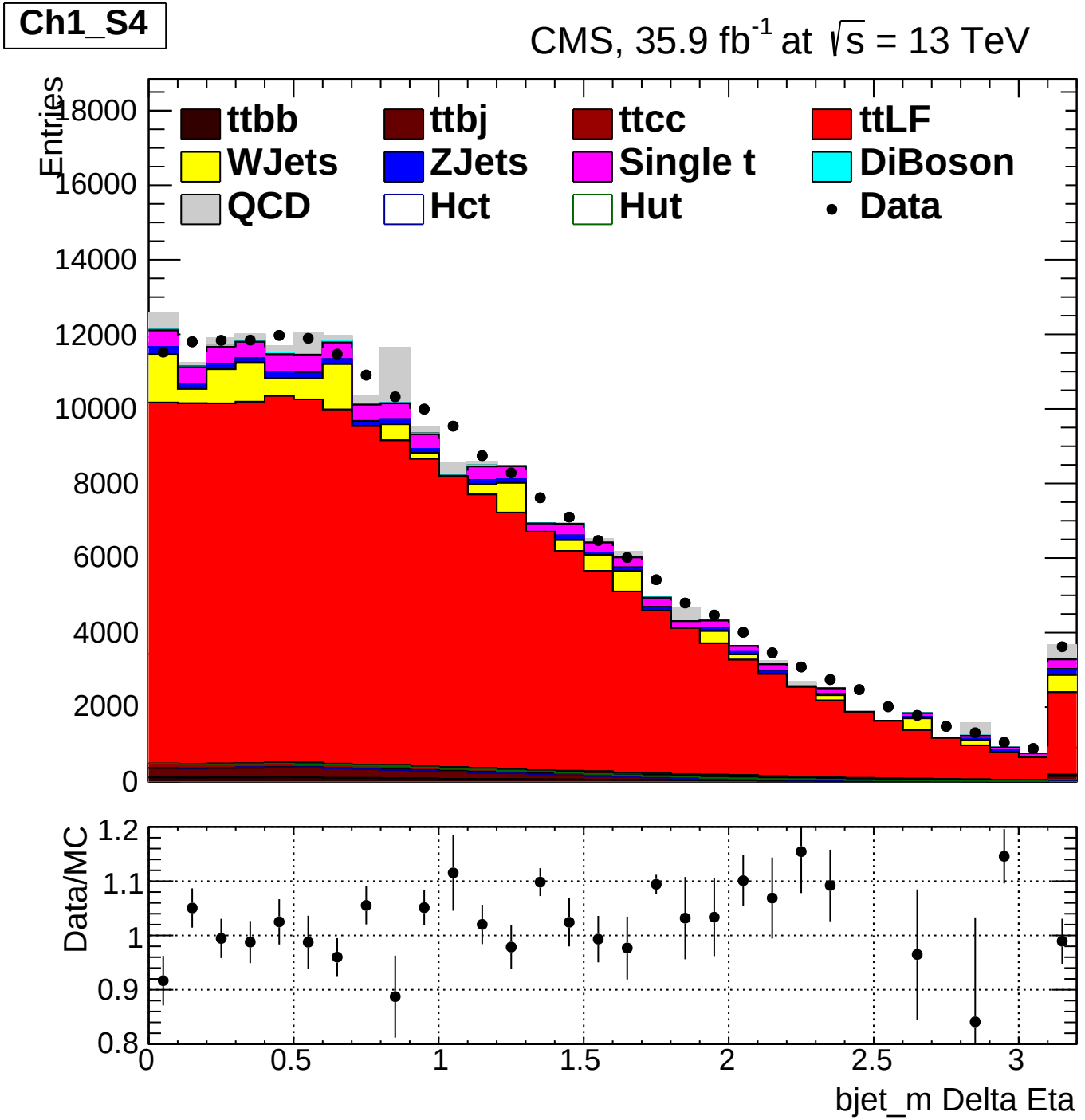

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
Di-bjet (medium) Mass (GeV)

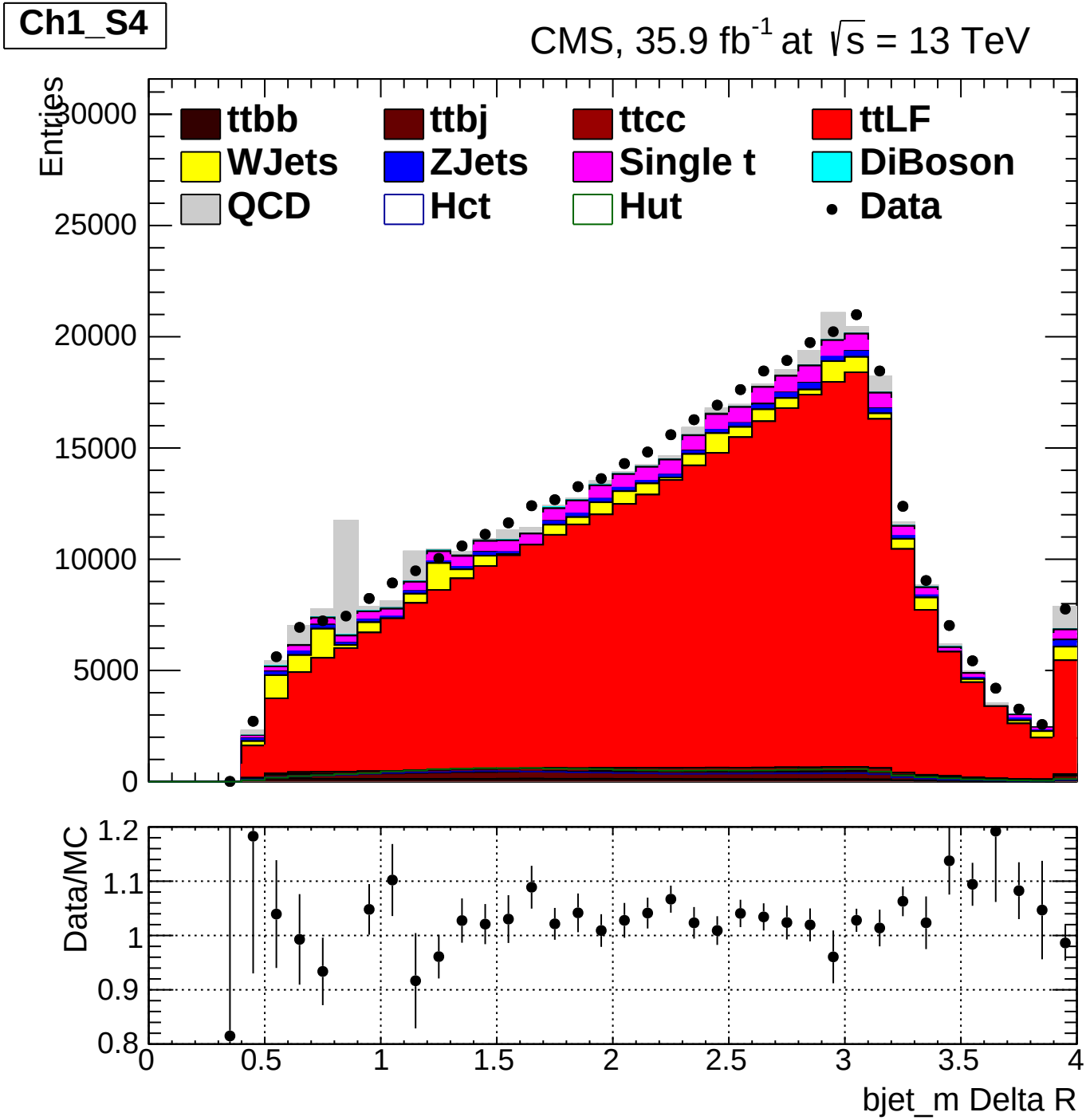

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)


Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
16000
14000
12000
10000
8000
6000
4000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi


Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
14000
12000
10000
8000
6000
4000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttcc
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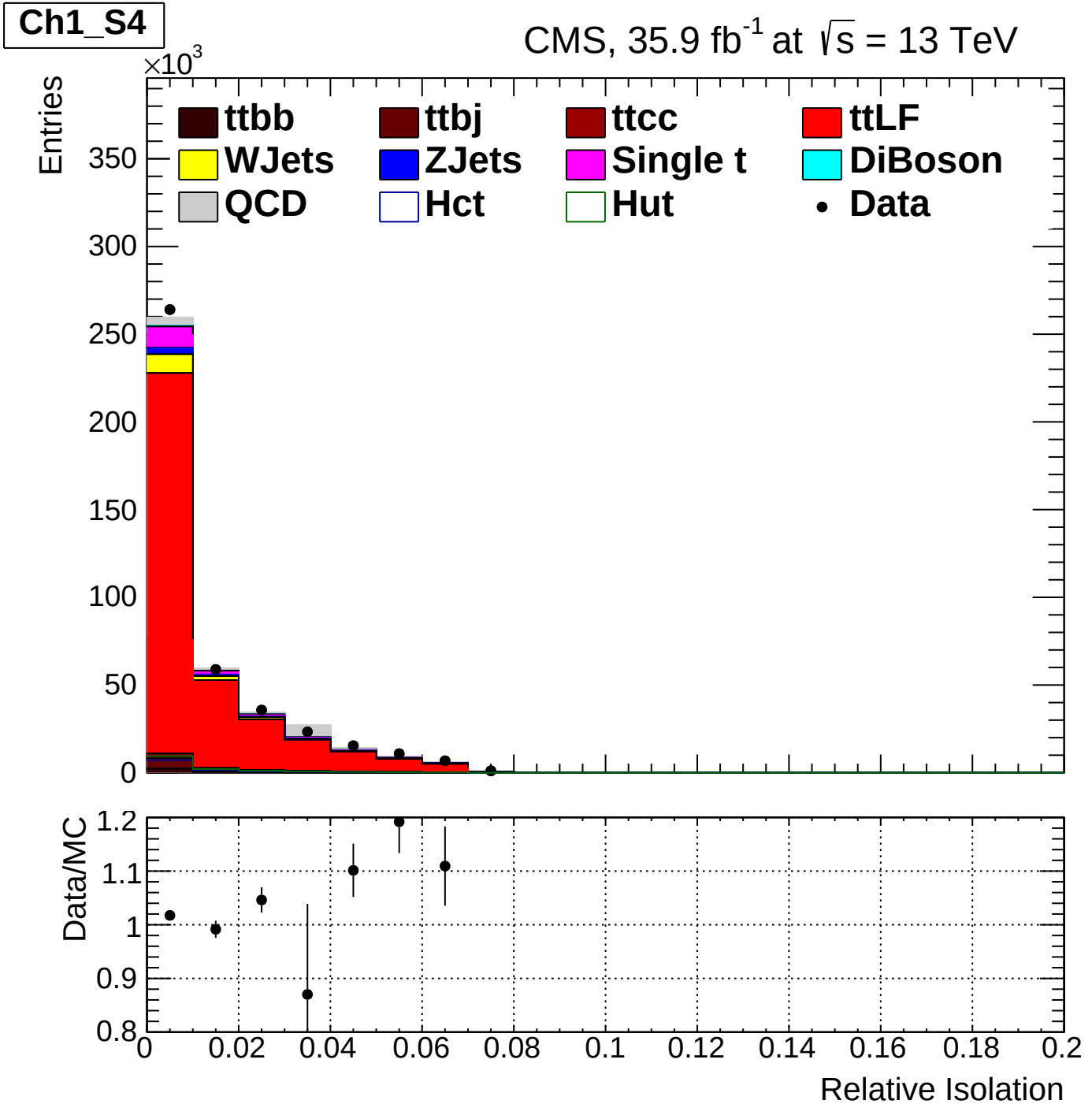
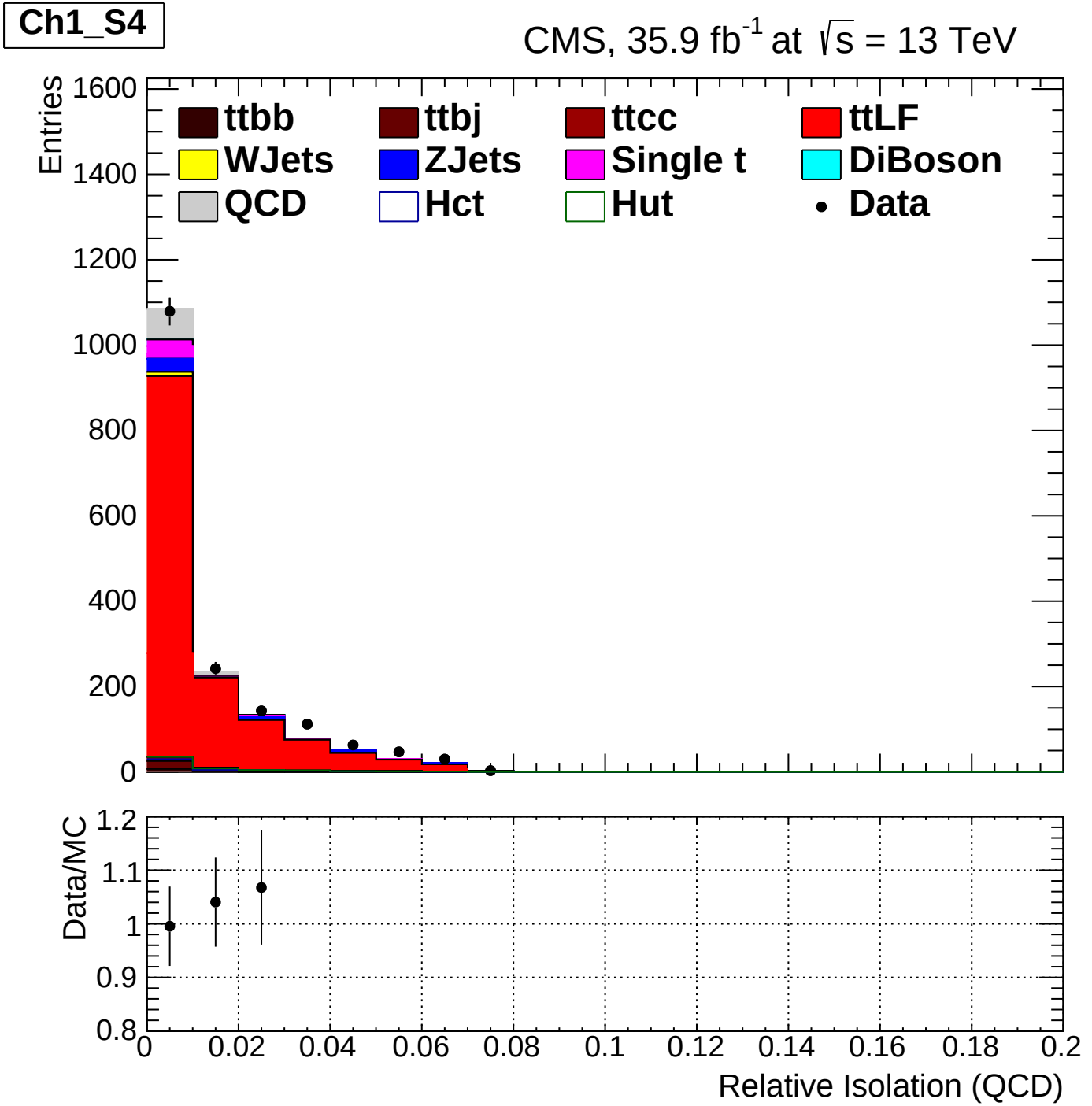
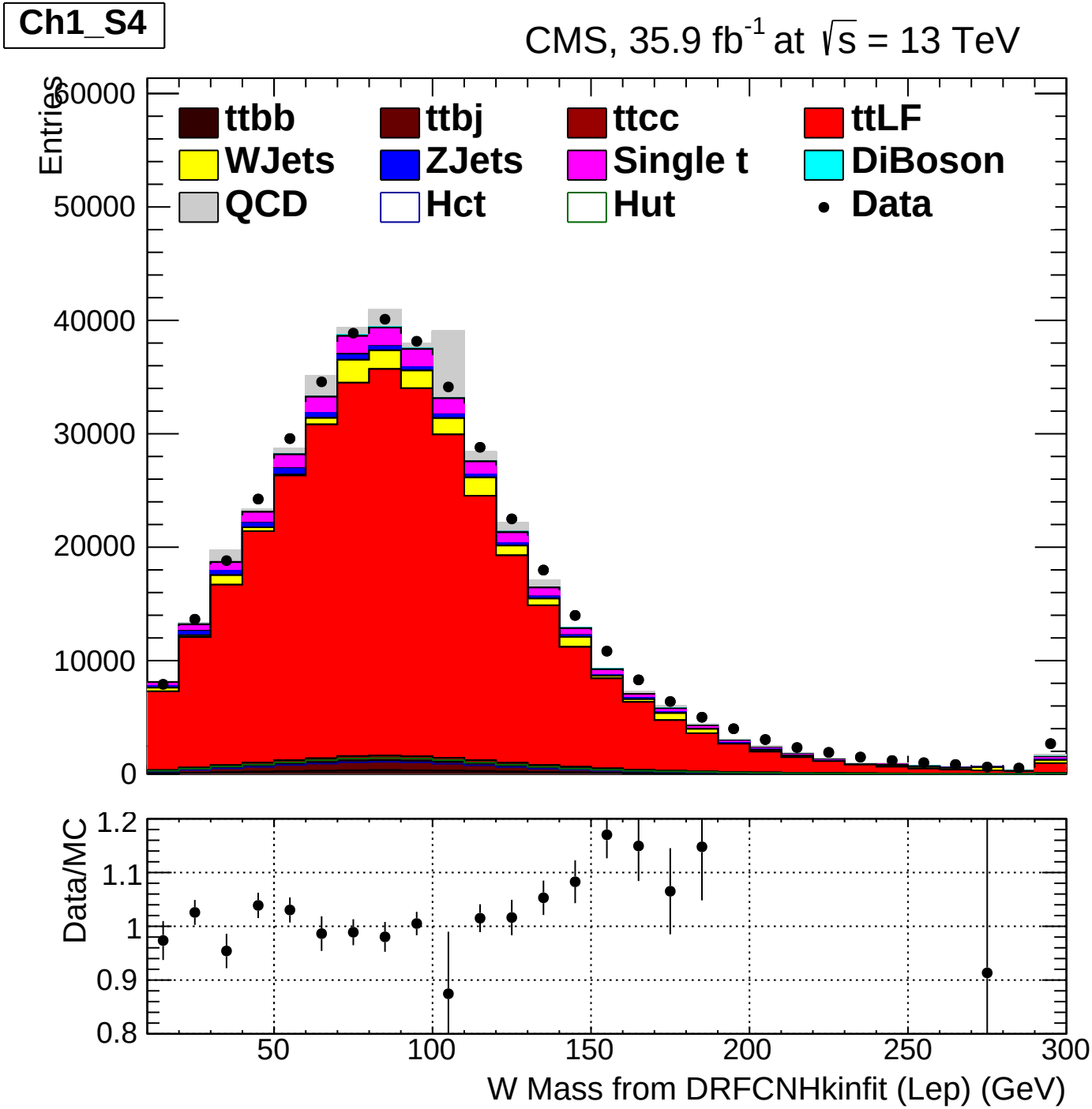
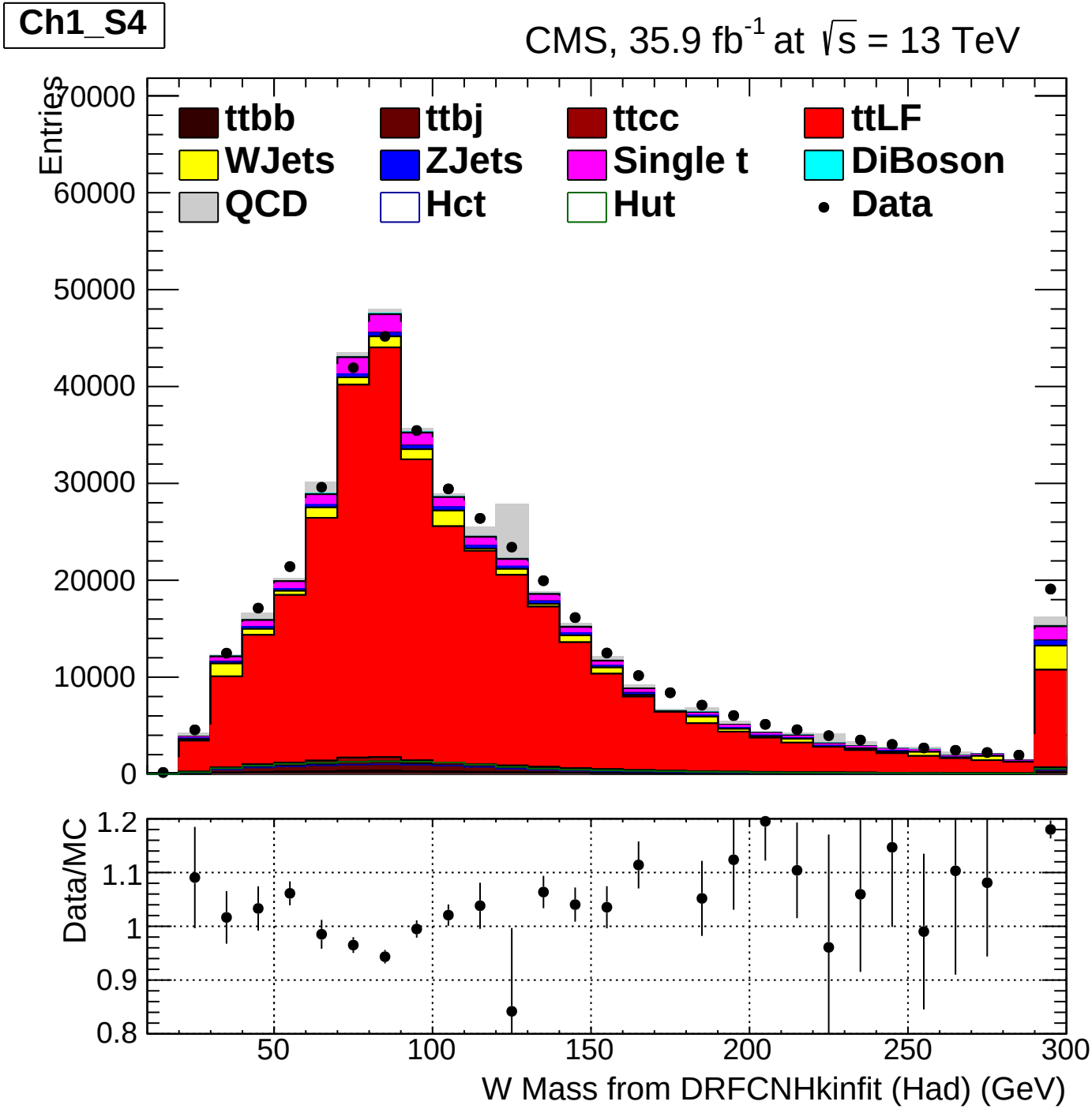
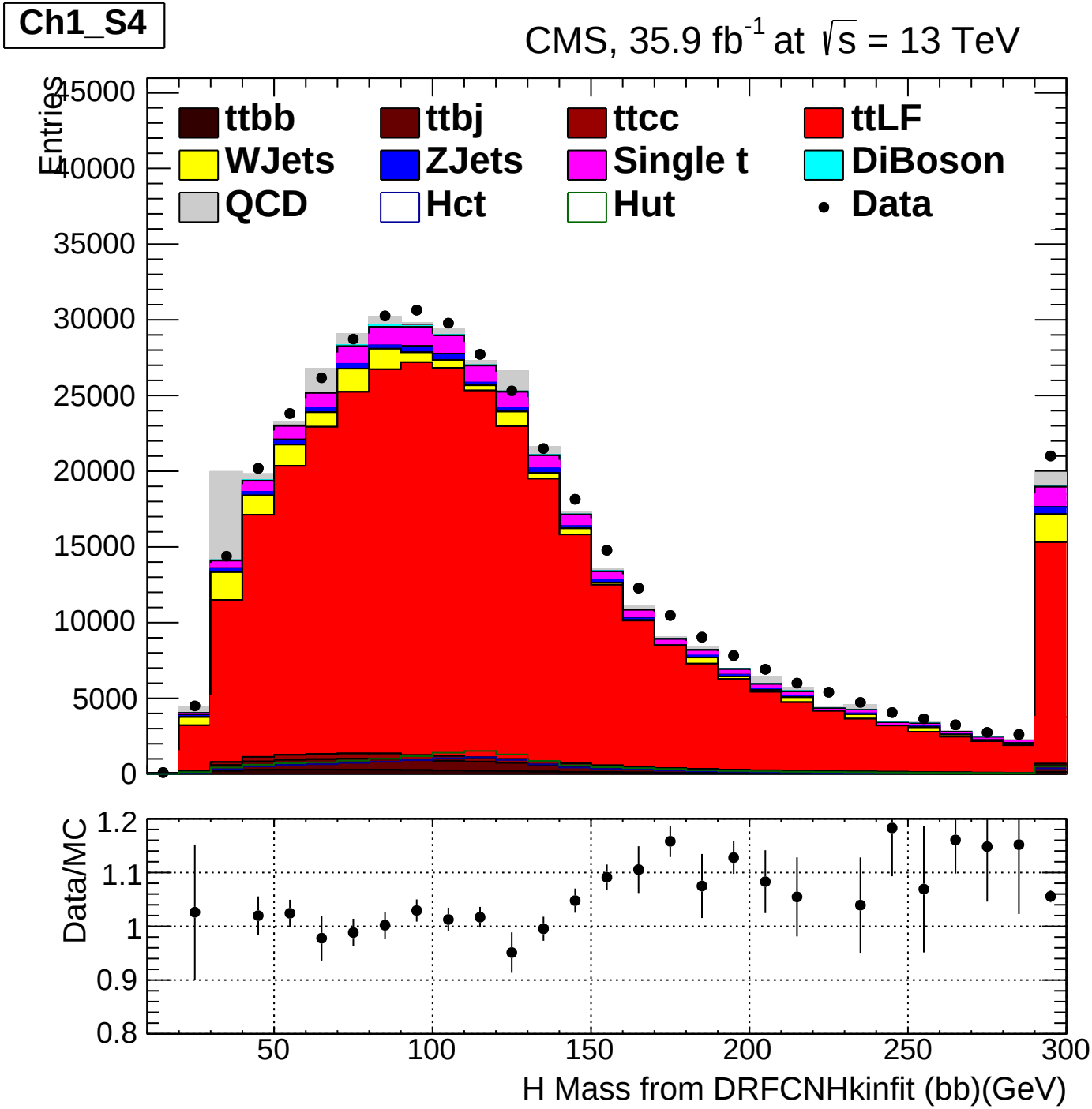
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

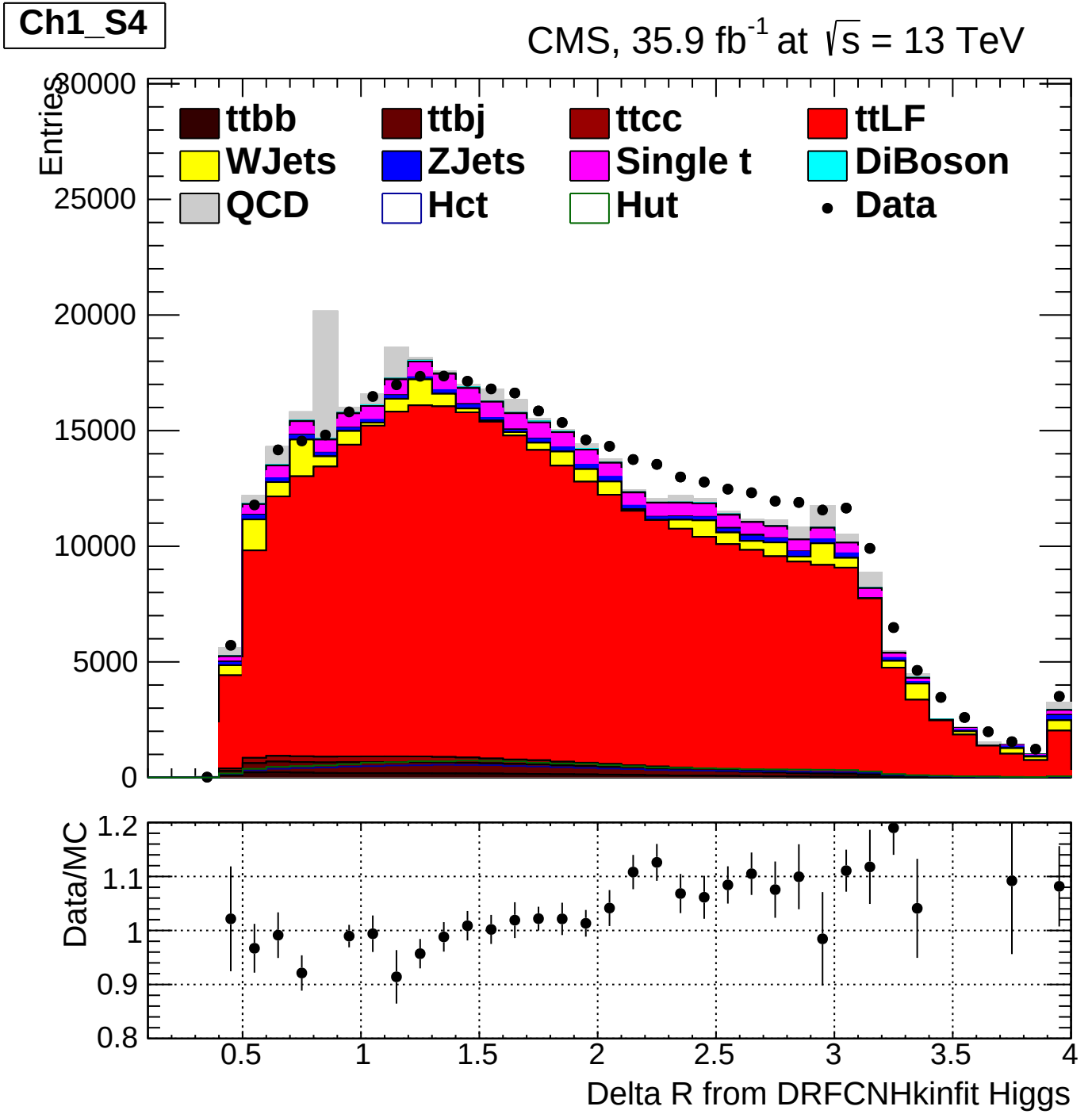

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

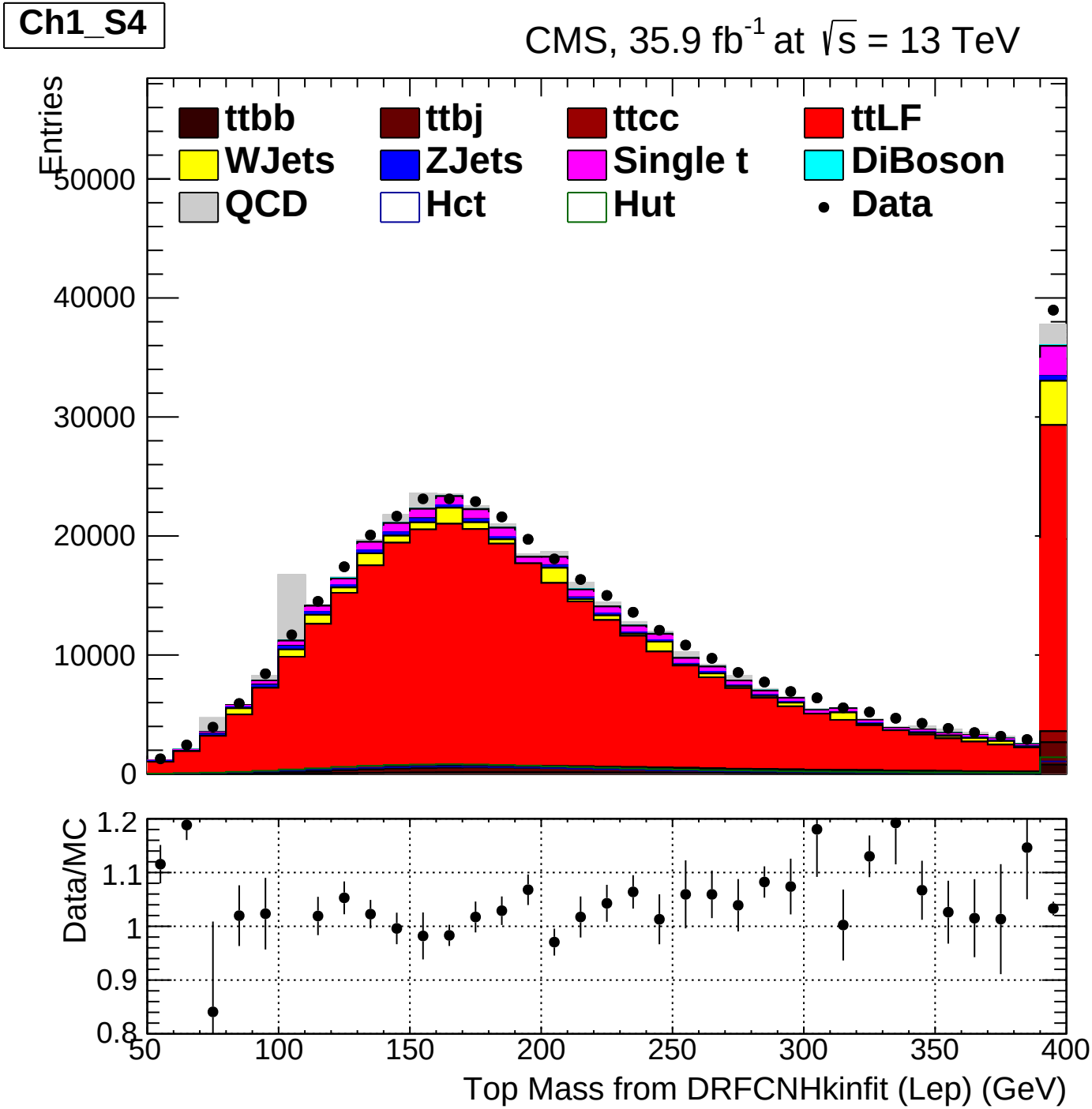

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

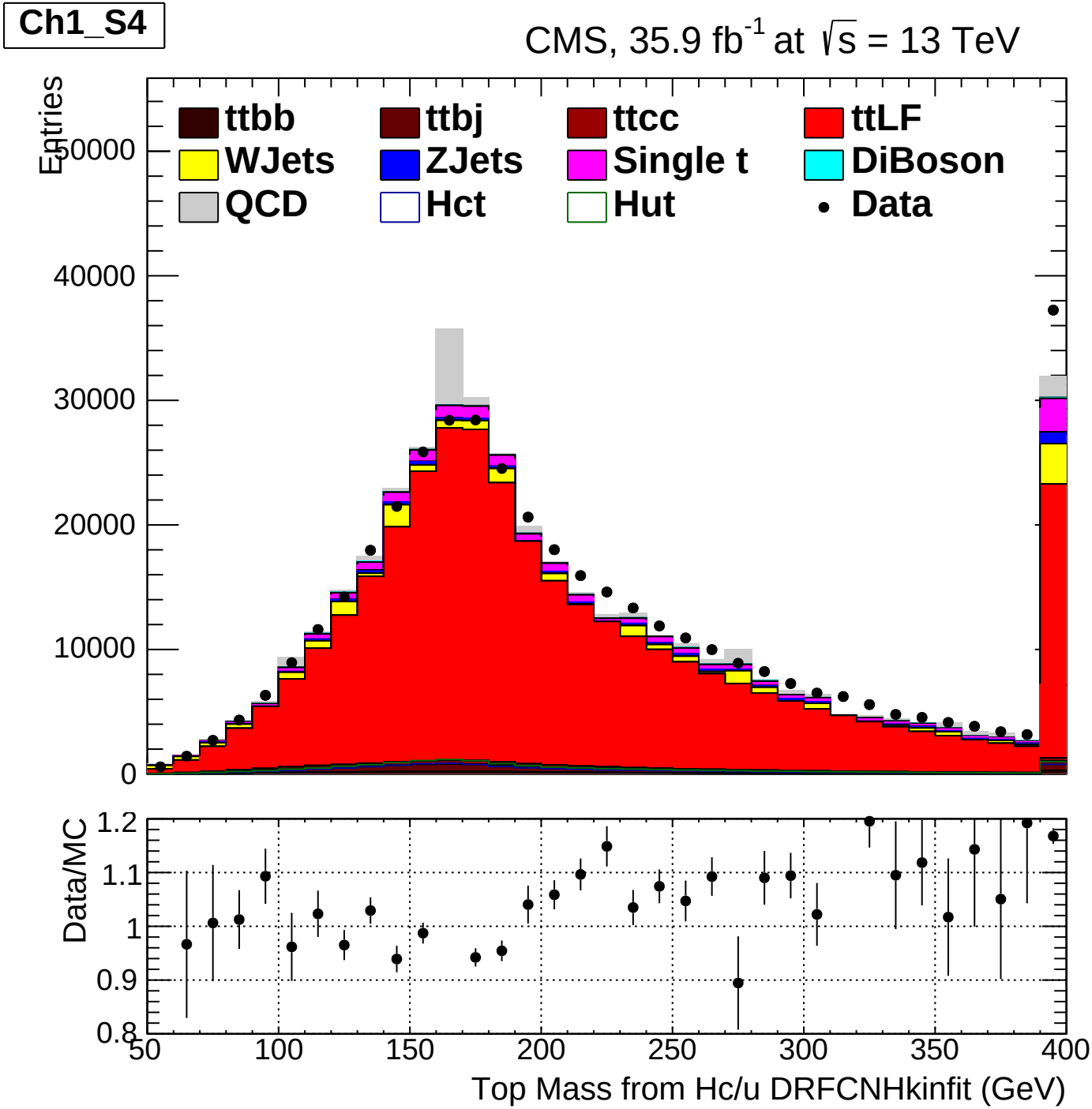

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

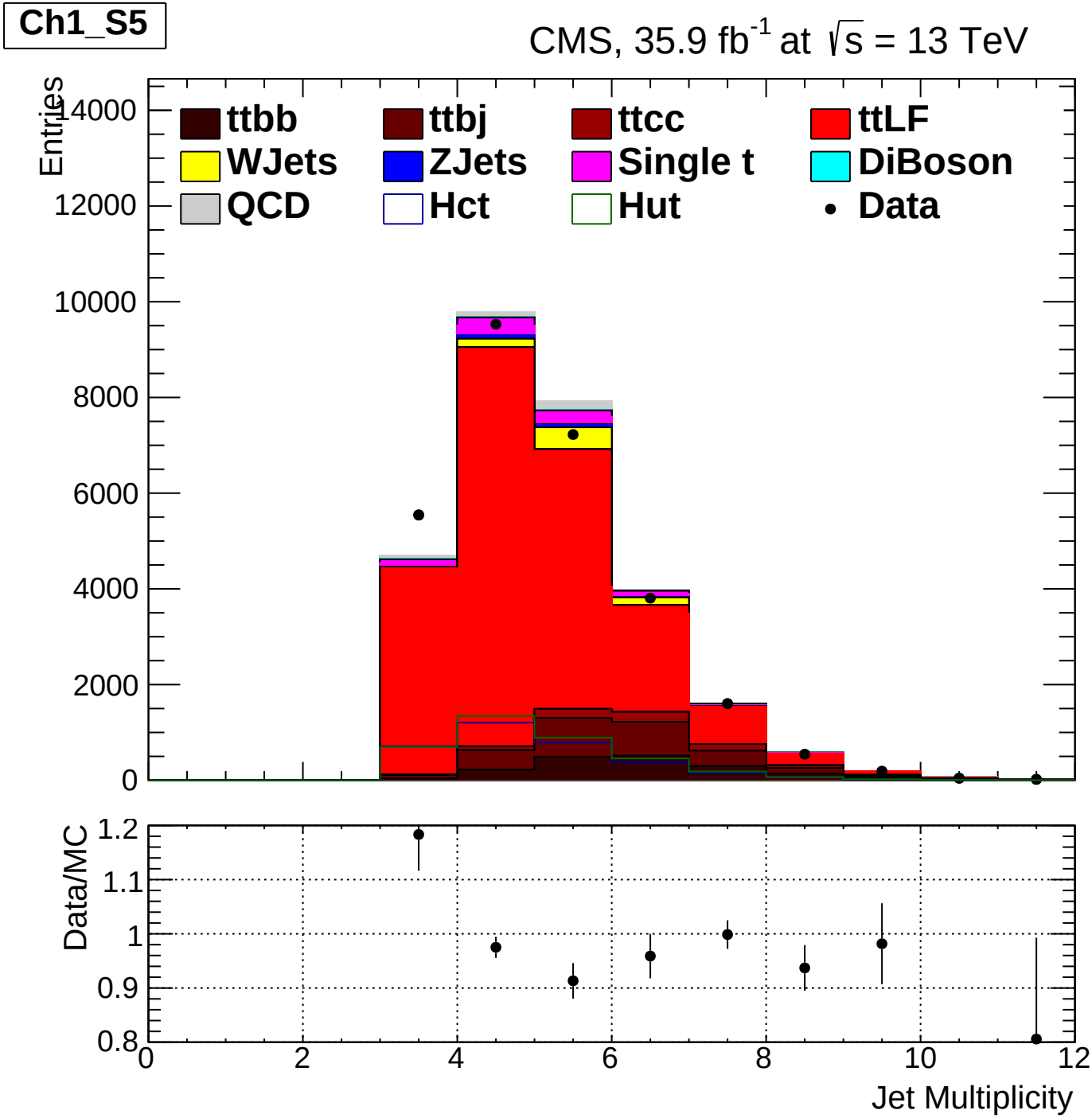

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

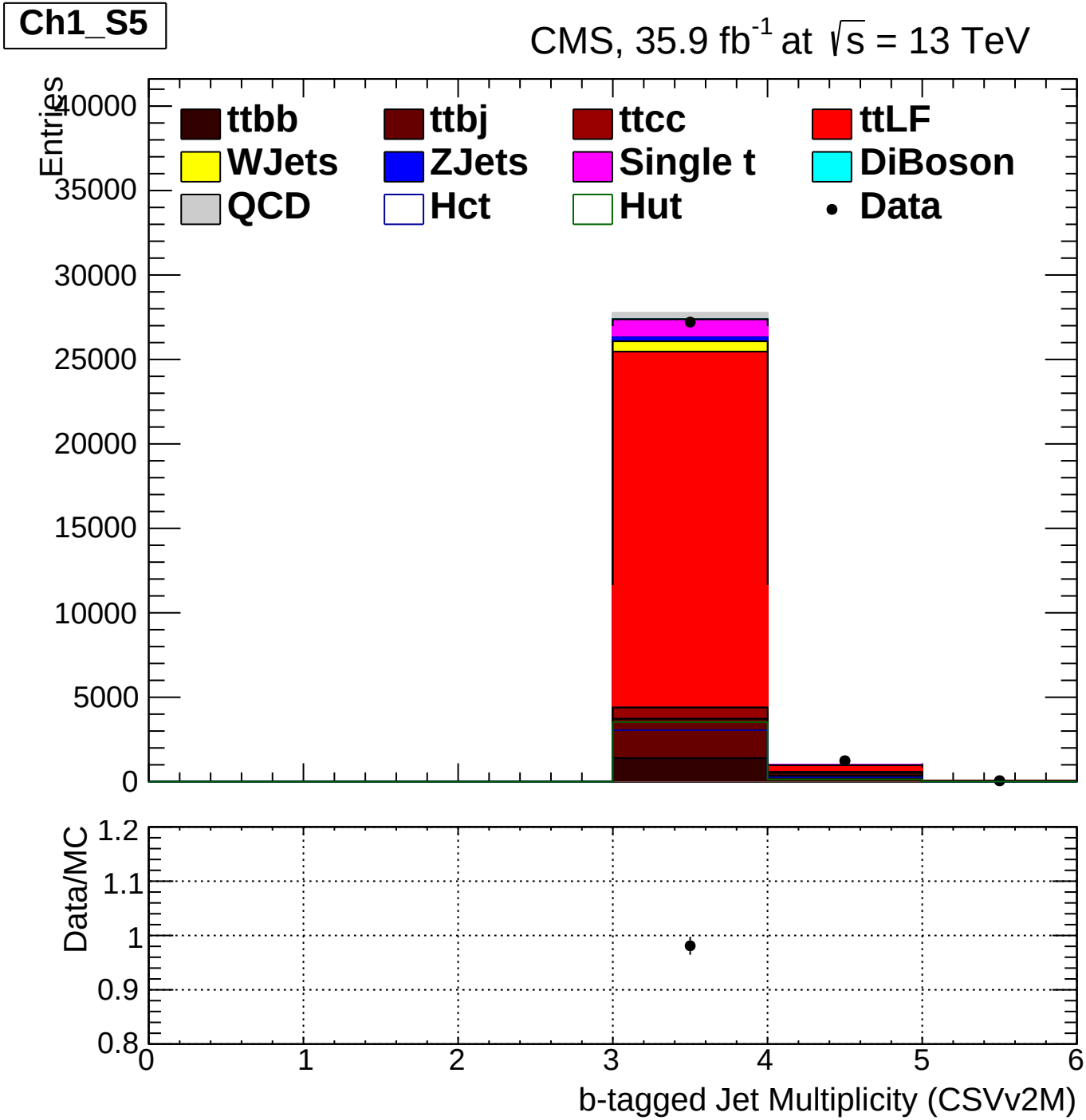

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

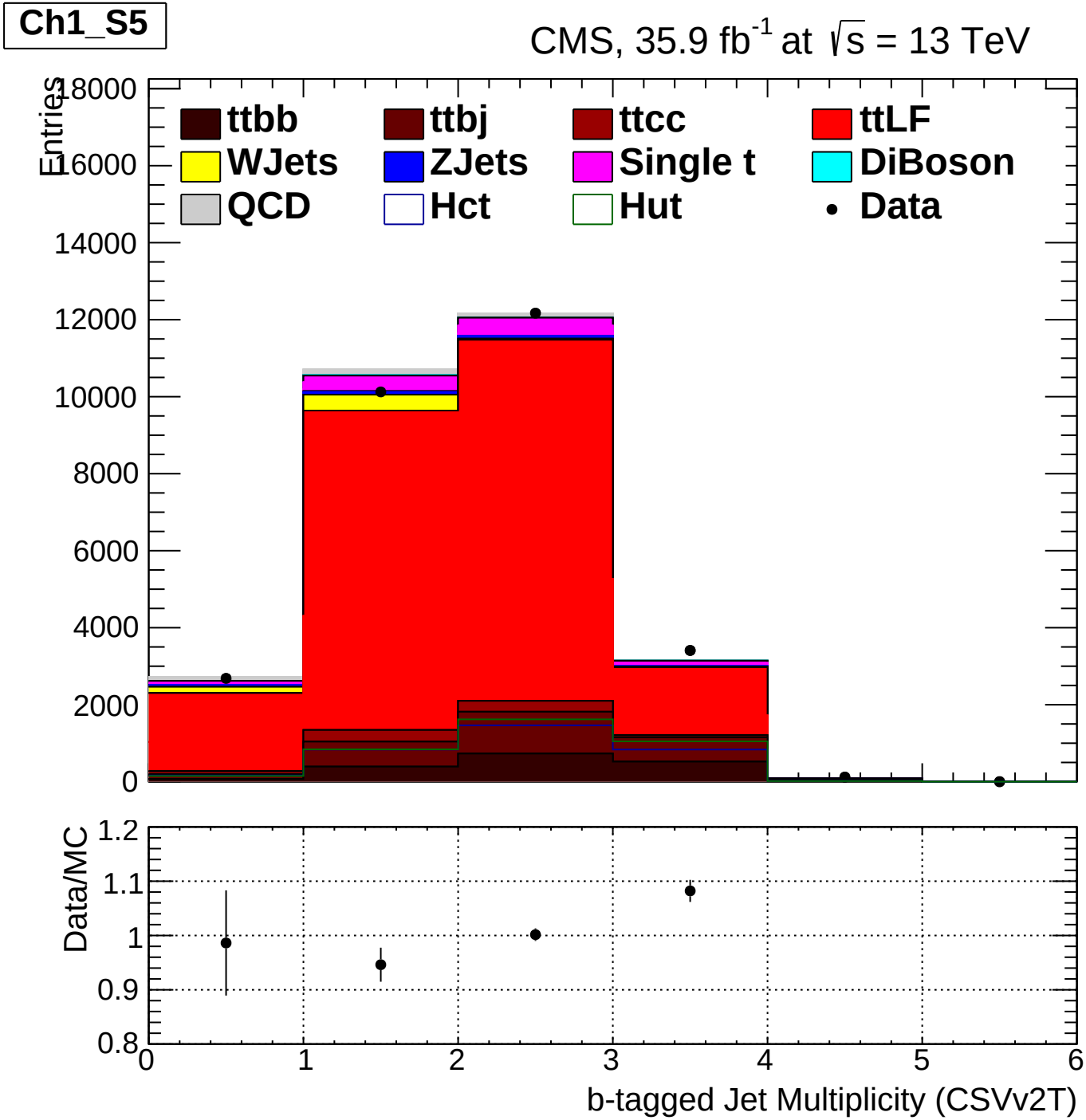

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

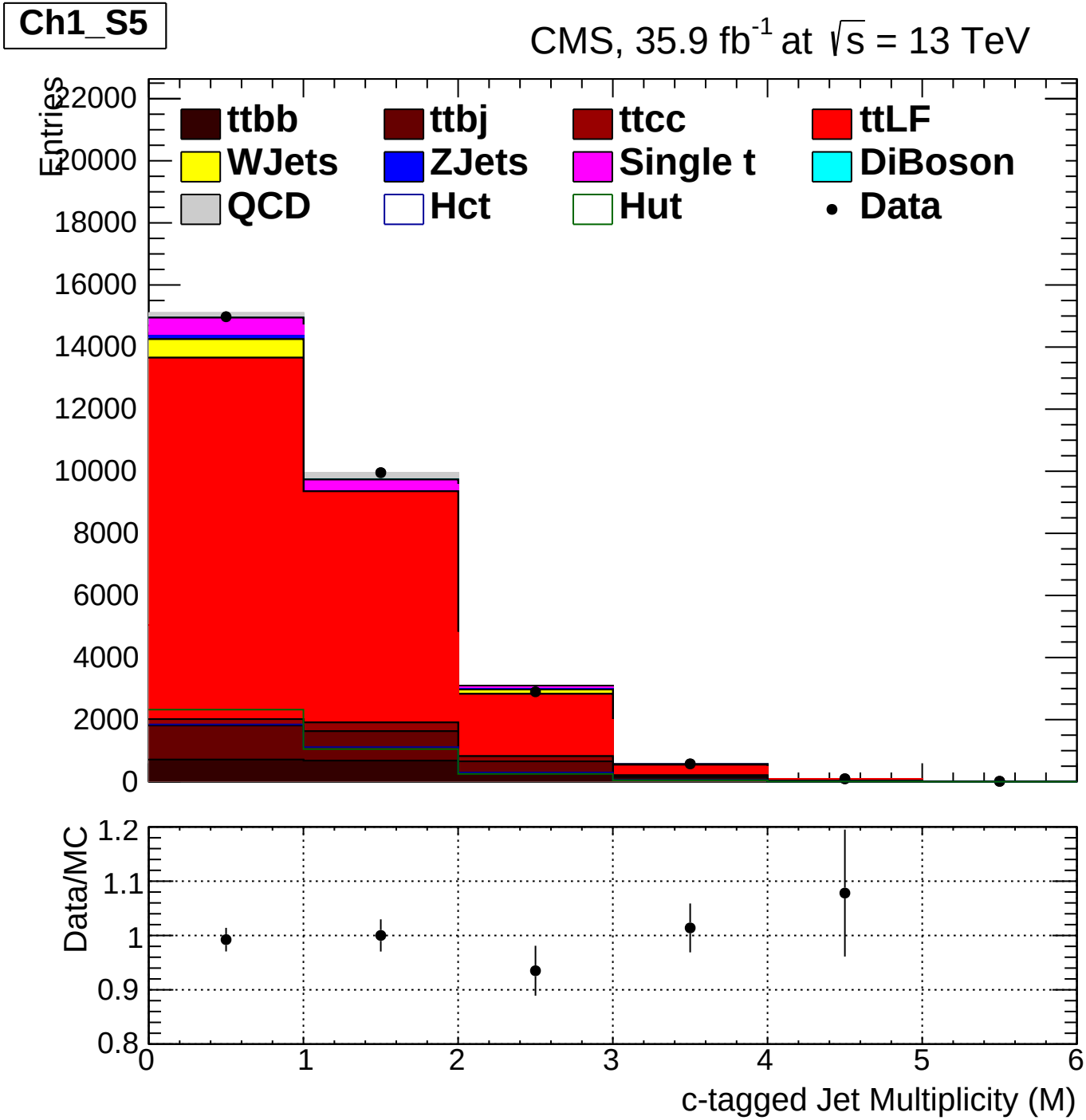

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
10000
20000
30000
40000
50000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

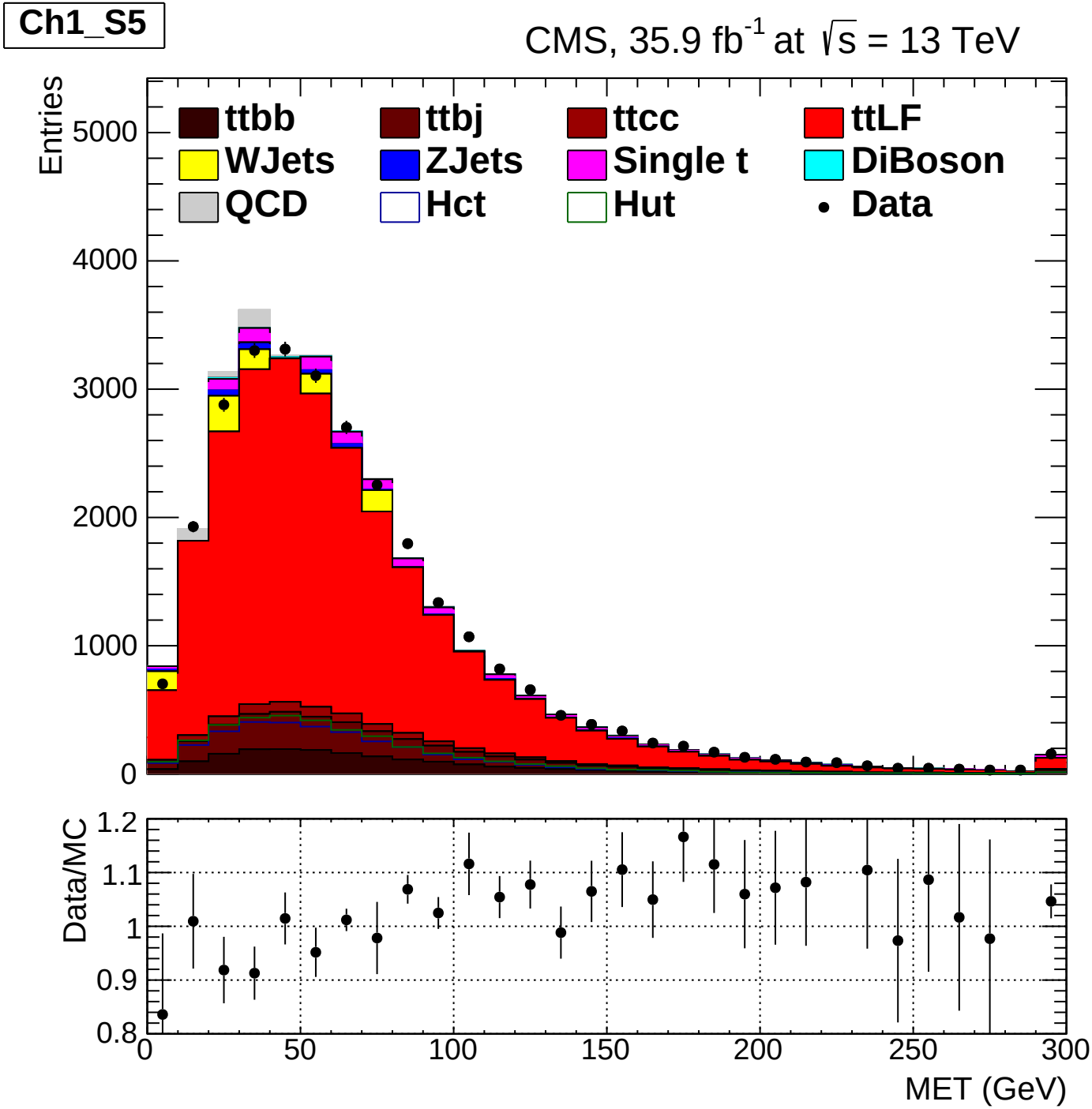

Ch1_S4
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from Hc/u DRFCNHkinfit (GeV)

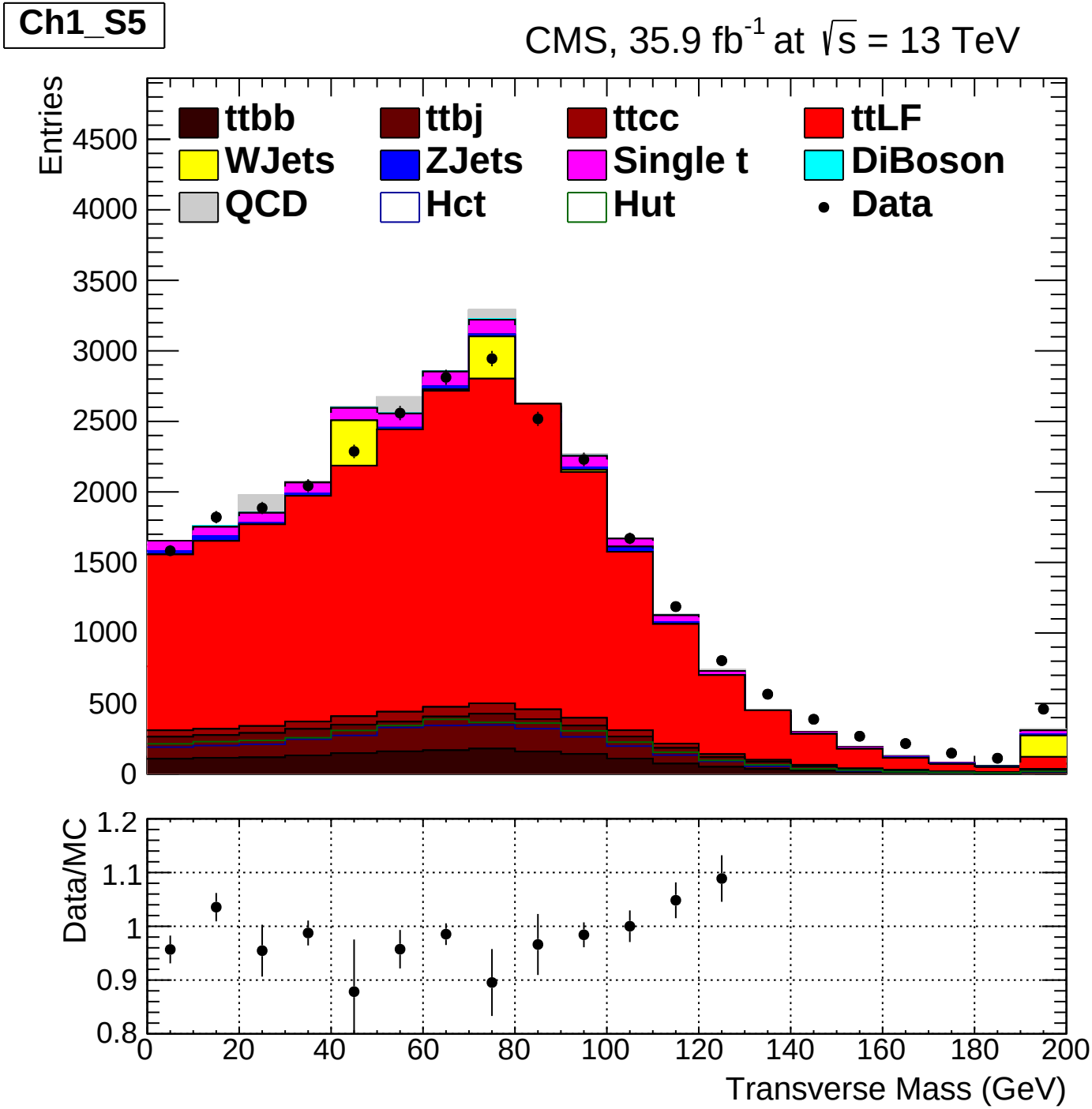

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

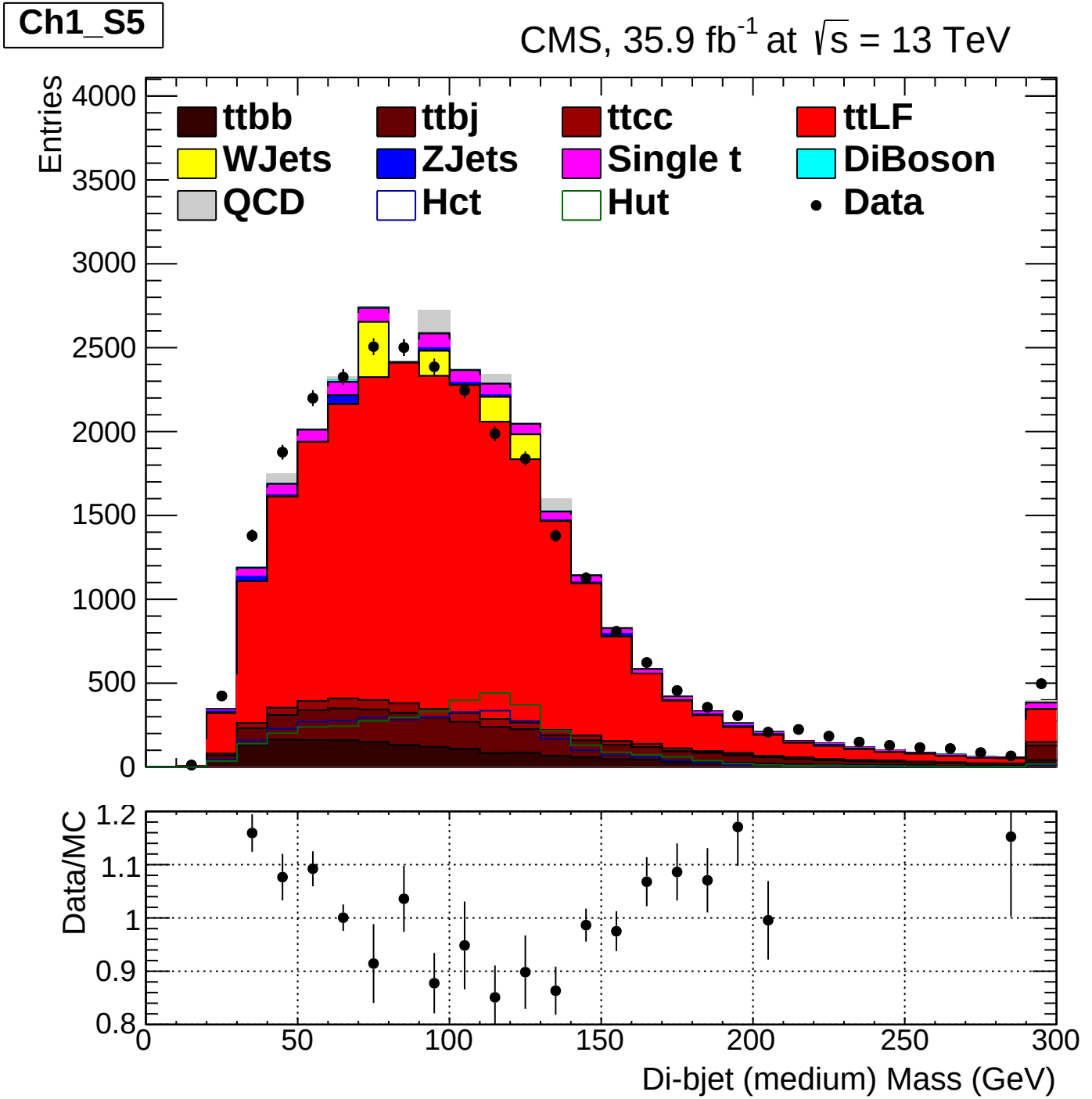

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

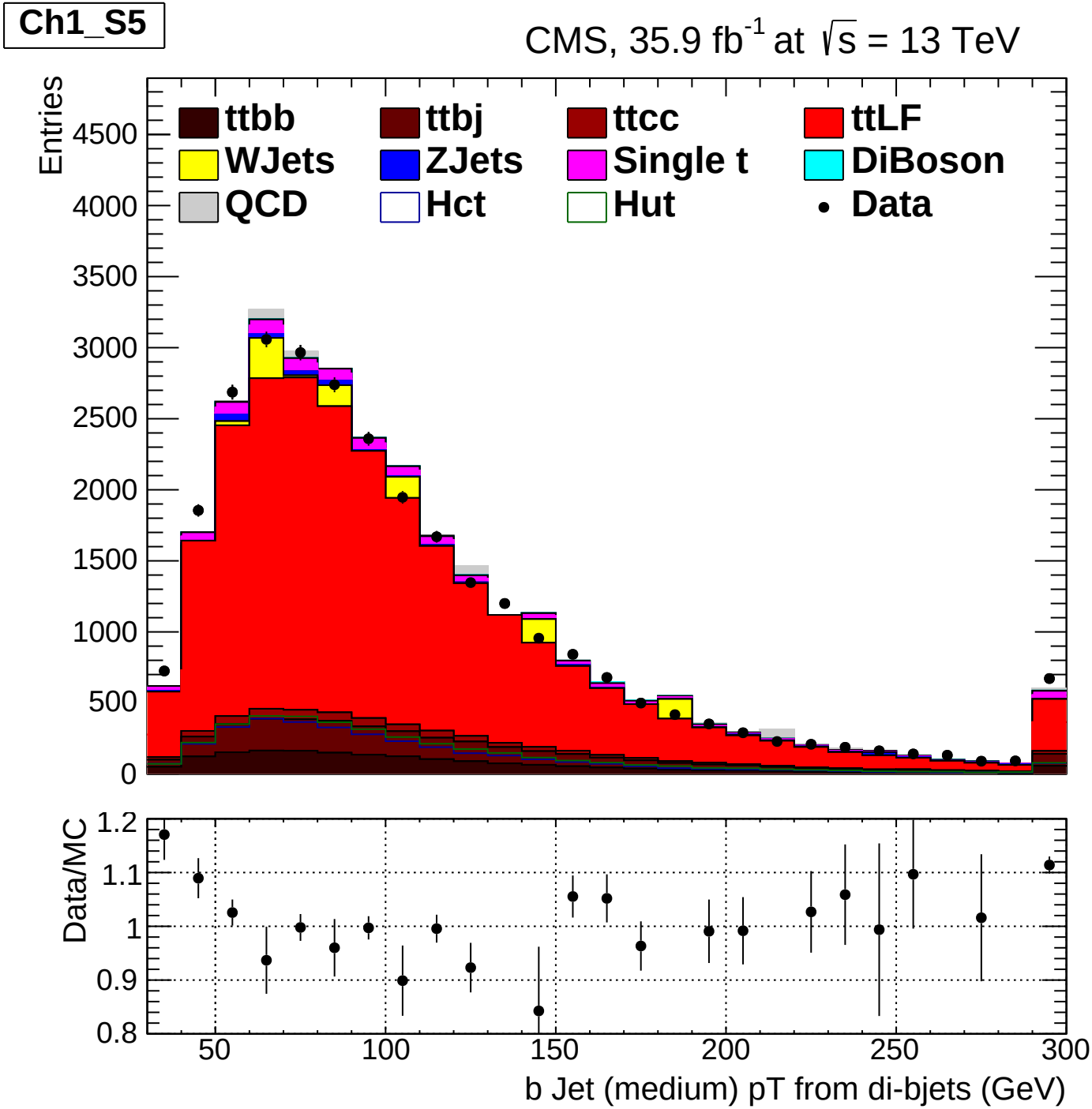

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

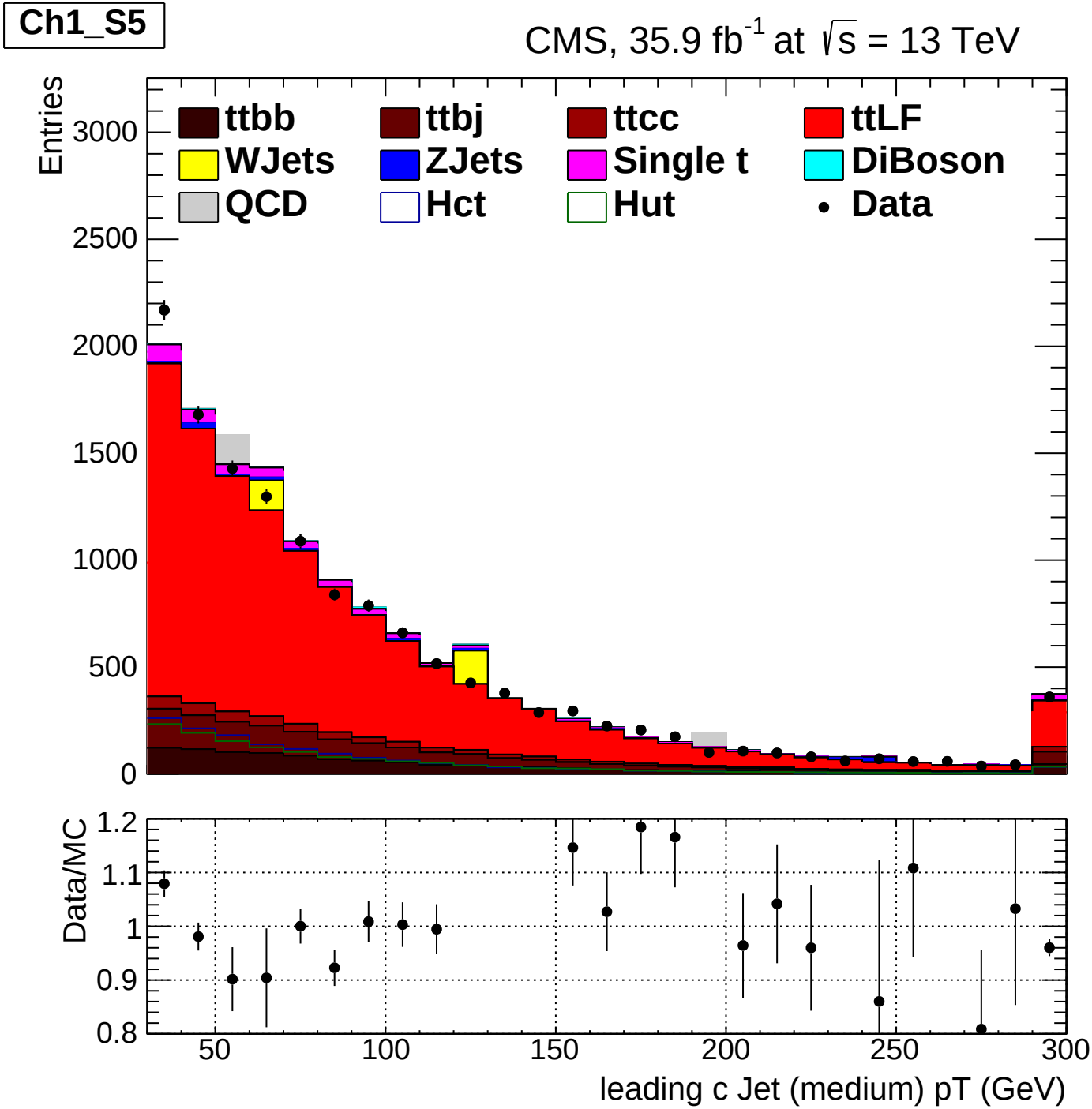

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

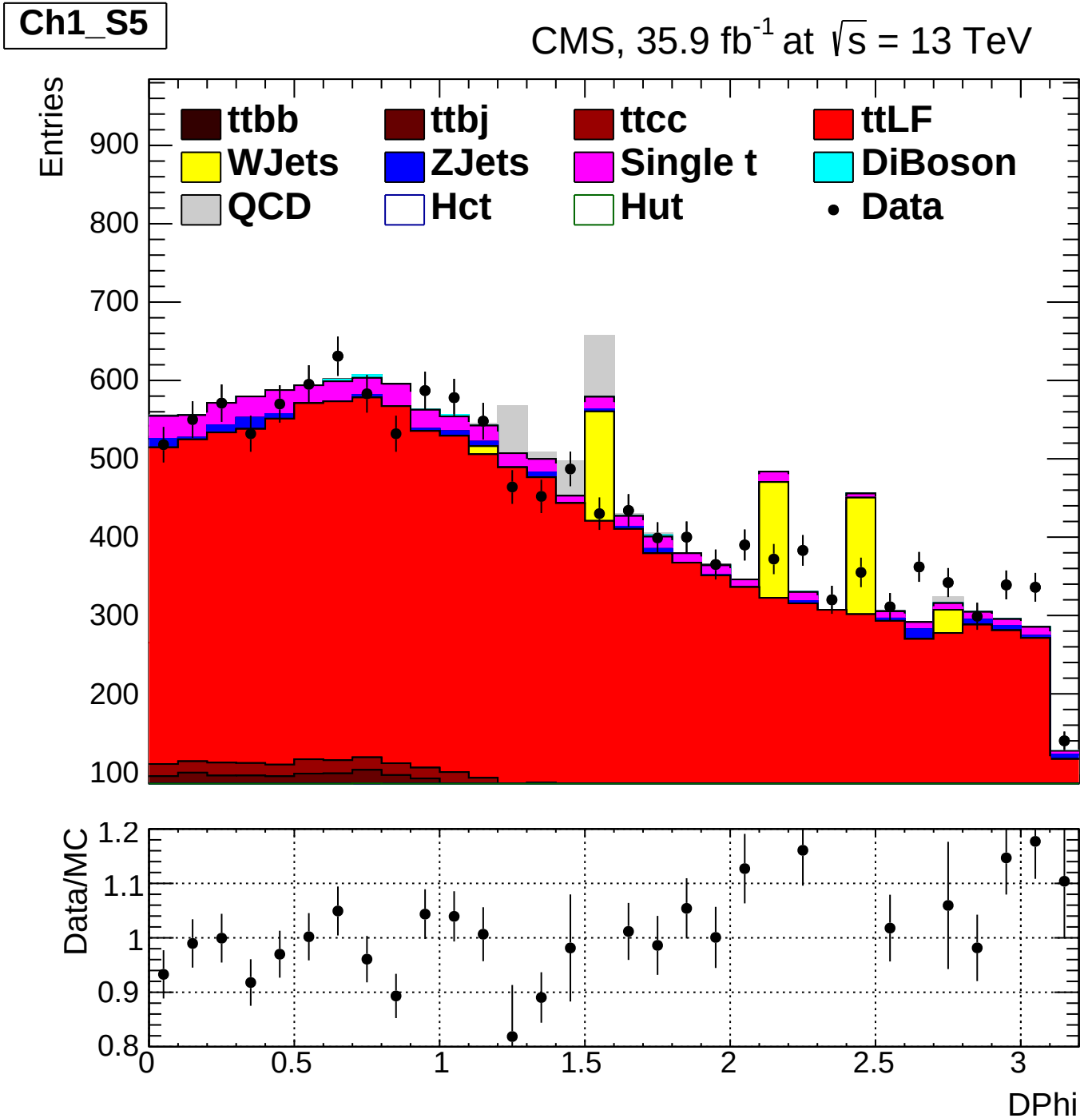

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

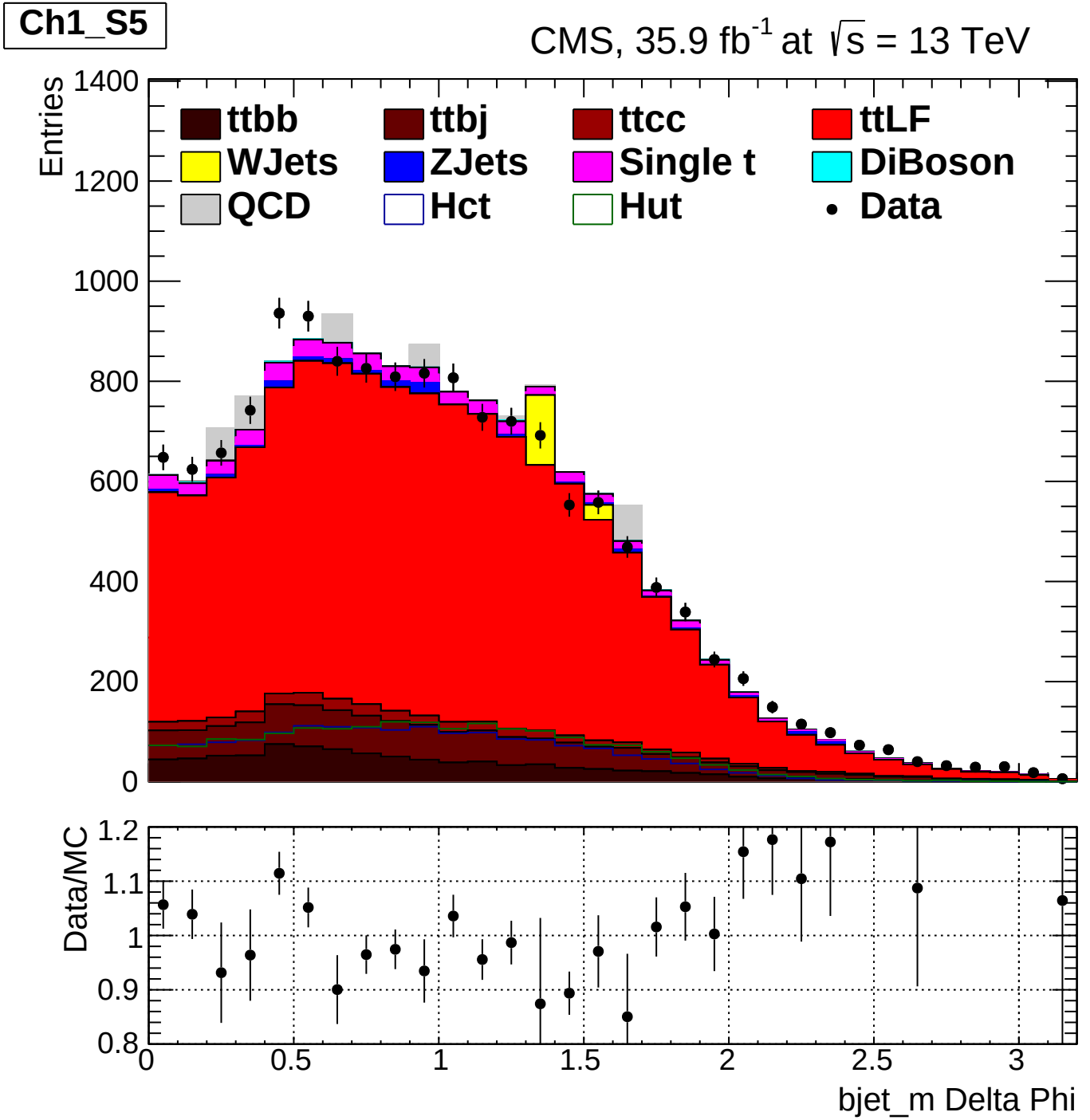

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

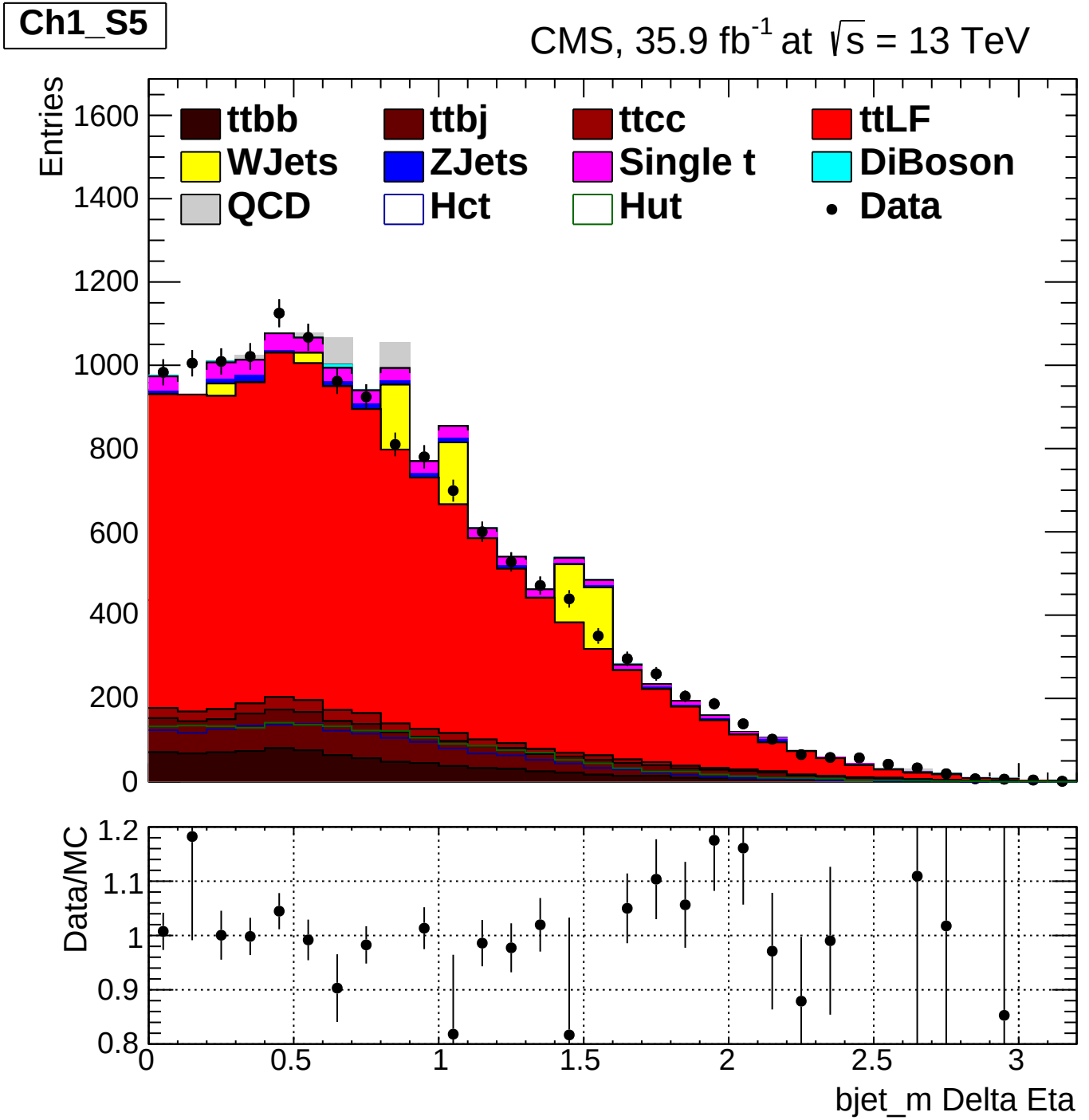

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

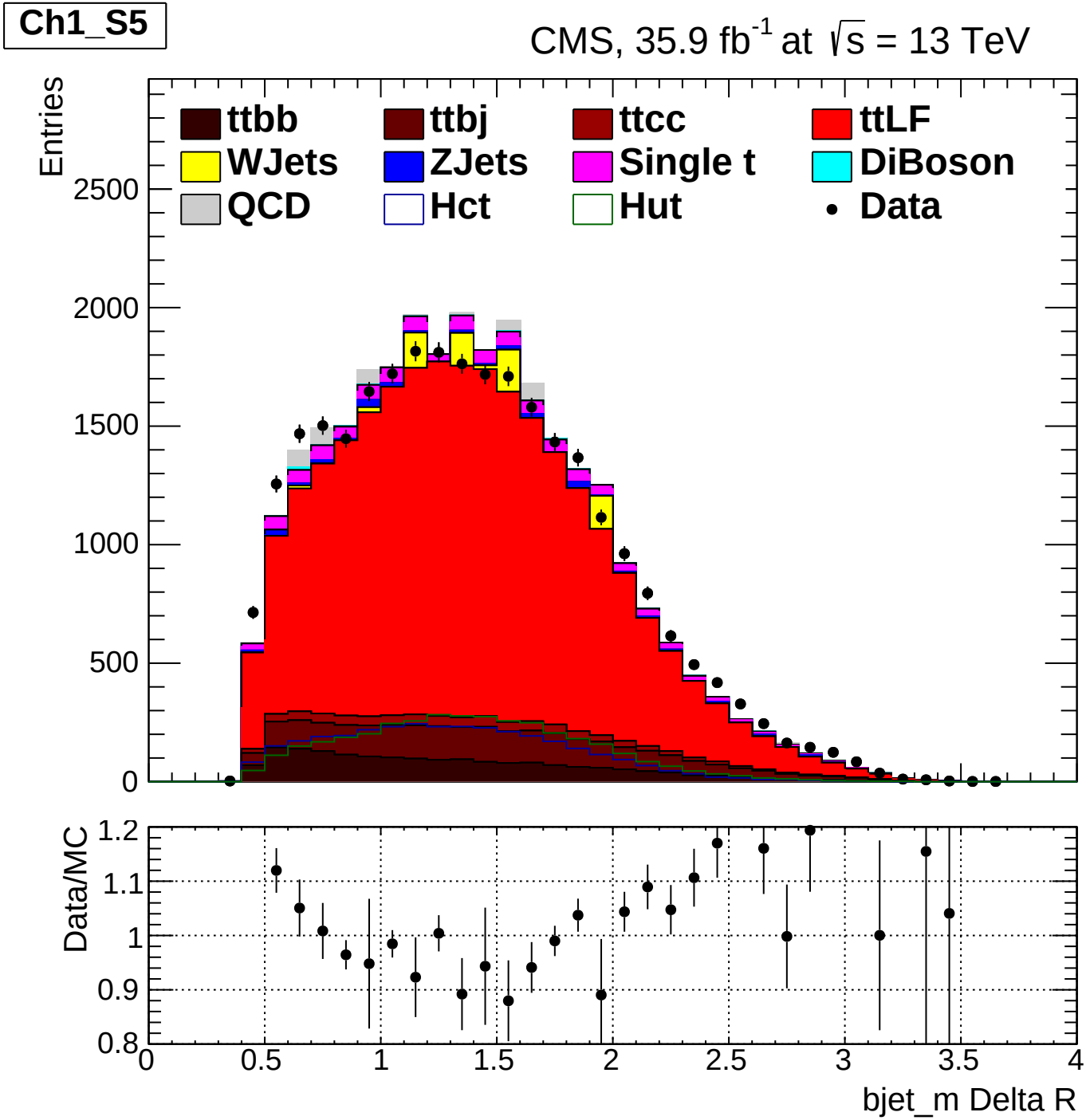

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

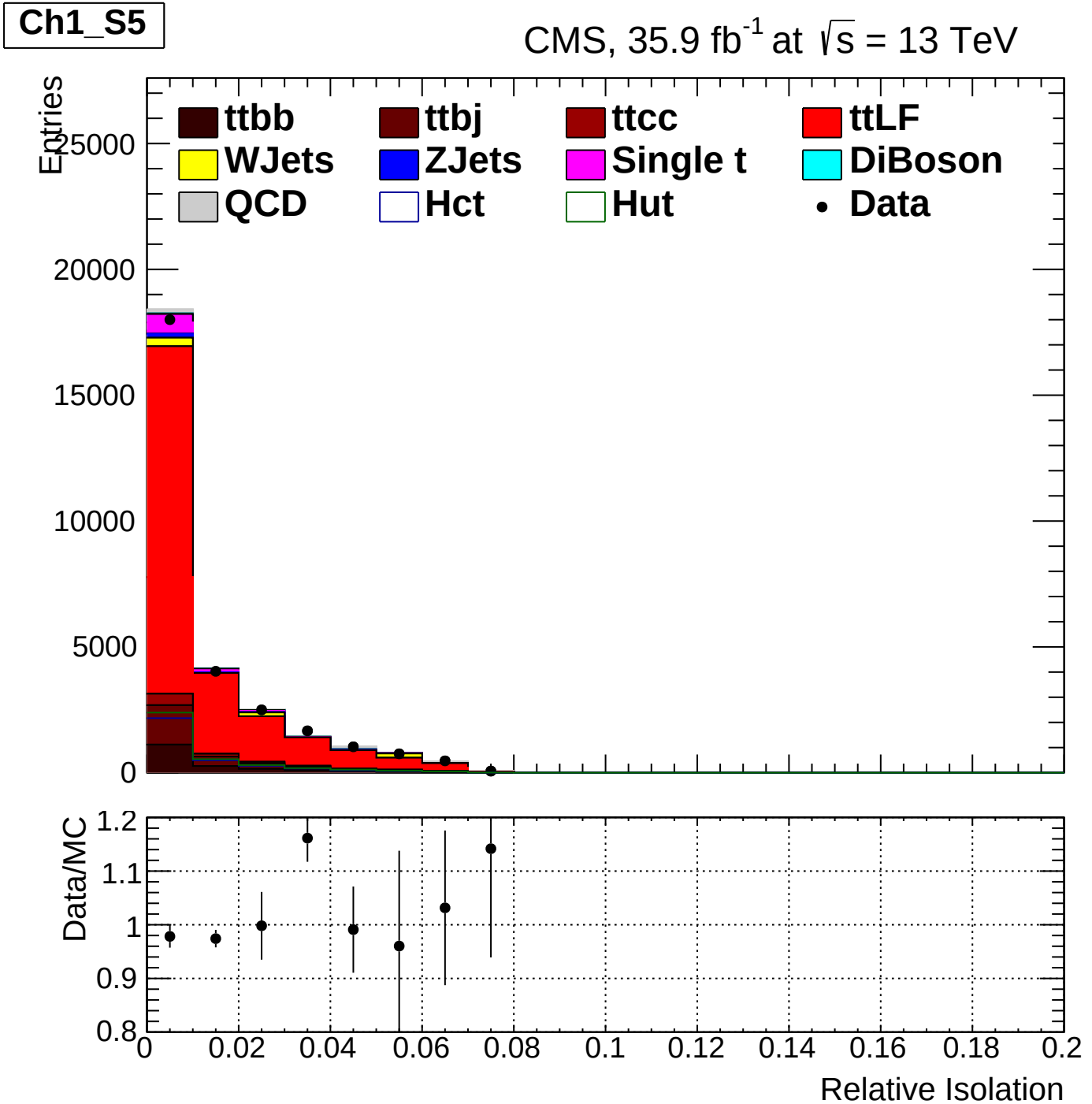

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

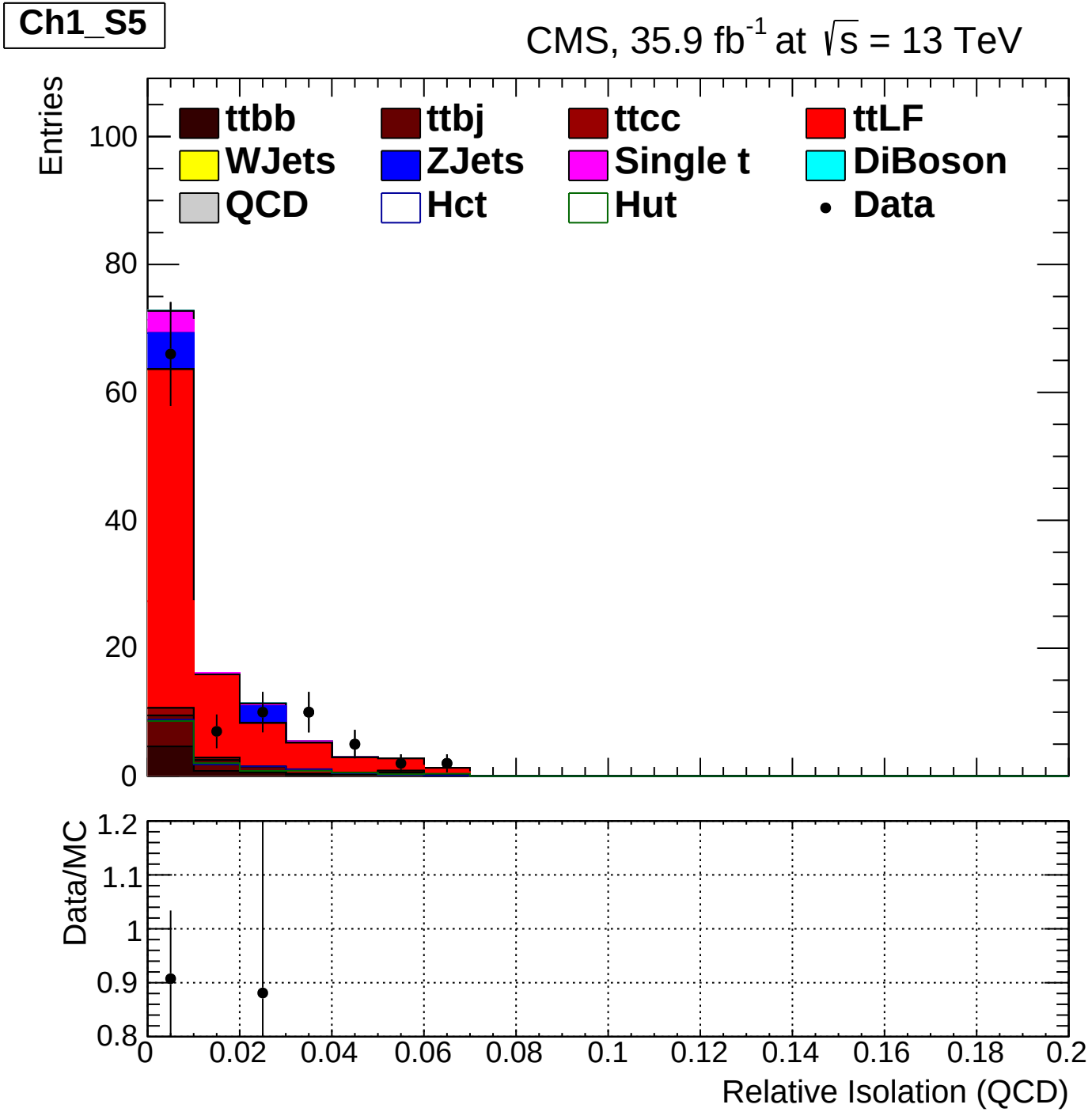

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
900
800
700
600
500
400
300
200
100
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

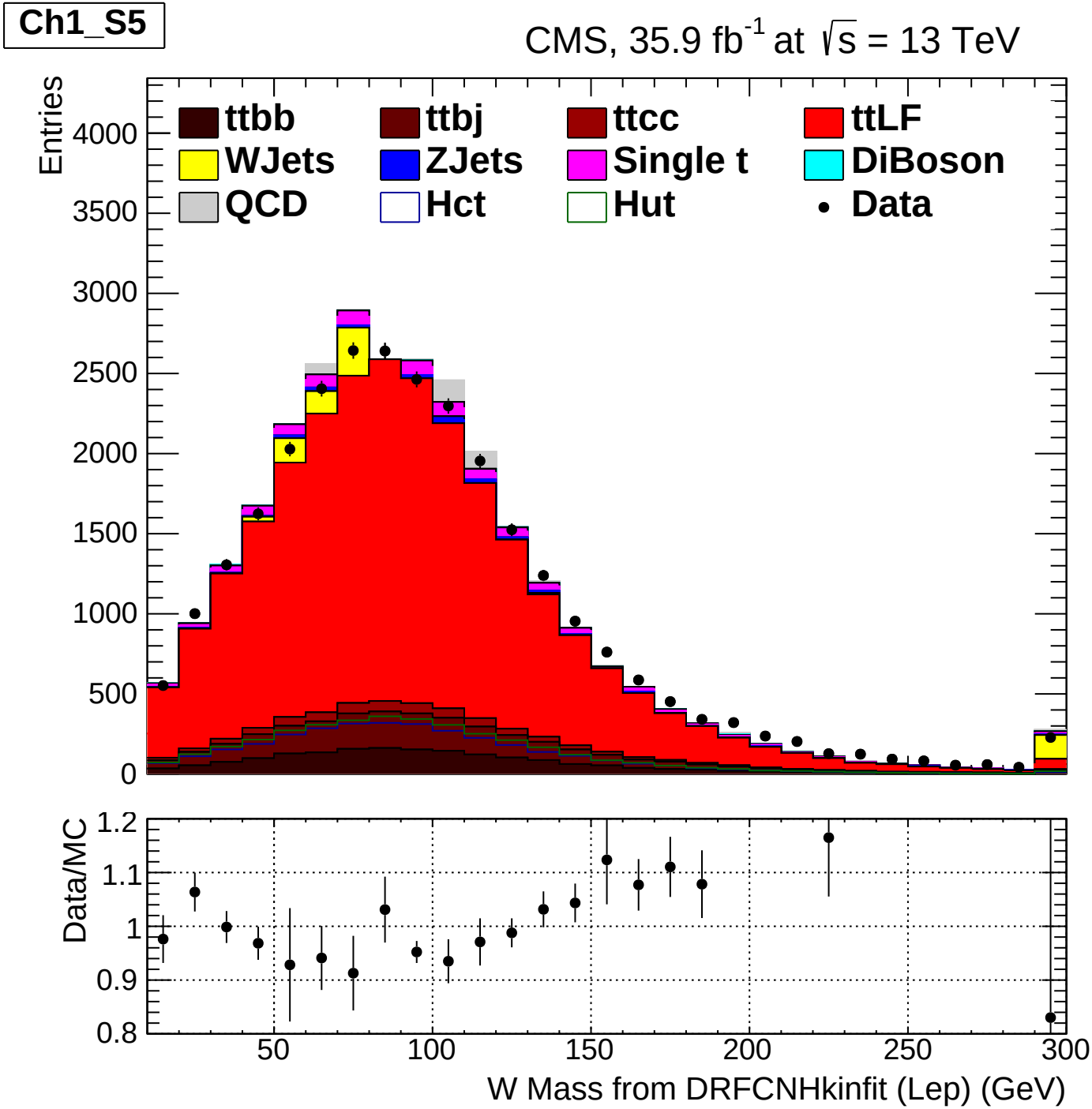

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

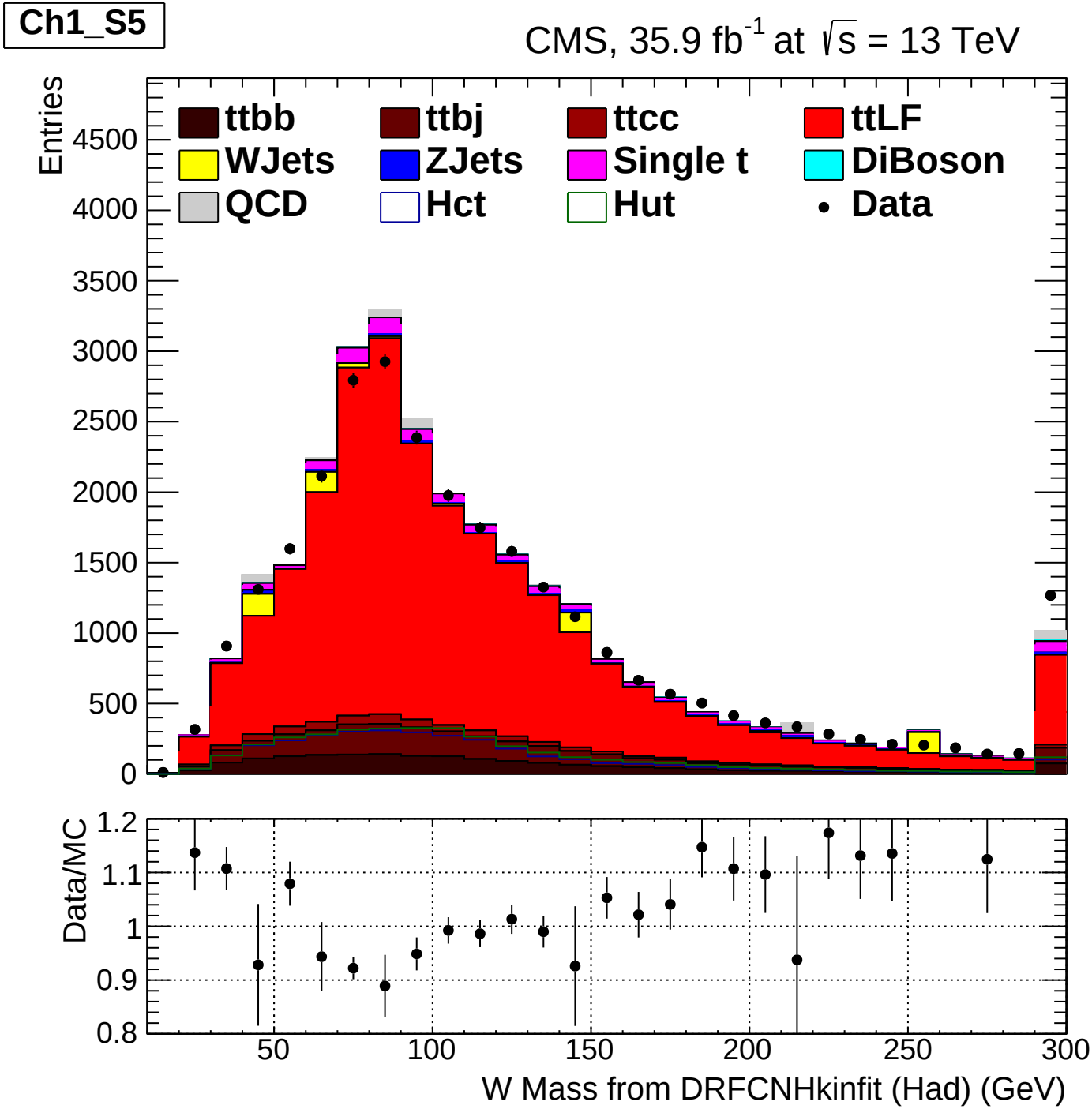

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

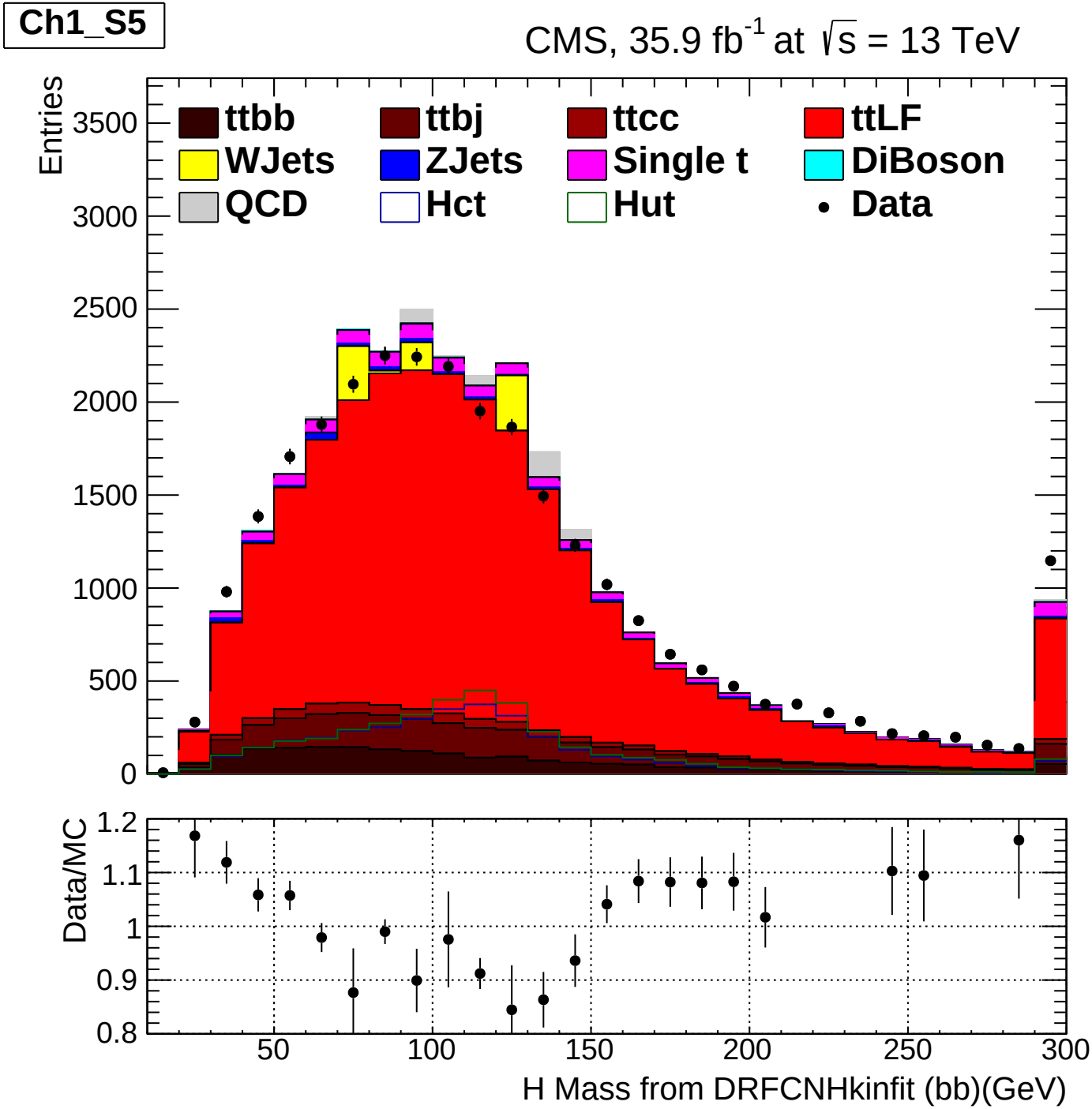

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R

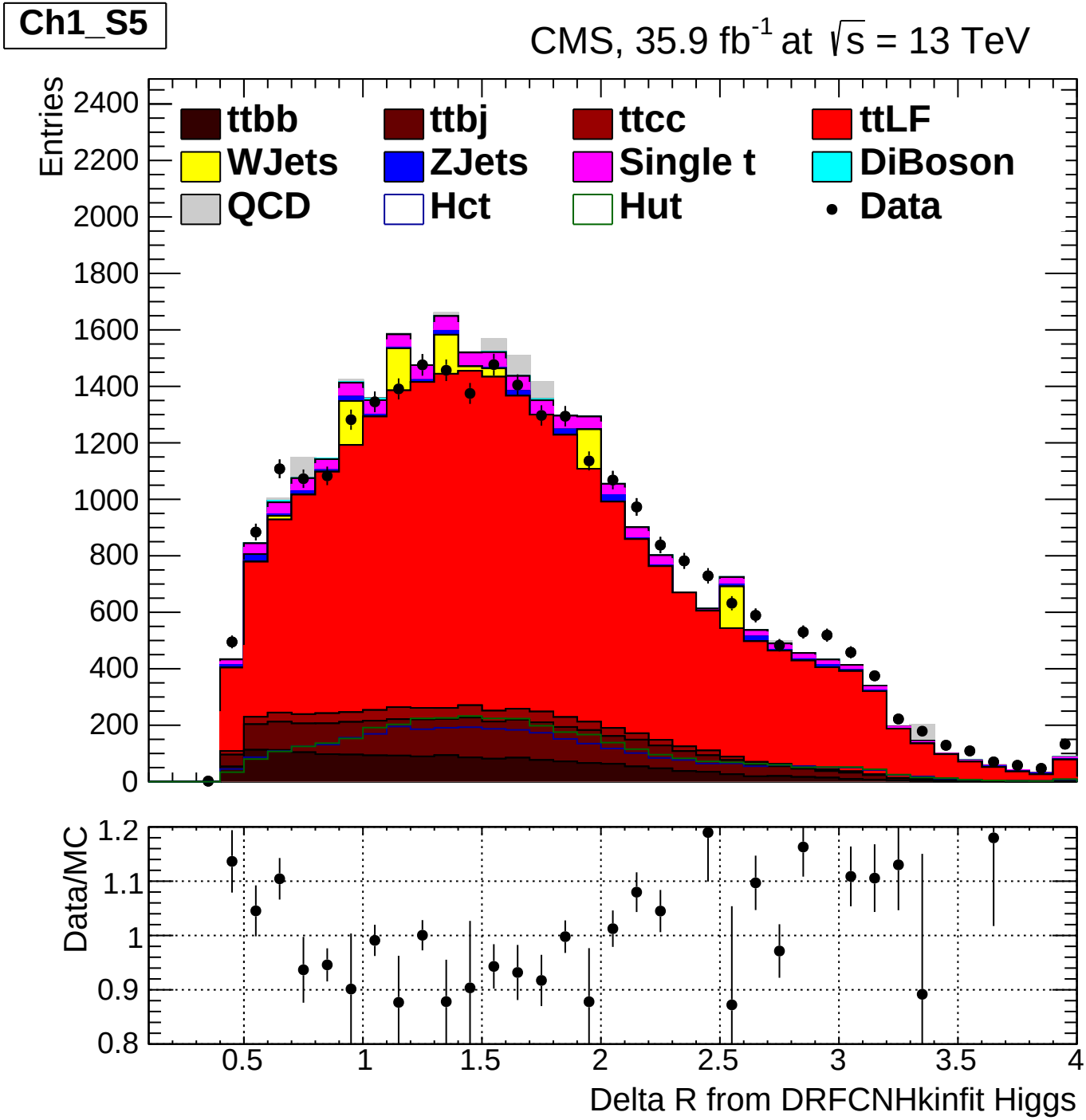

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

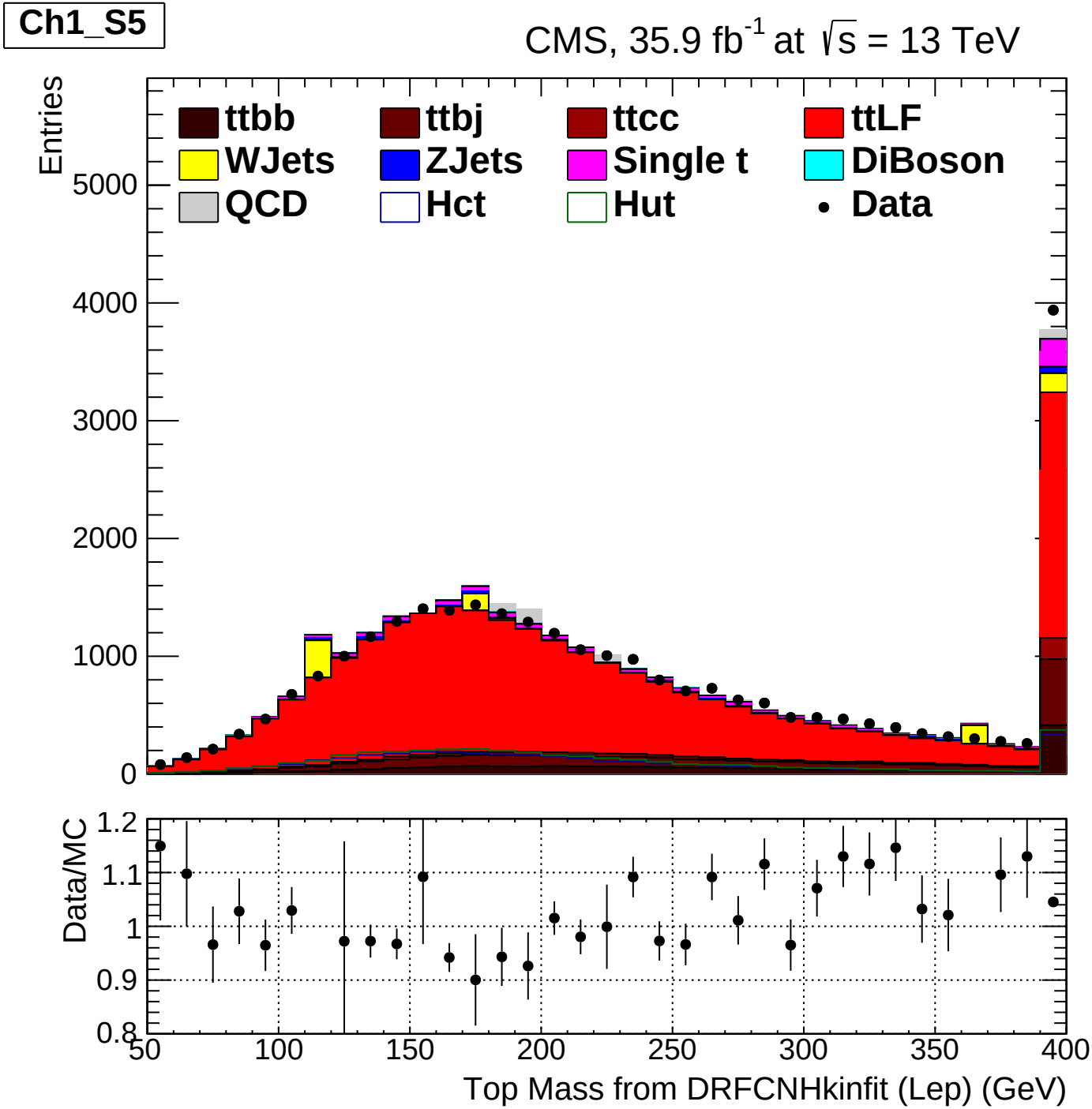

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

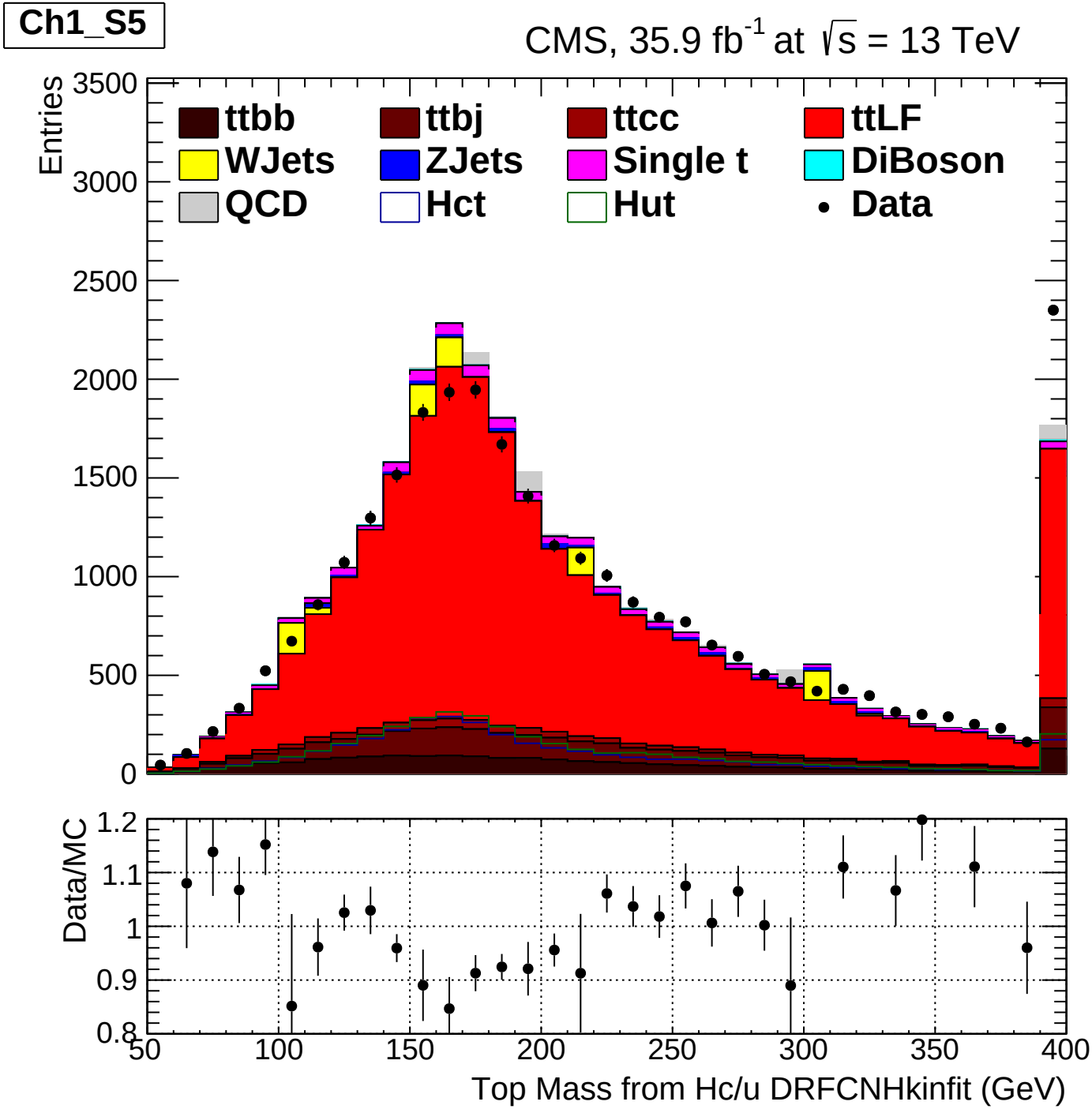

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

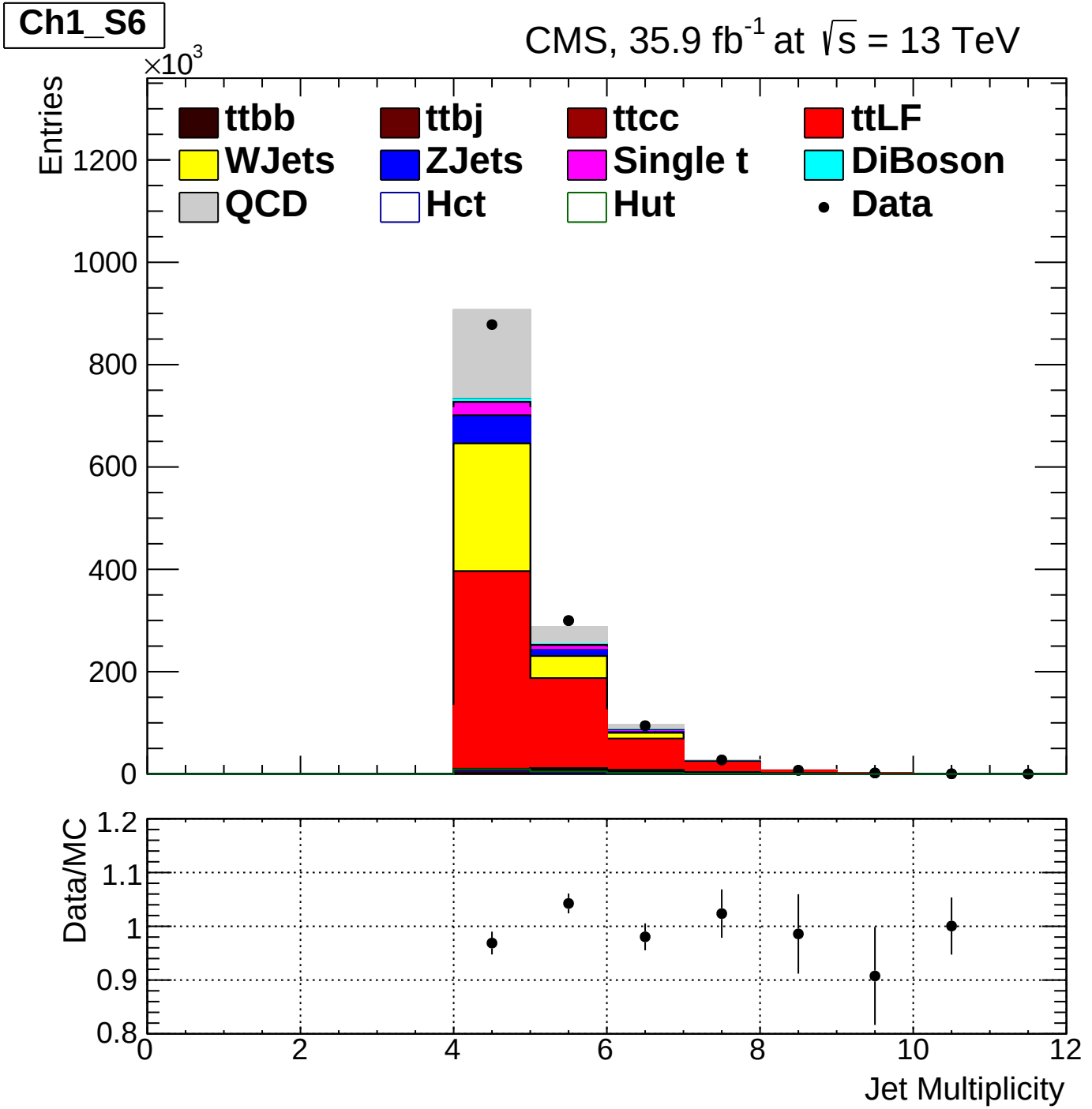

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

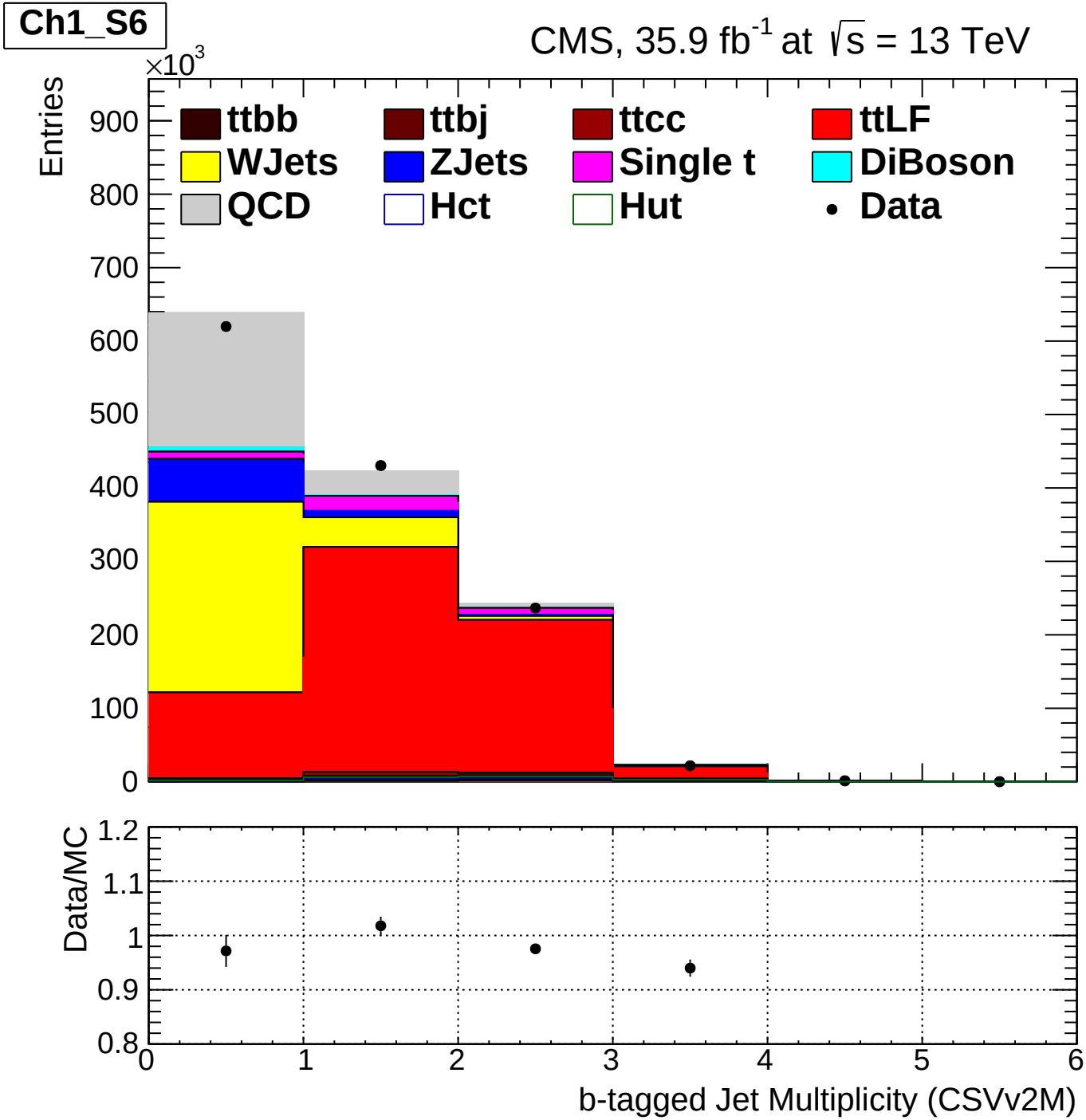

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

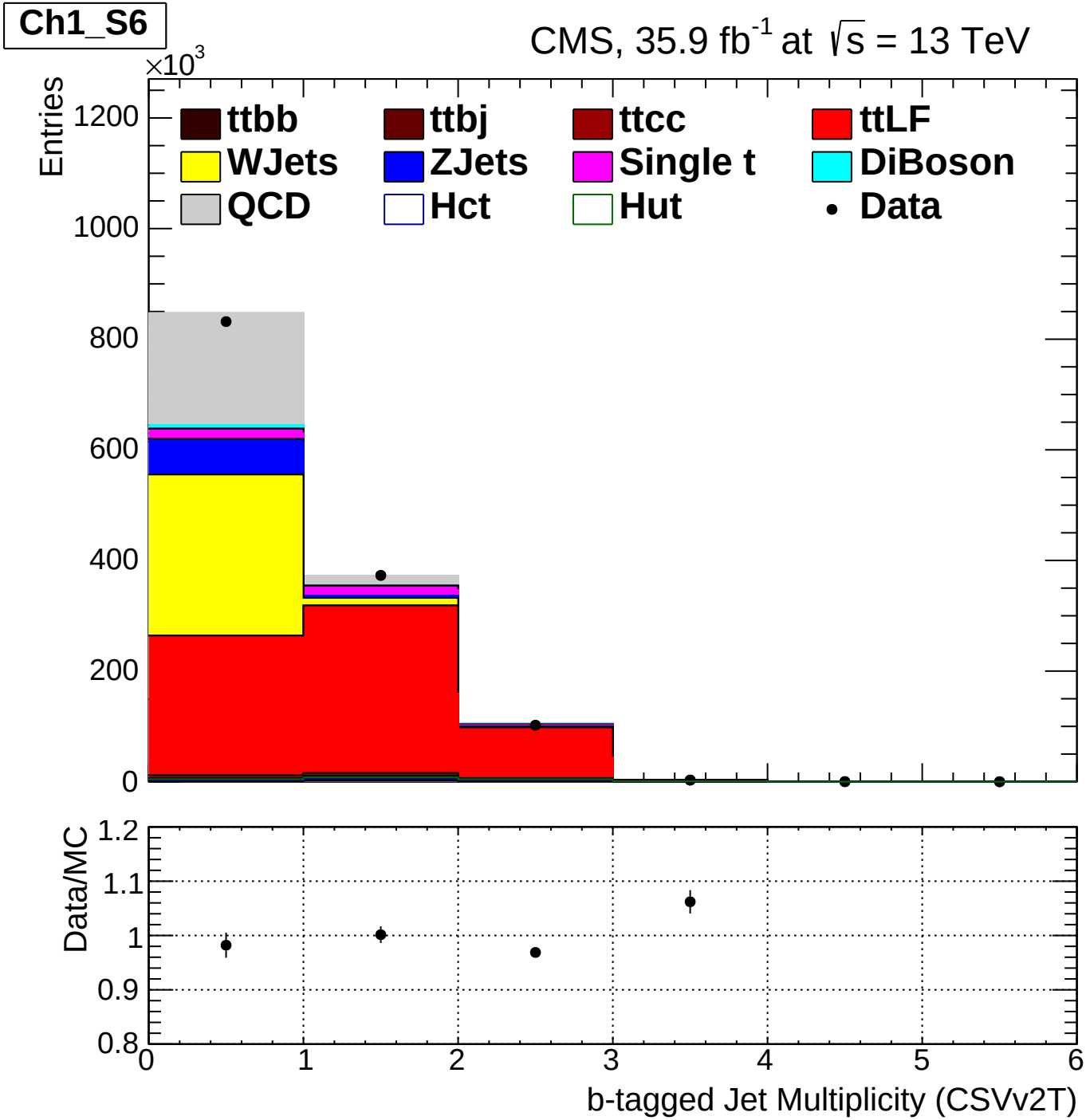

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

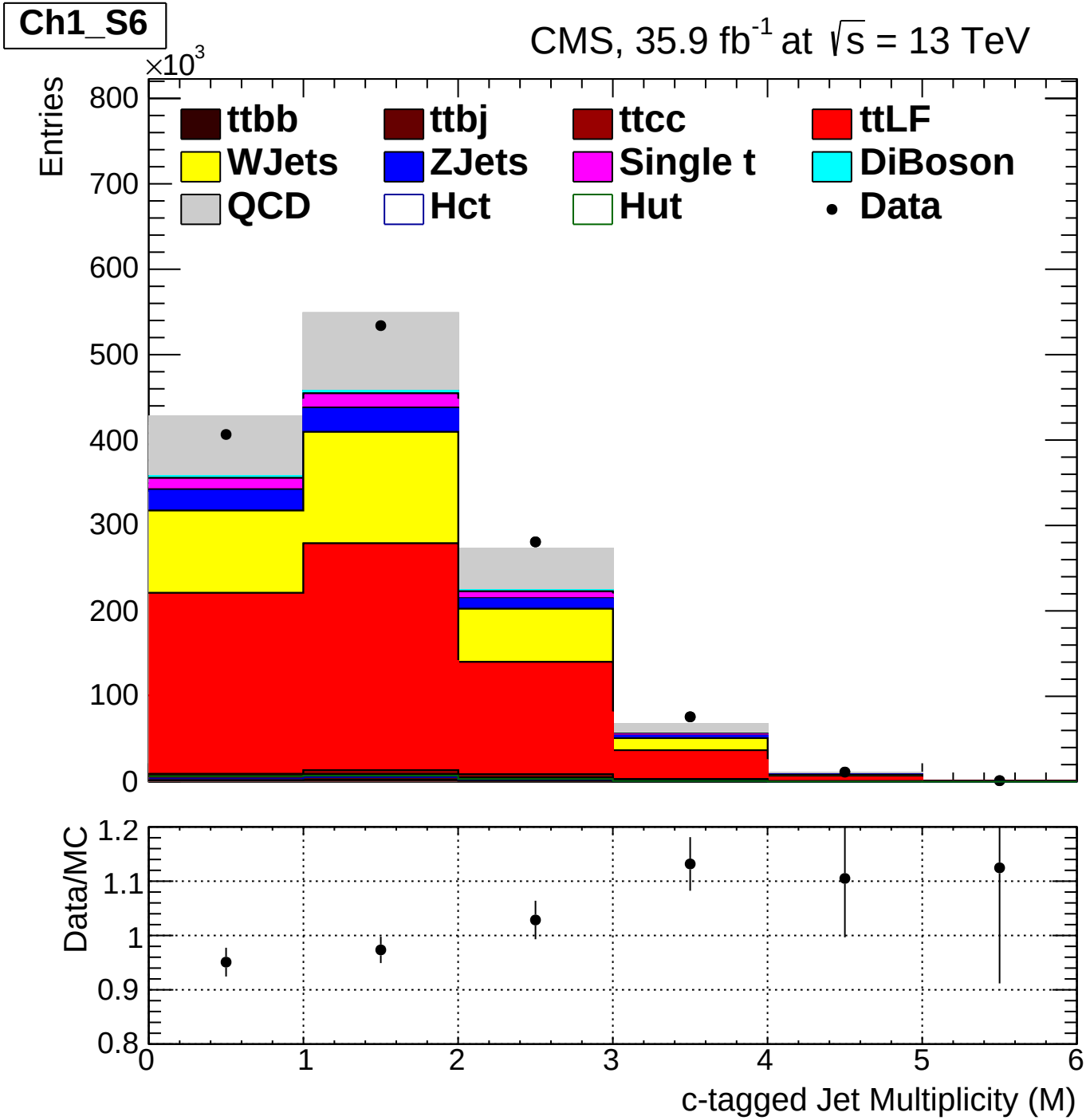

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

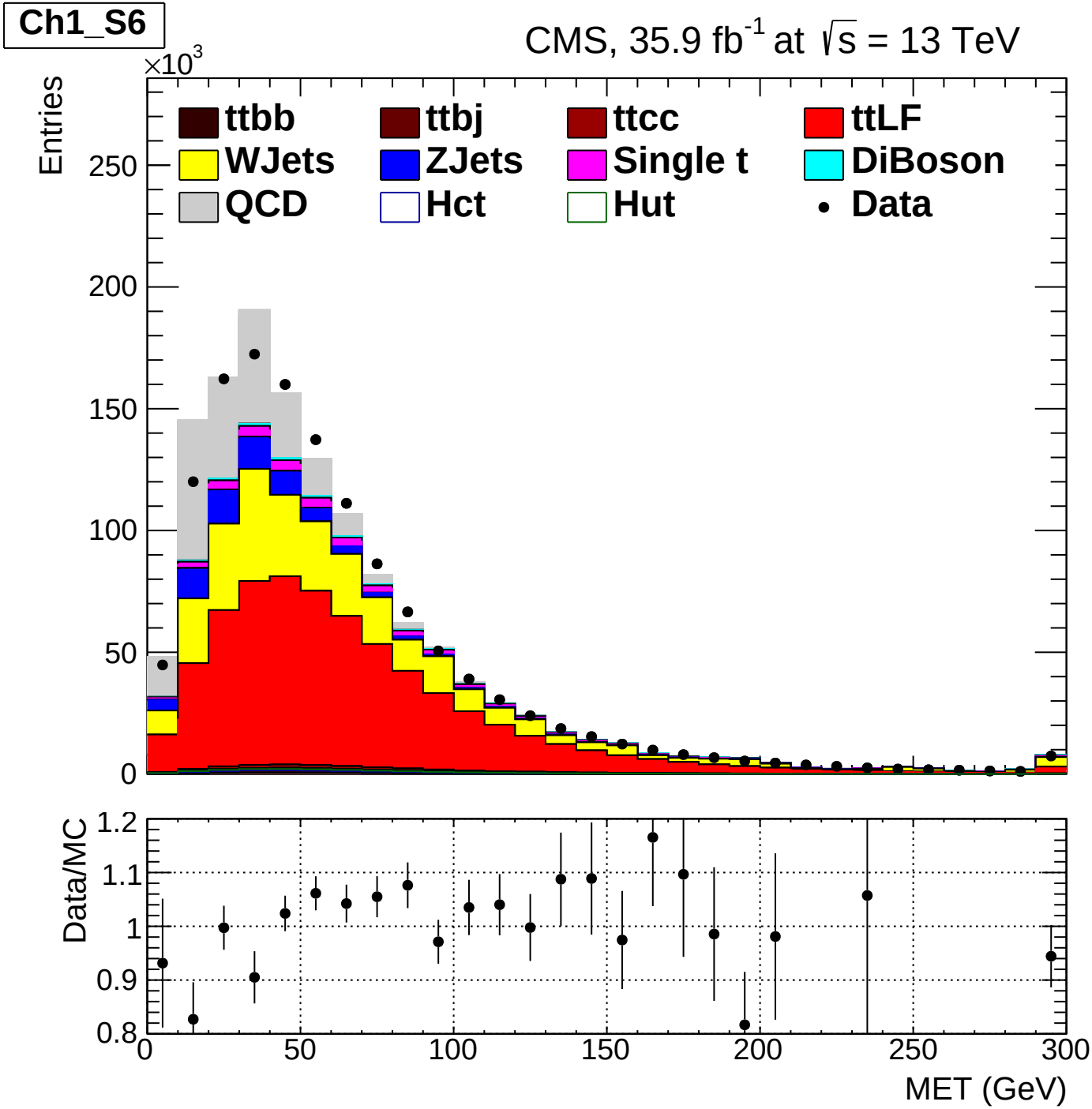

Ch1_S5
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

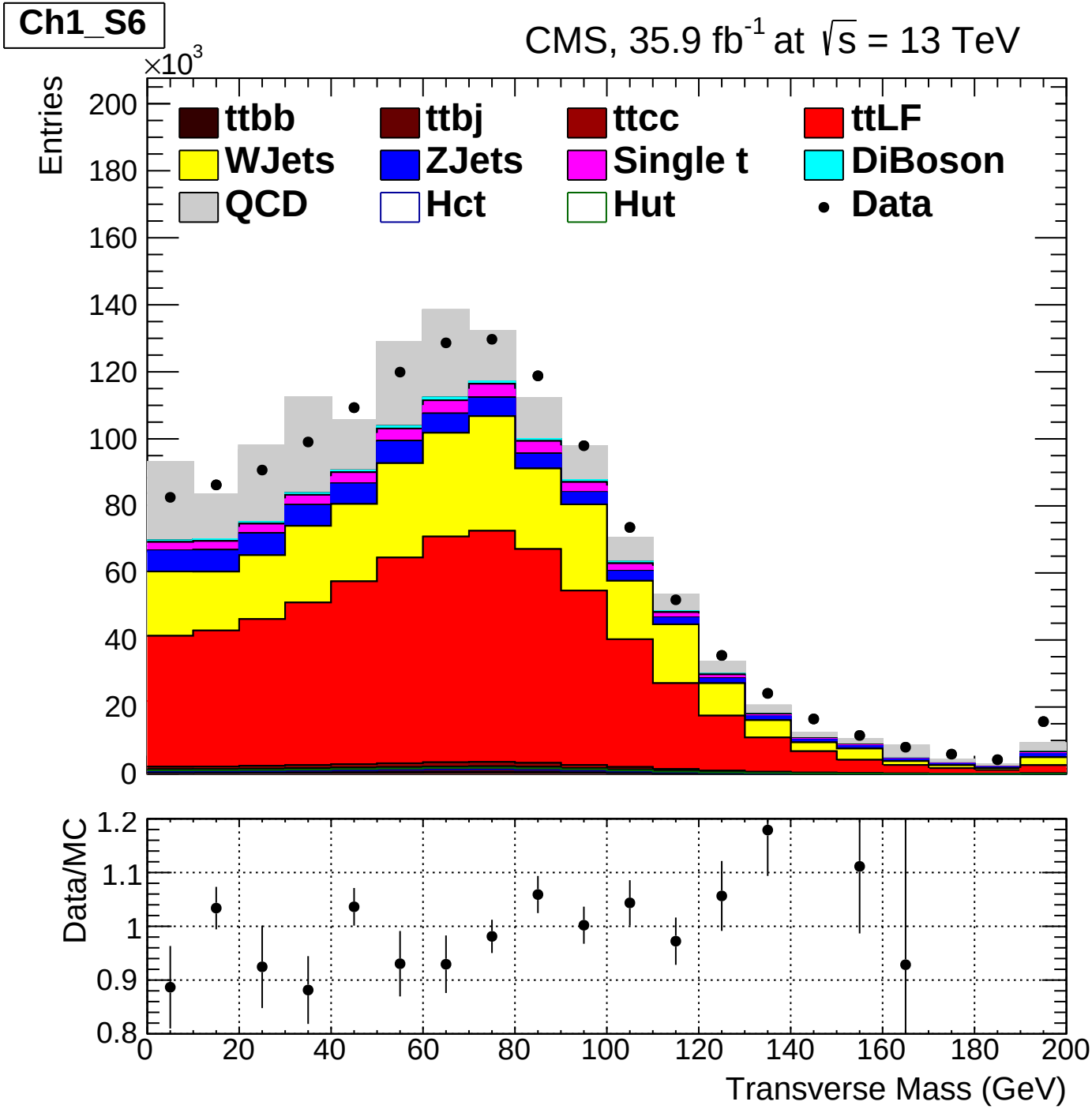

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
1200
Data/MC
0.8
0.9
1
1.1
1.2
0
2
4
6
8
10
12
Jet Multiplicity

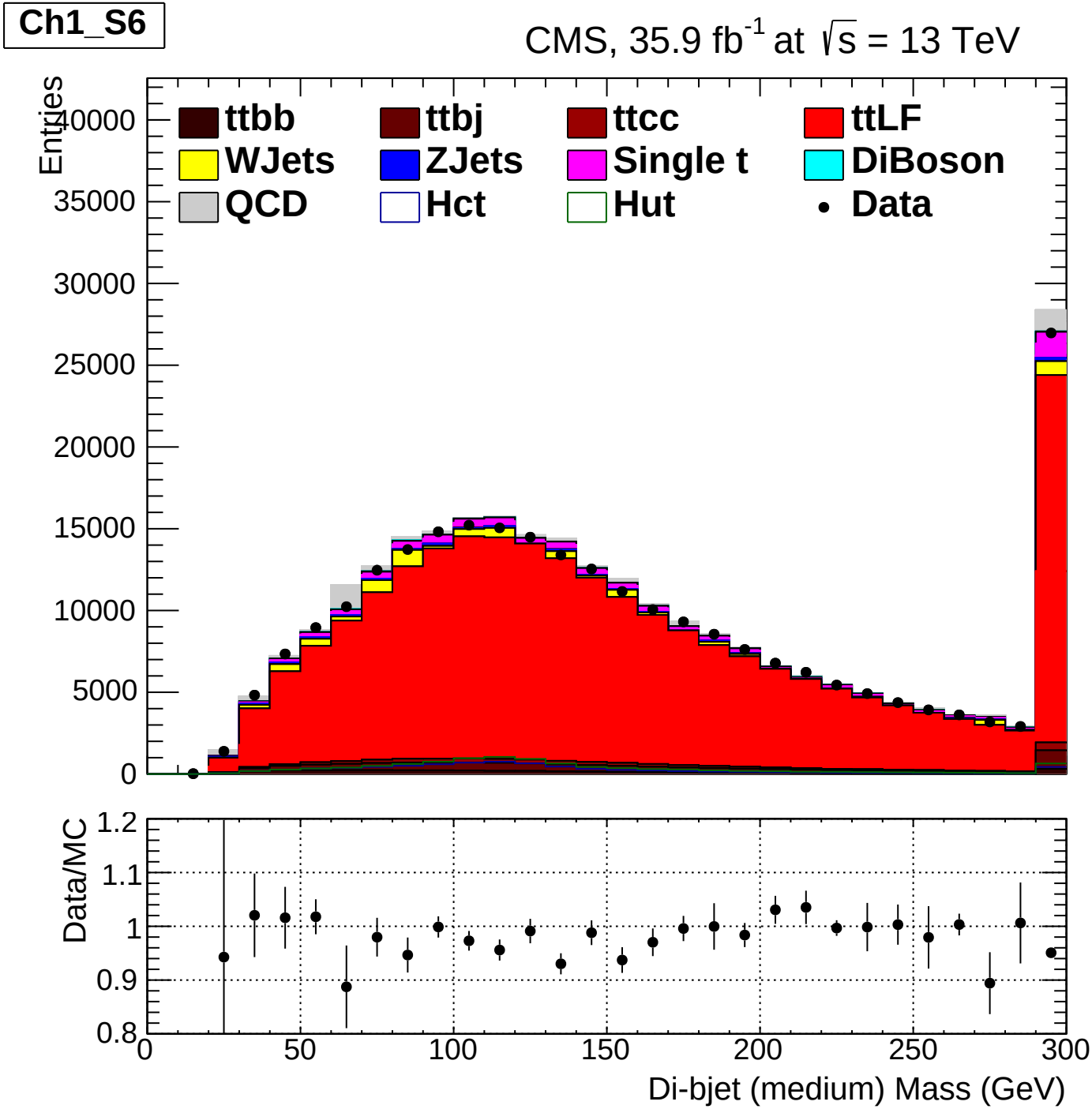

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

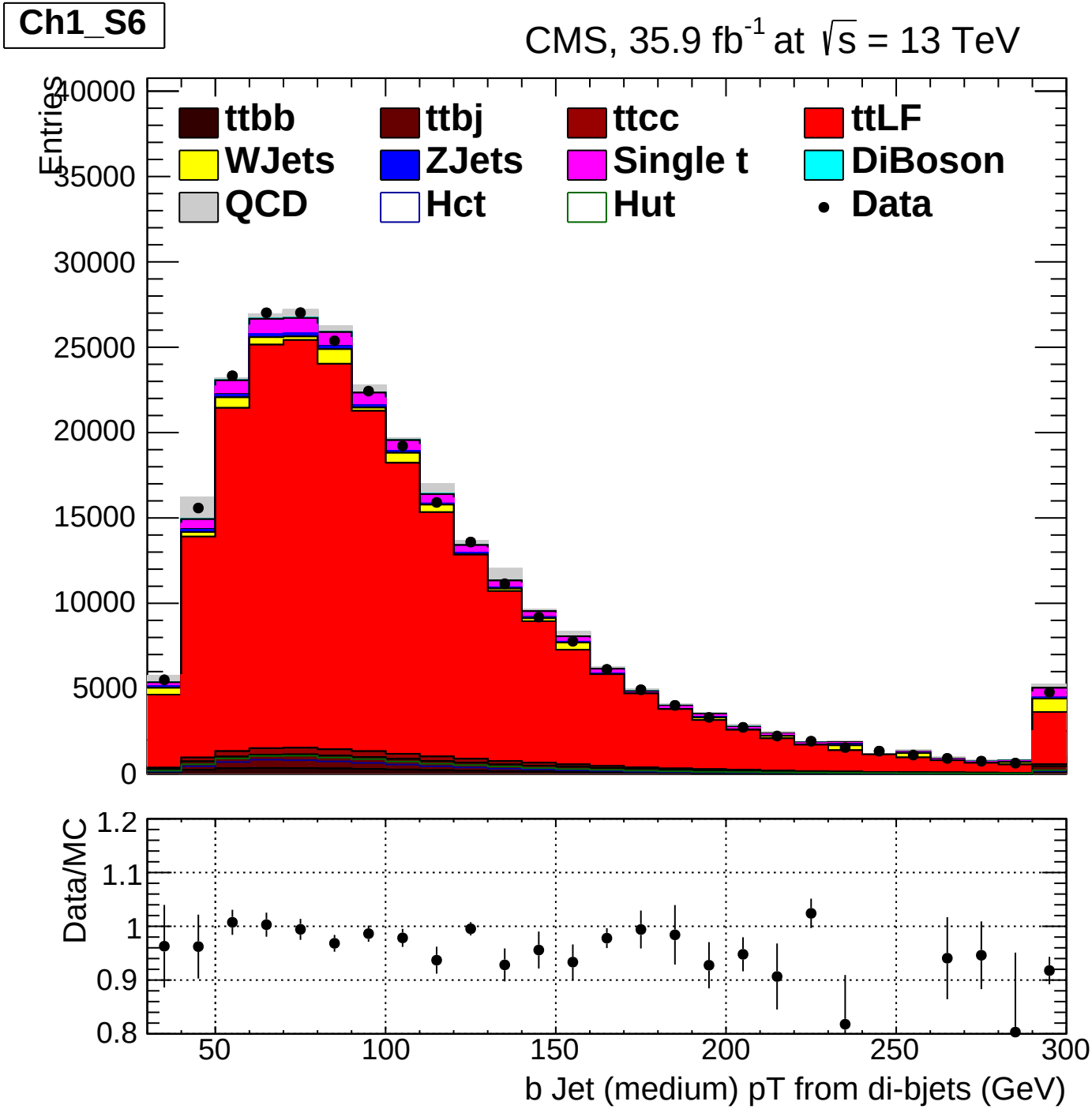

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

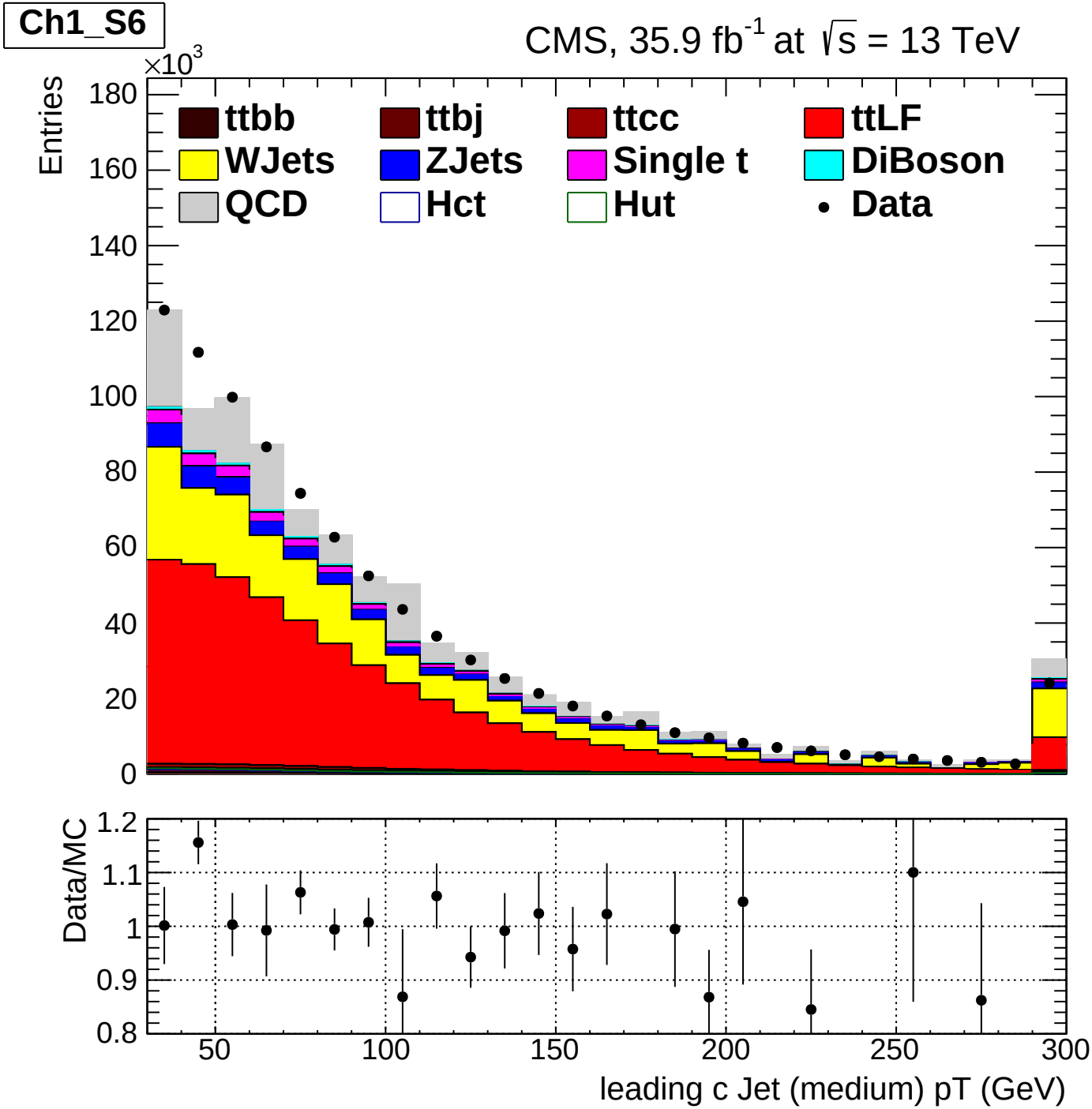

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

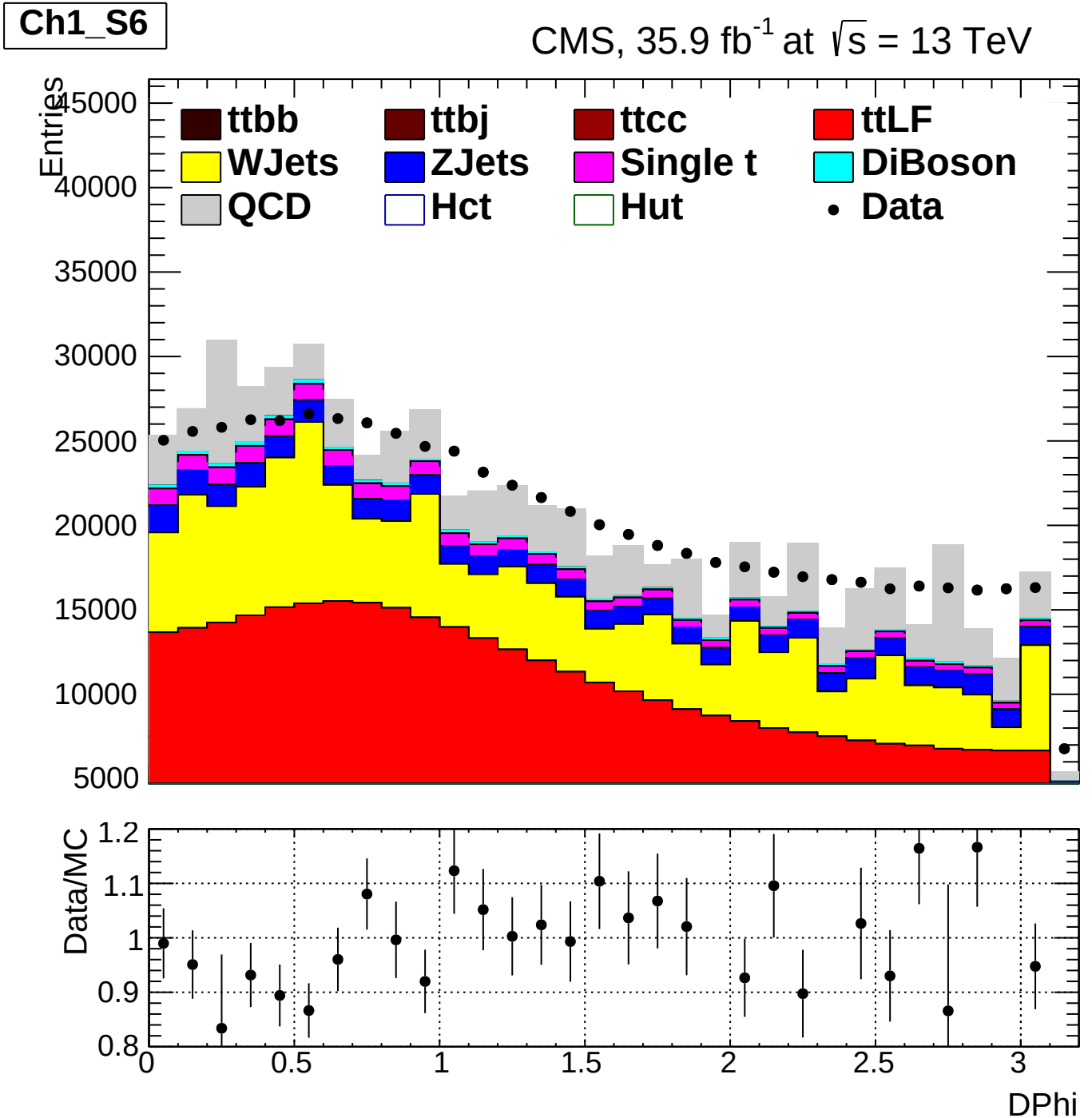

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

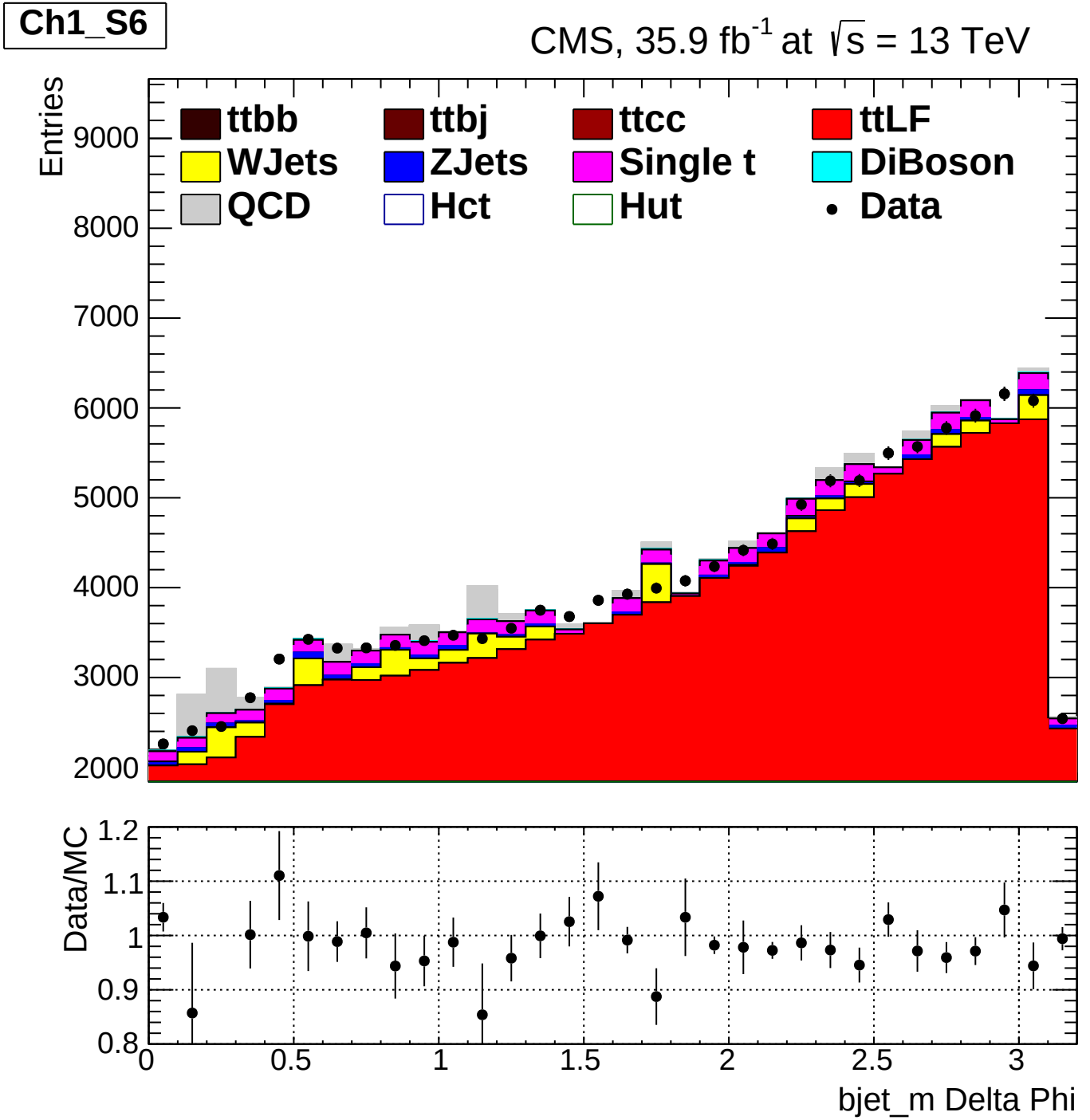

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

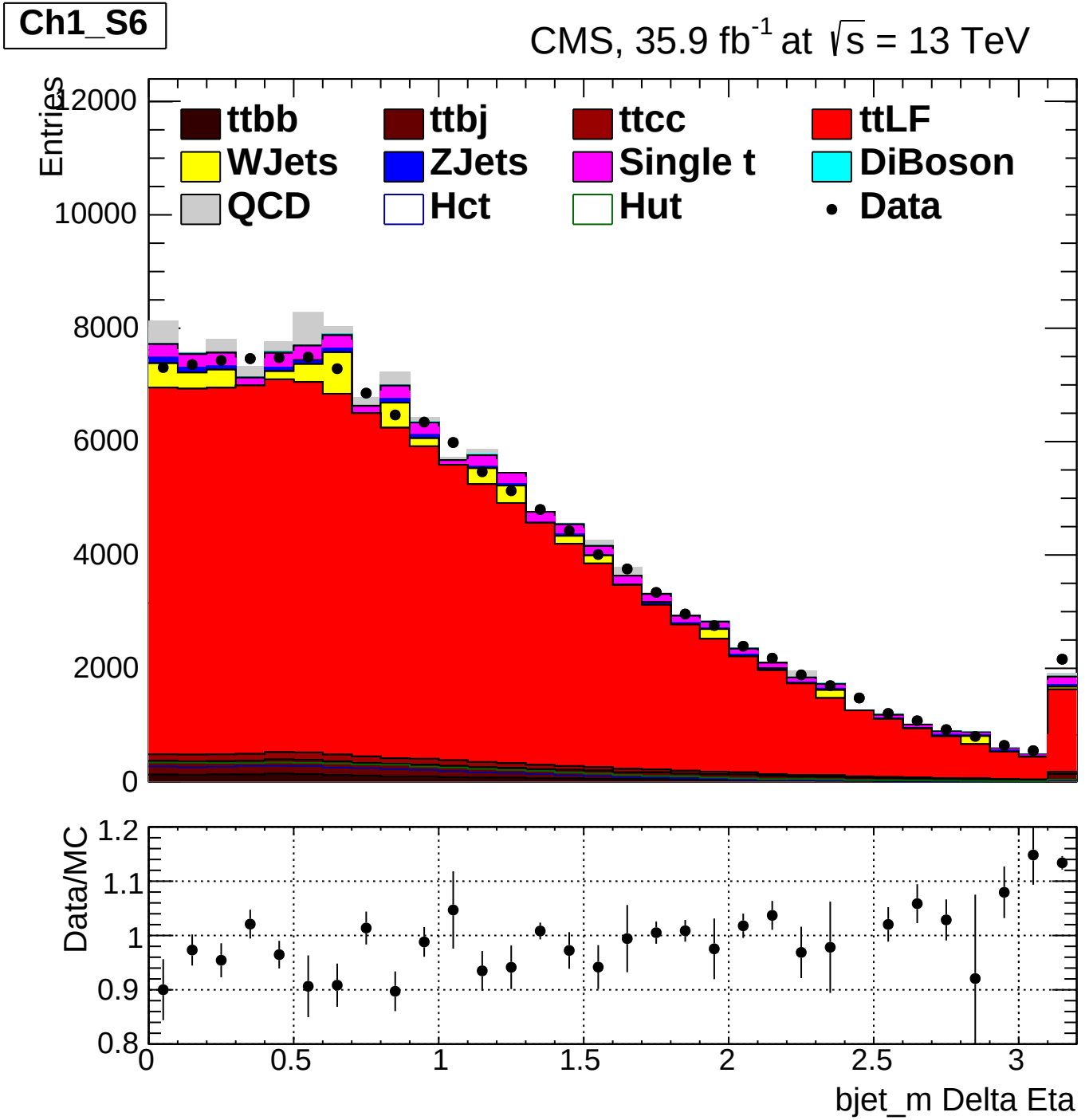

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

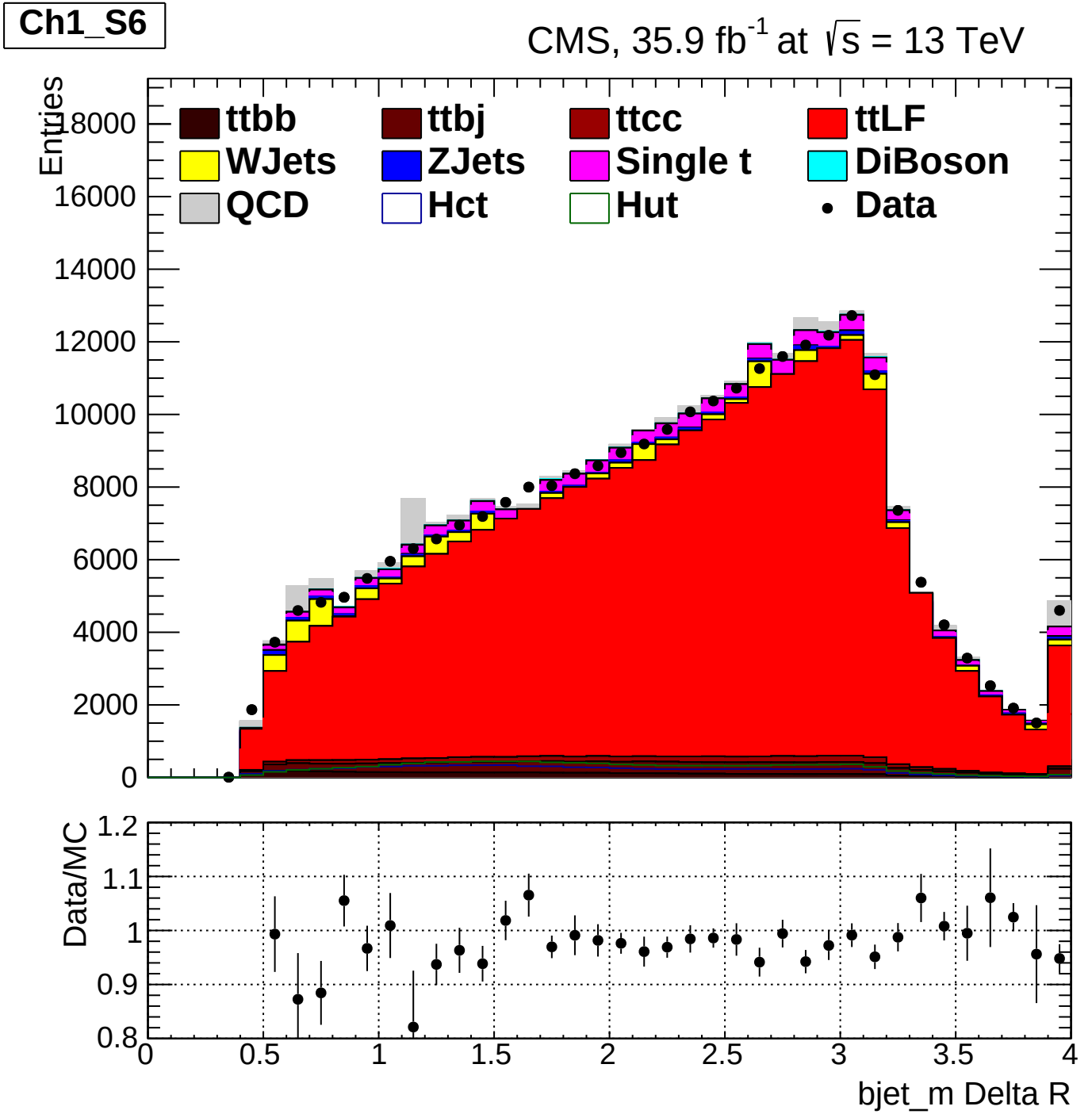

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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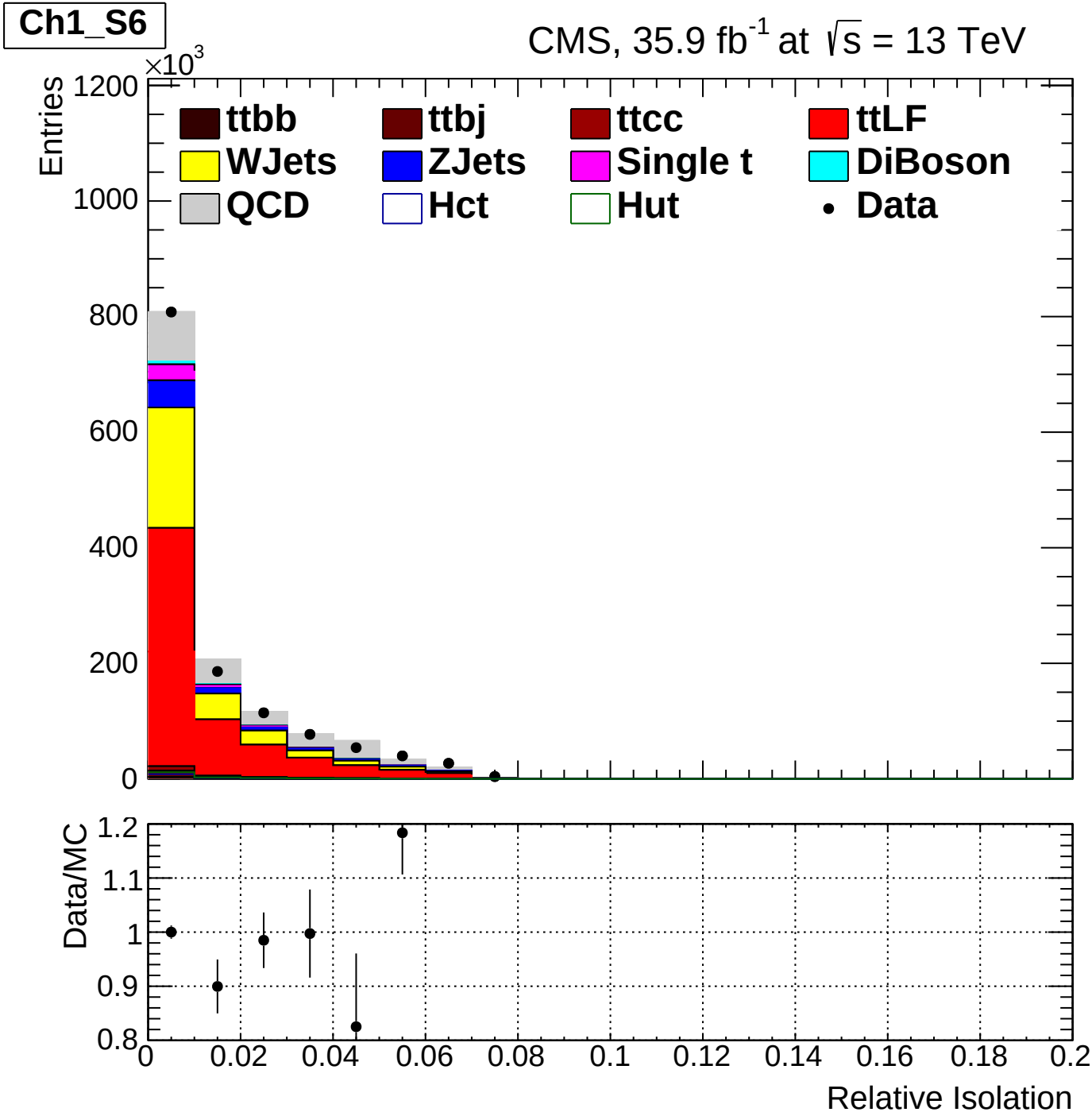
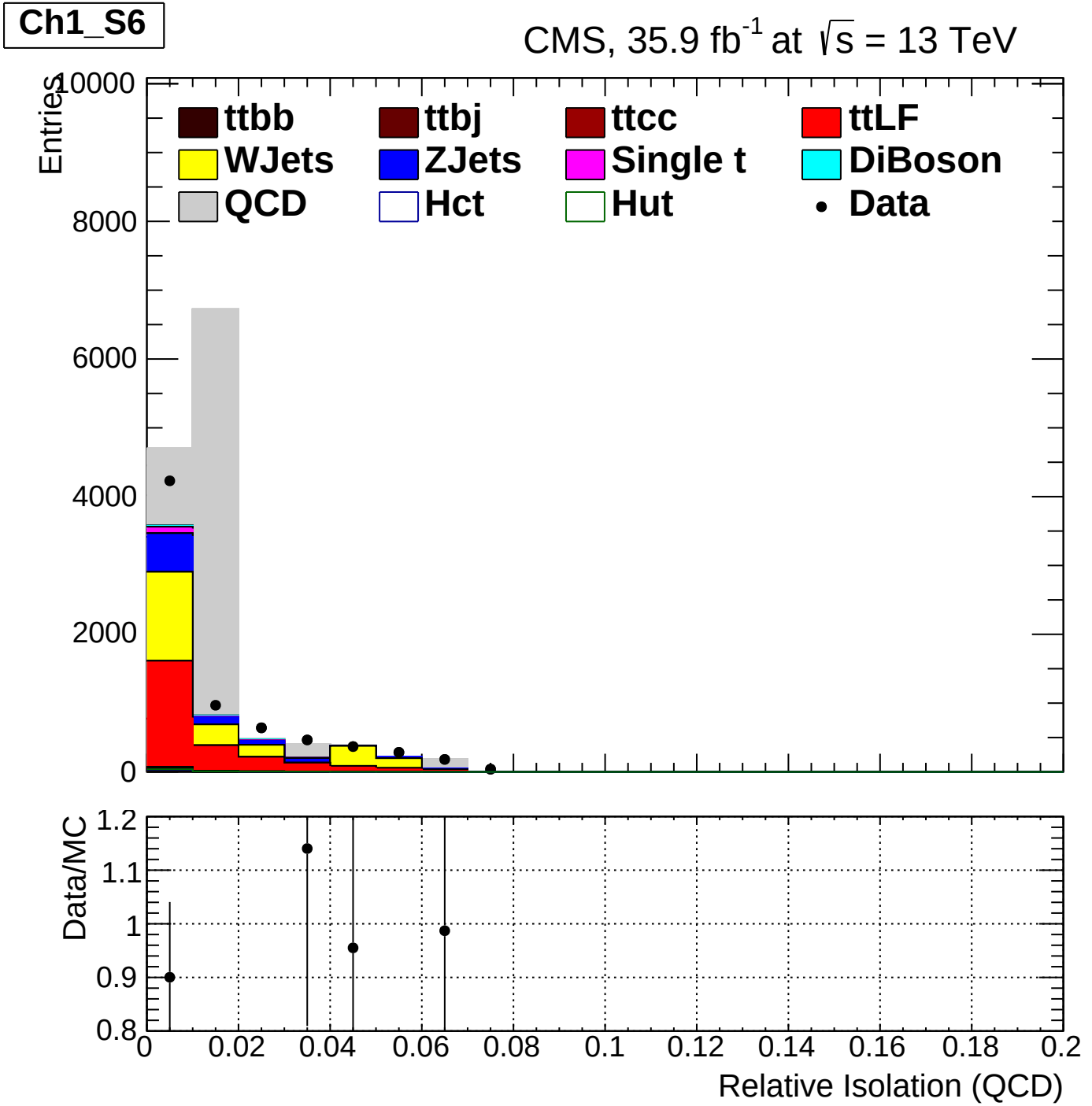
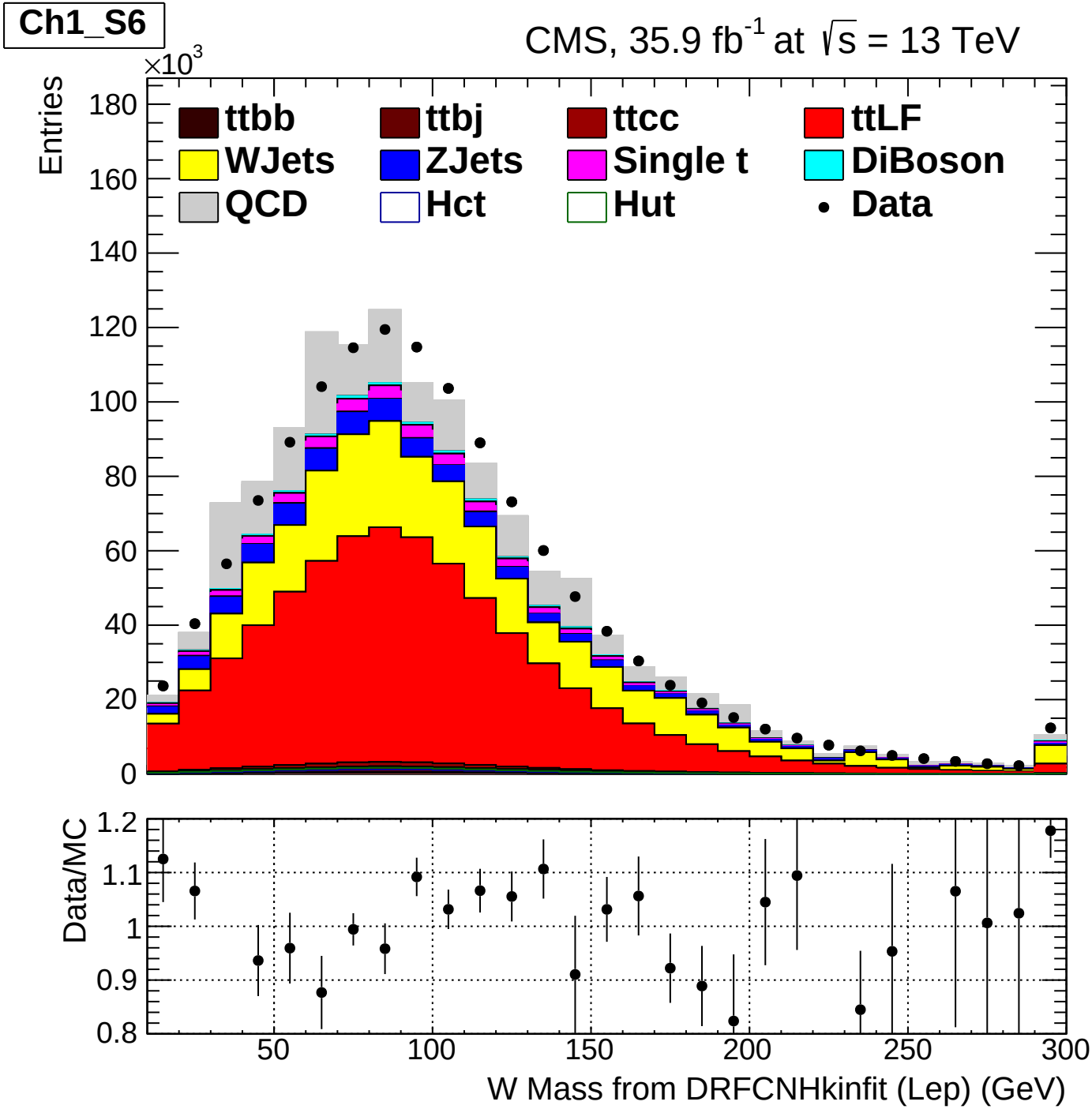
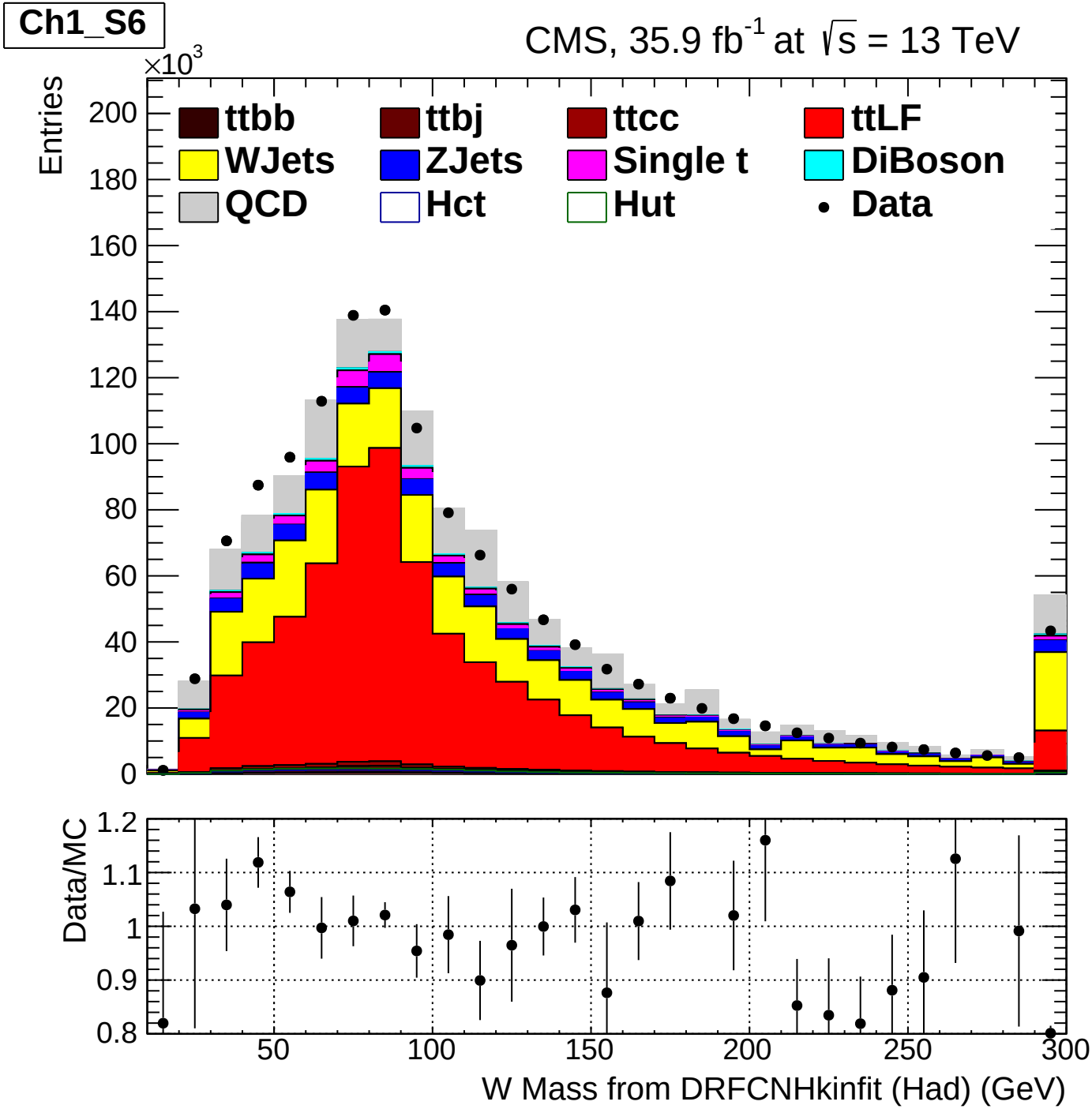
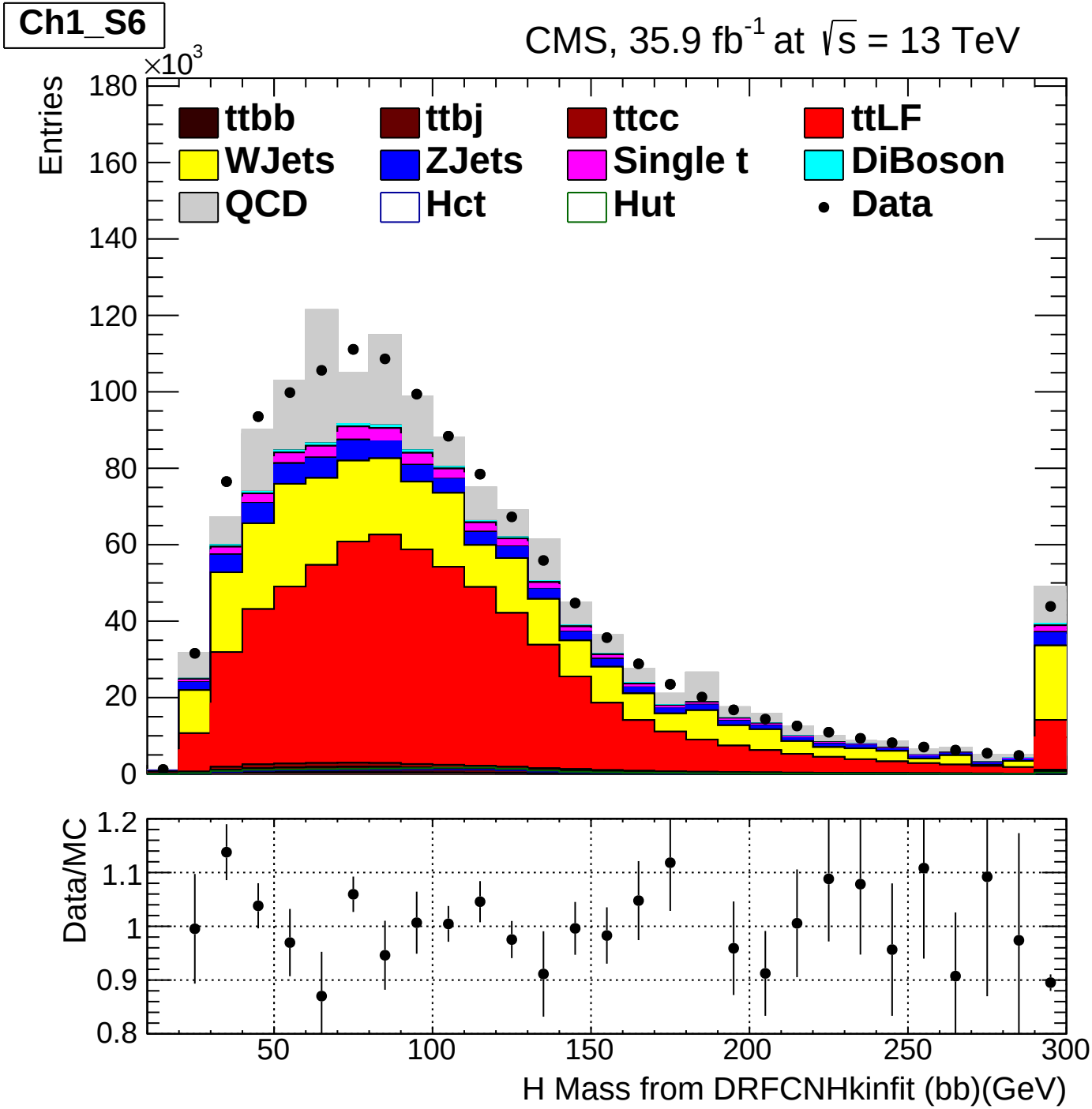
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

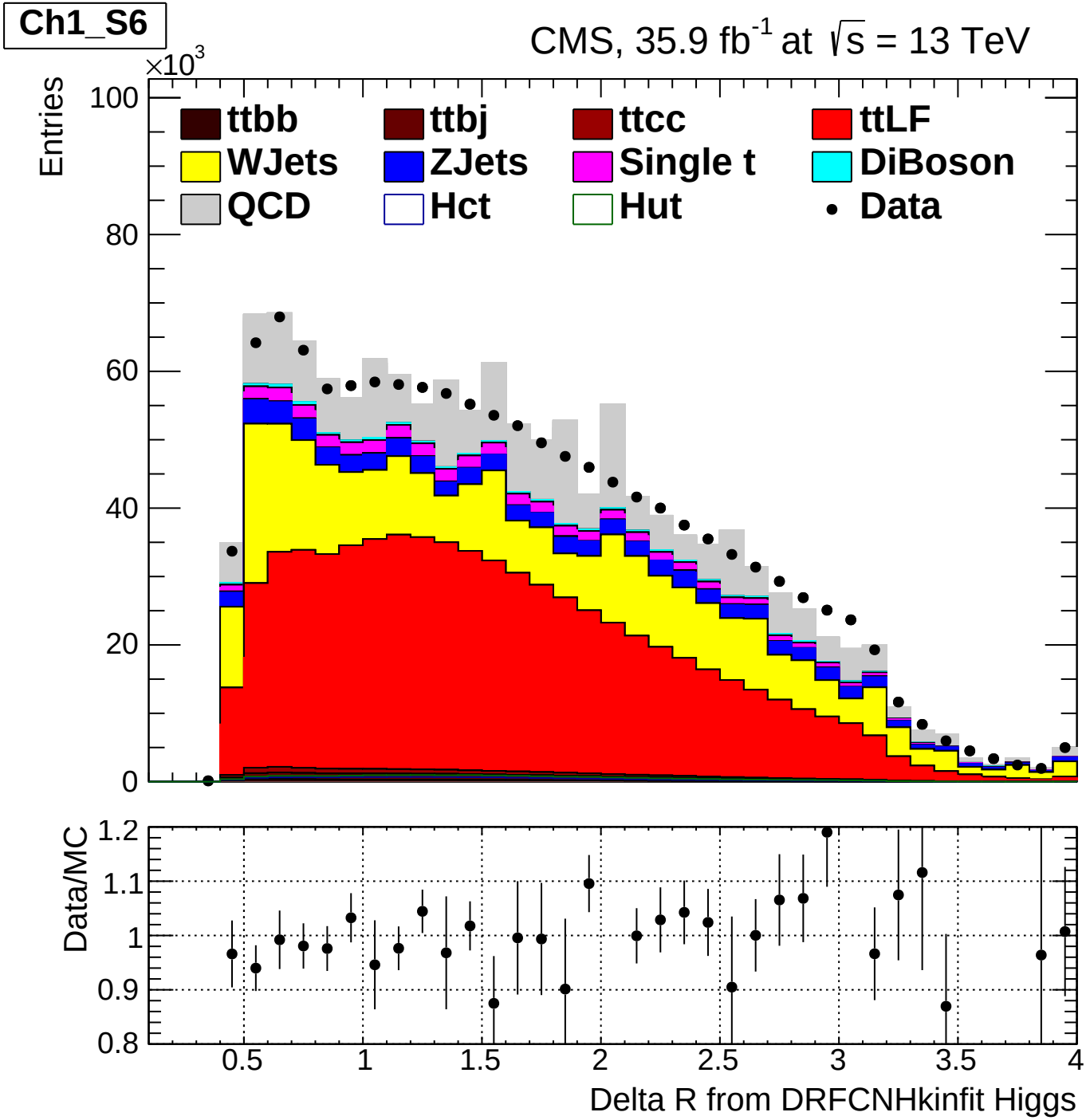

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

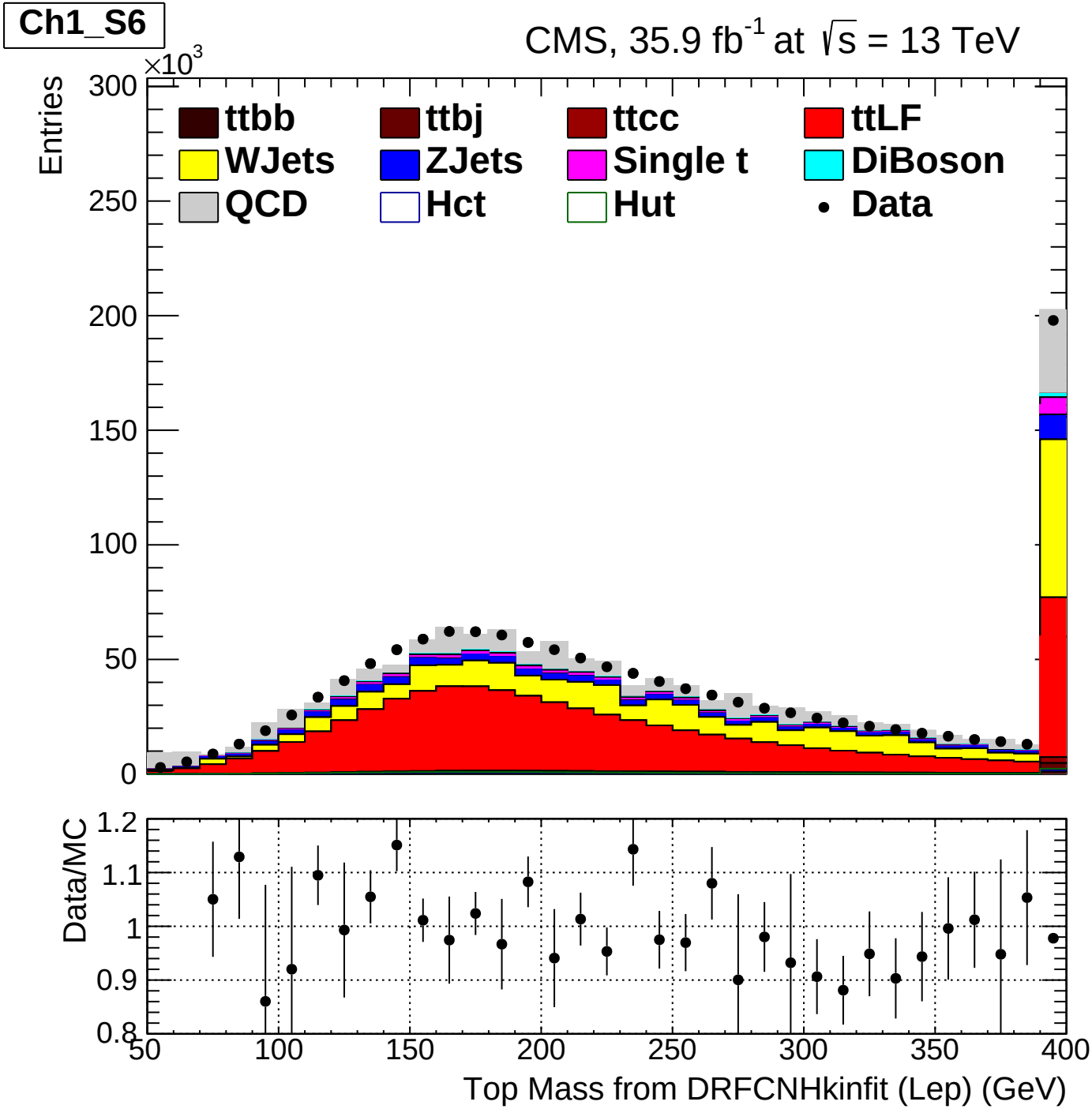

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation (QCD)

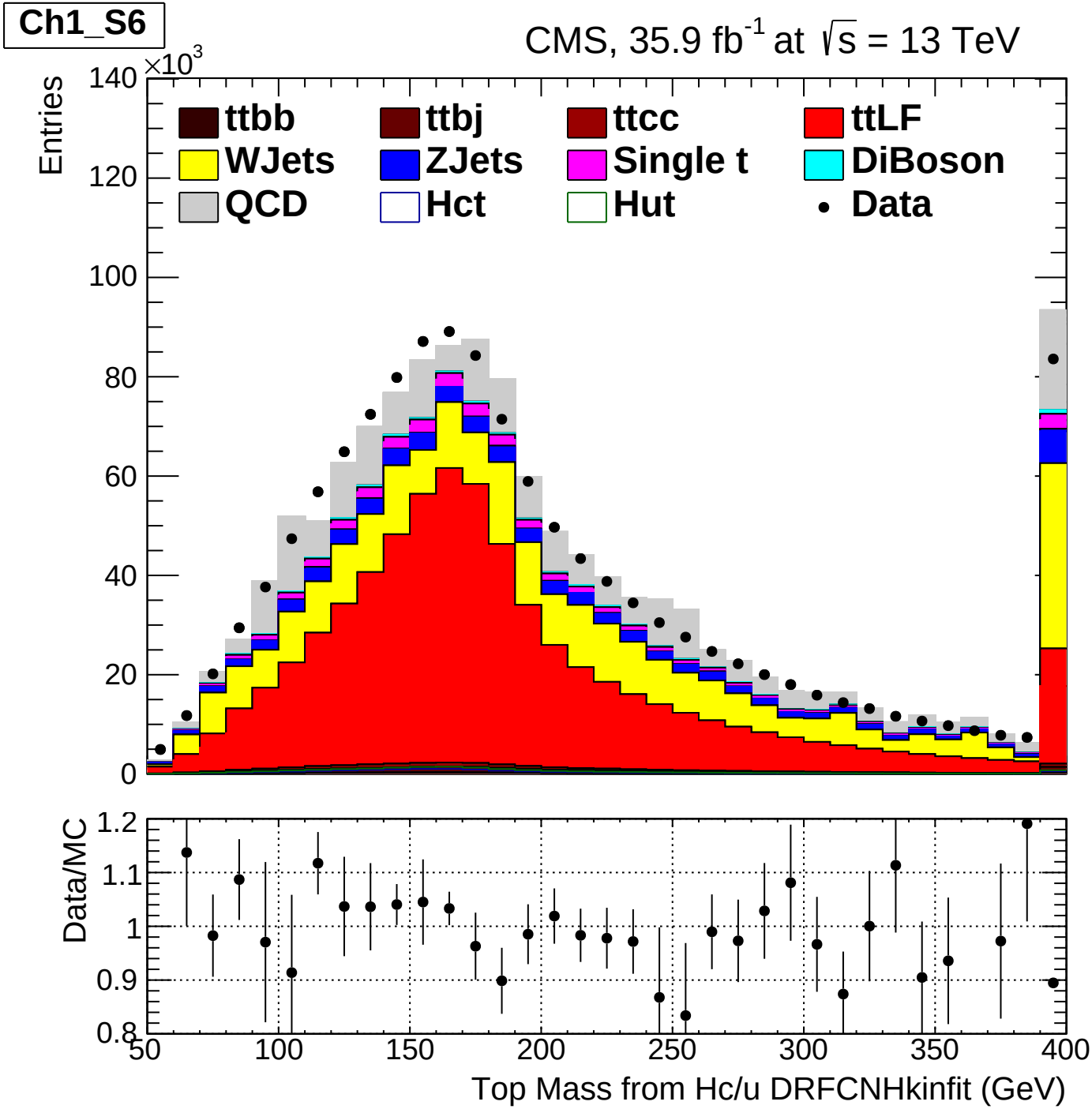

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

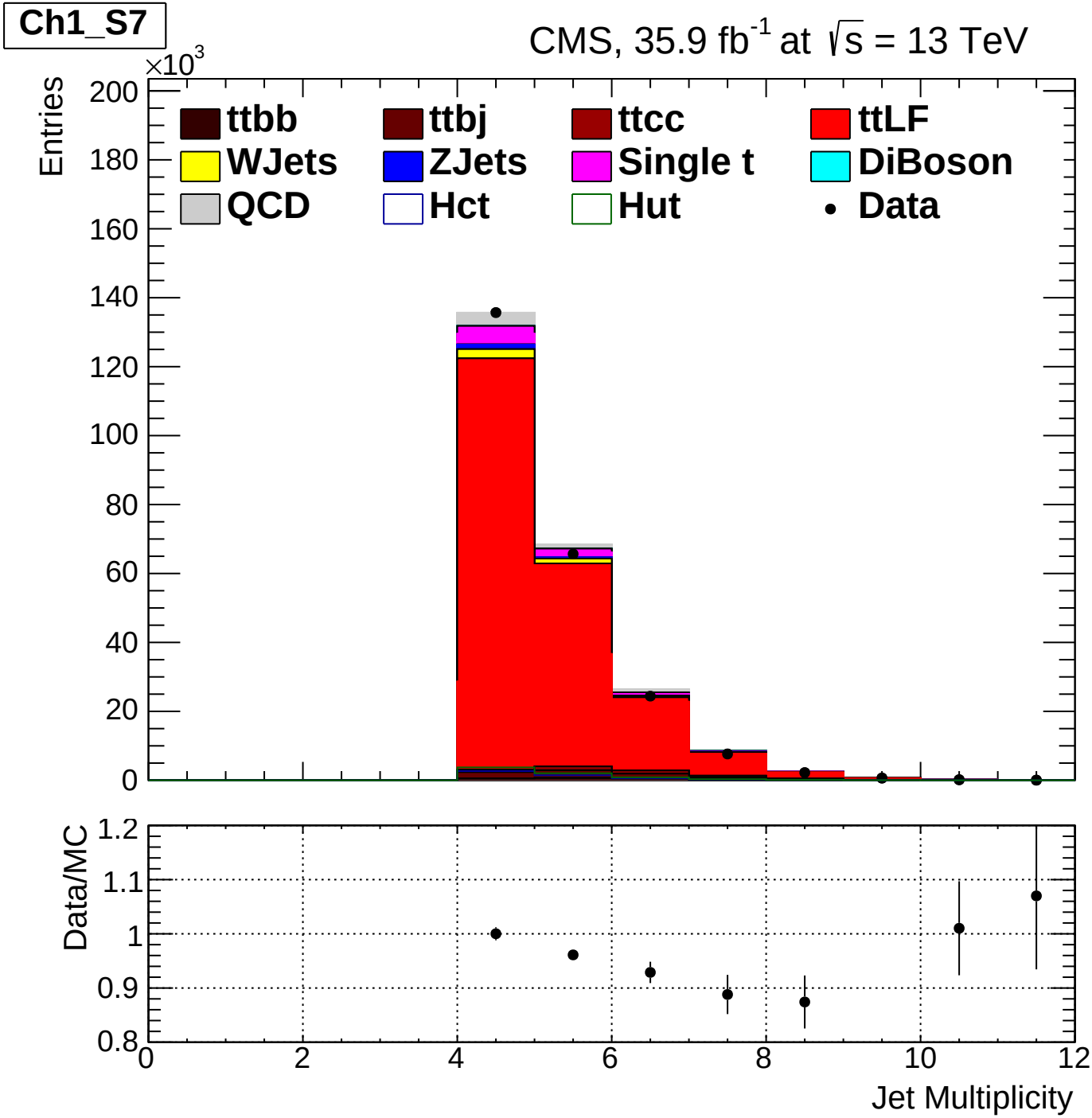

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

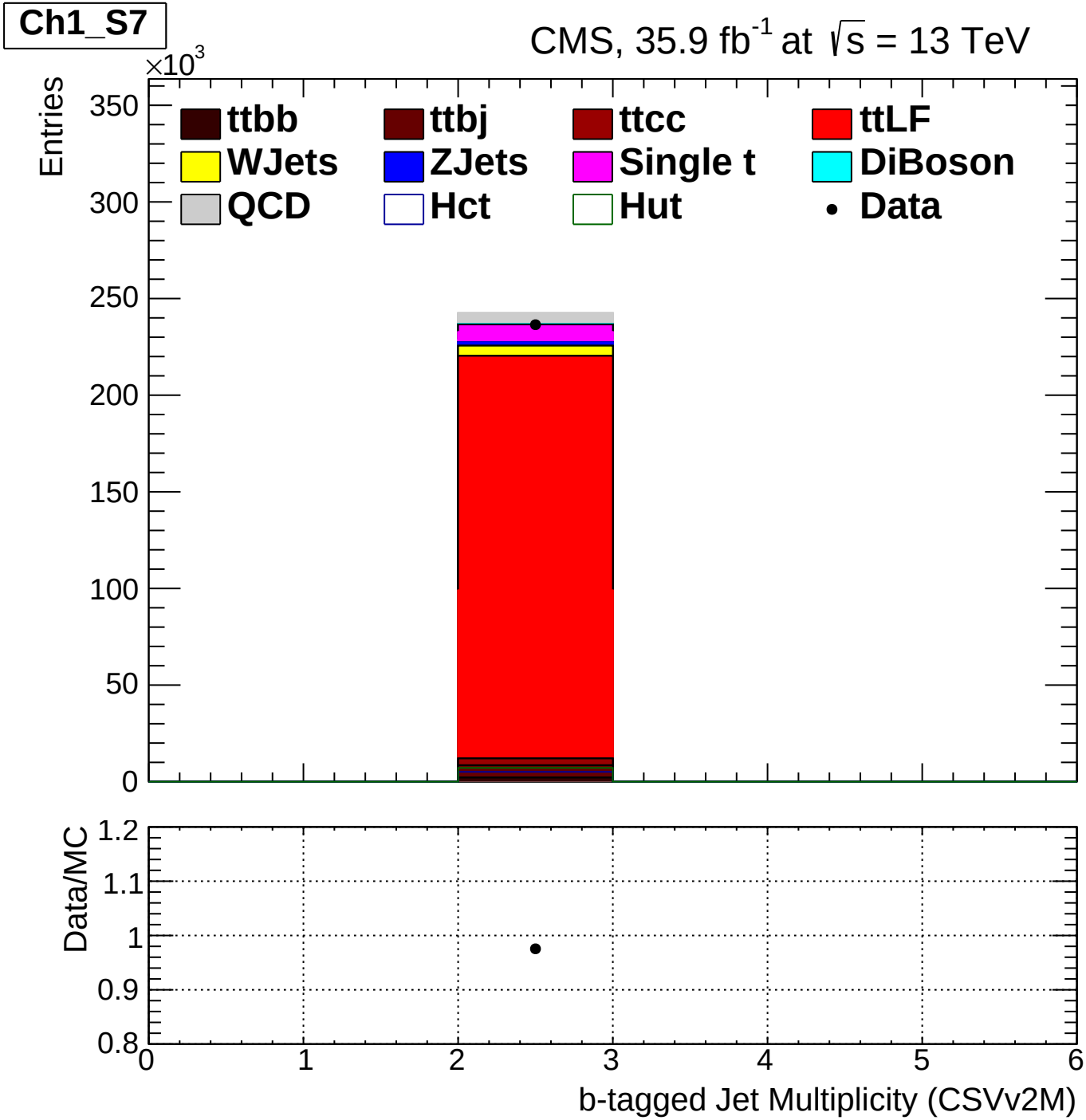

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

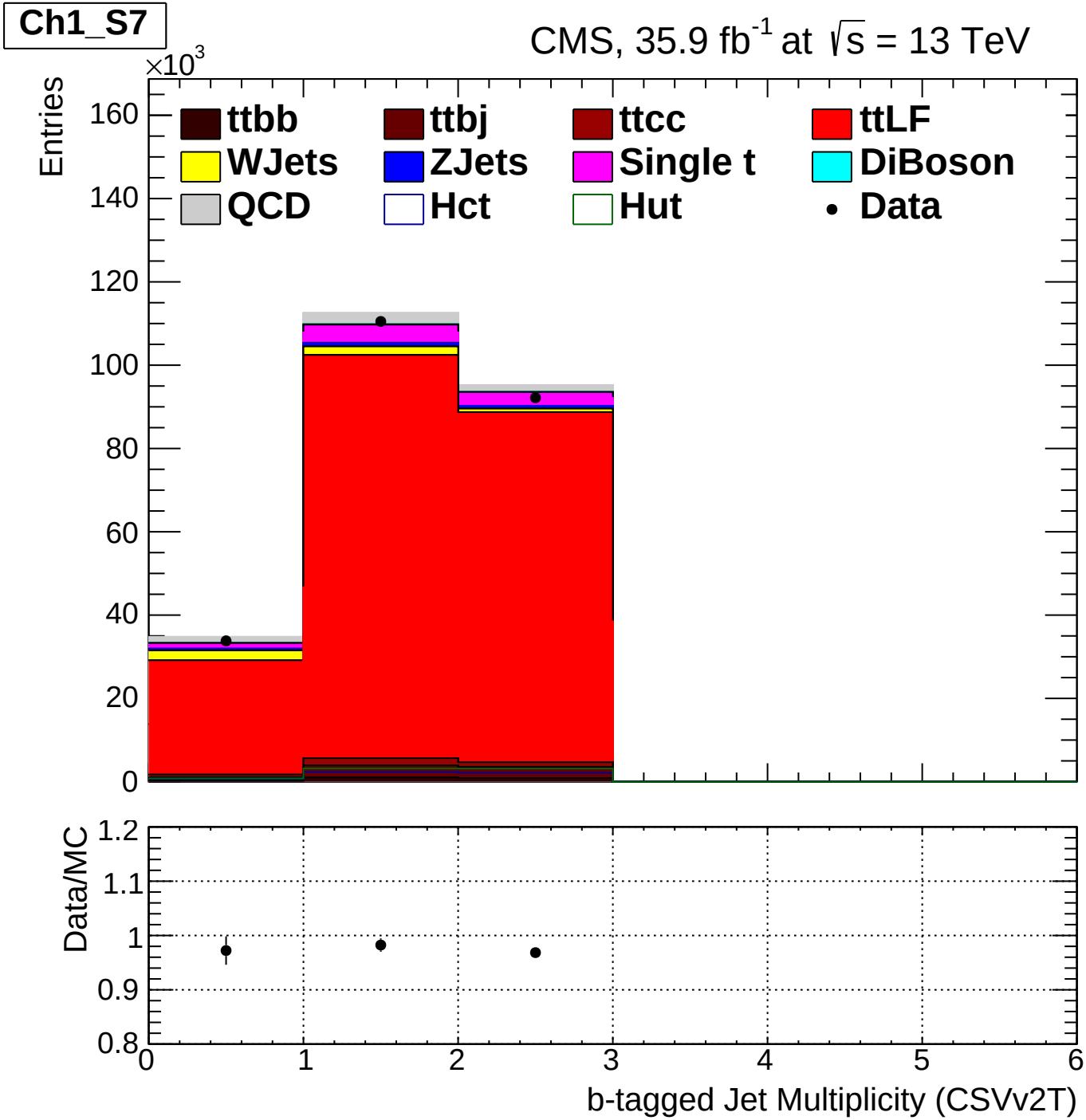

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

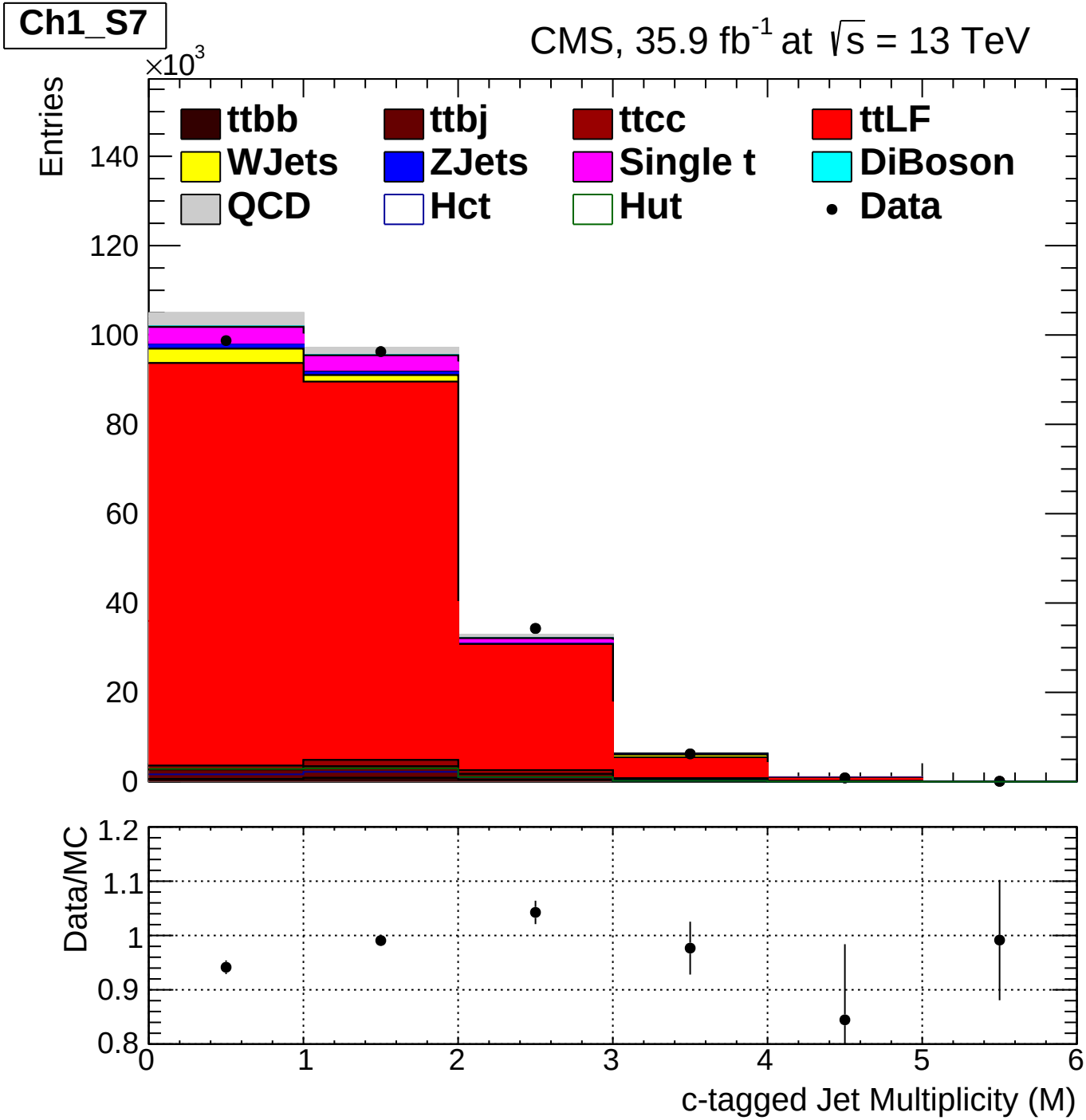

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

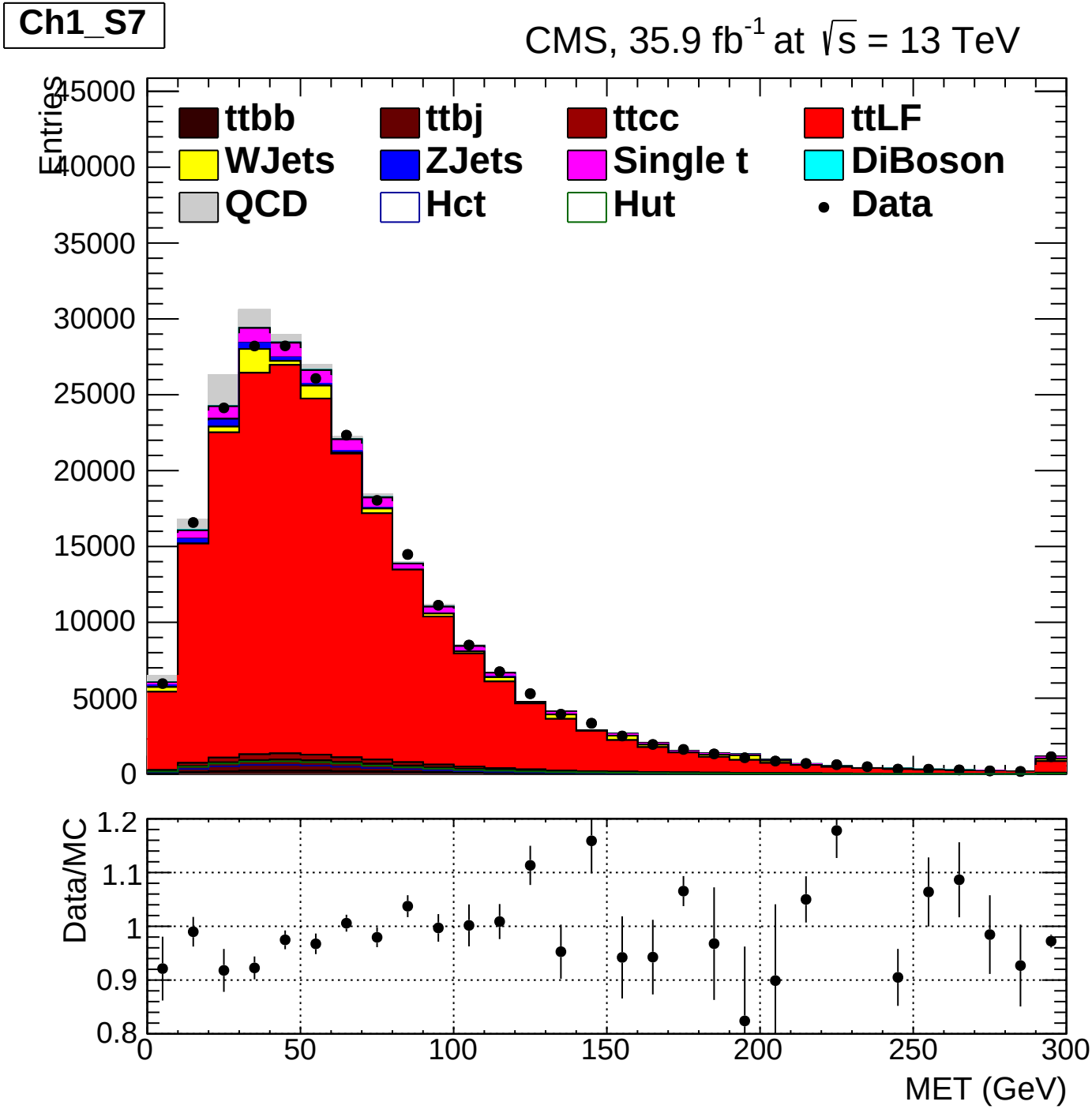

Ch1_S6
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

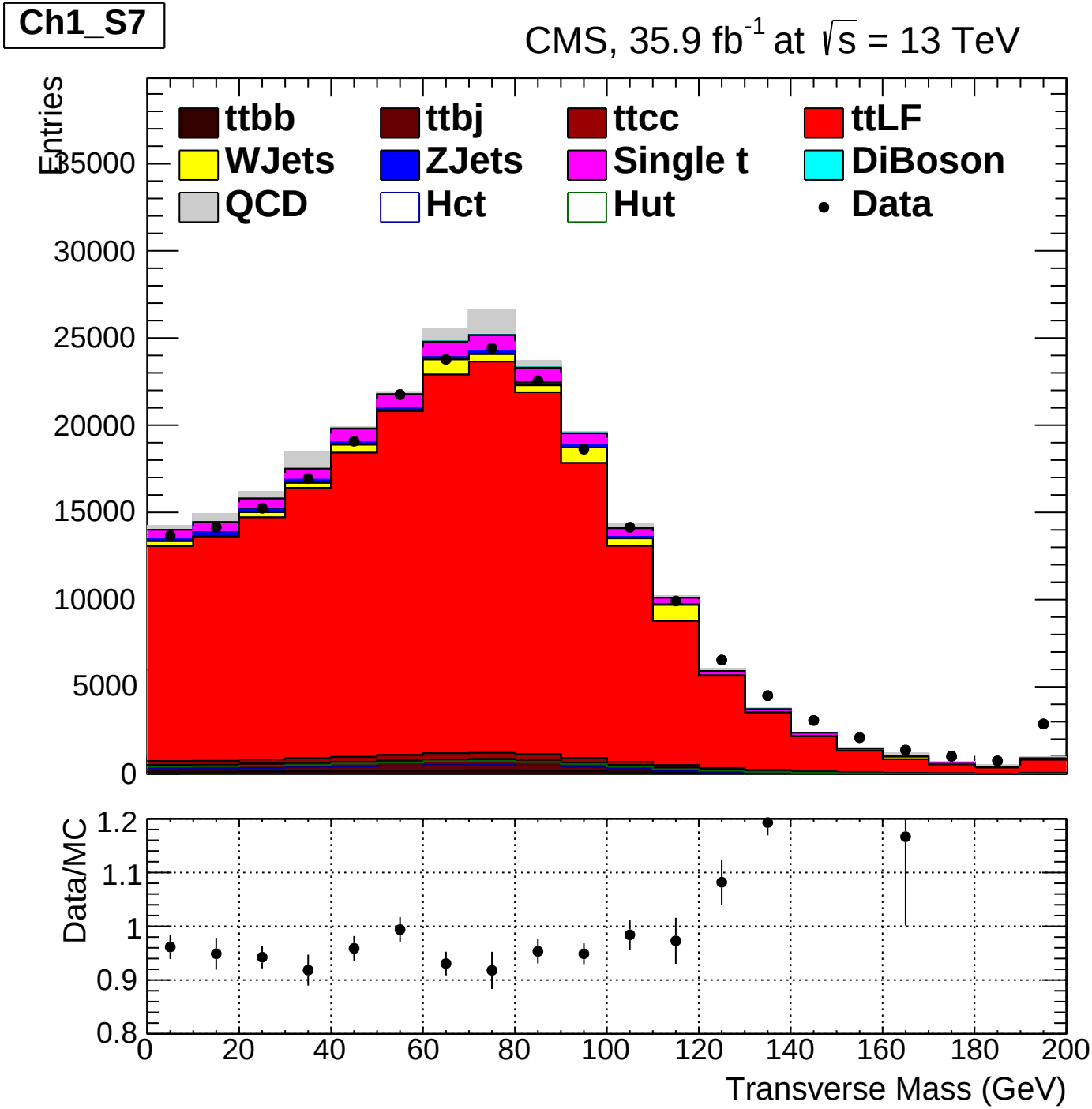

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

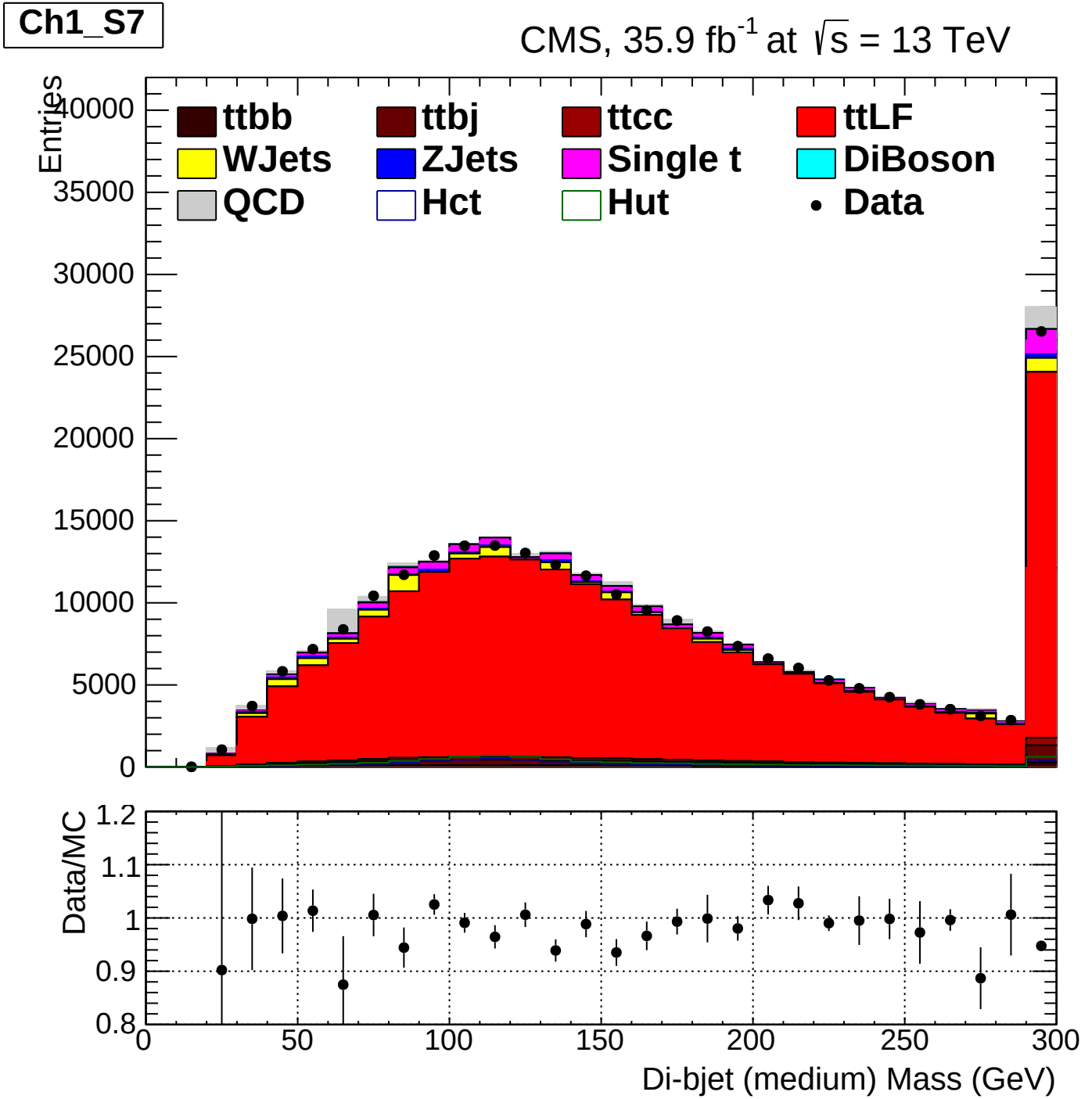

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

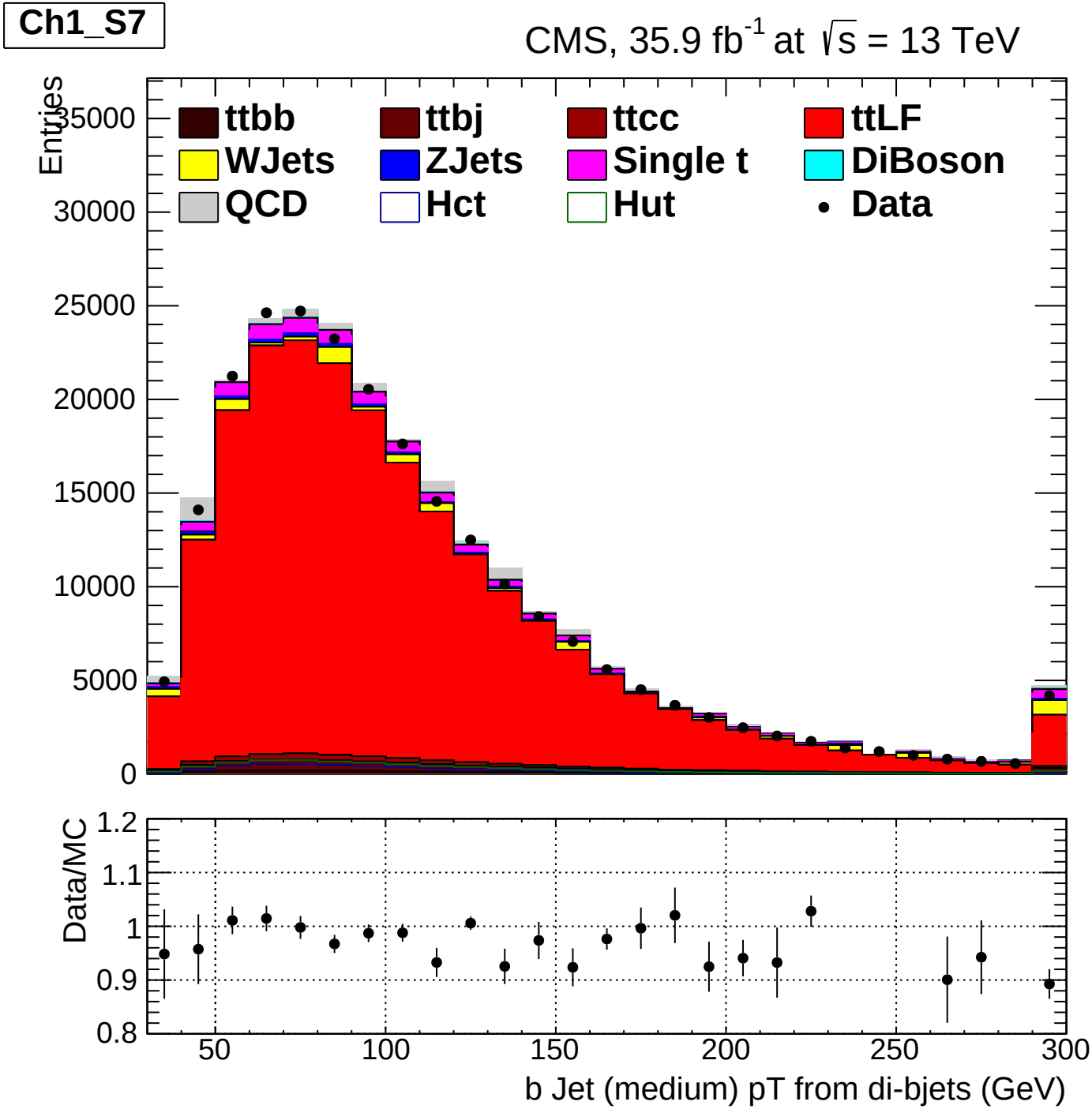

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
20
40
60
80
100
120
140
160
180
200
Transverse Mass (GeV)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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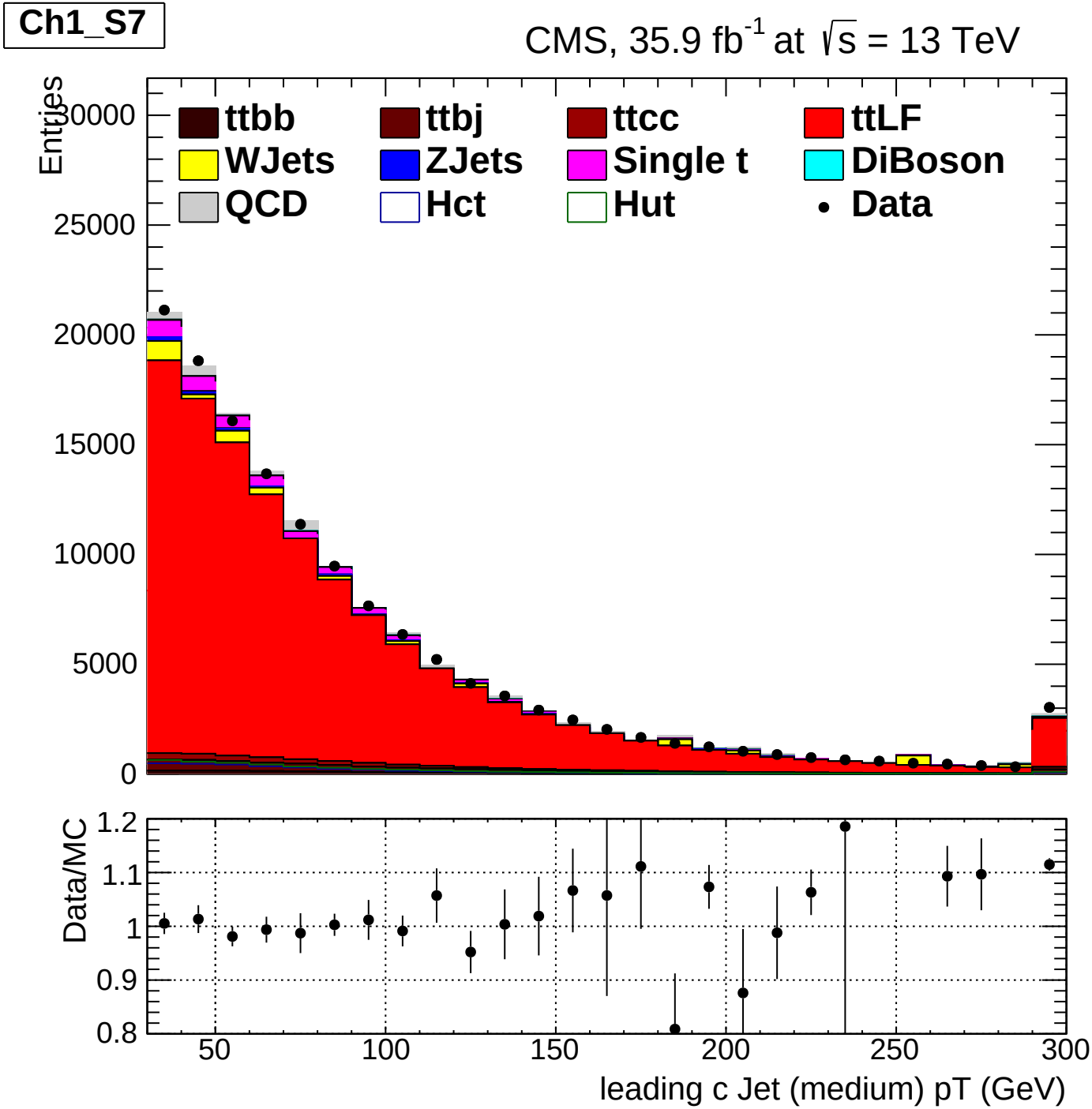
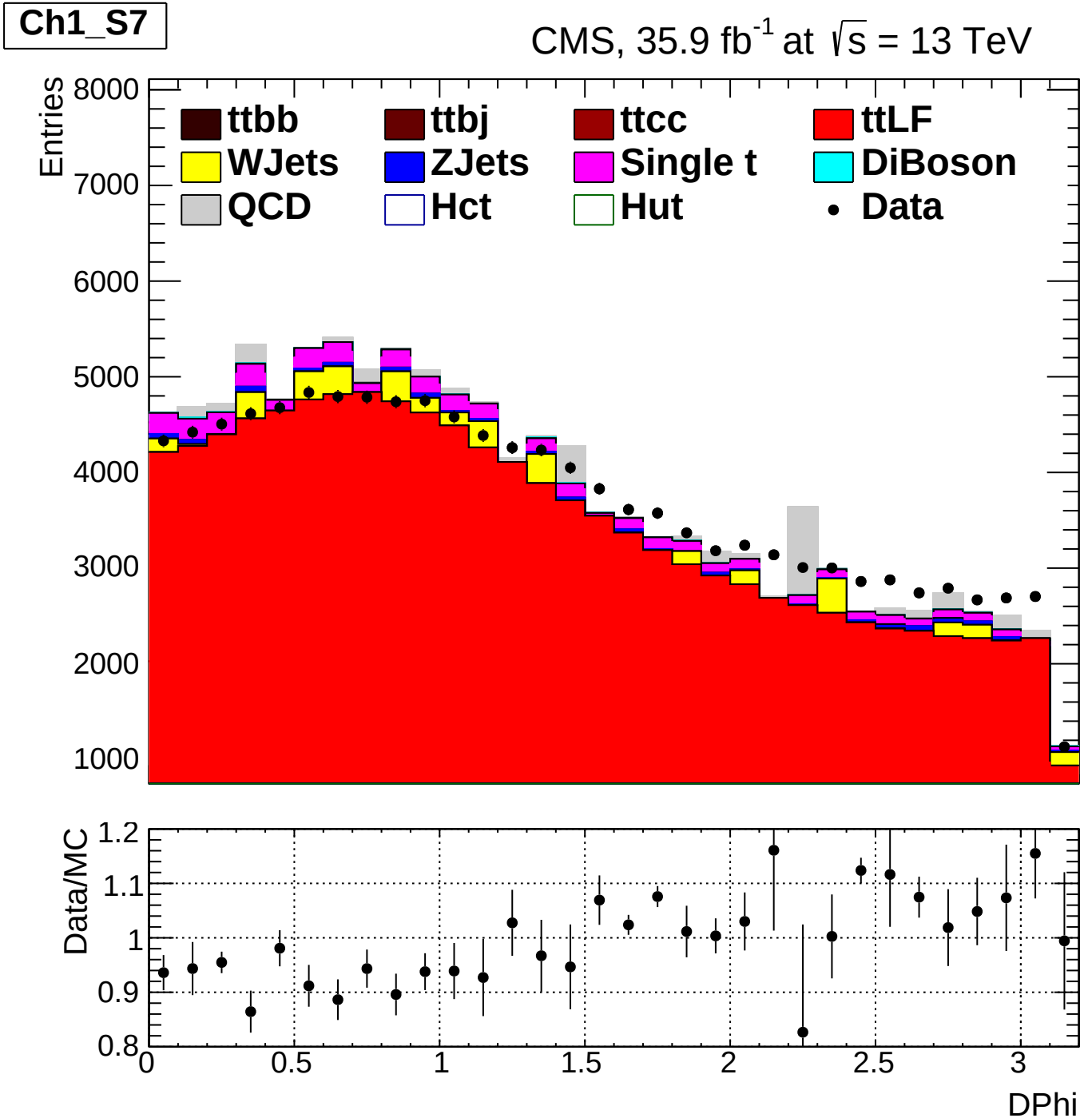
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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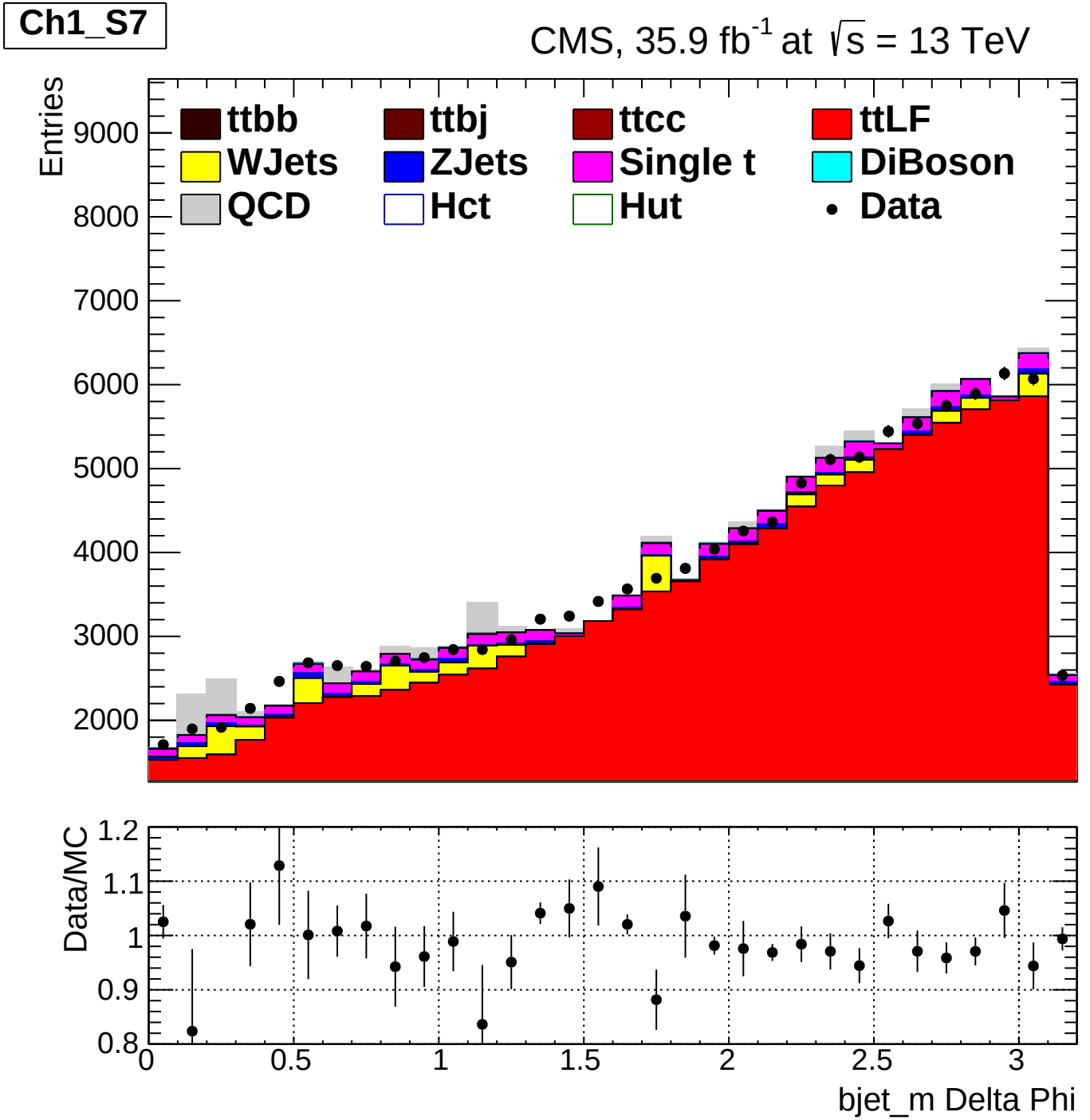
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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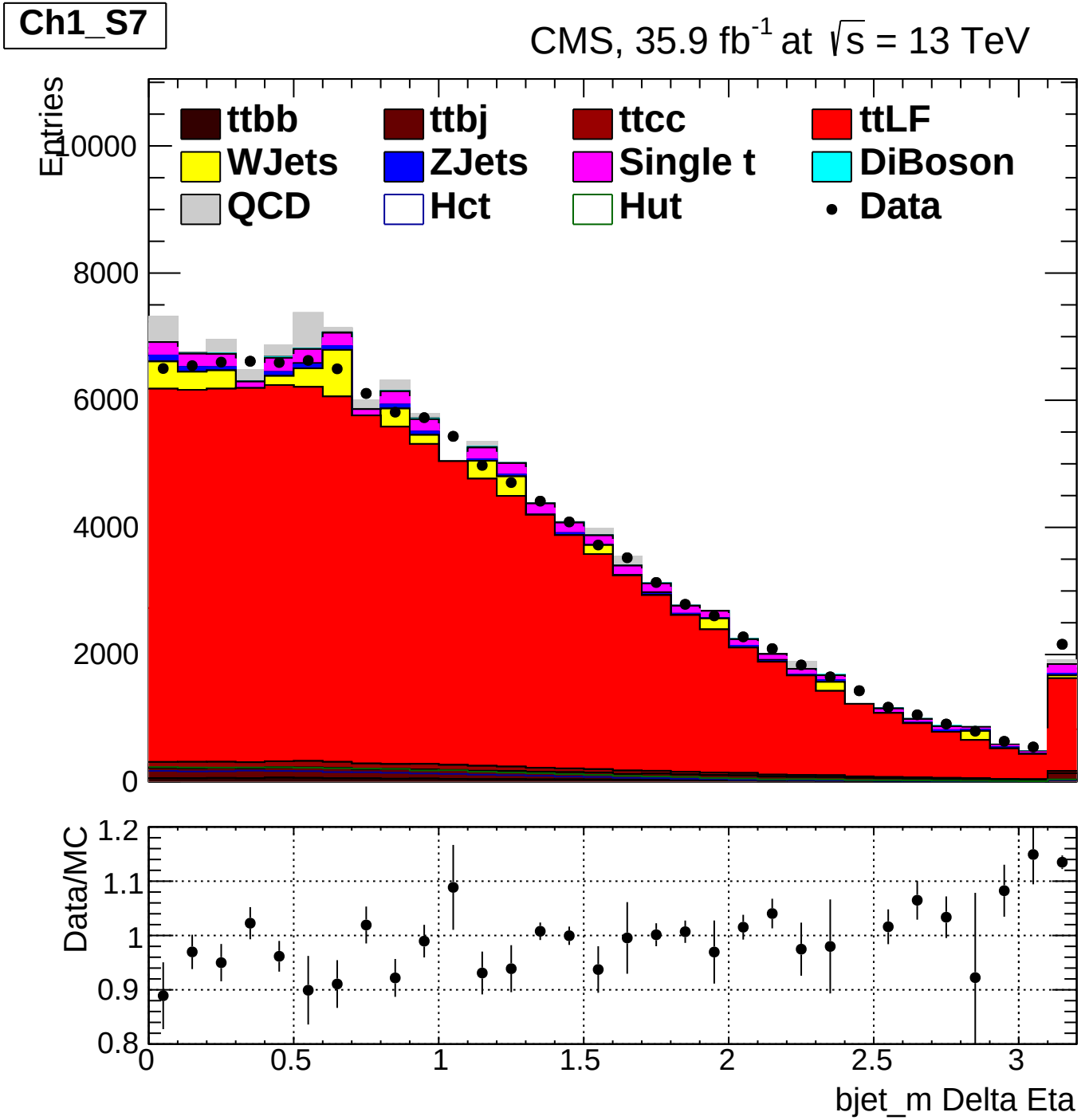
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
9000
8000
7000
6000
5000
4000
3000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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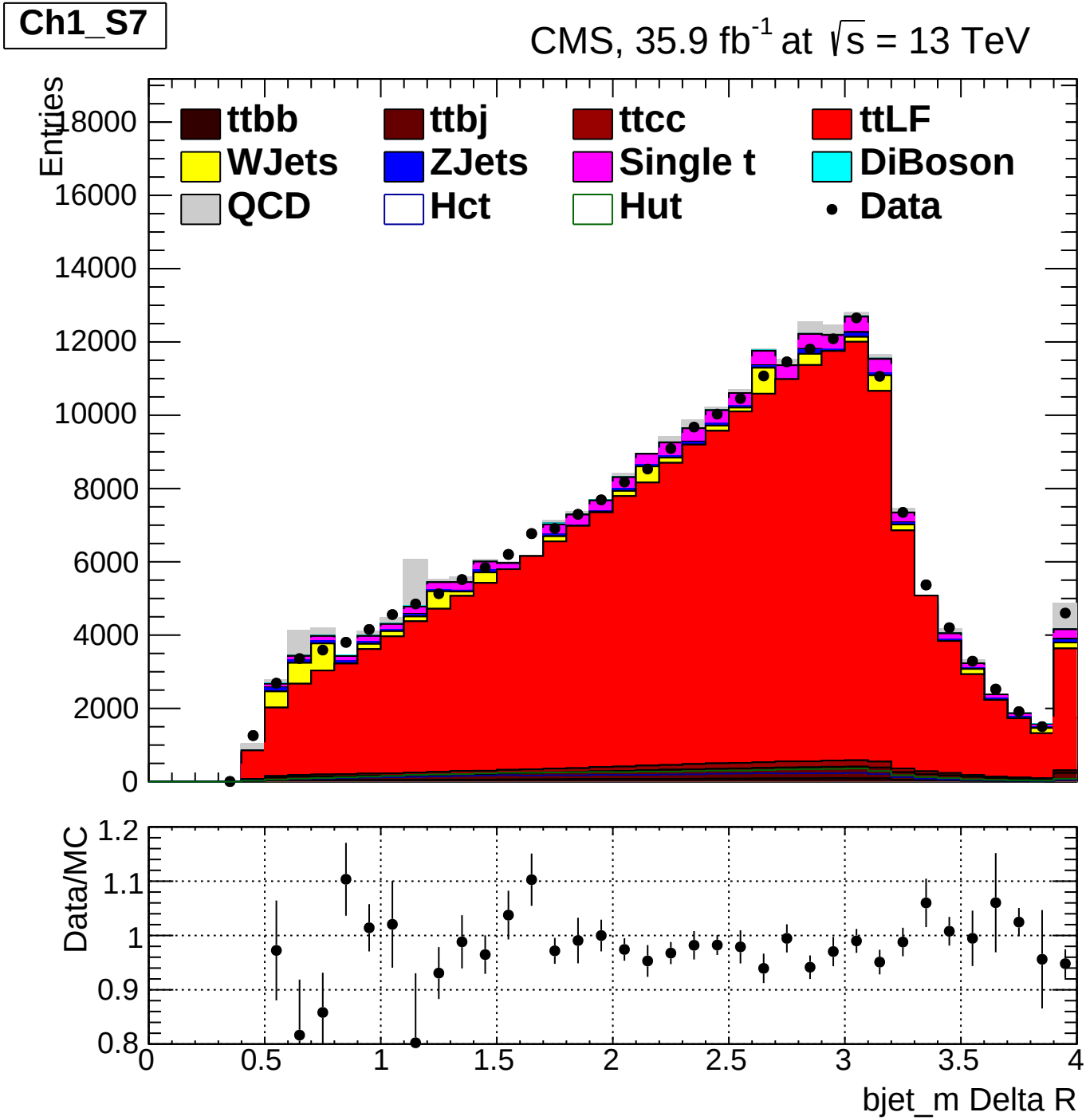
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
10000
8000
6000
4000
2000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta


Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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ttcc
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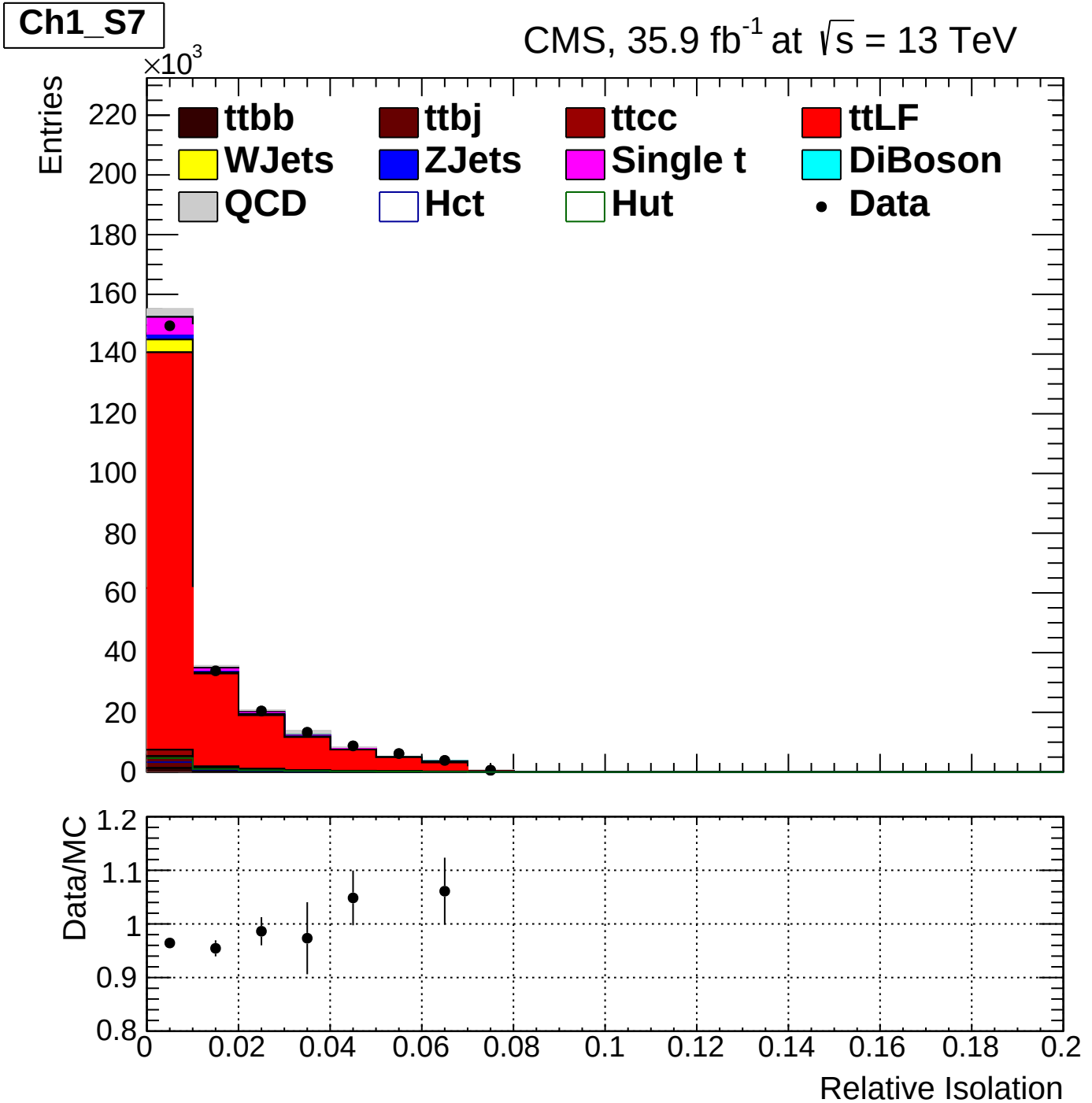
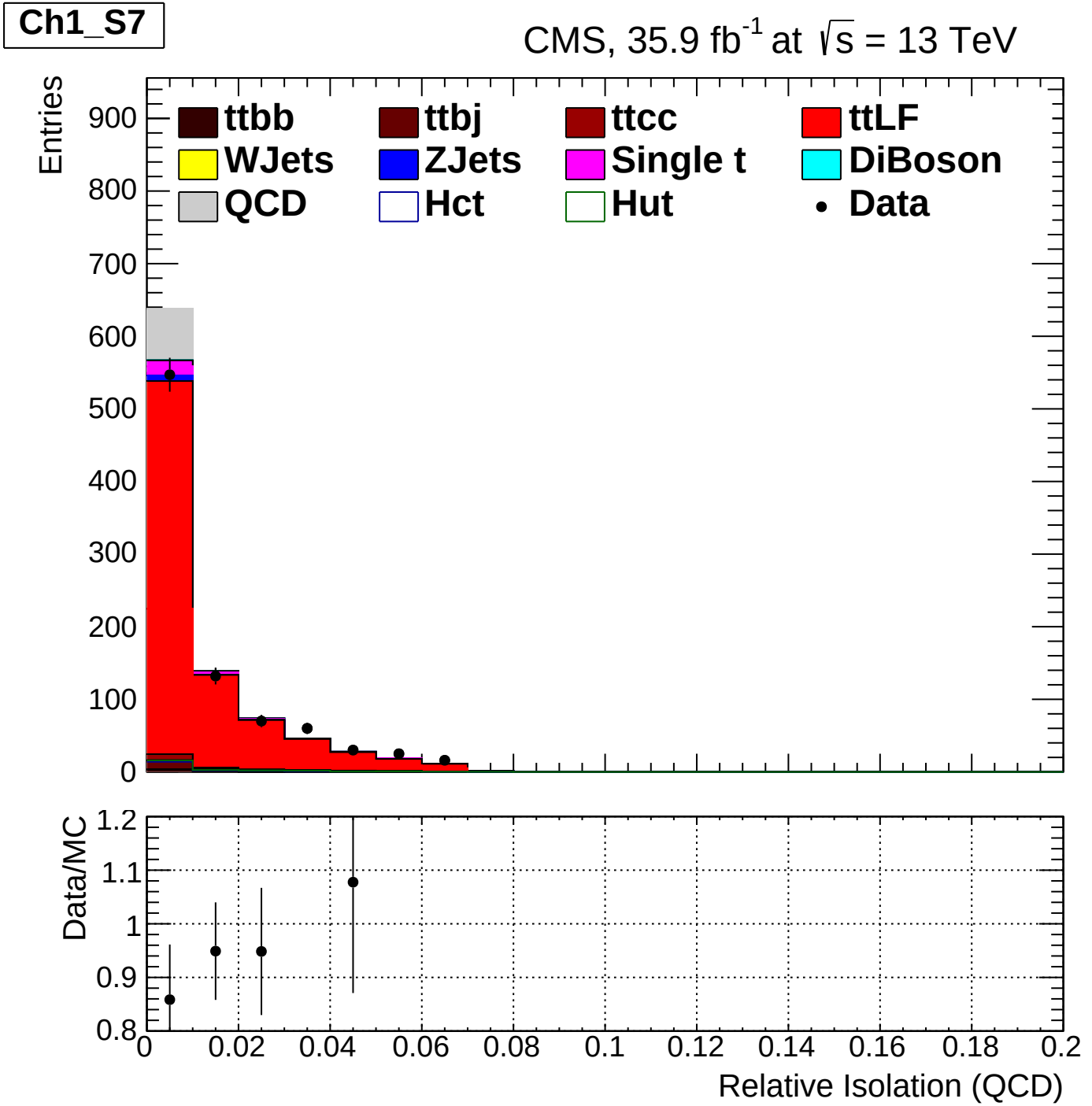
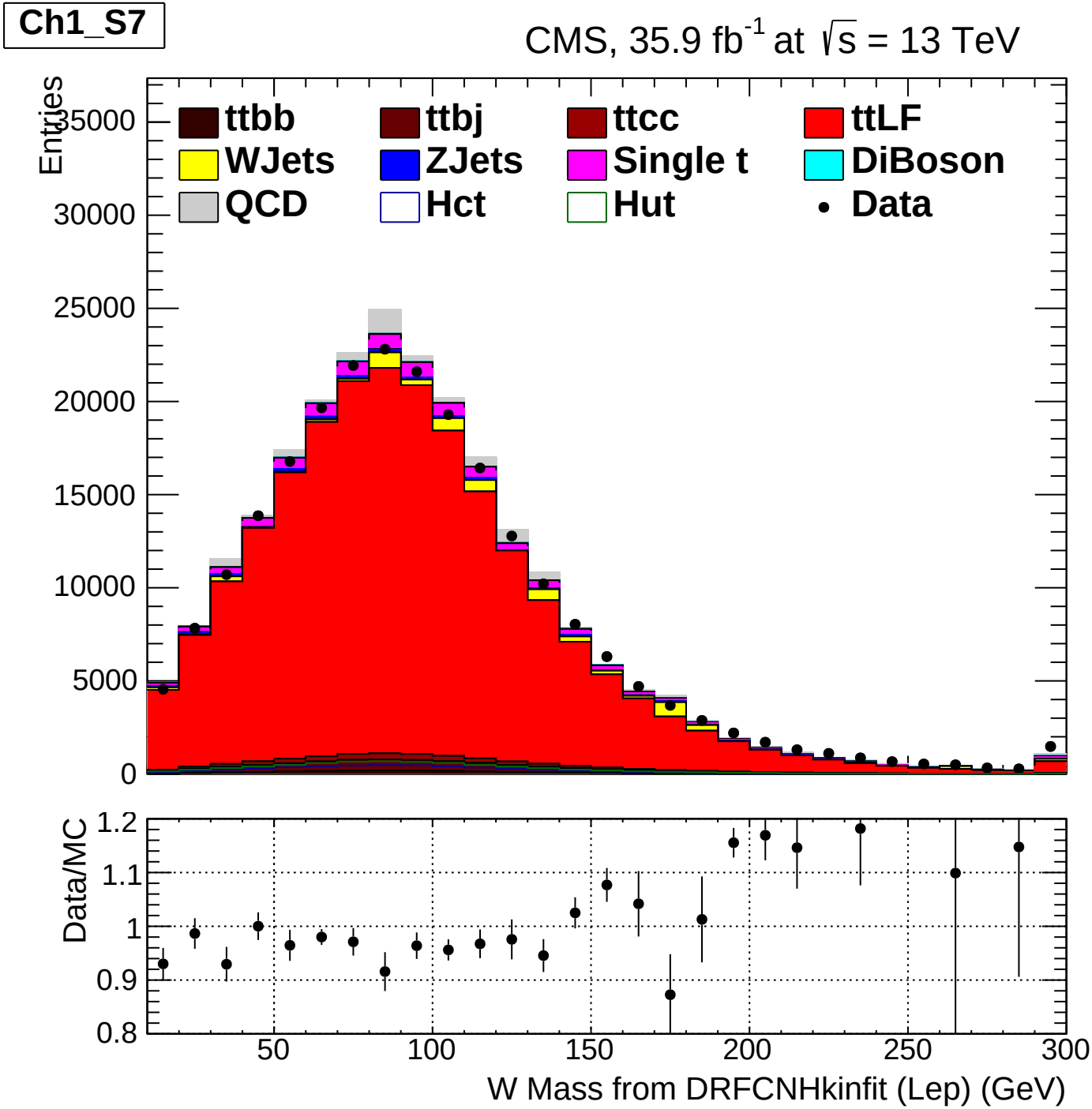
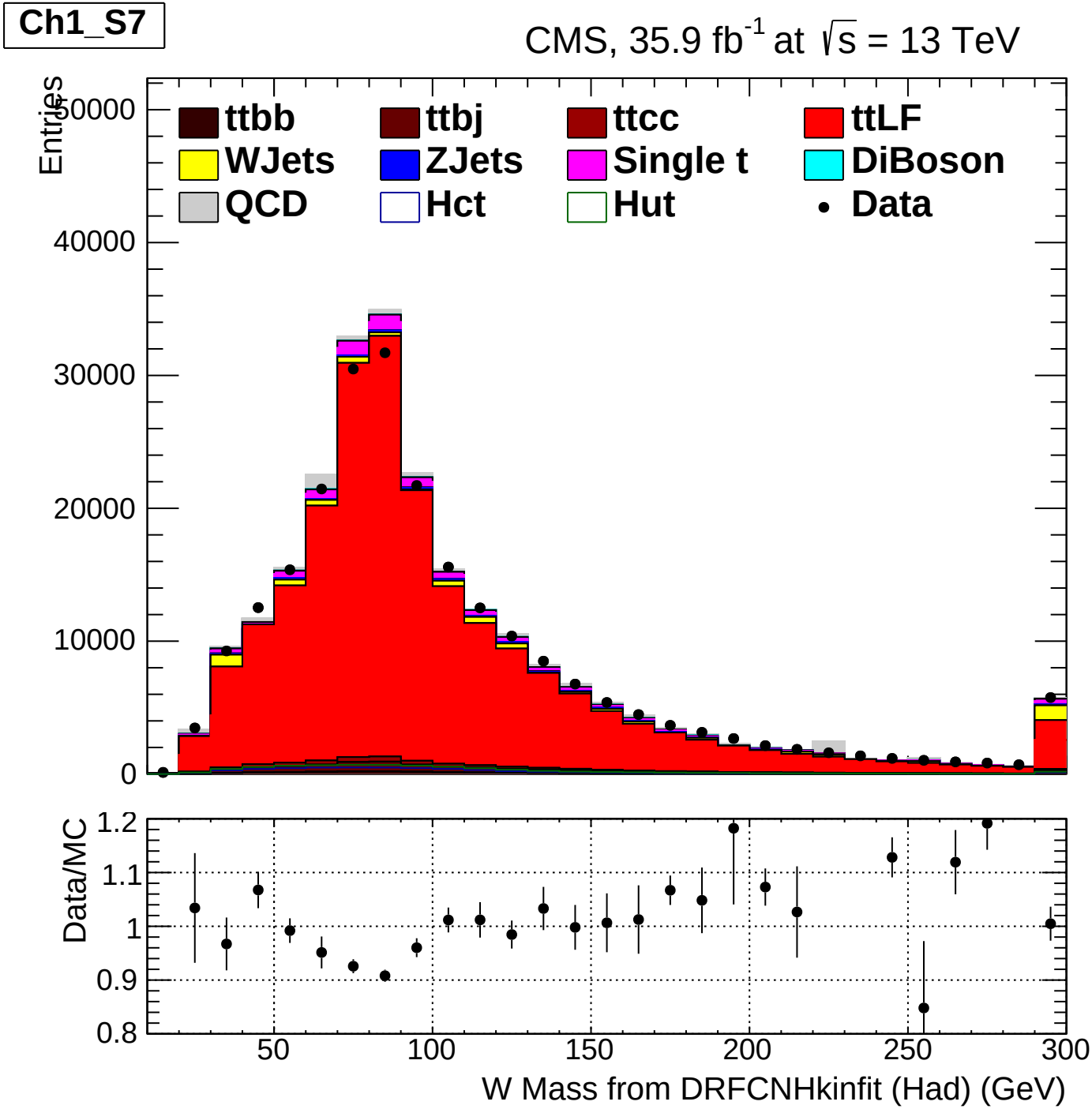
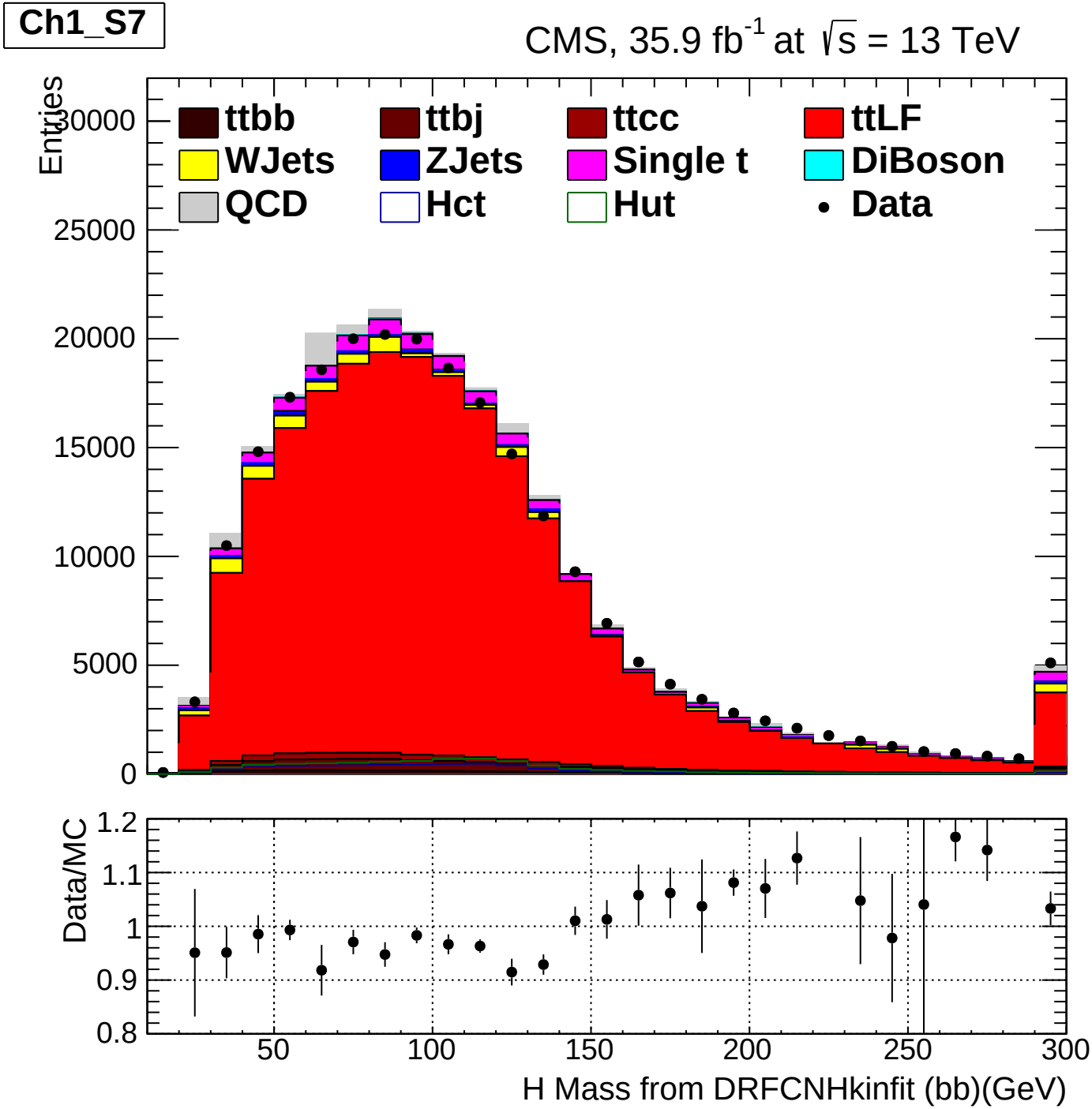
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

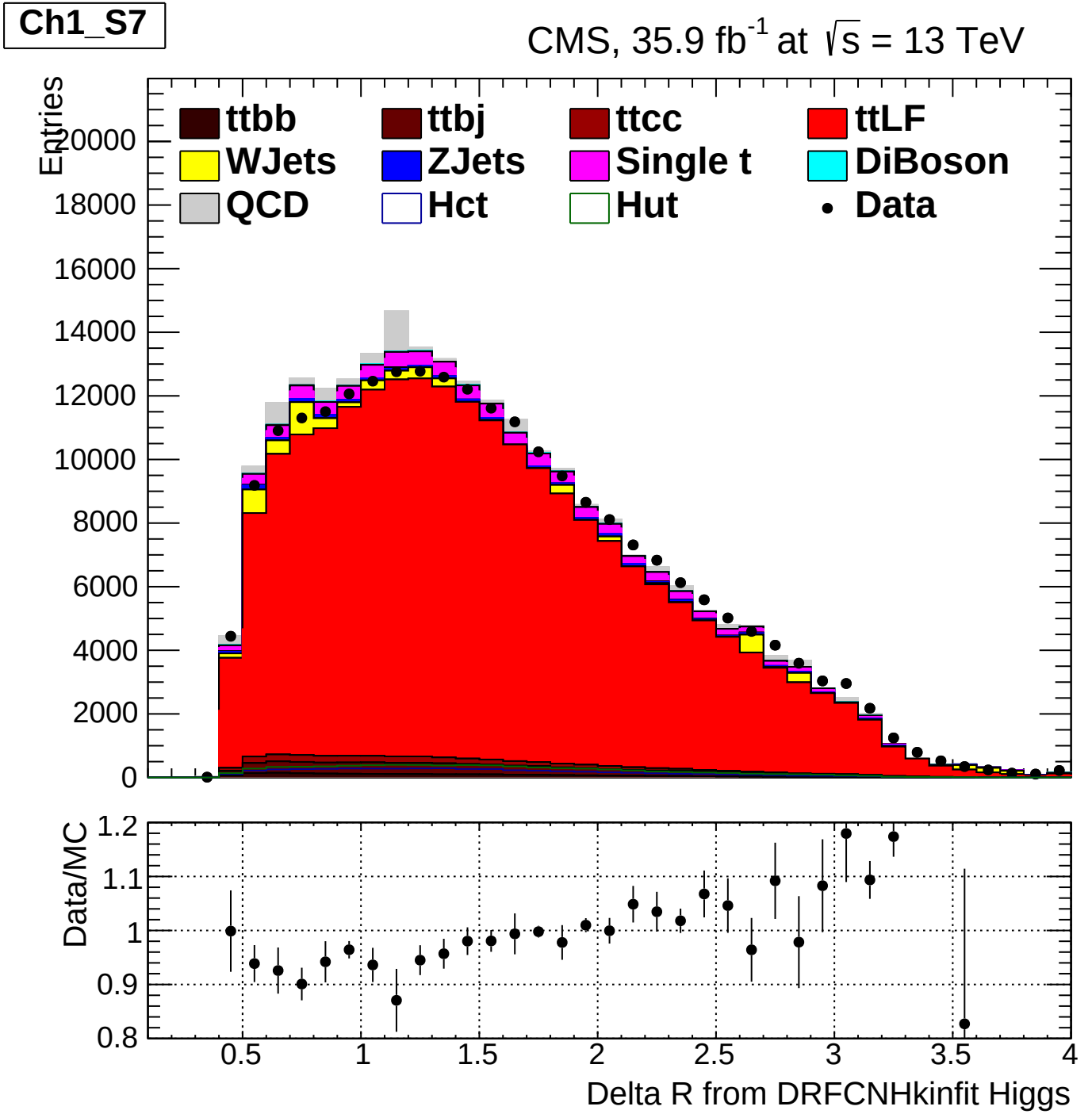

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

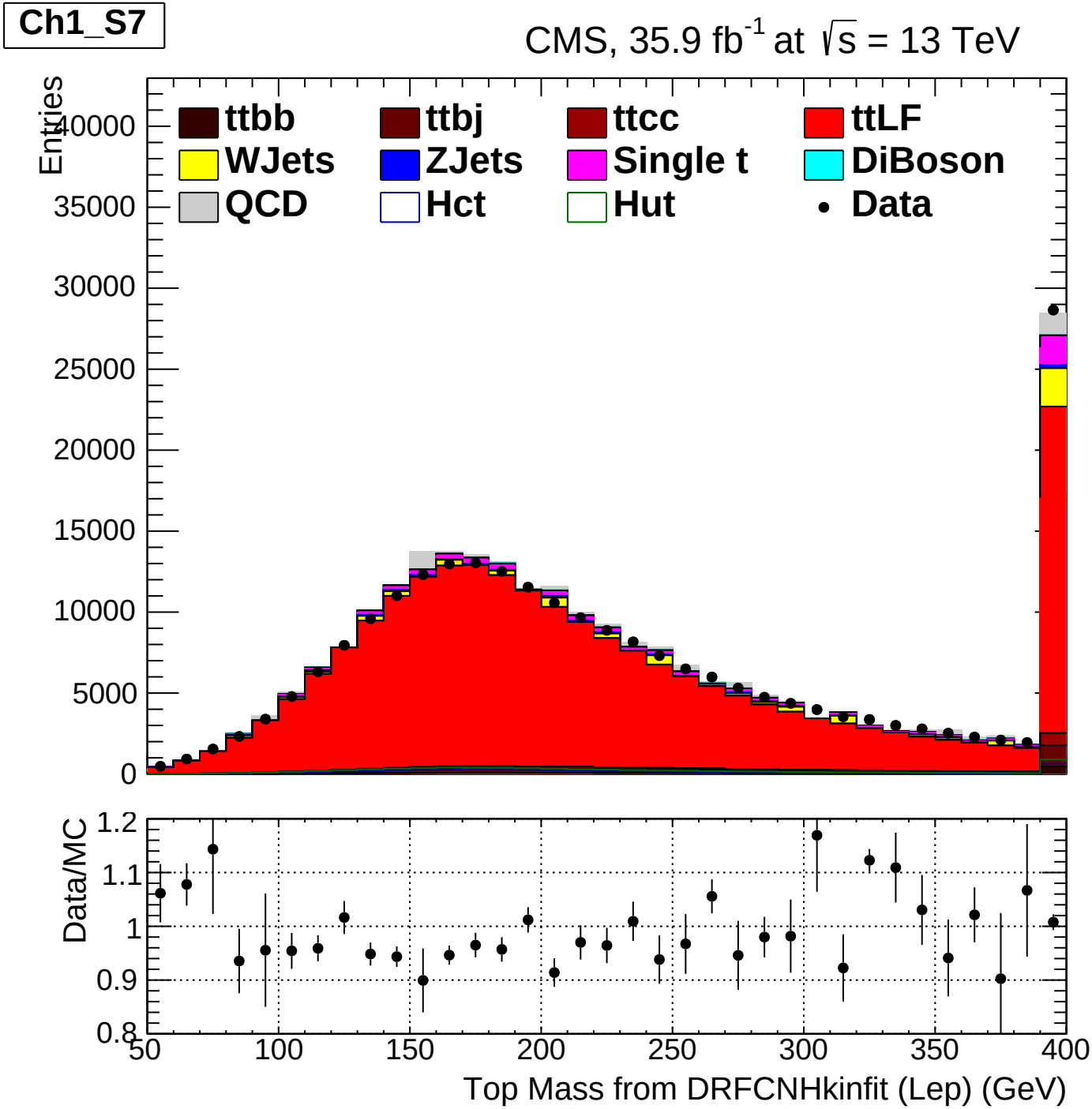

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

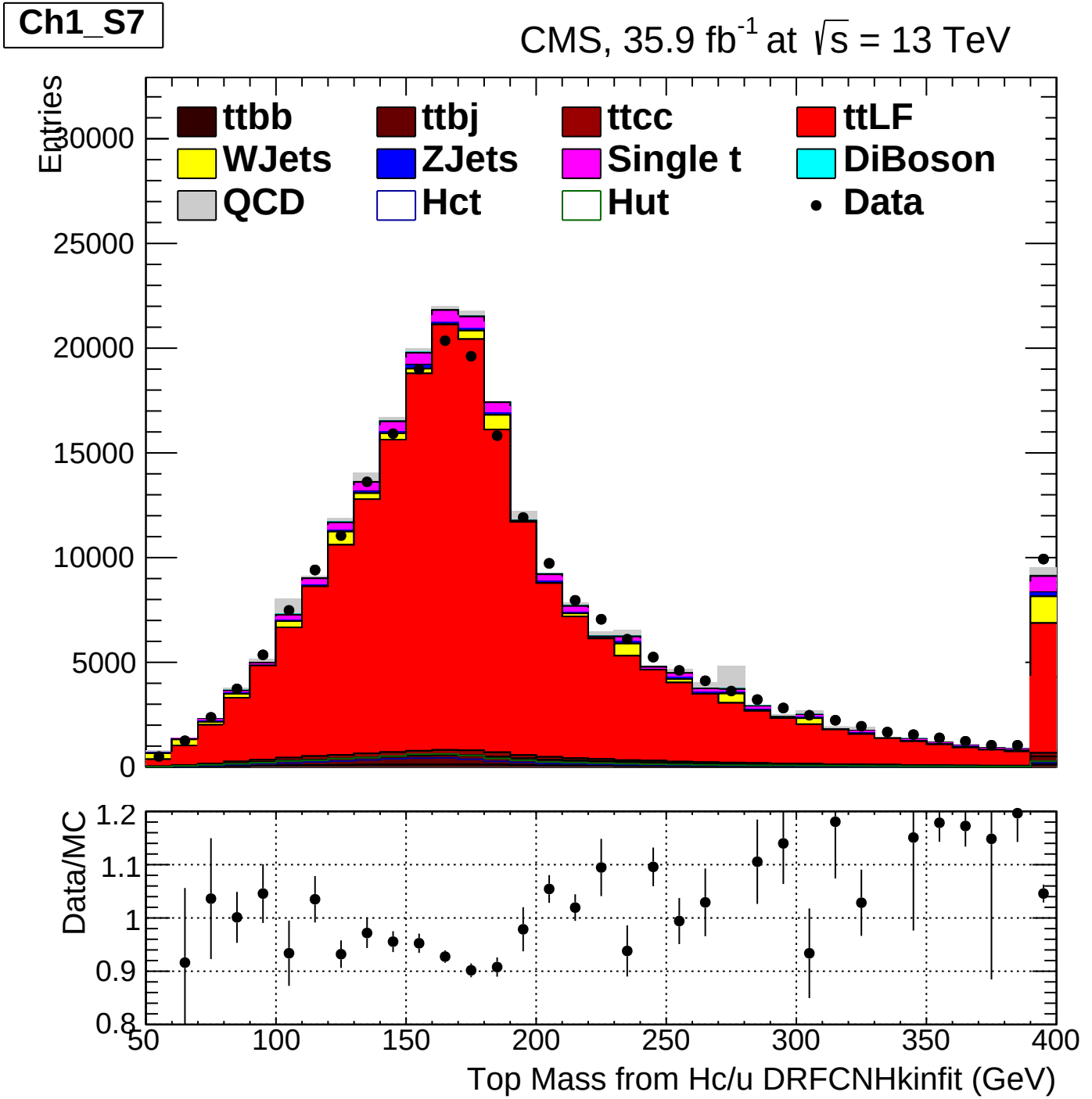

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)

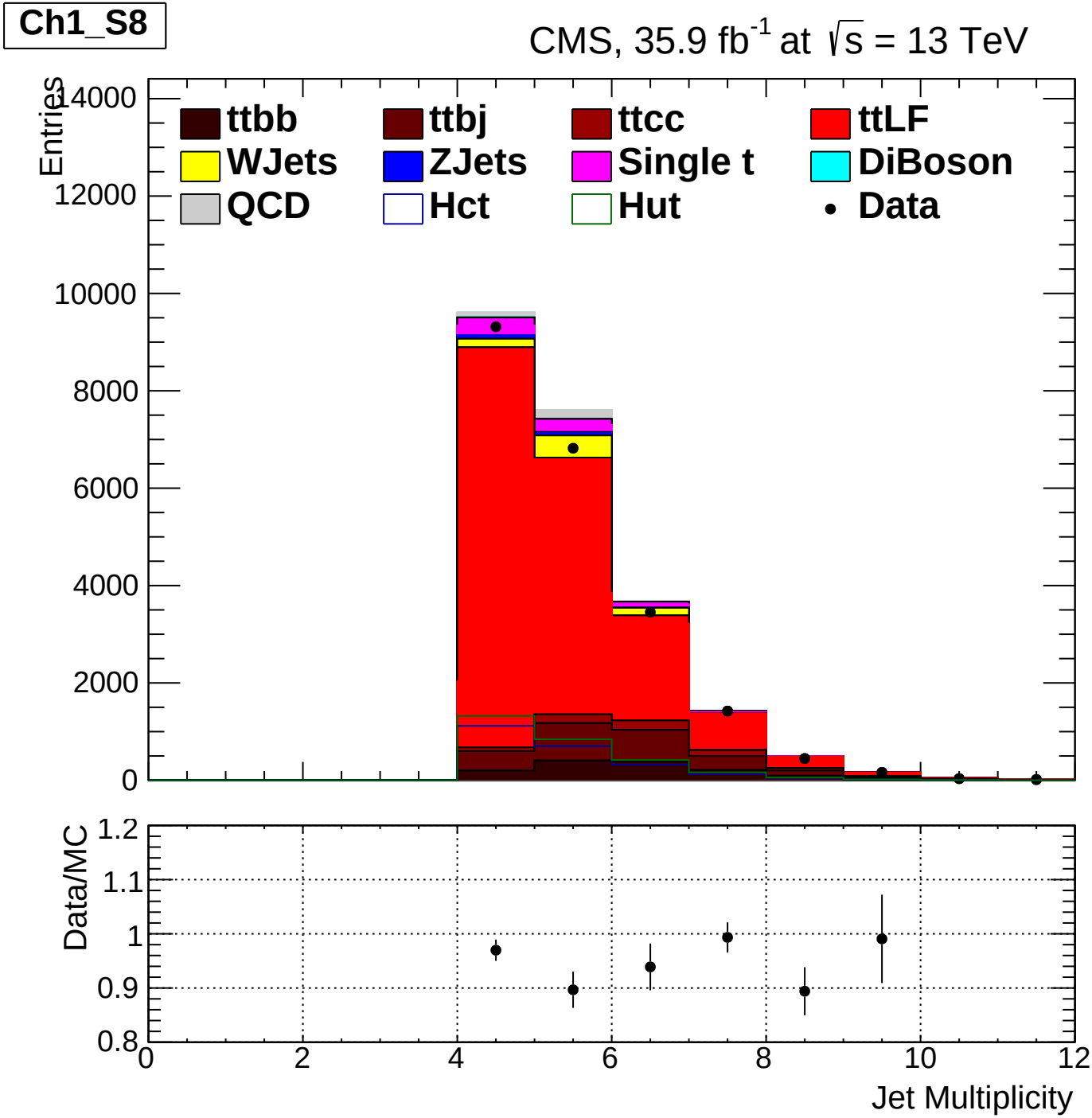

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

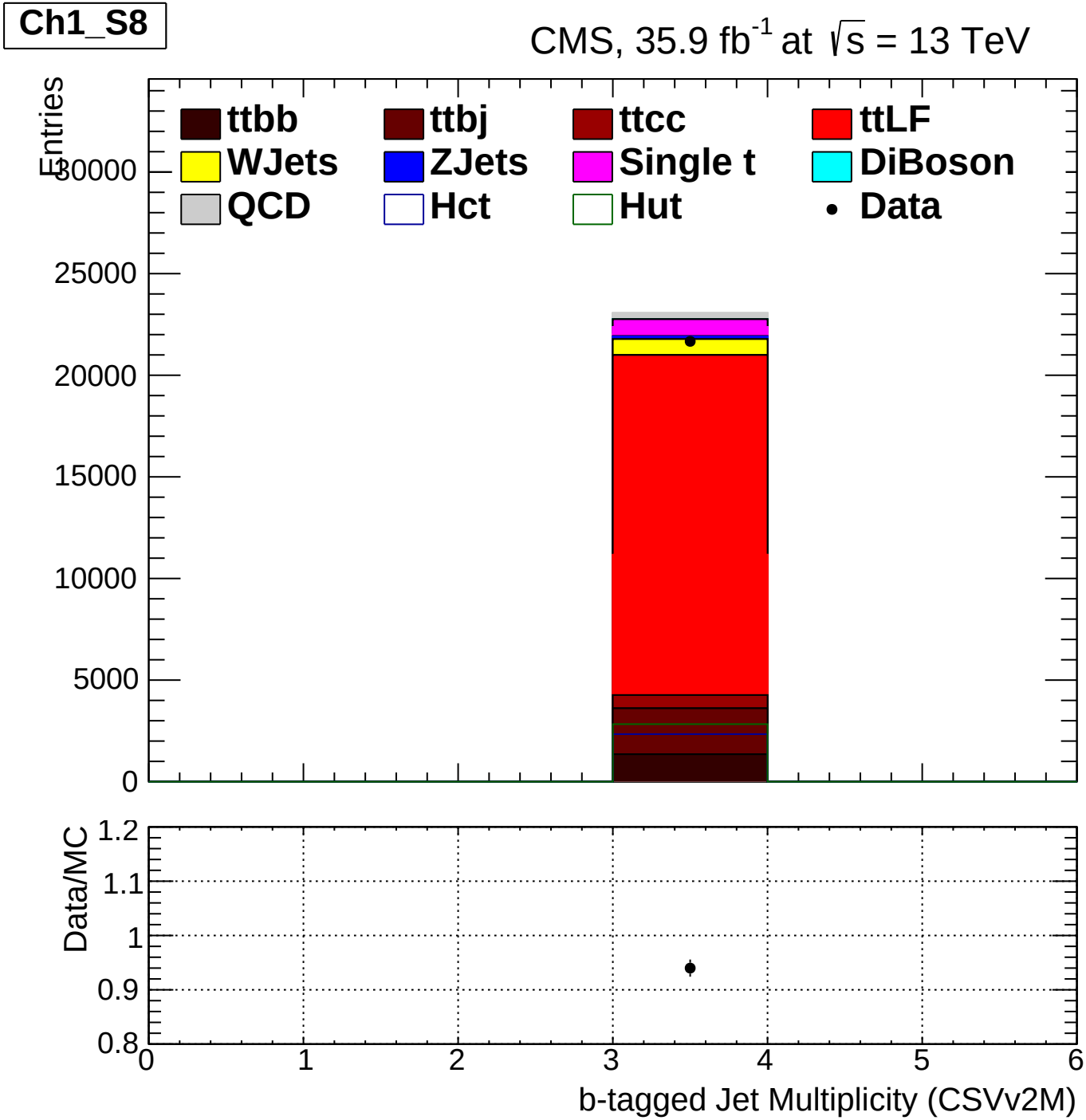

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)

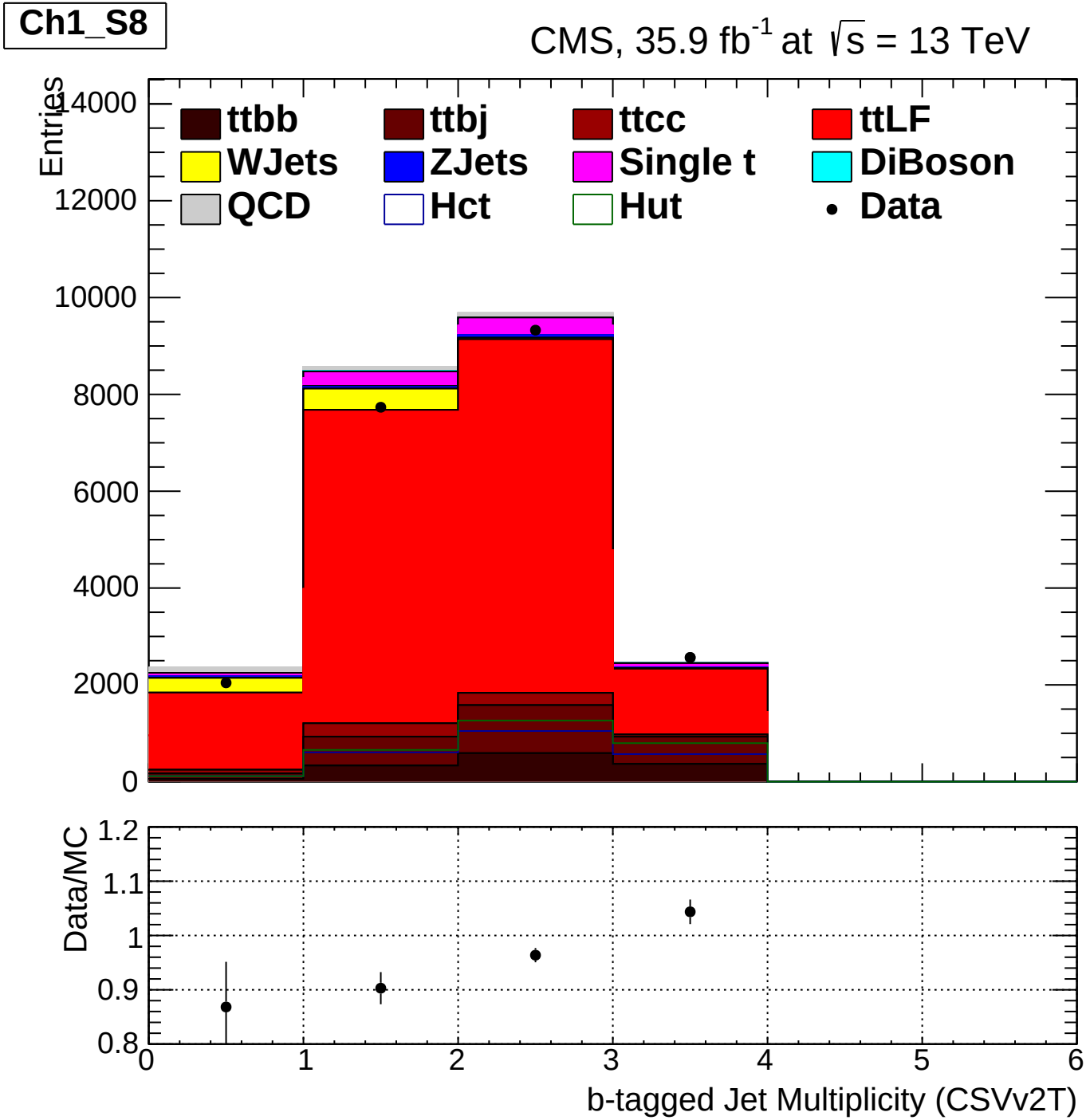

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

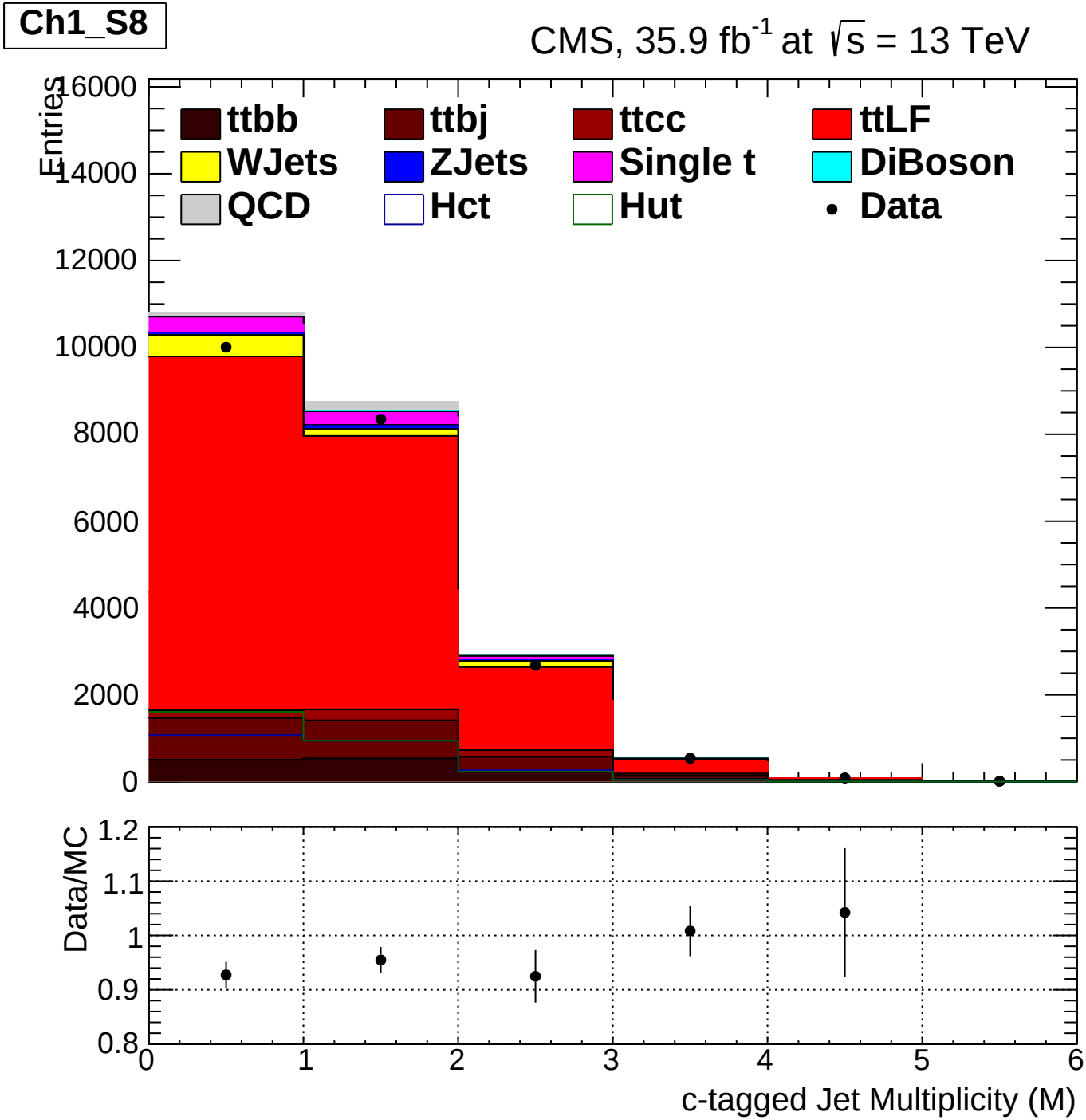

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

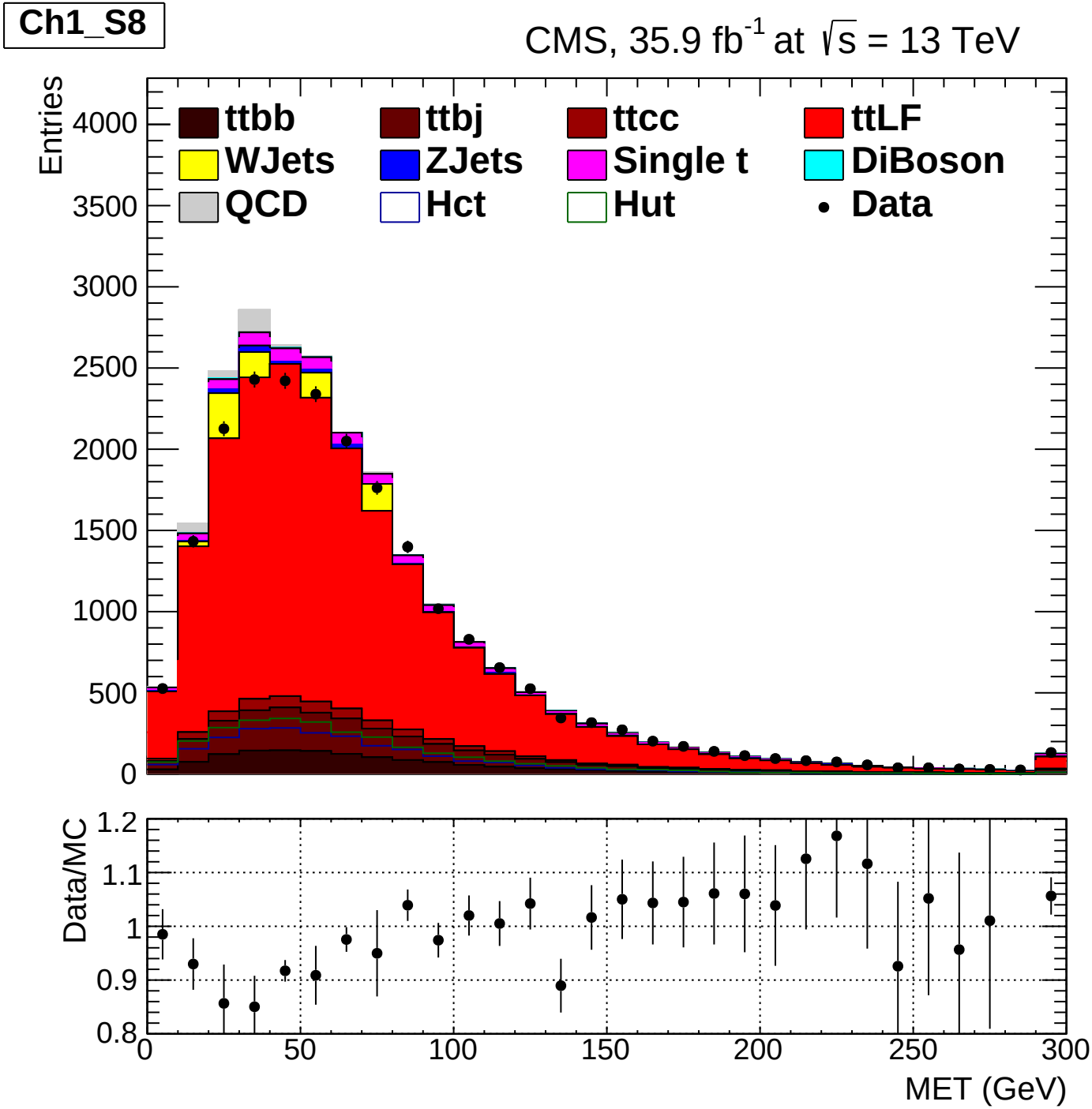

Ch1_S7
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from Hc/u DRFCNHkinfit (GeV)

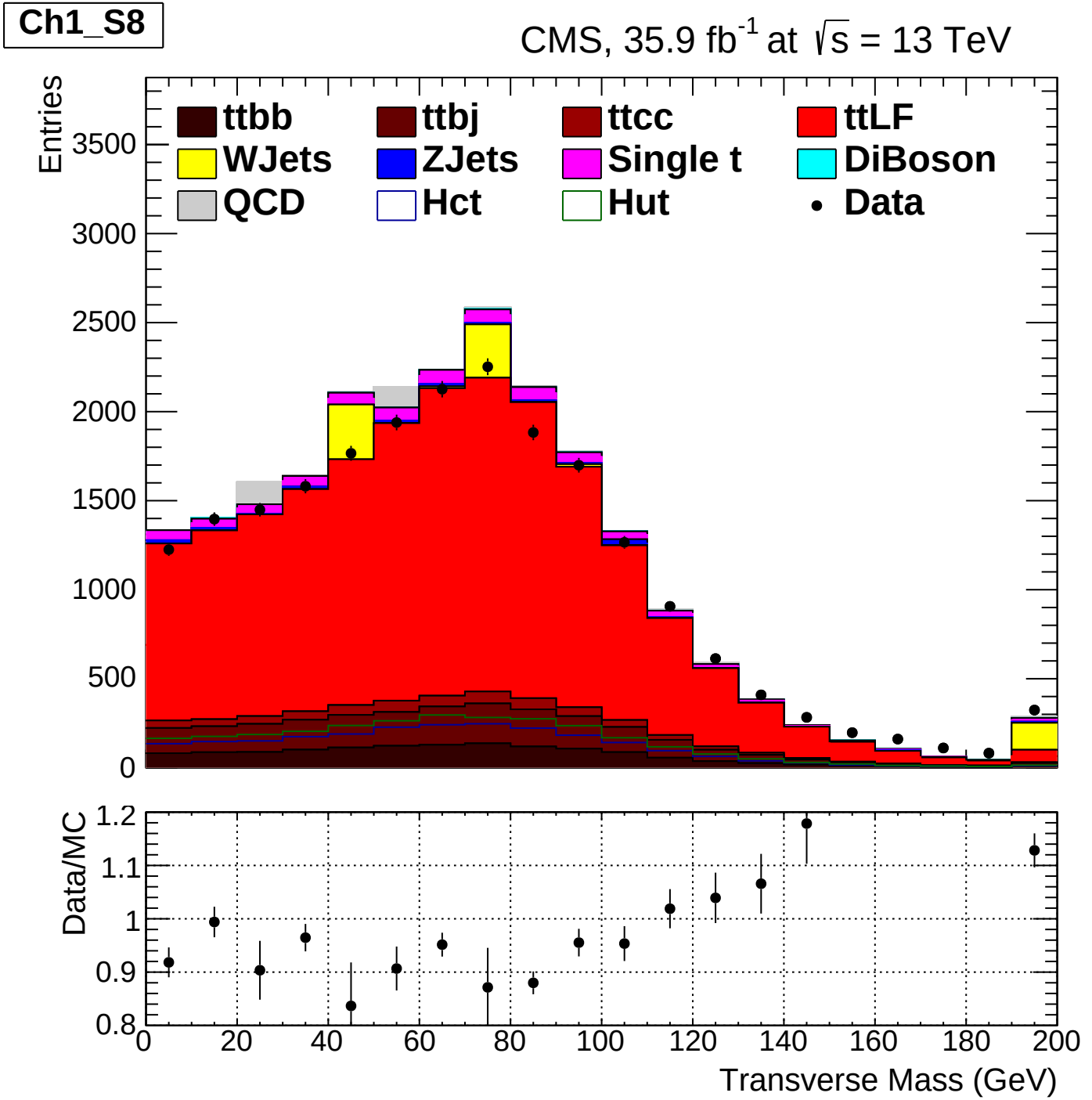

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

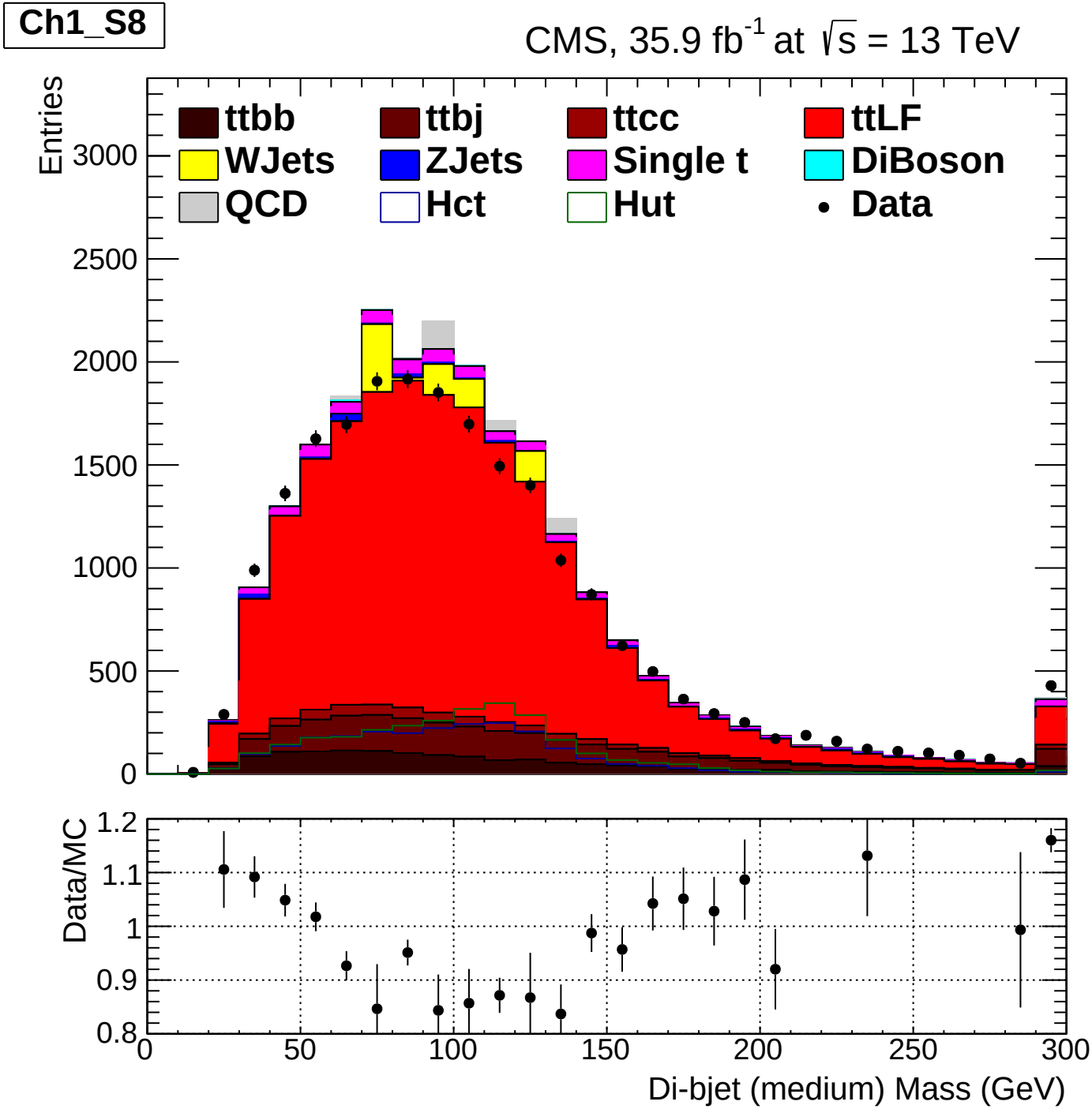

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

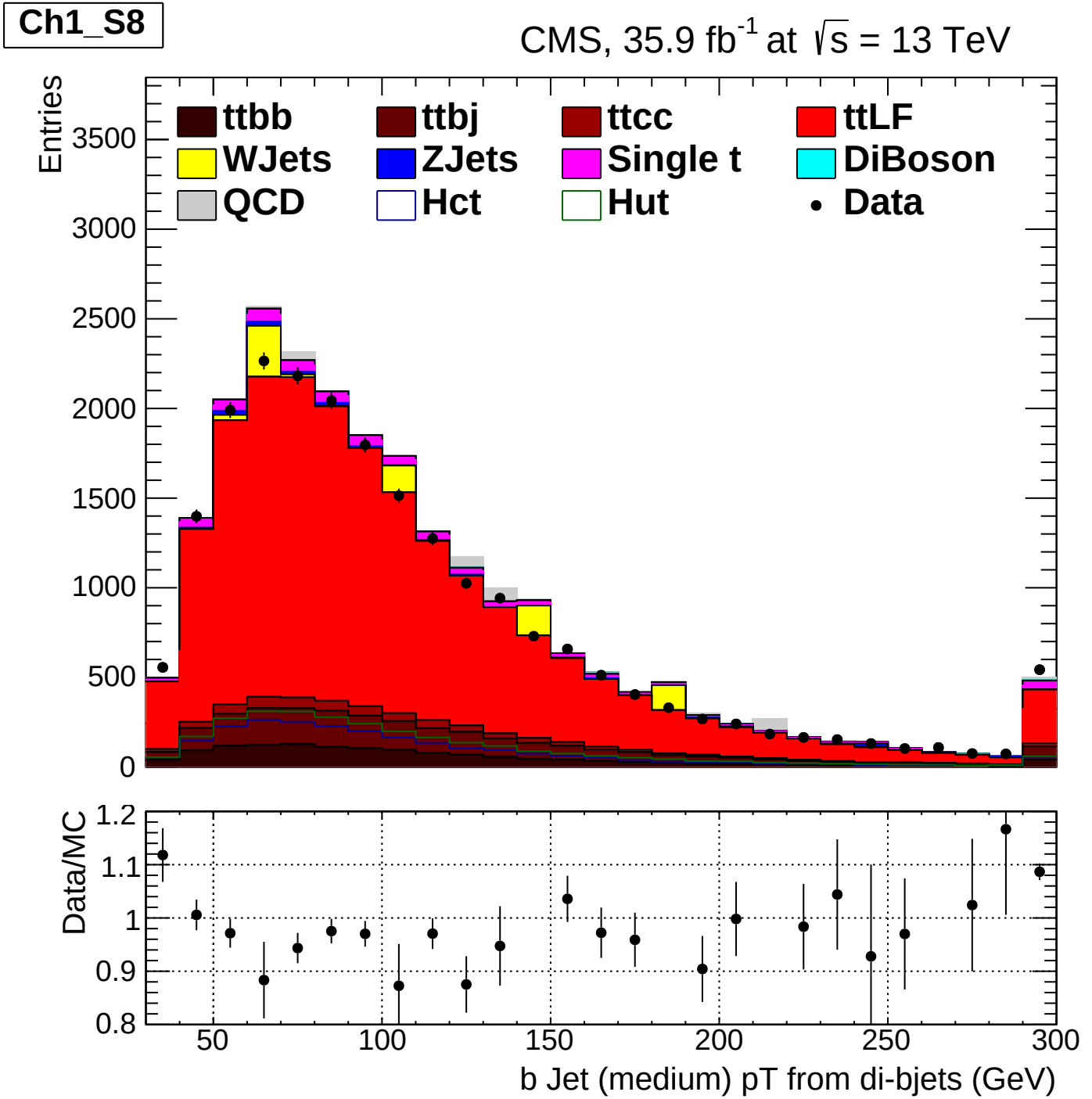

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

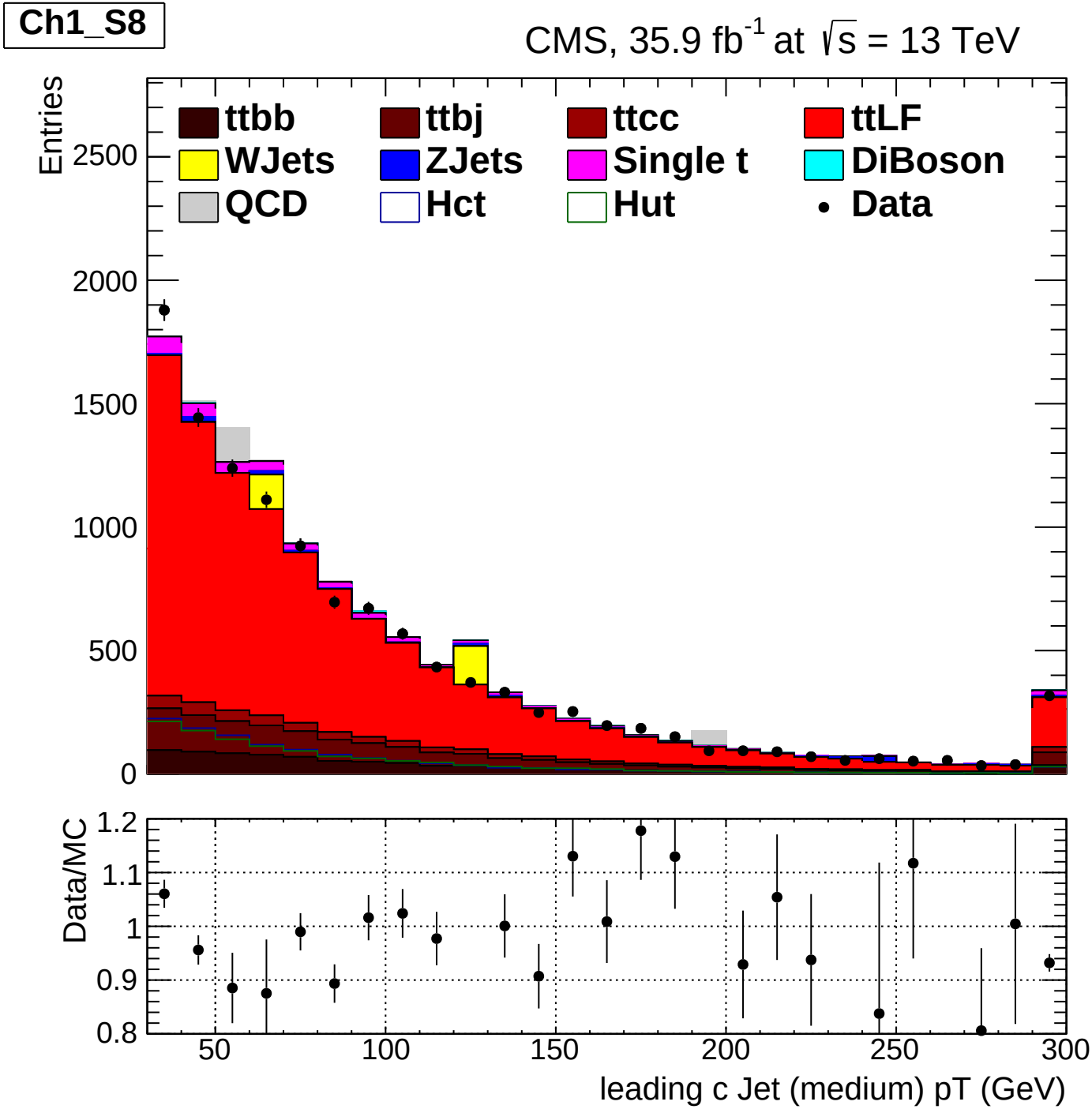

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

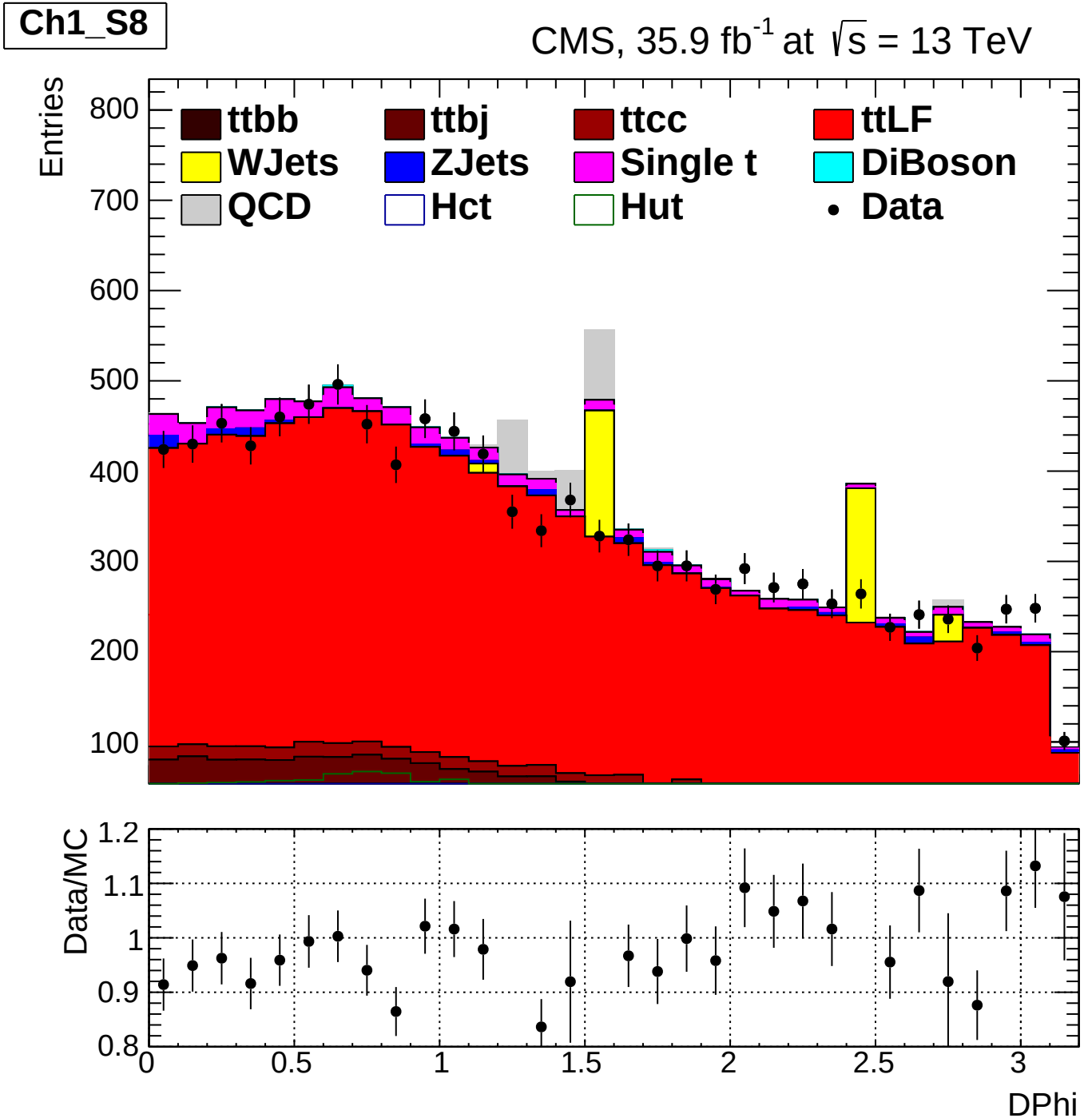

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

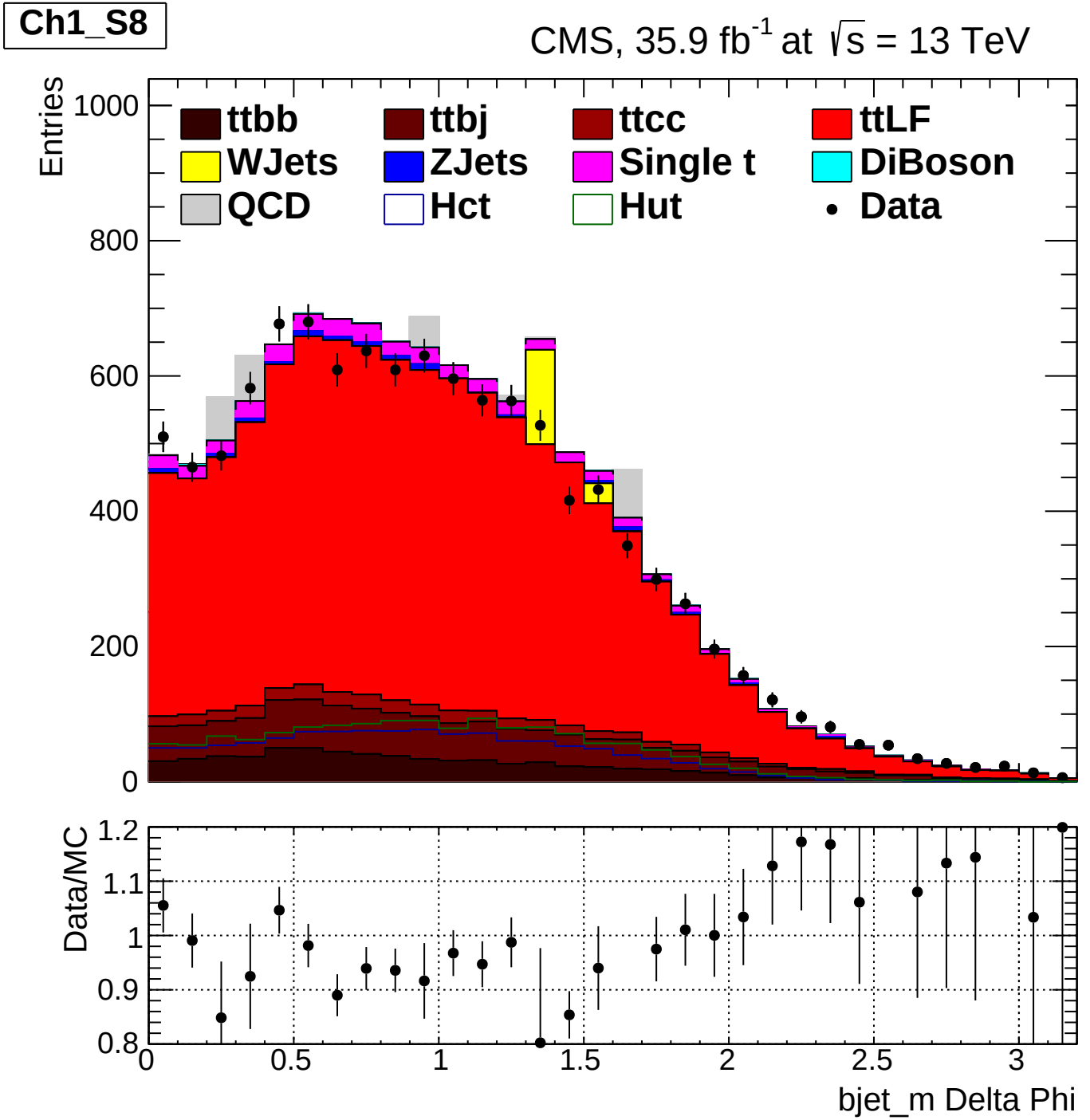

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

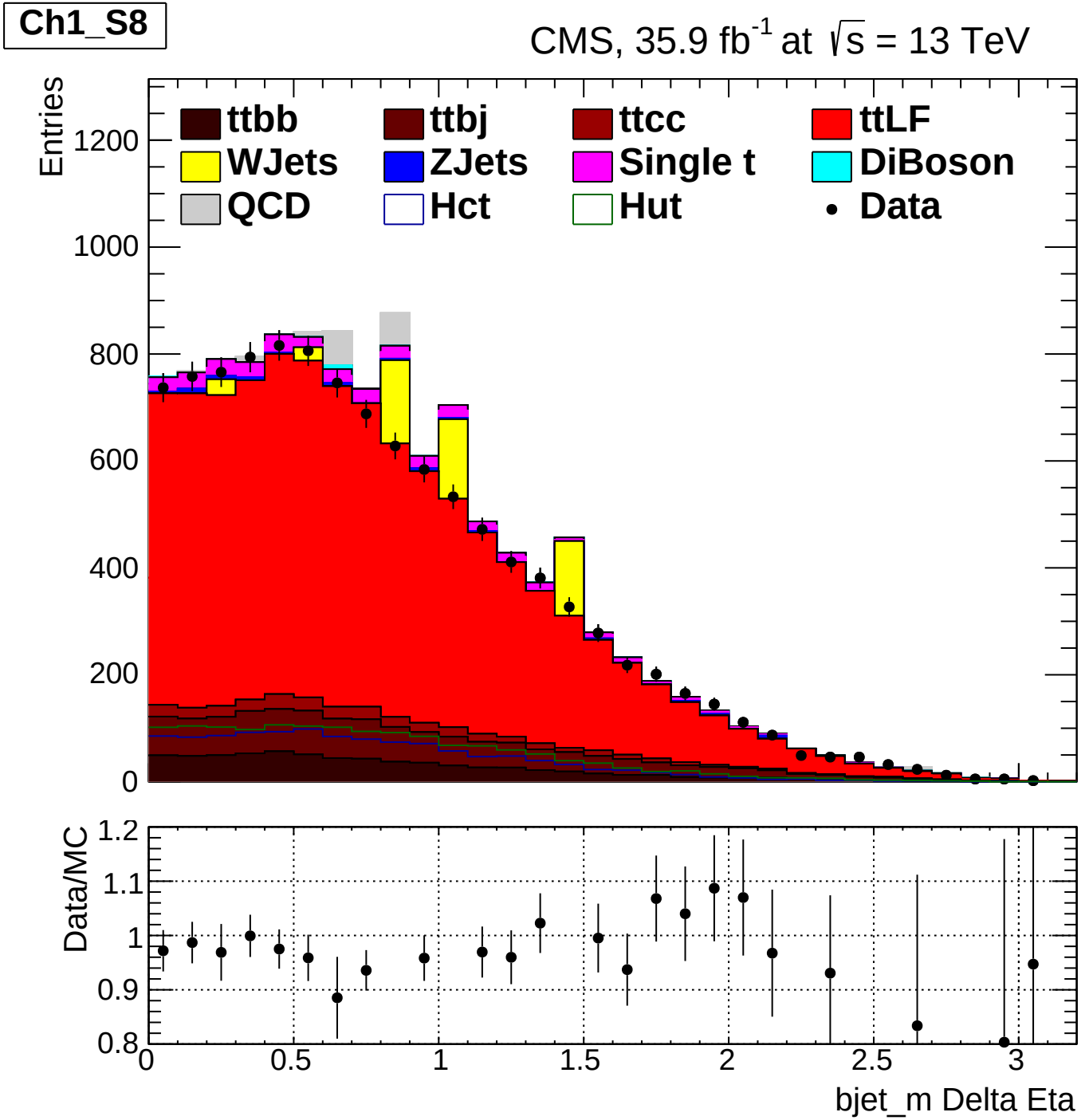

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

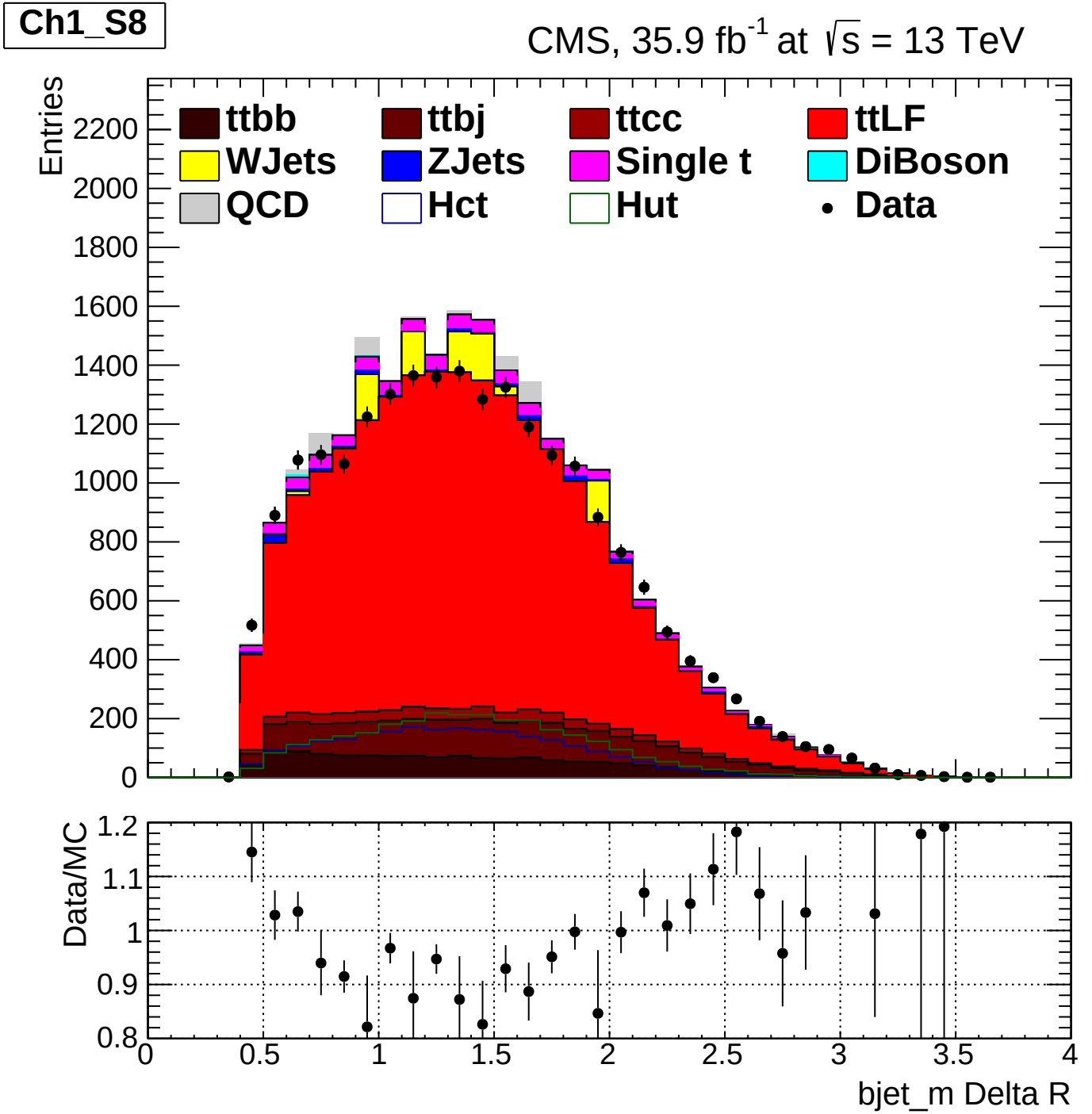

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

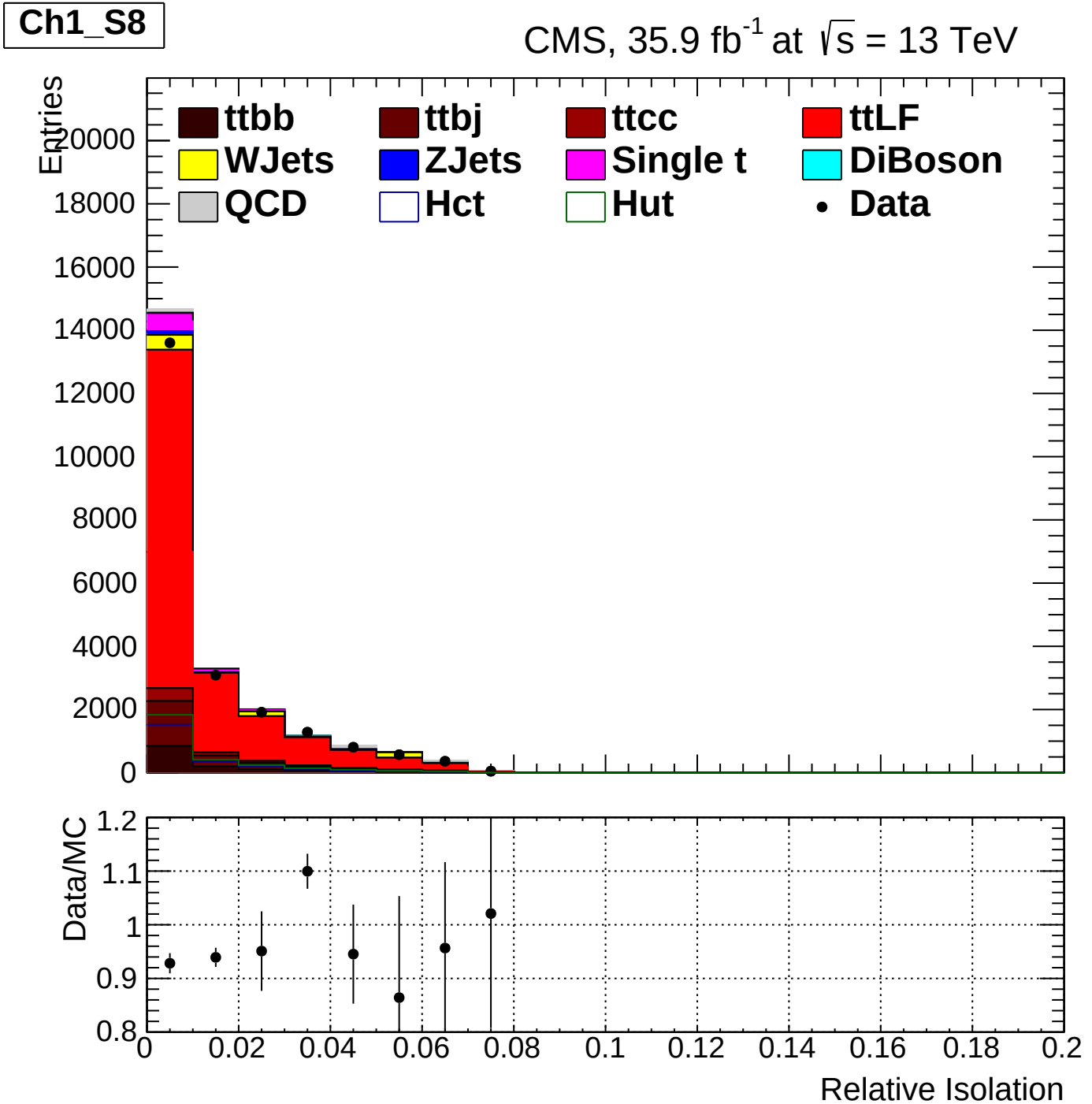

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

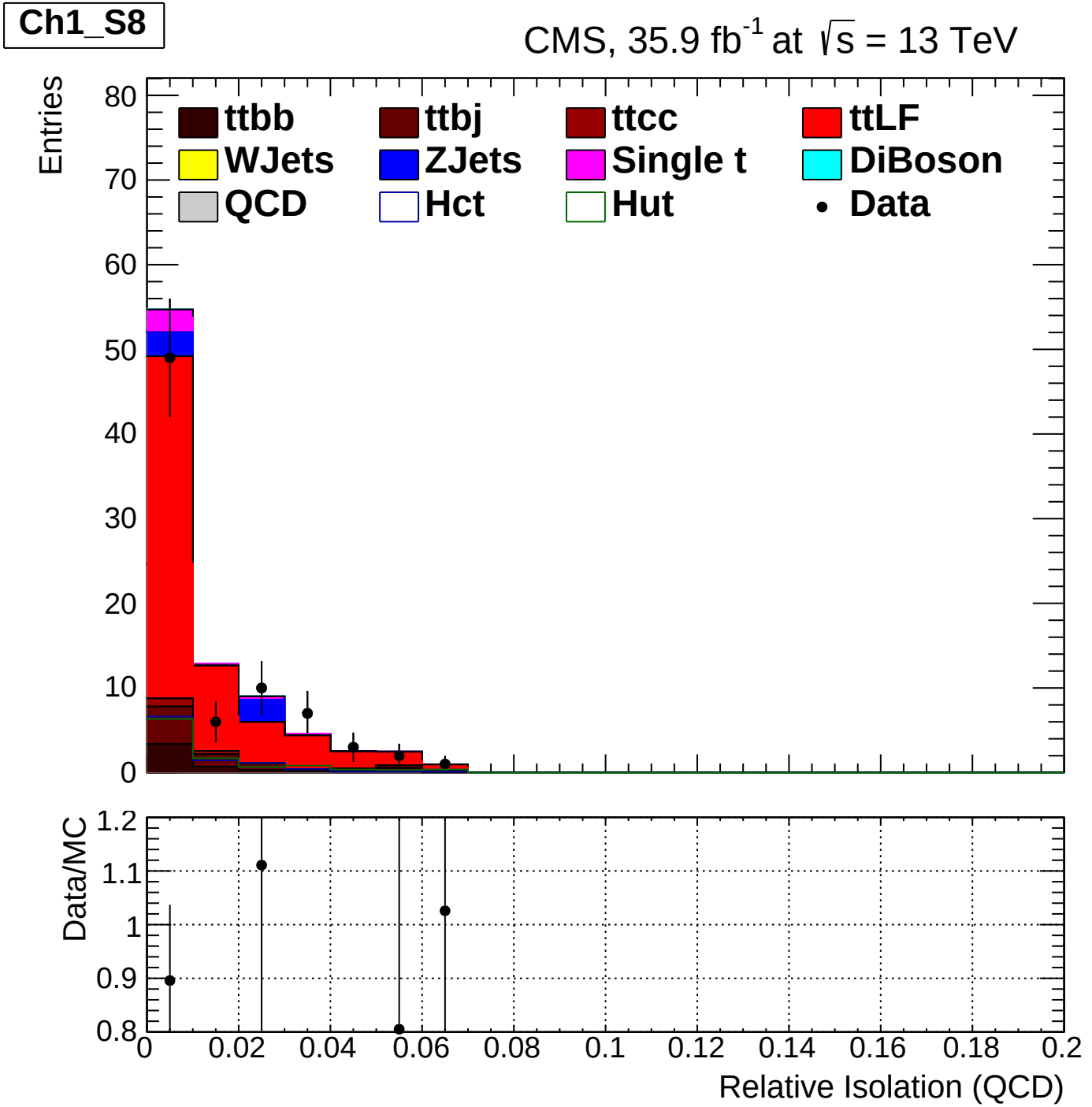

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
800
700
600
500
400
300
200
100
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

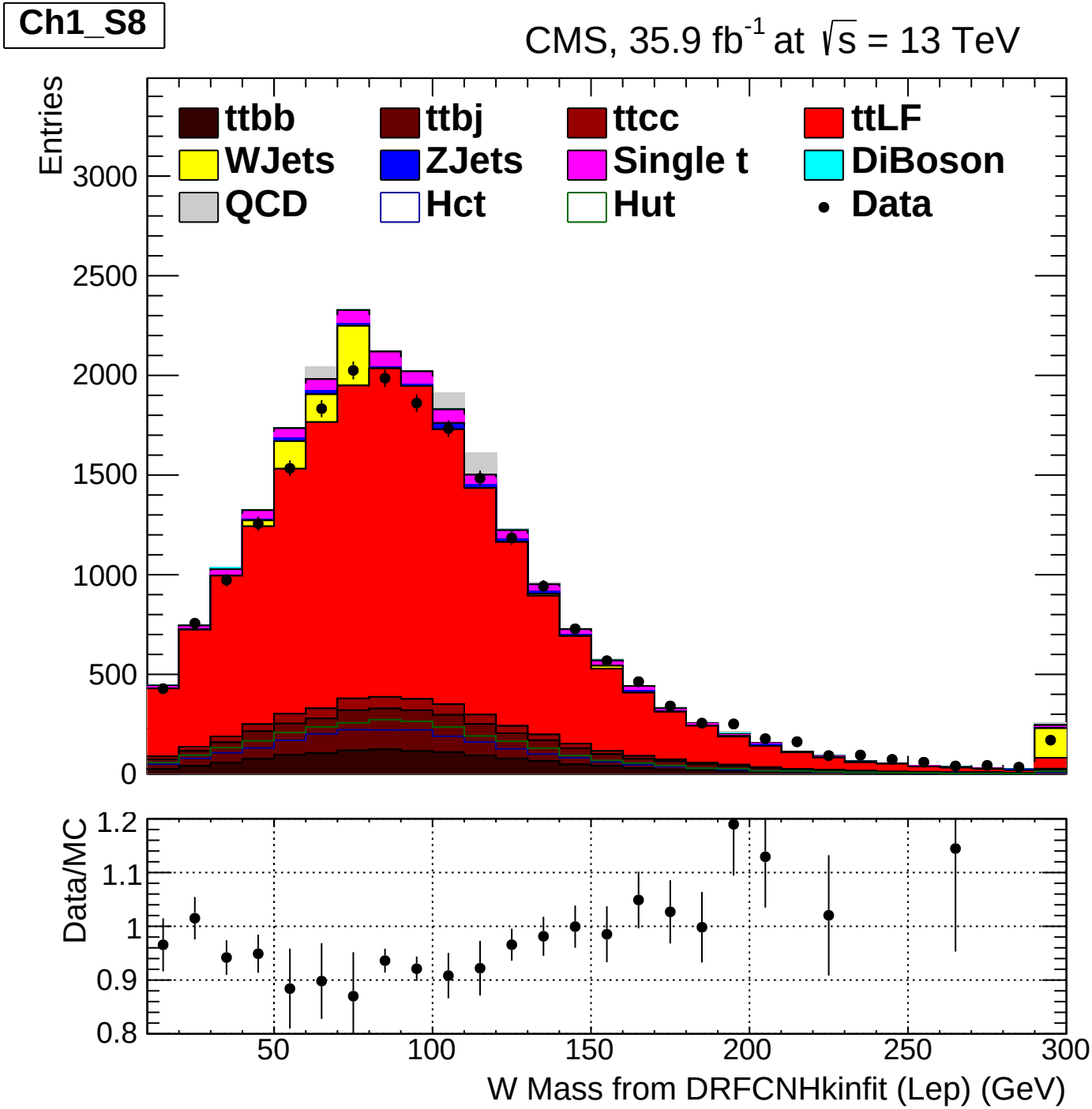

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

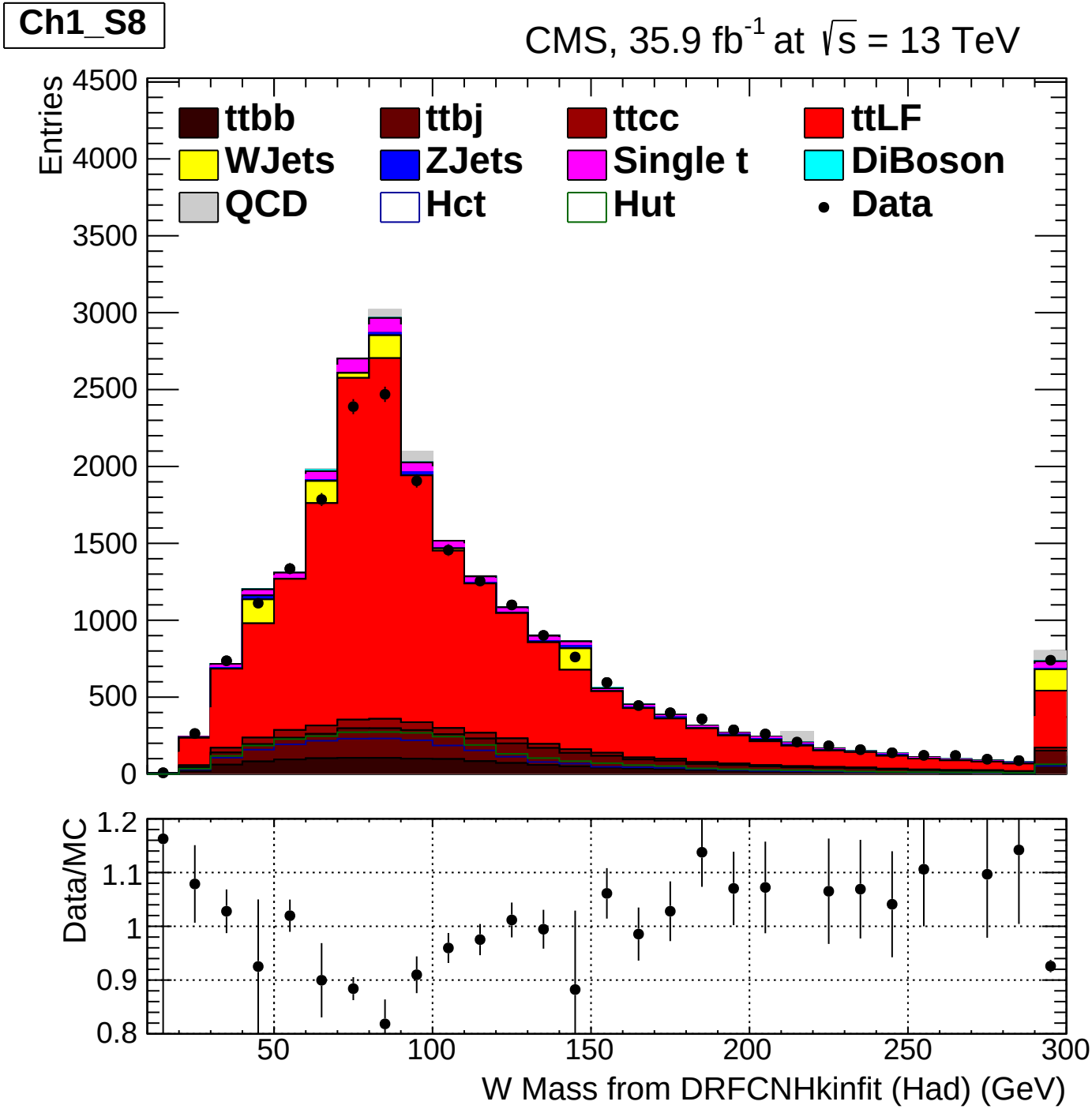

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

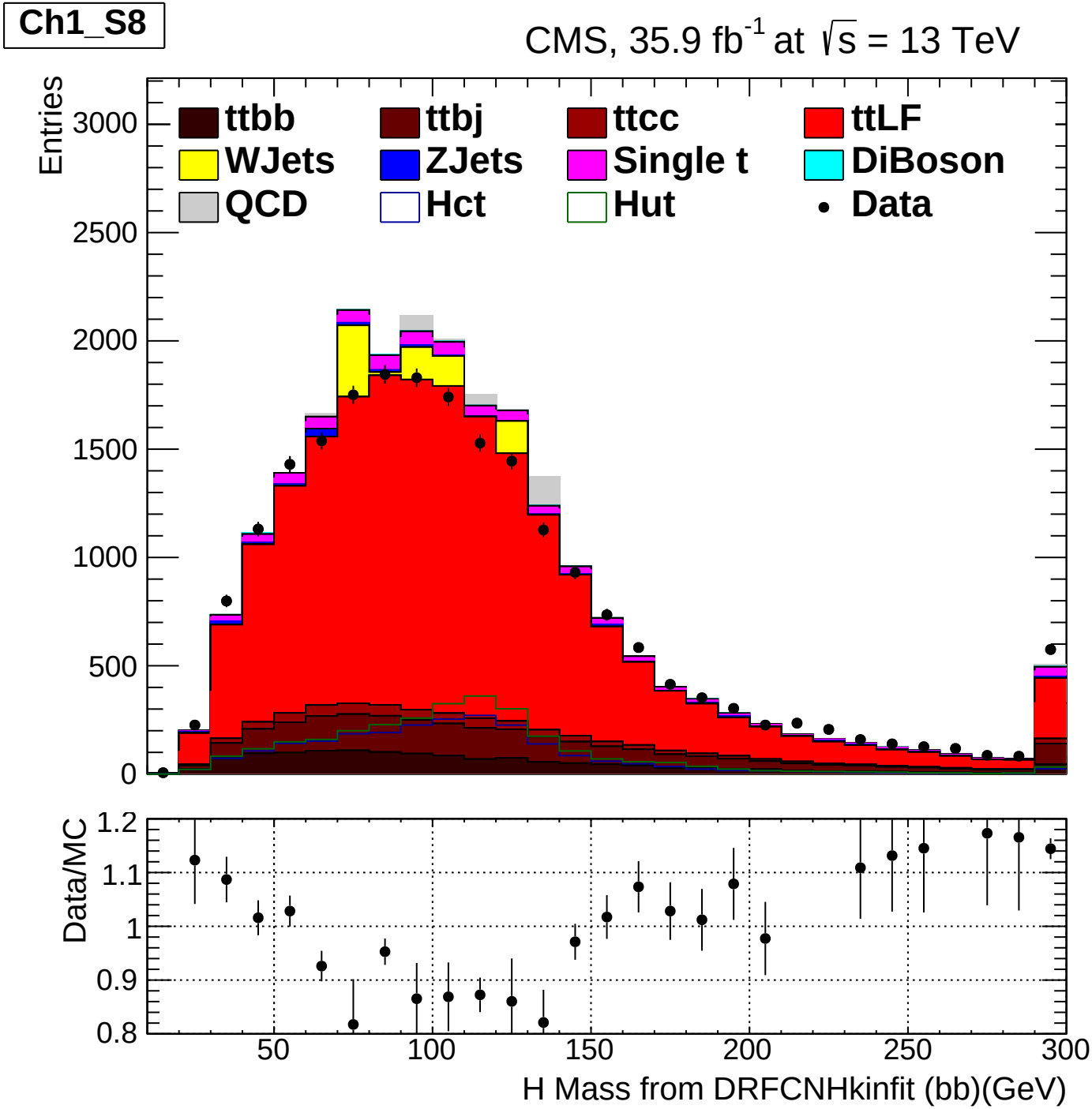

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

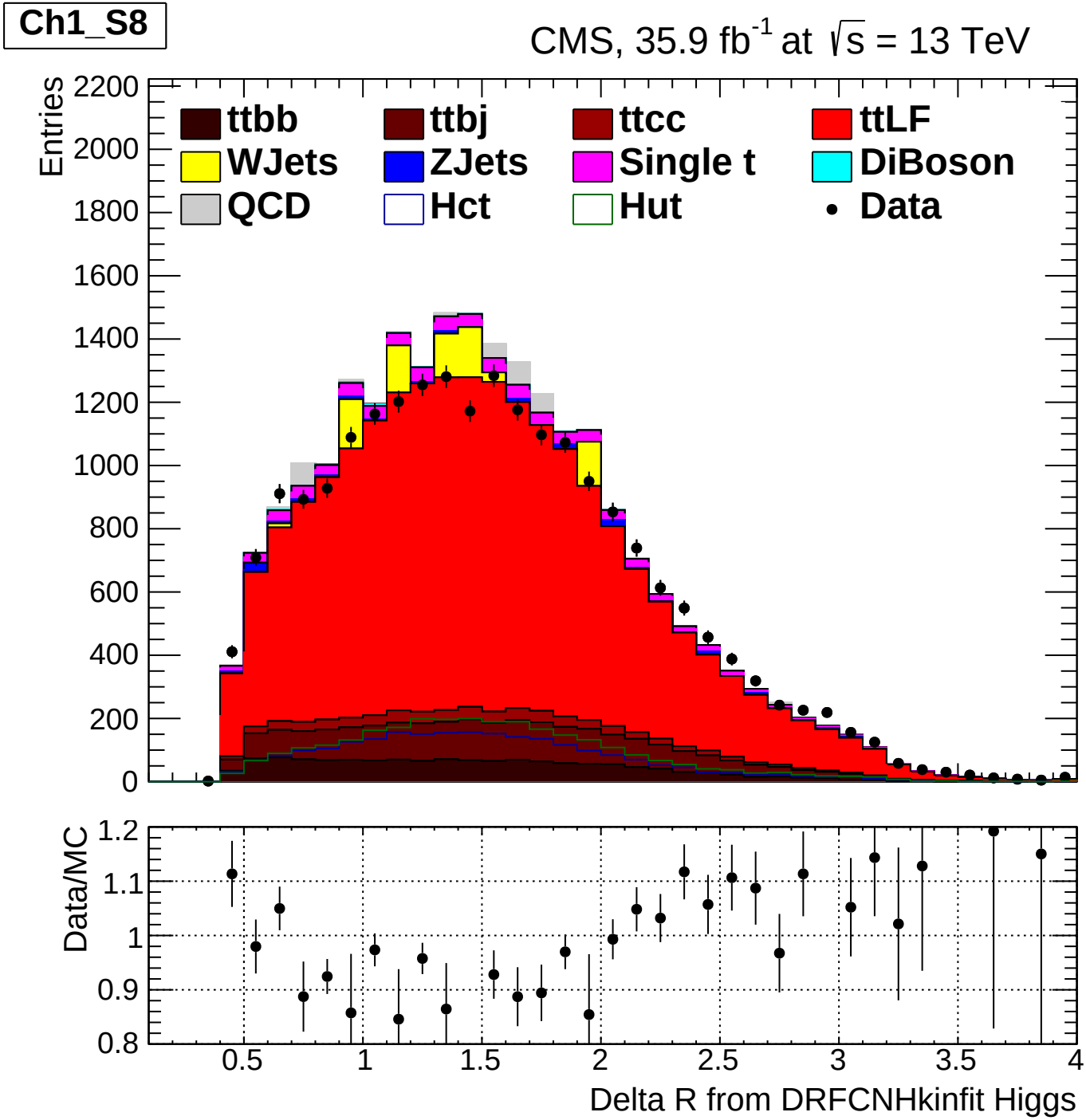

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

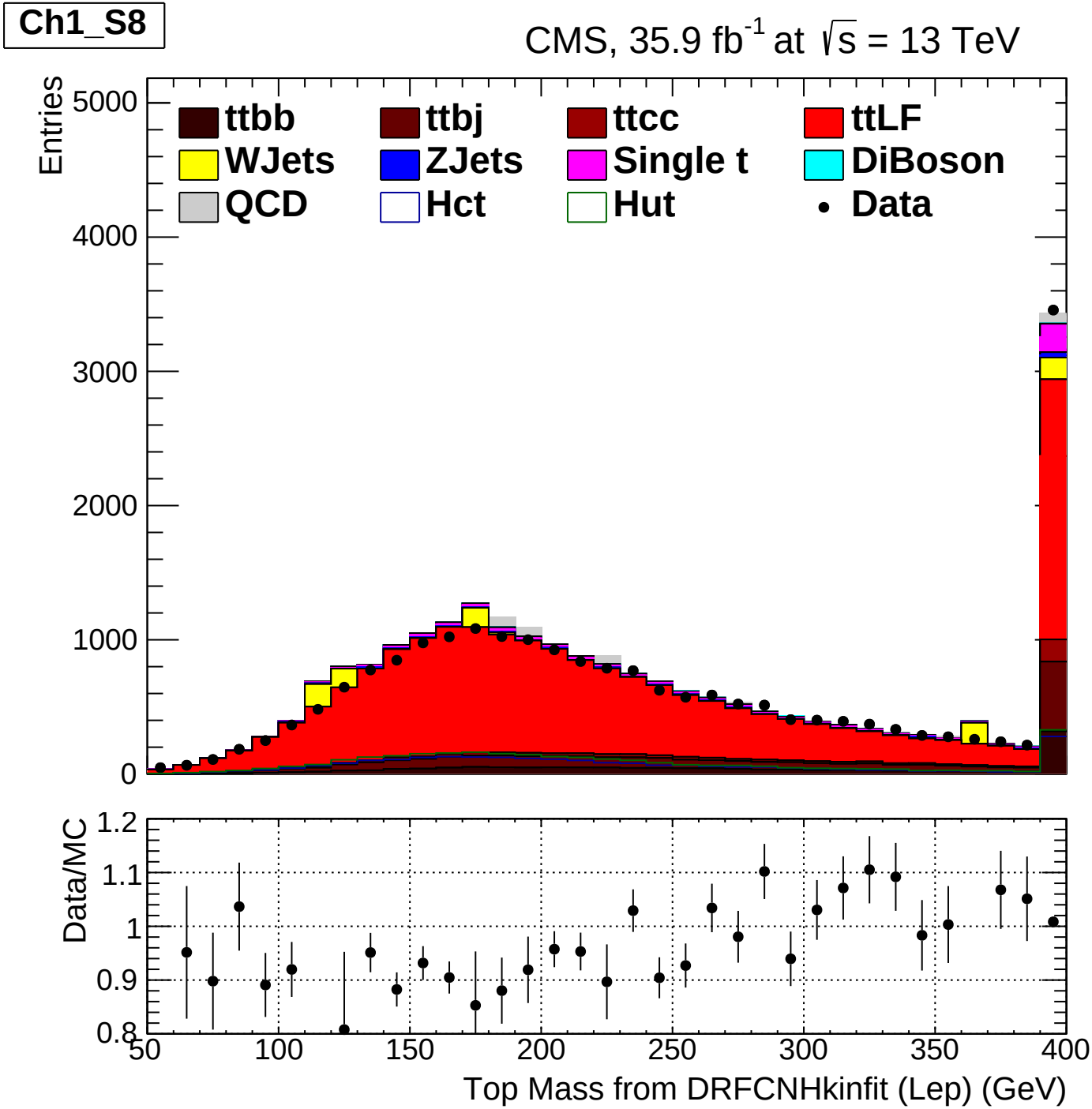

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

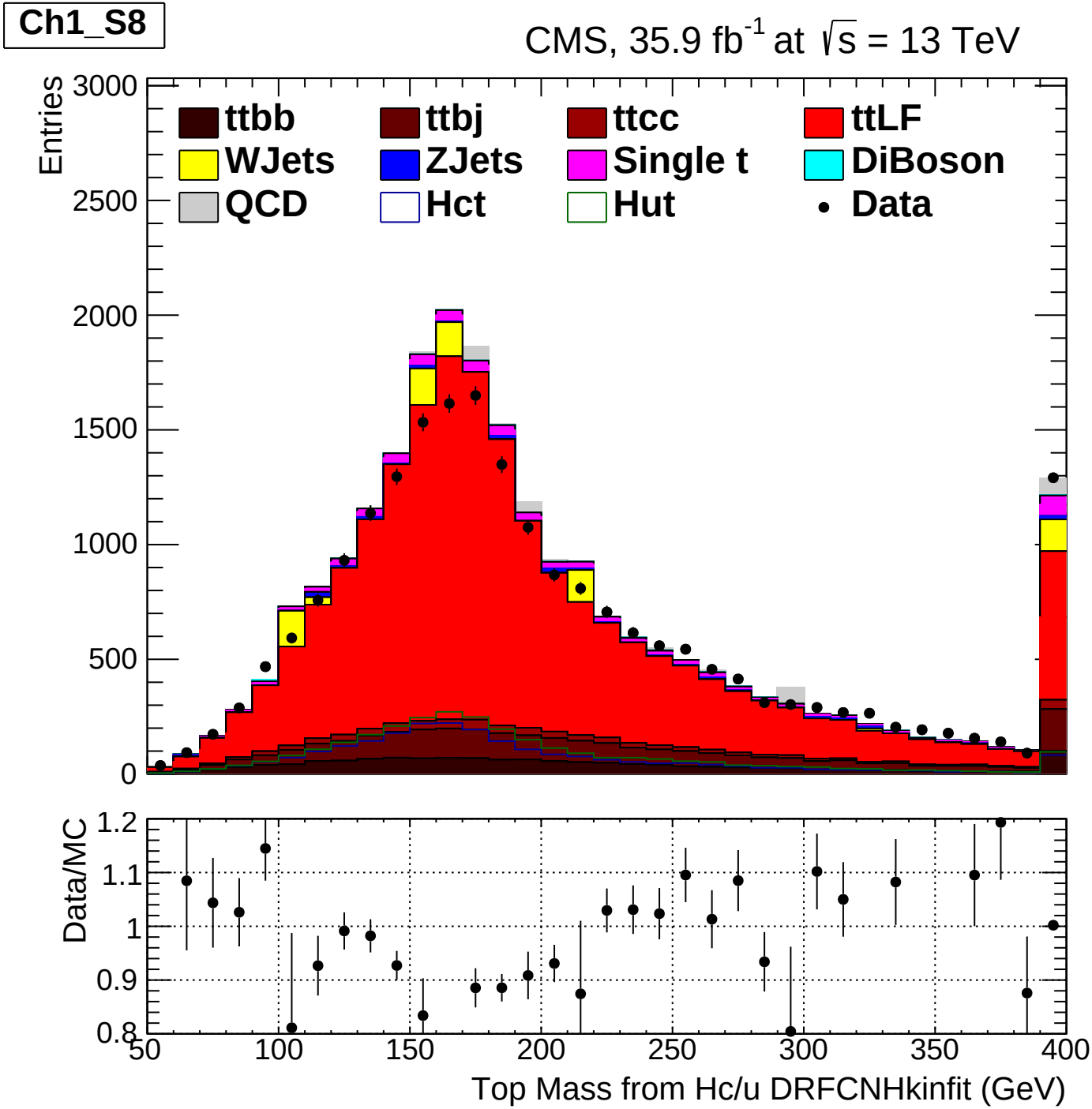

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
500
1000
1500
2000
2500
3000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Lep) (GeV)

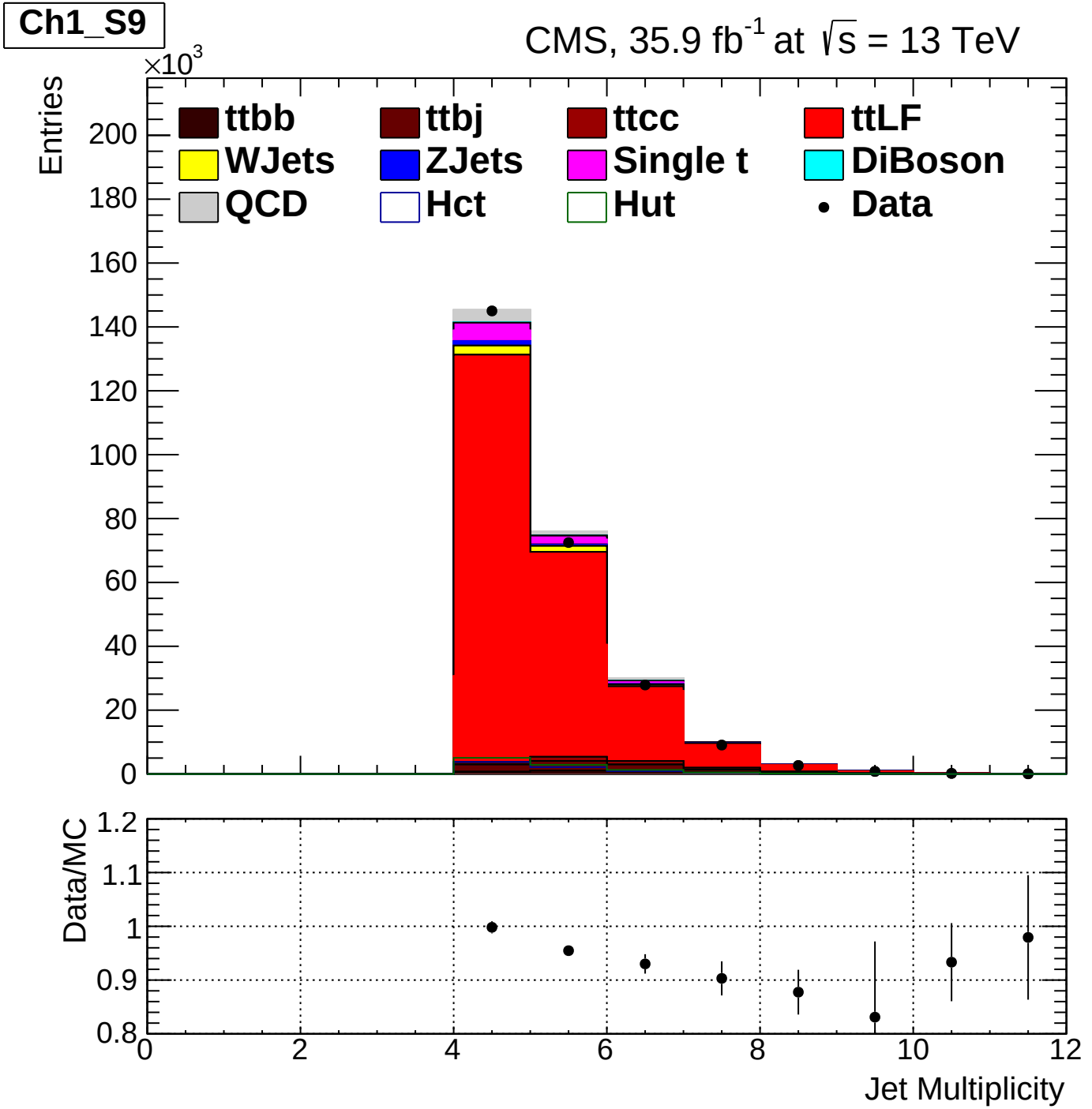

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

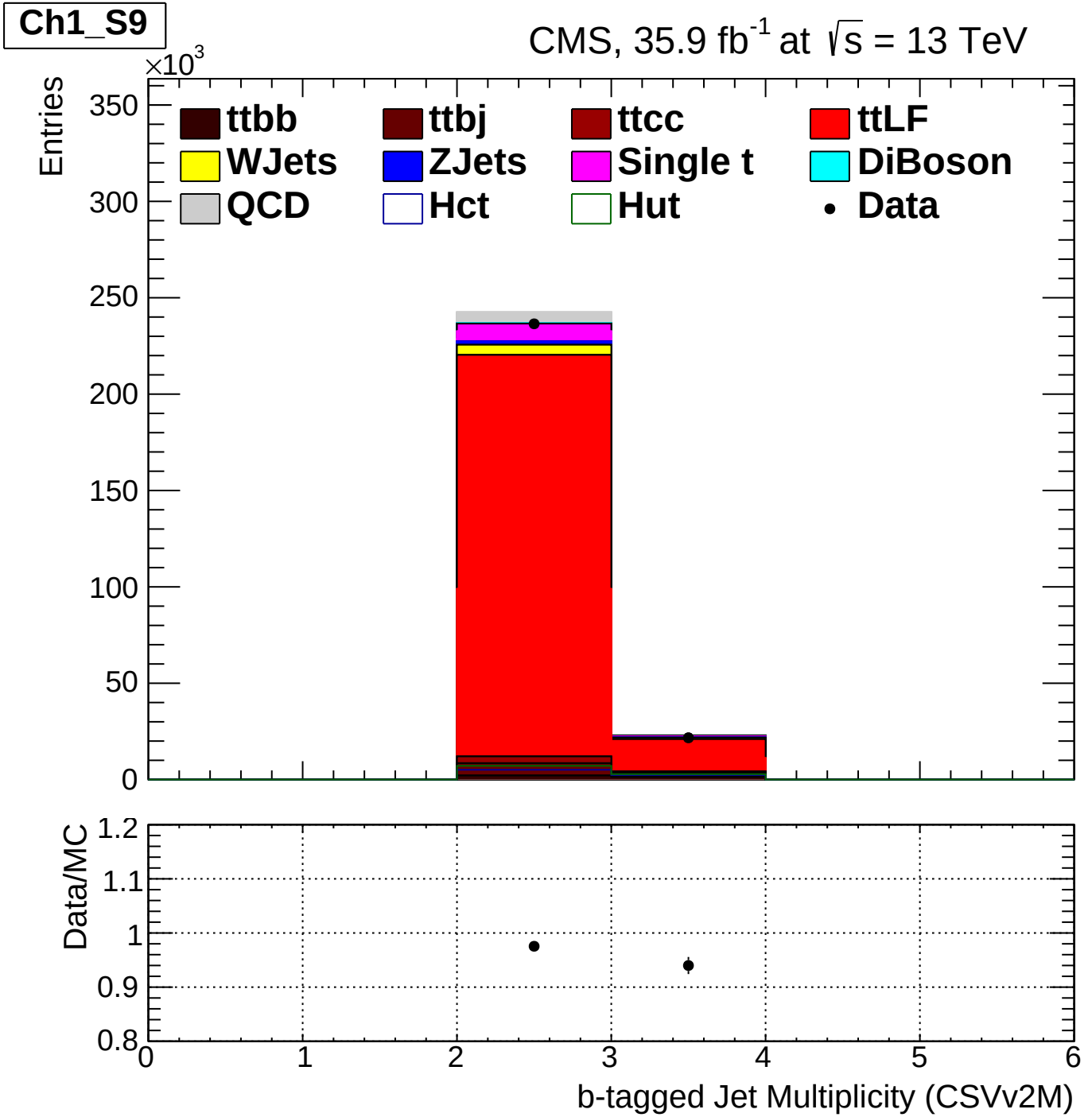

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

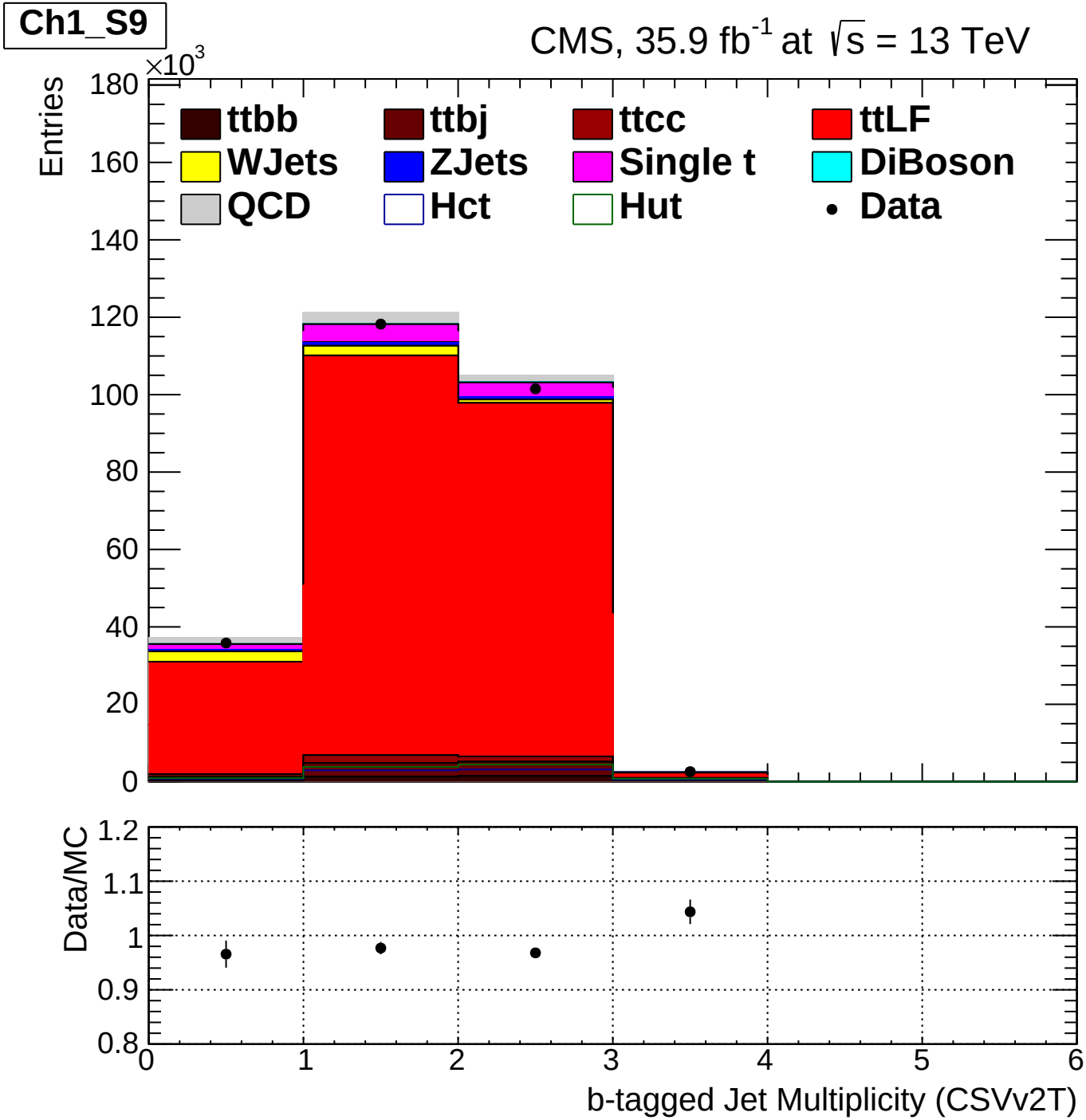

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

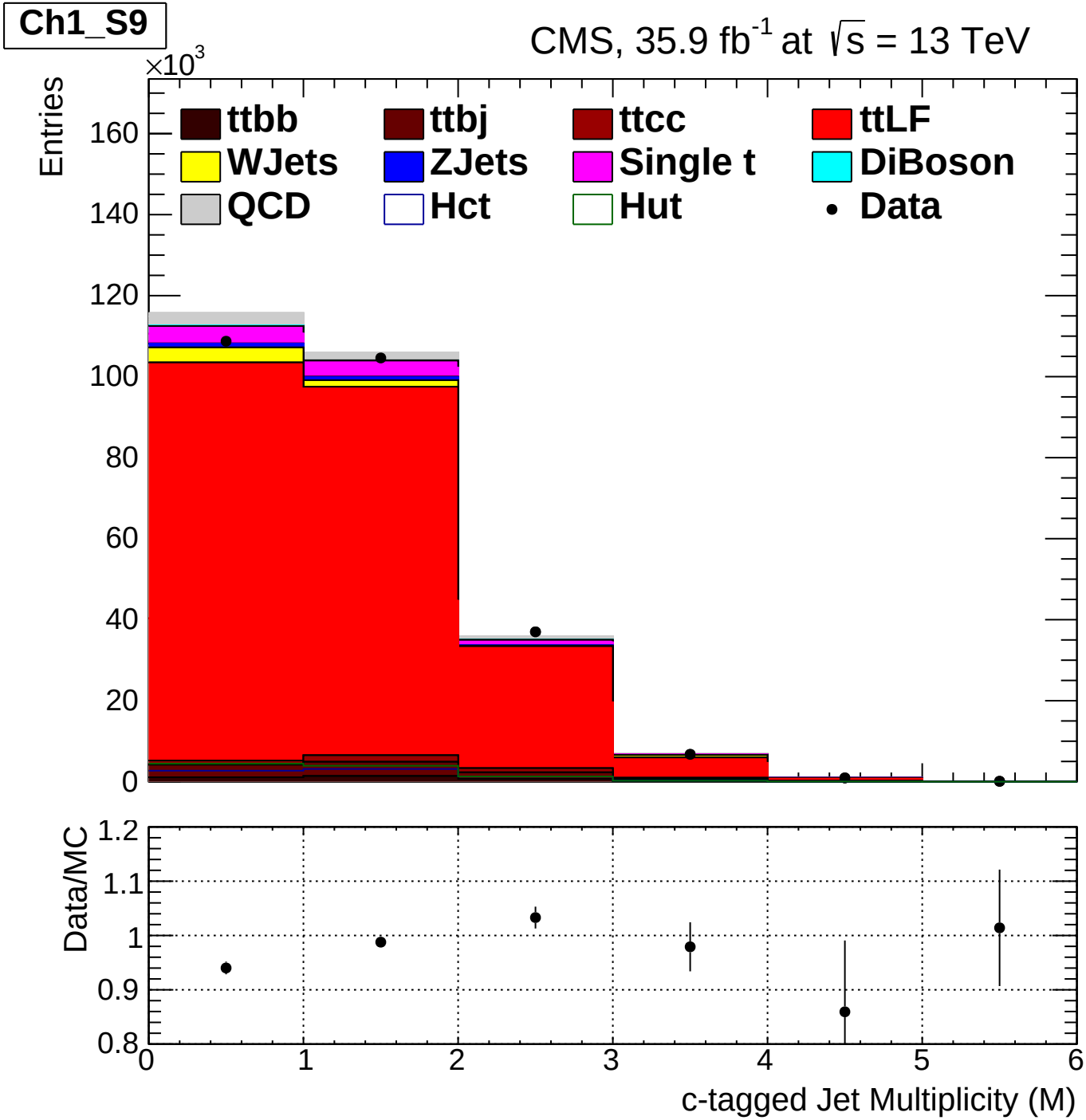

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

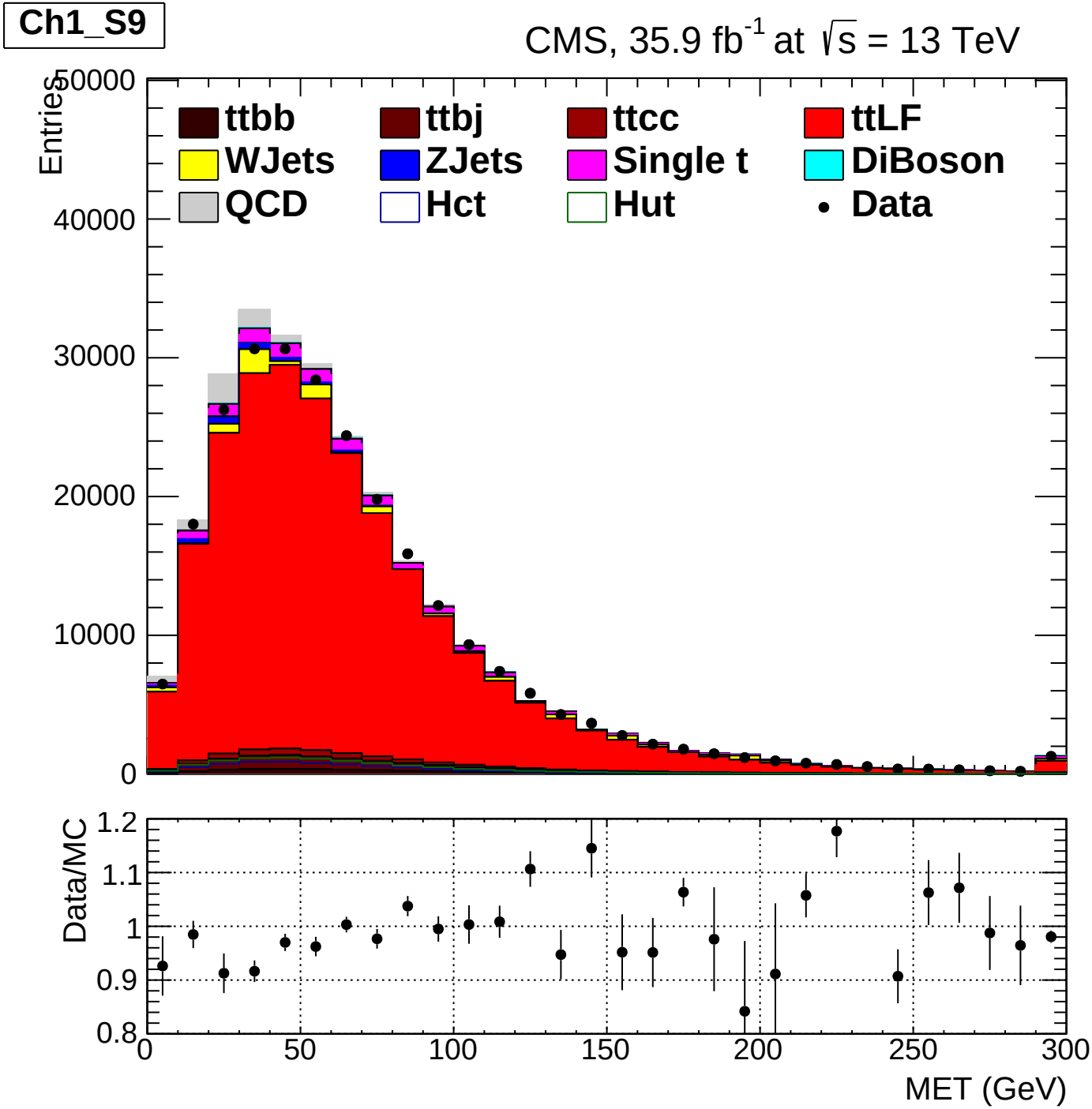

Ch1_S8
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

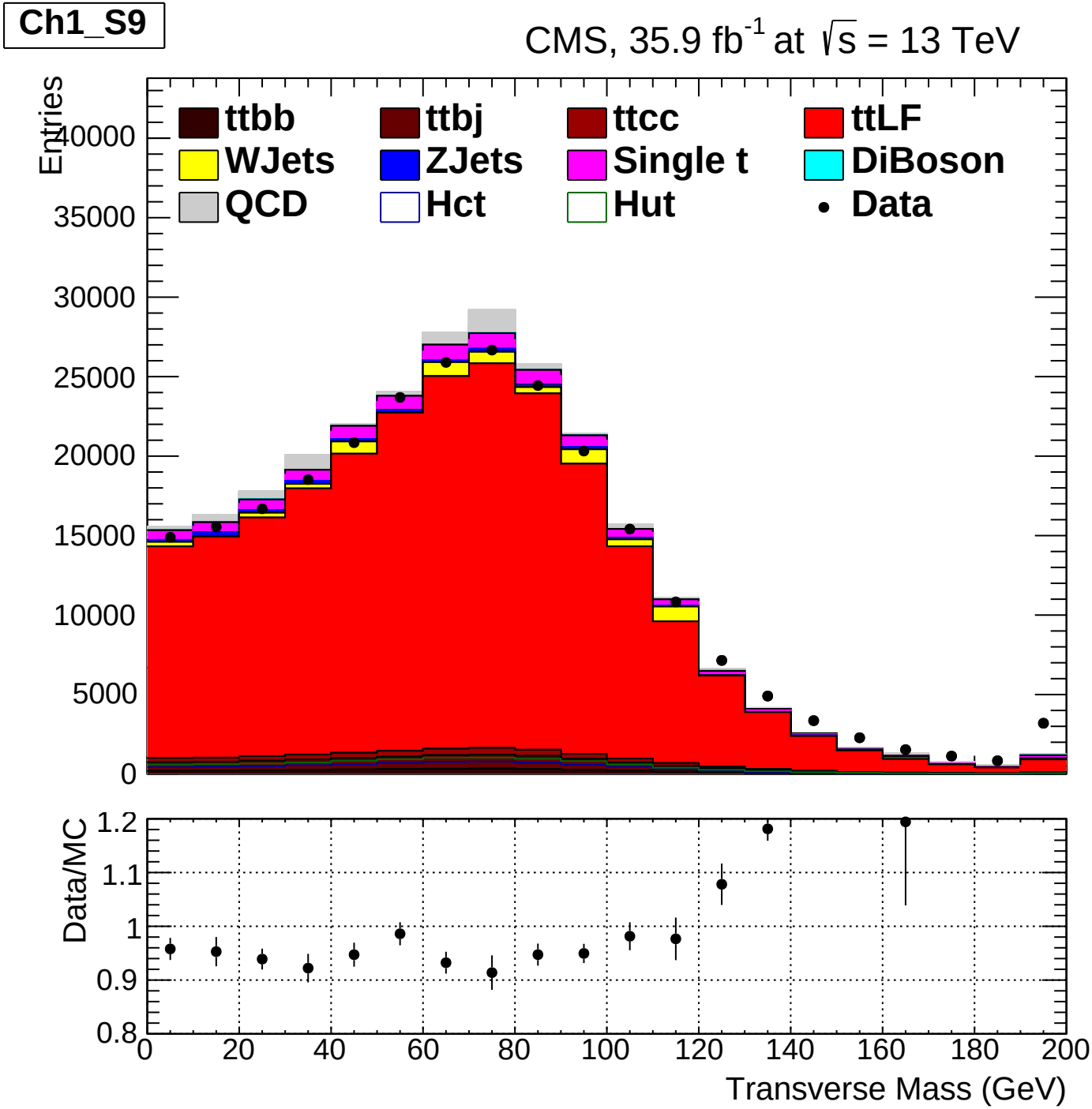

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
×10^3
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

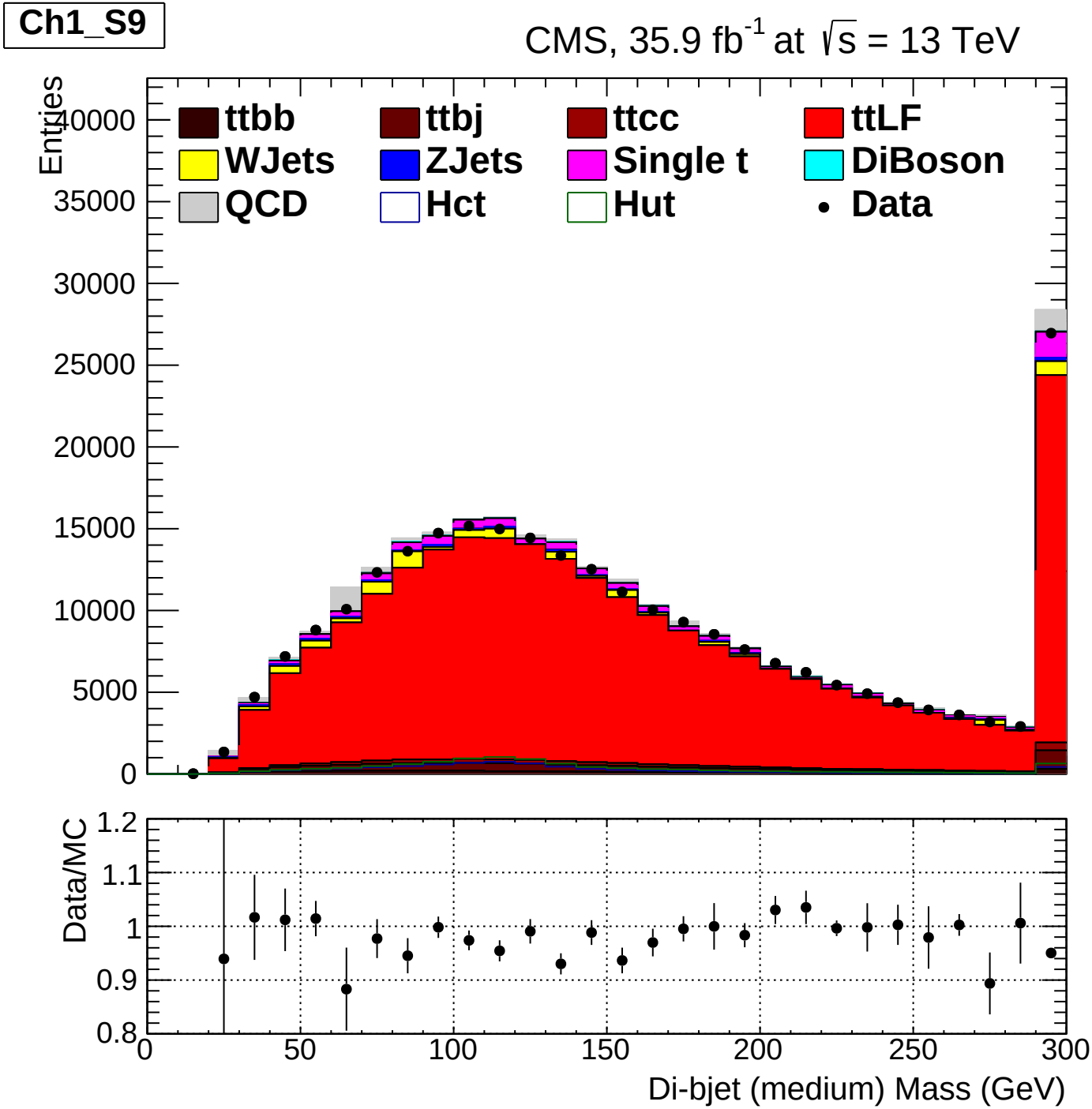

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

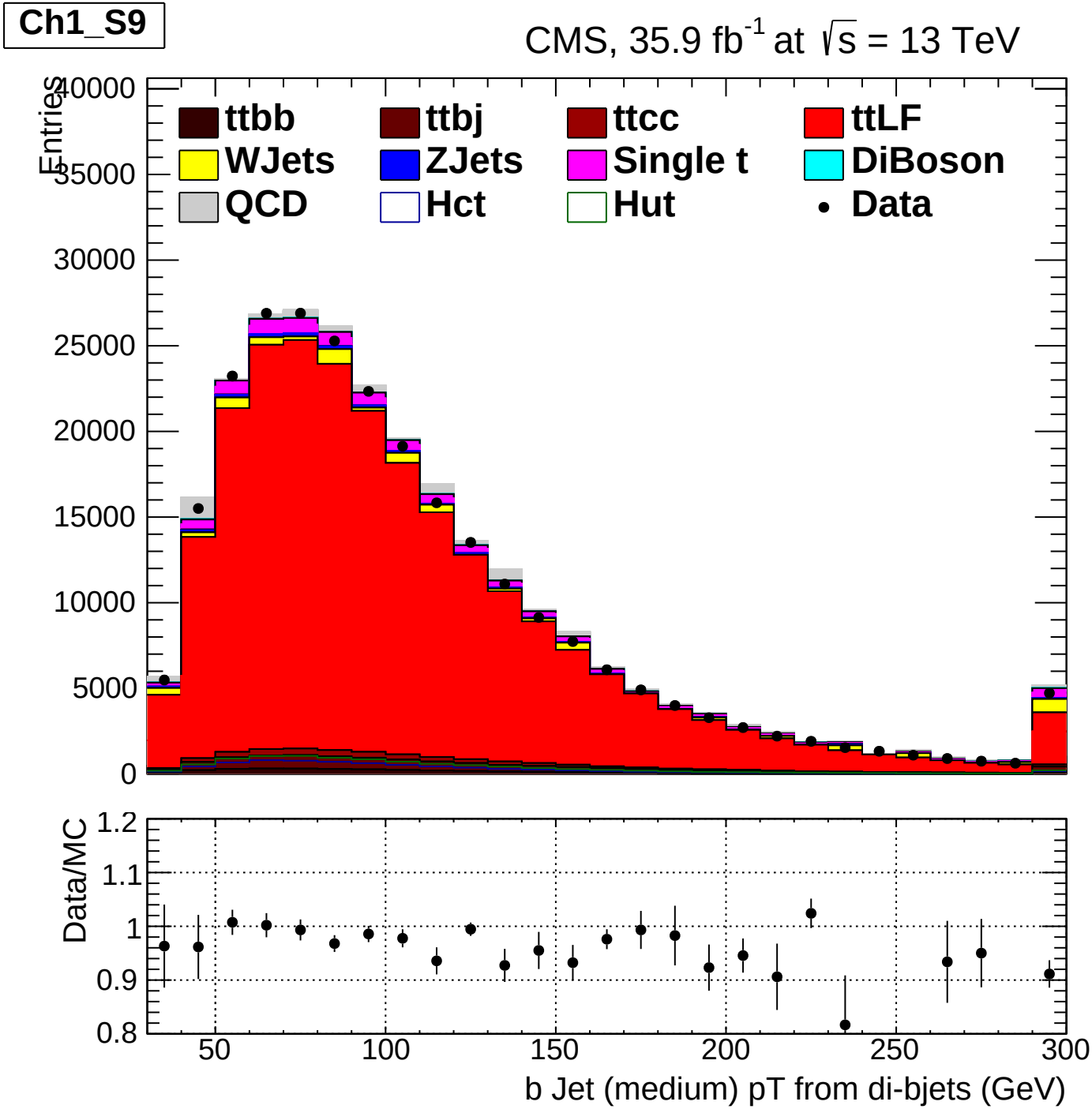

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

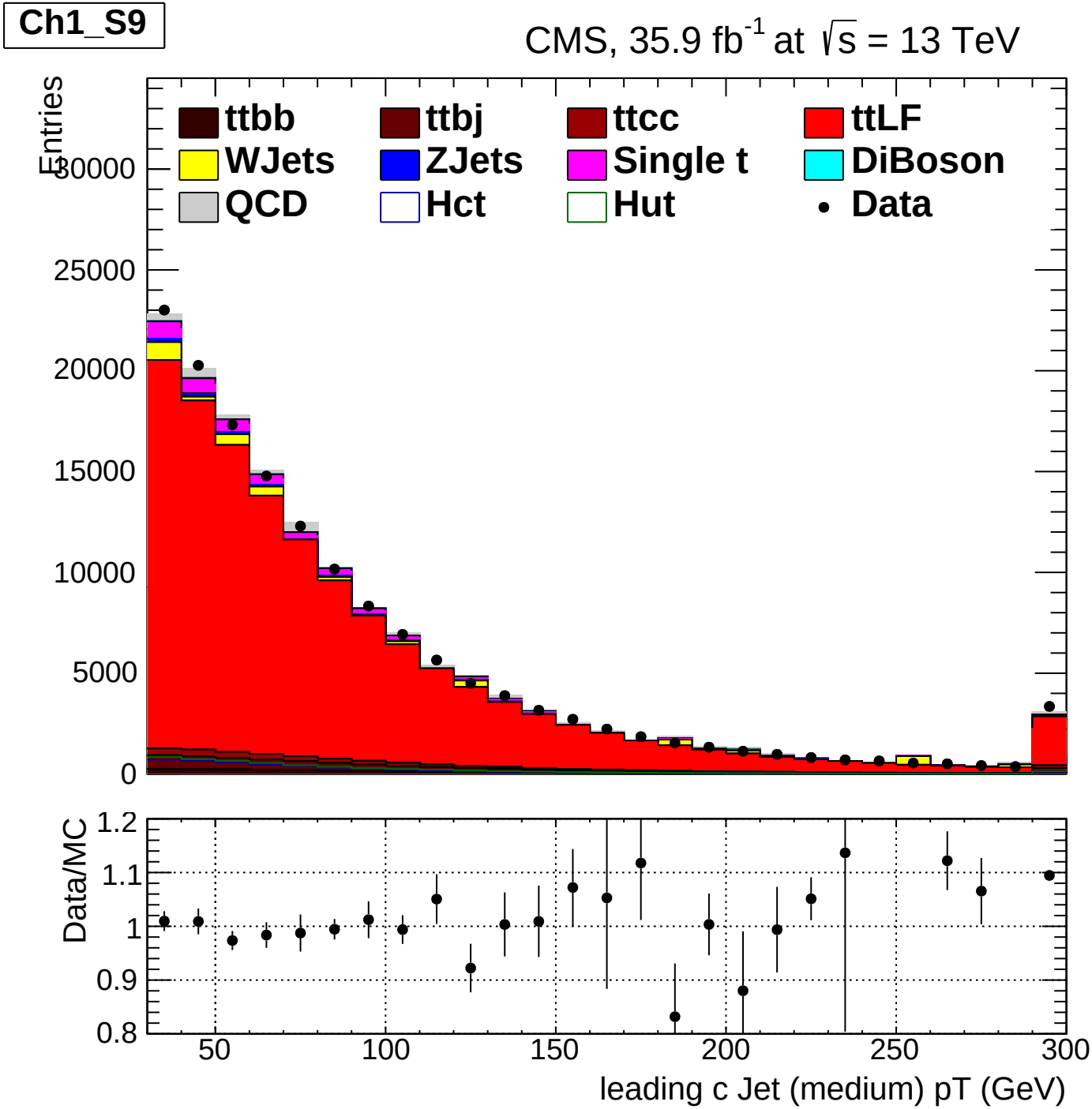

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

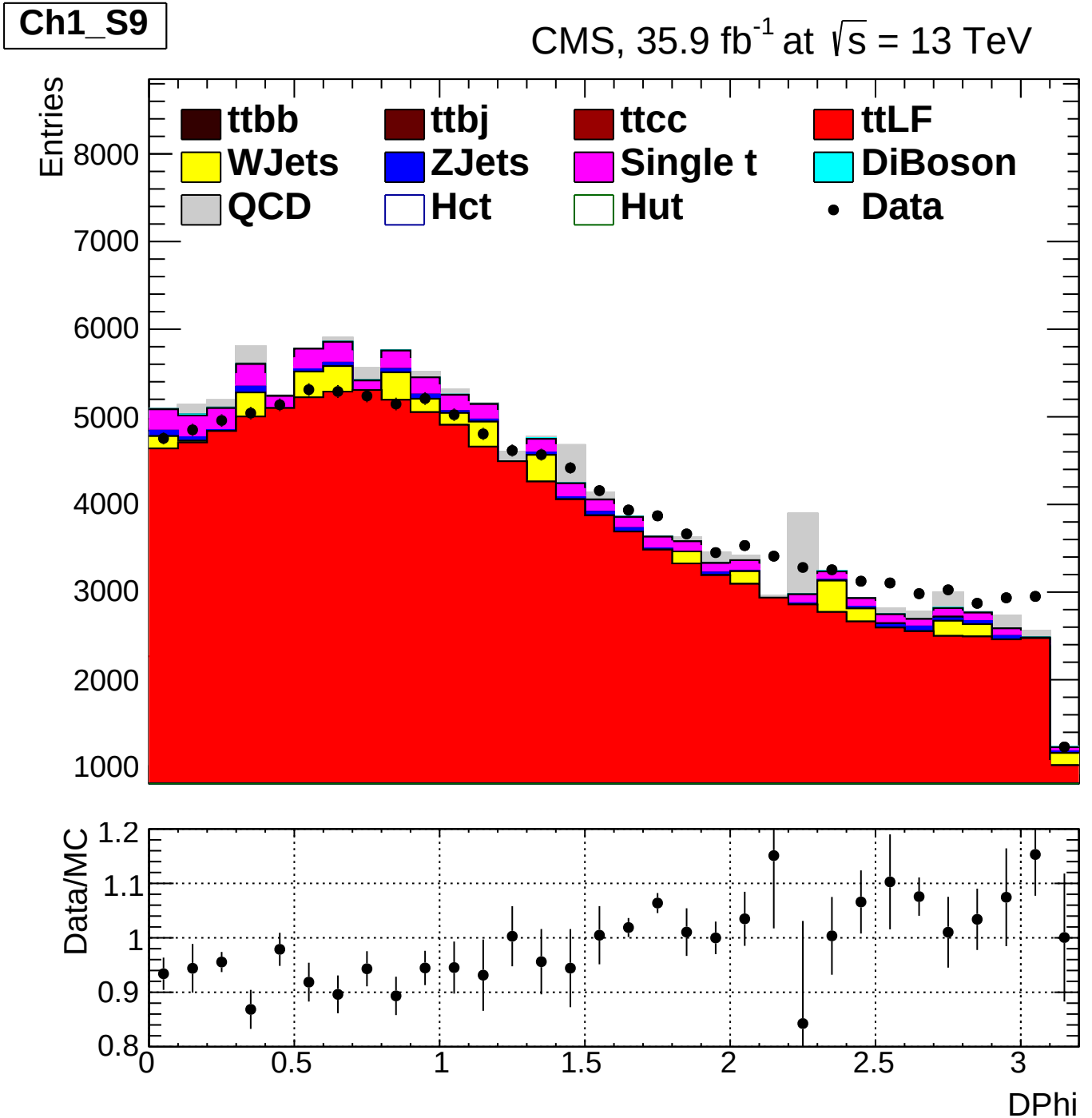

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
50
100
150
200
250
300
MET (GeV)

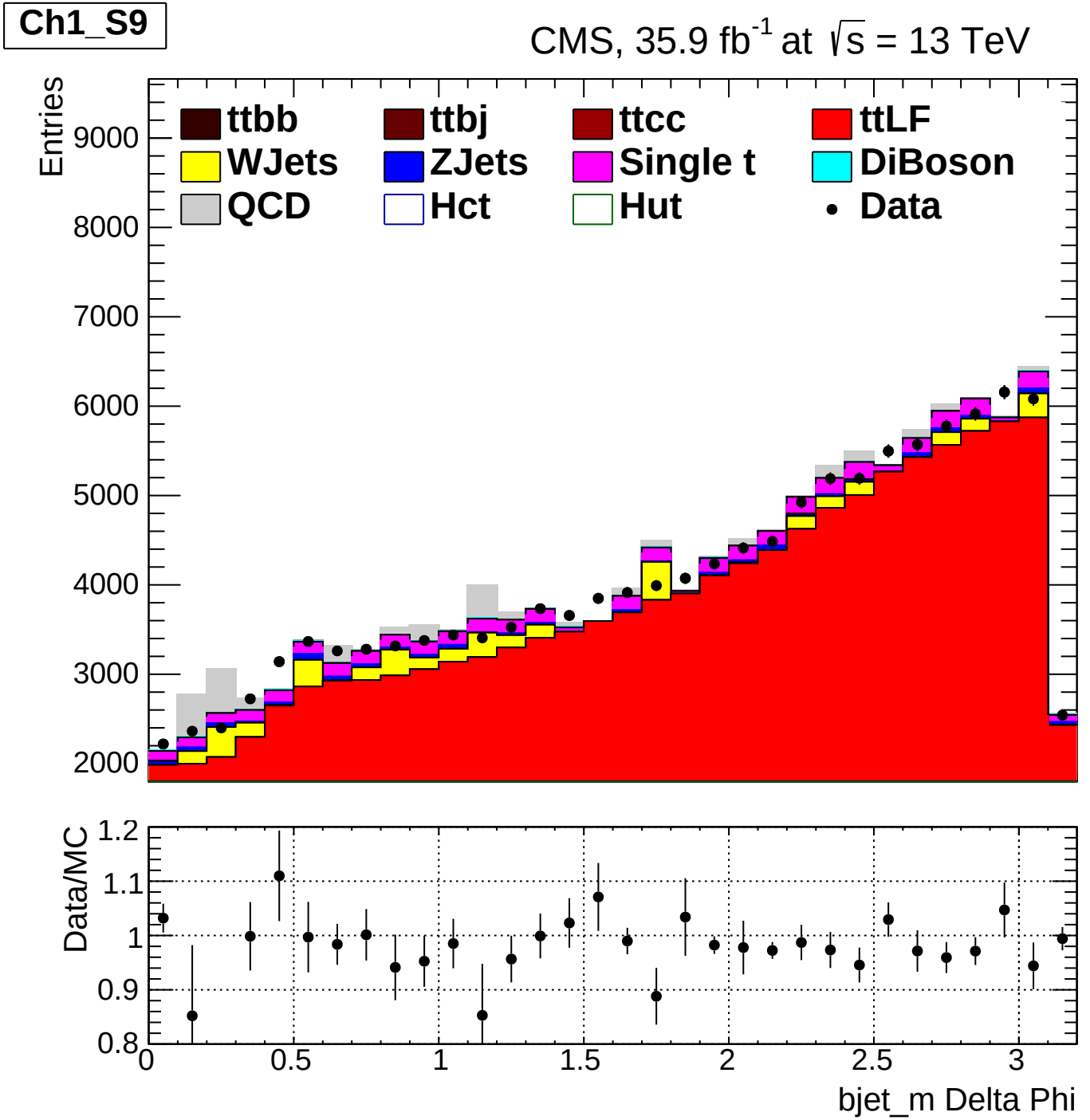

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

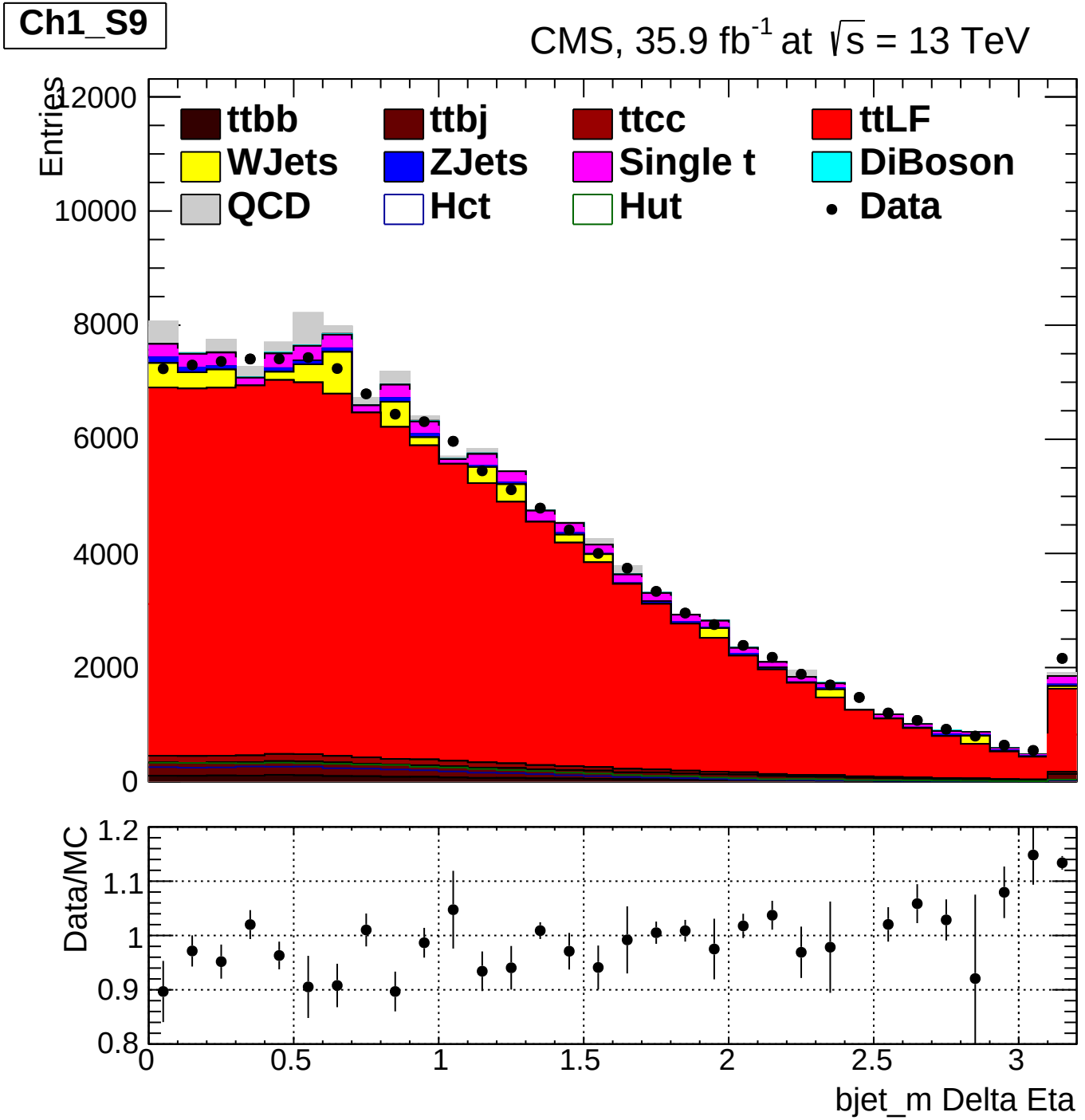

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

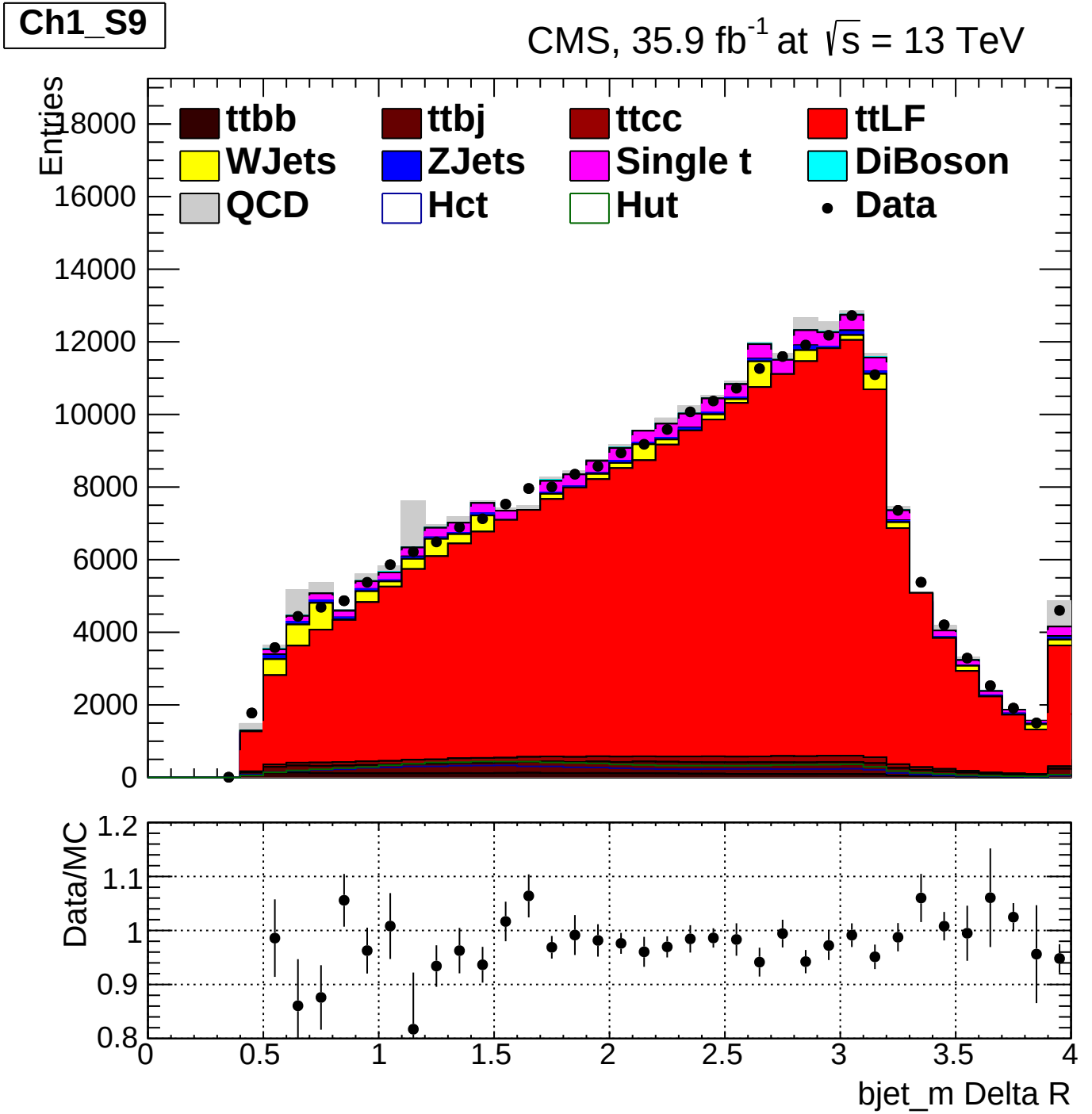

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

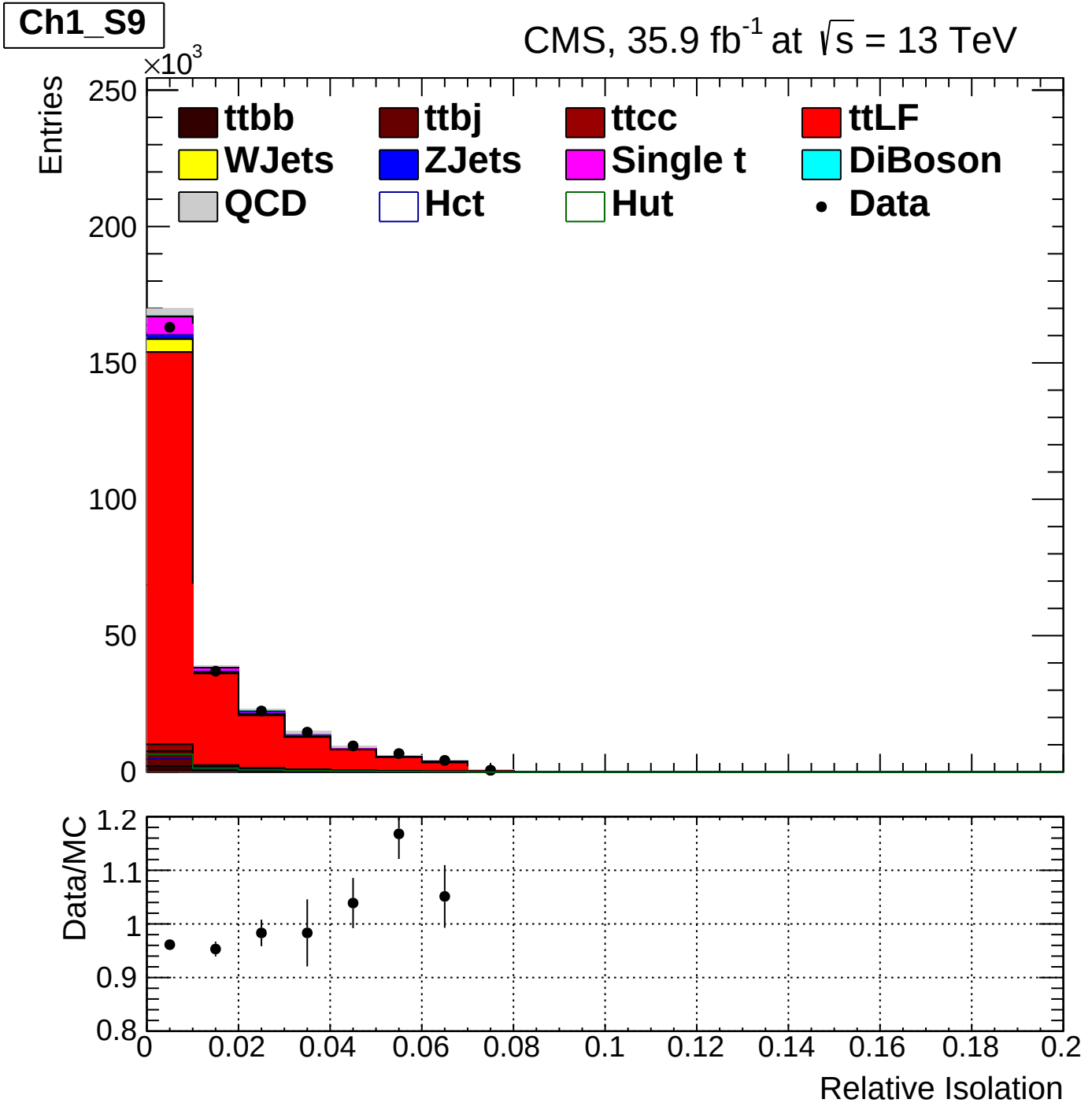

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

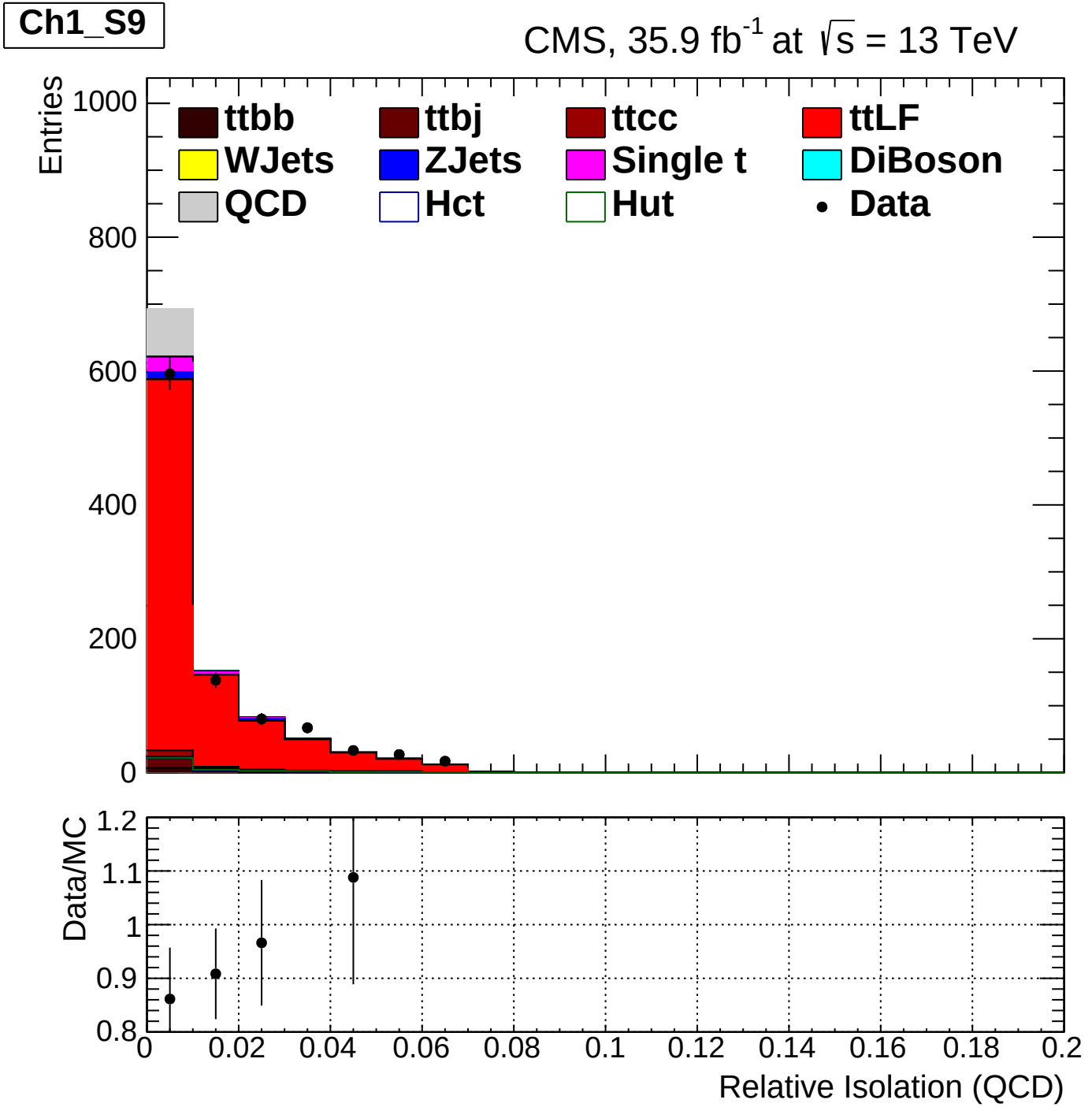

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
8000
7000
6000
5000
4000
3000
2000
1000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

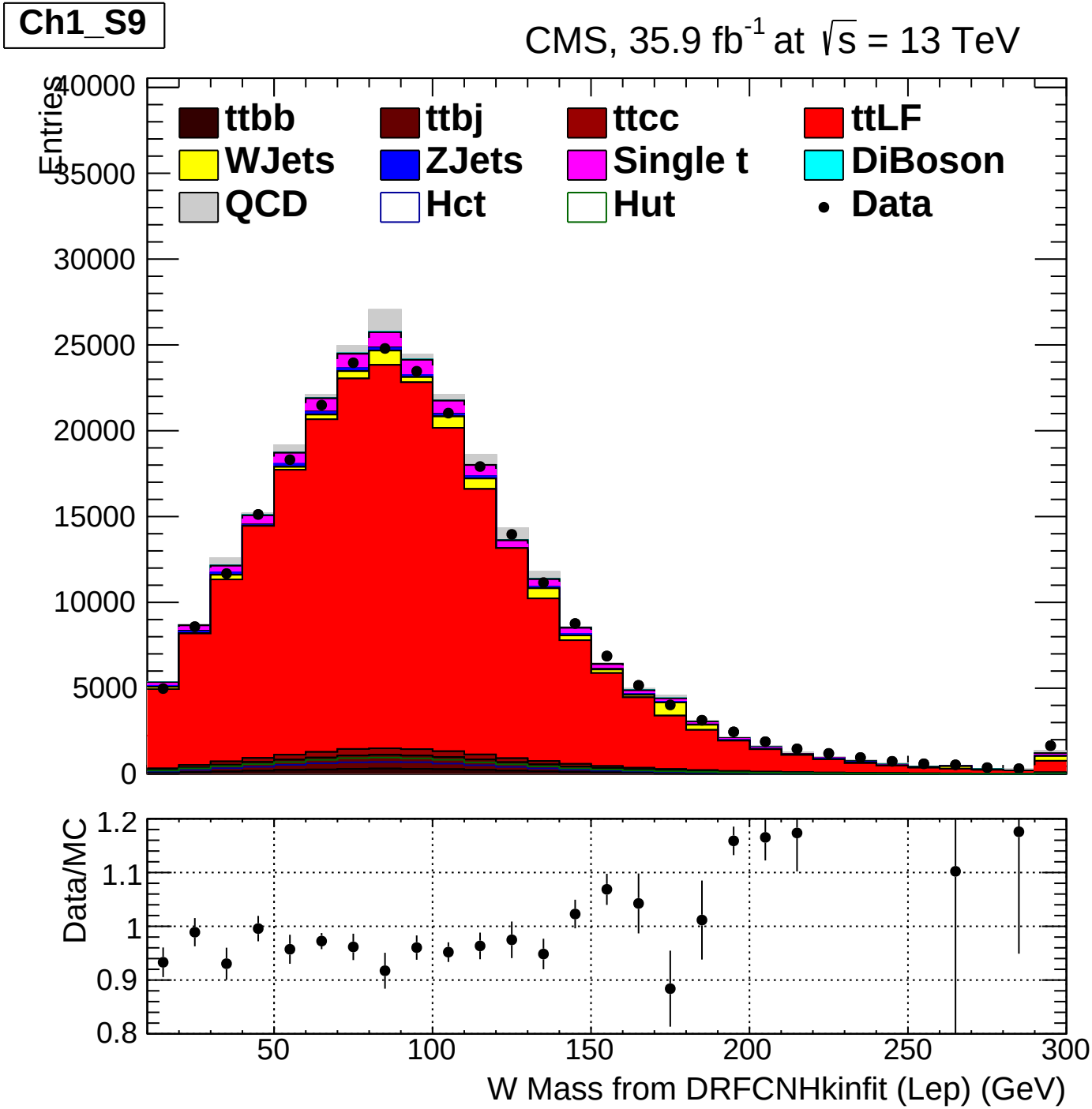

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
9000
8000
7000
6000
5000
4000
3000
2000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

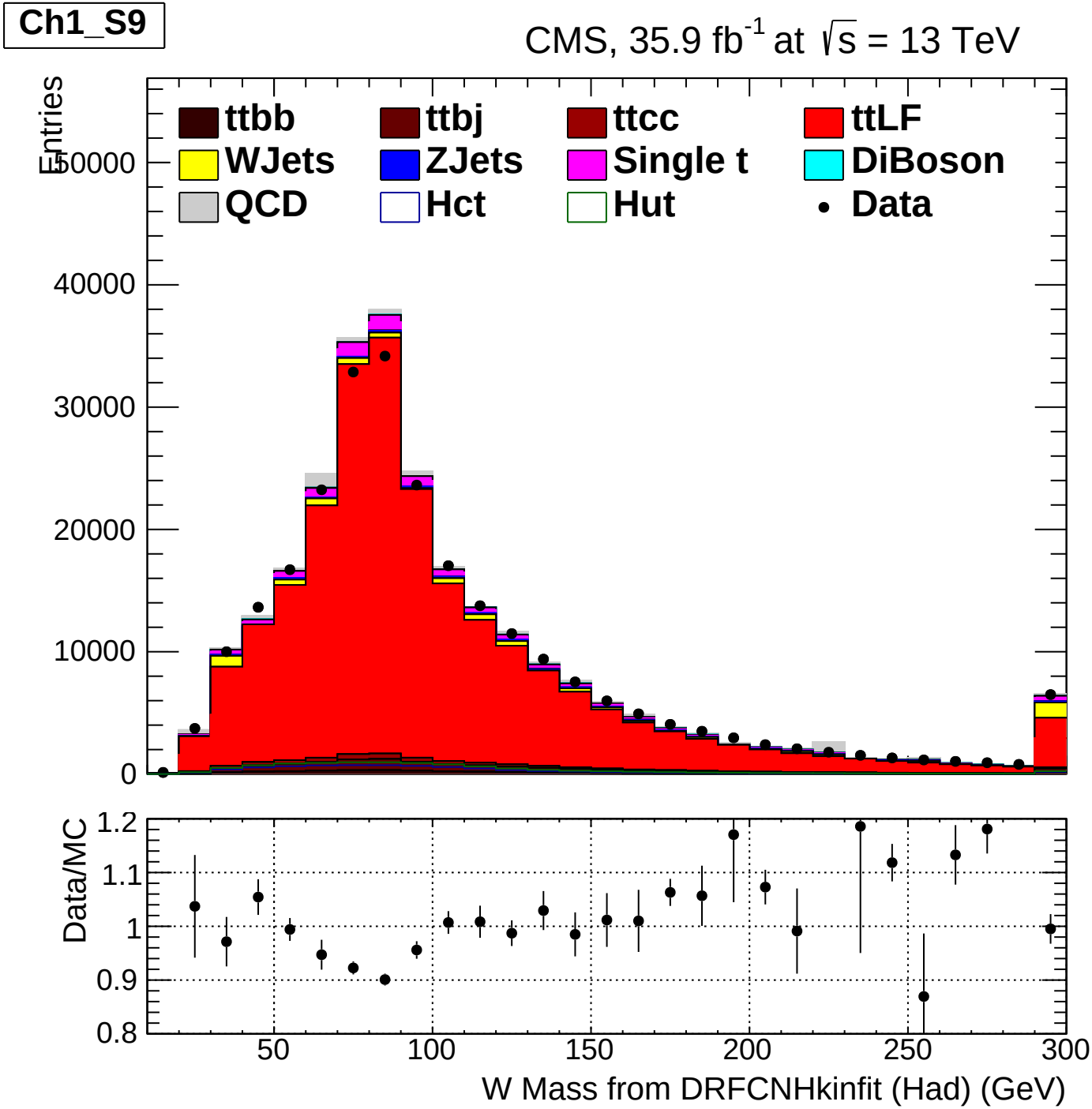

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

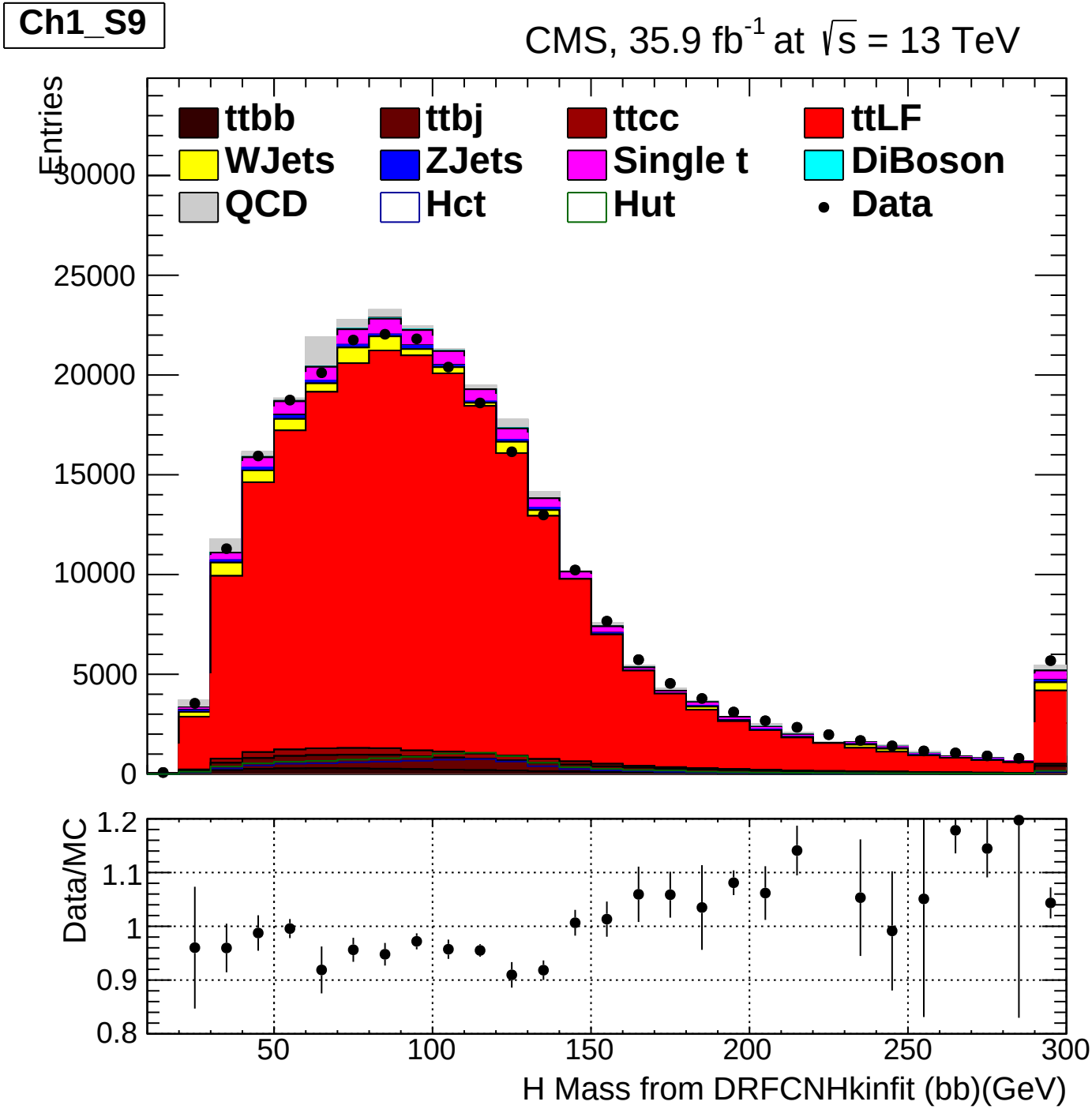

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

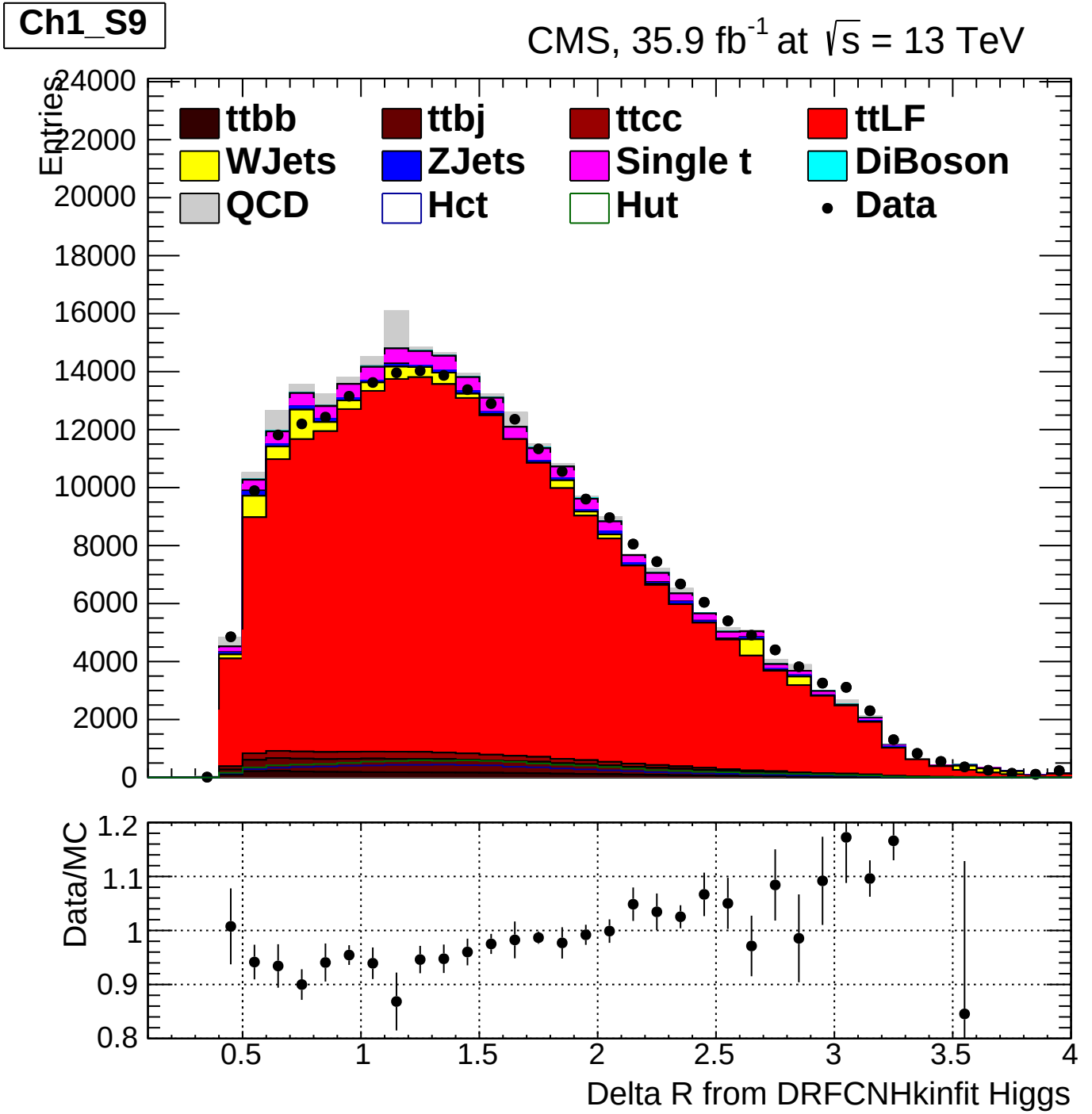

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

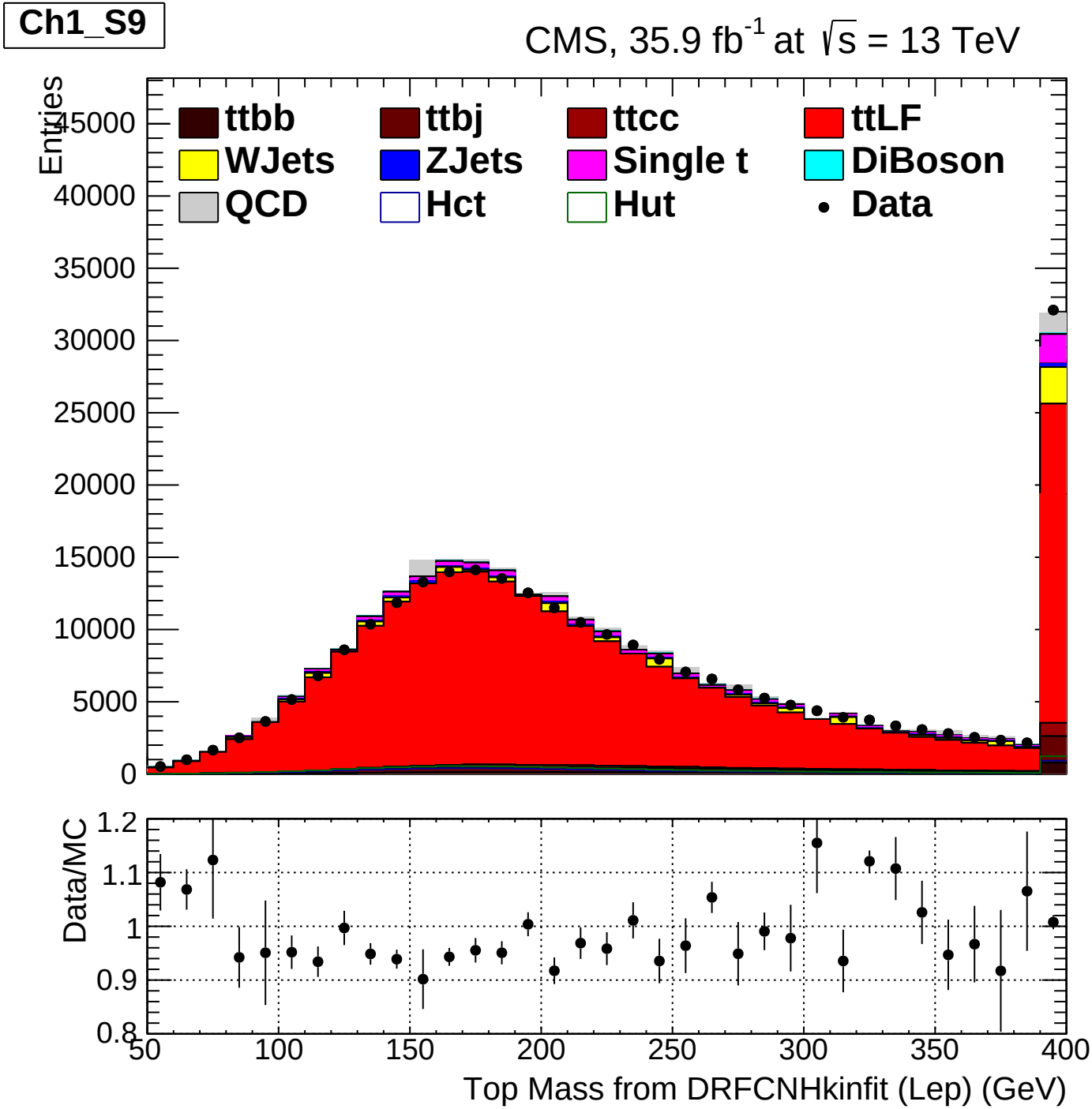

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

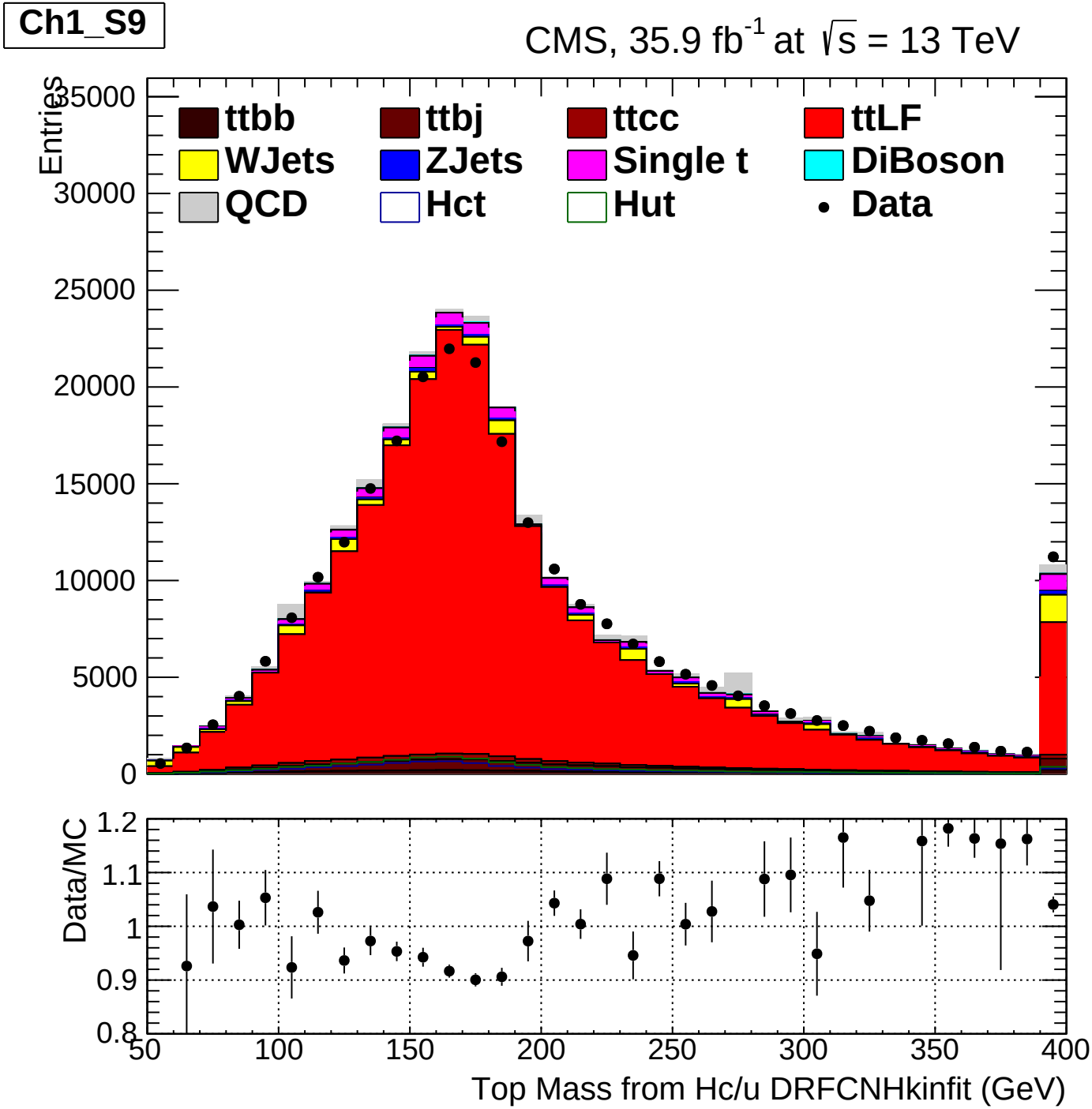

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

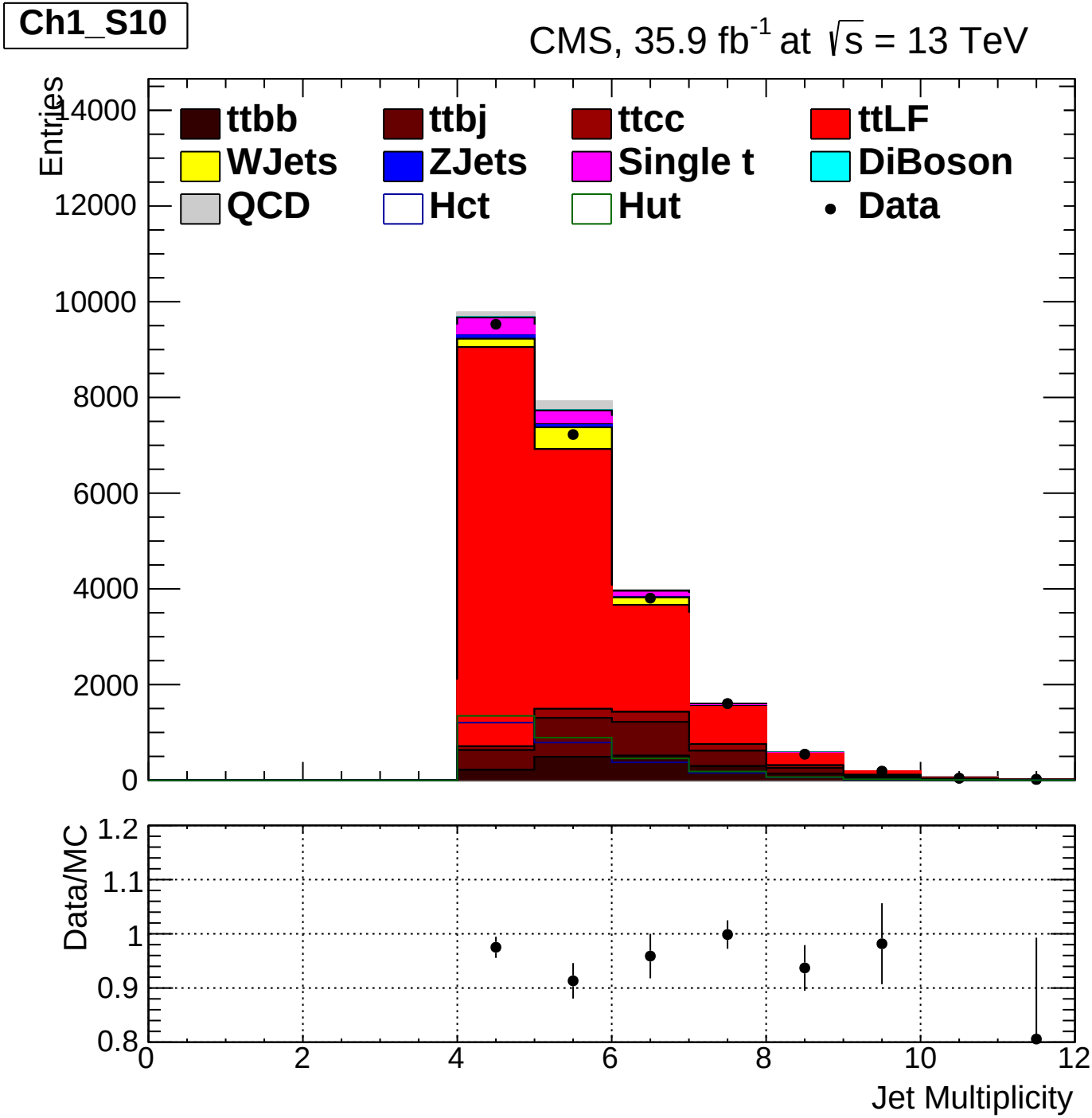

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
W Mass from DRFCNHkinfit (Had) (GeV)

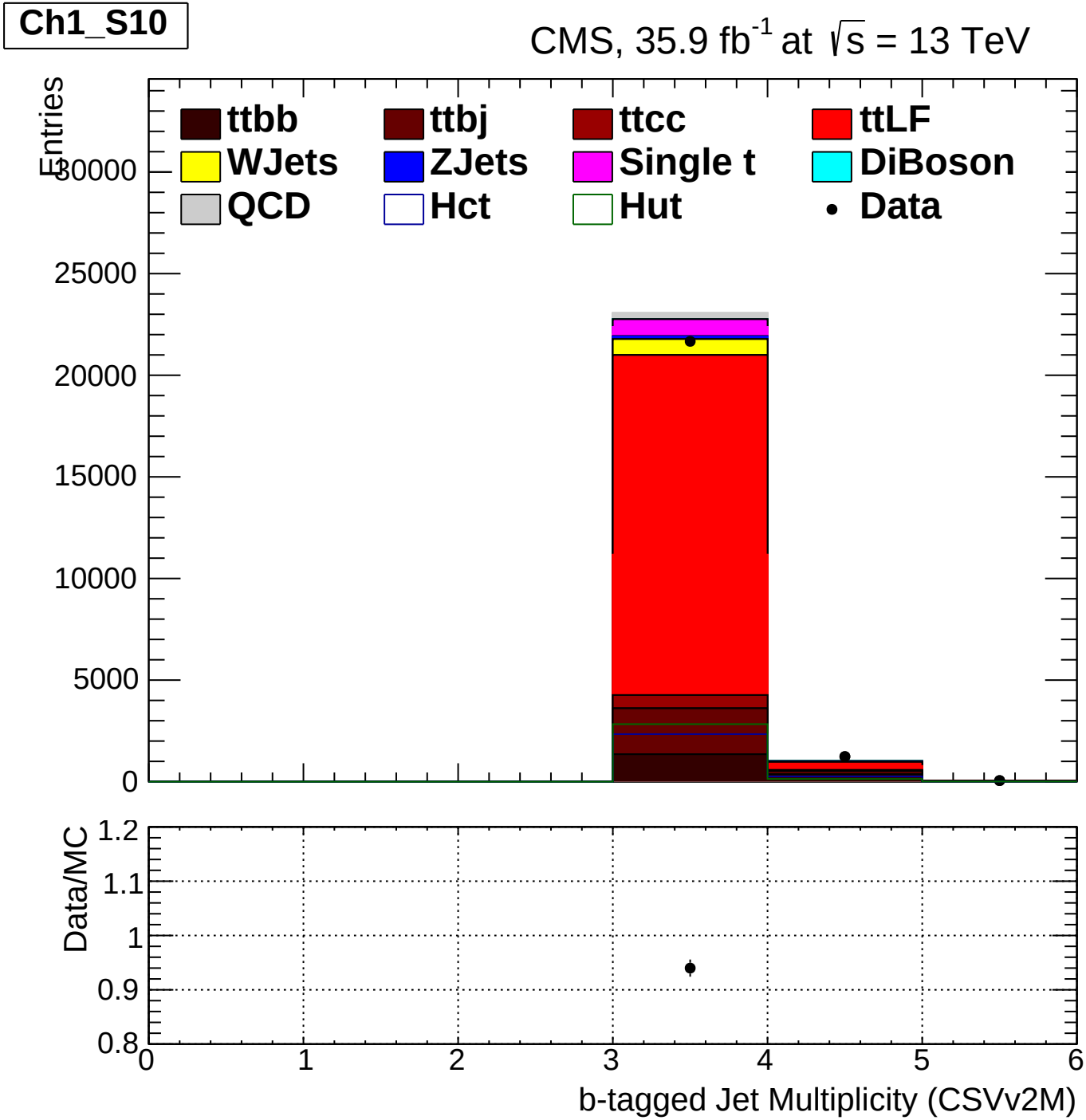

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)

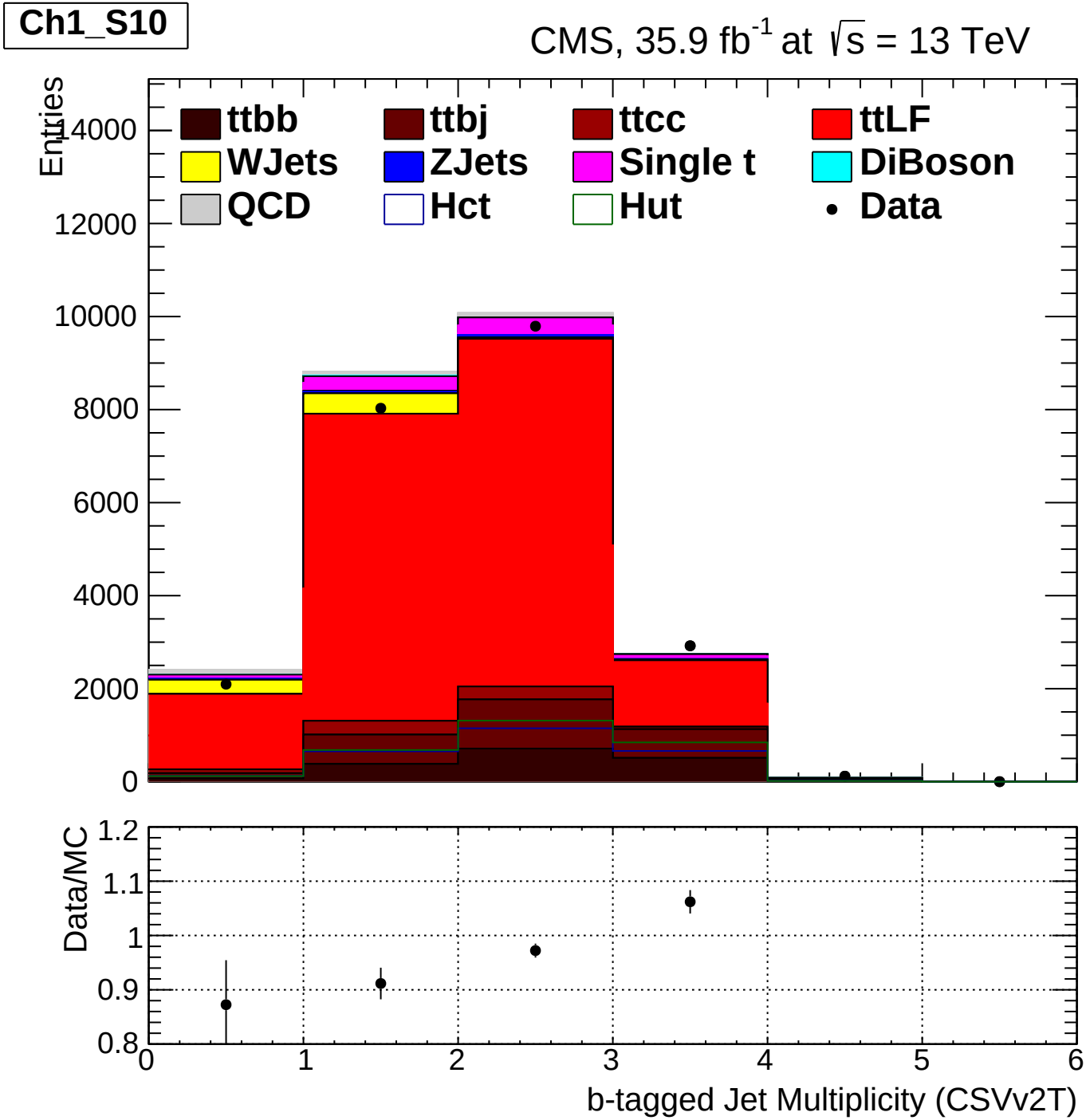

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

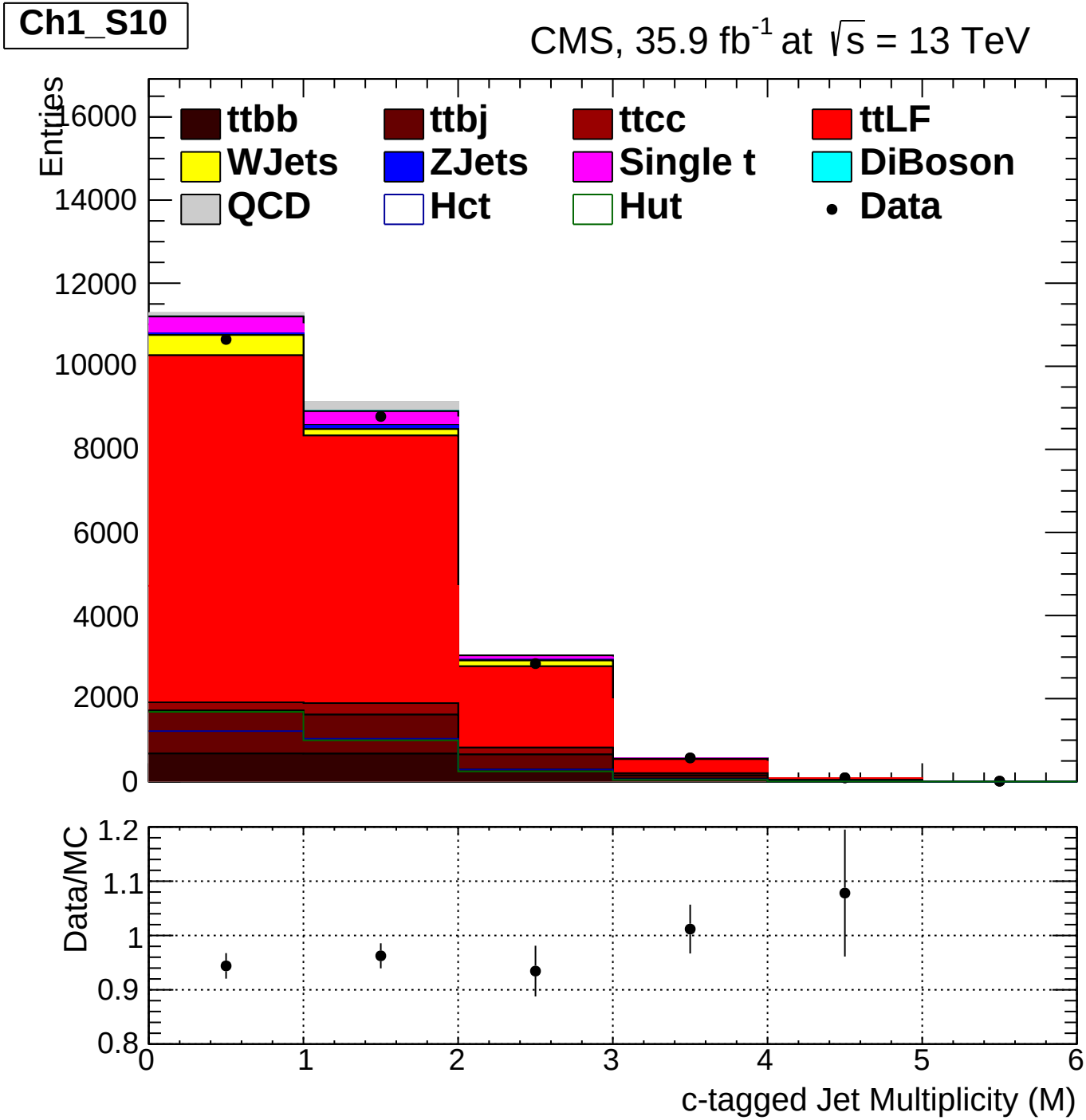

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

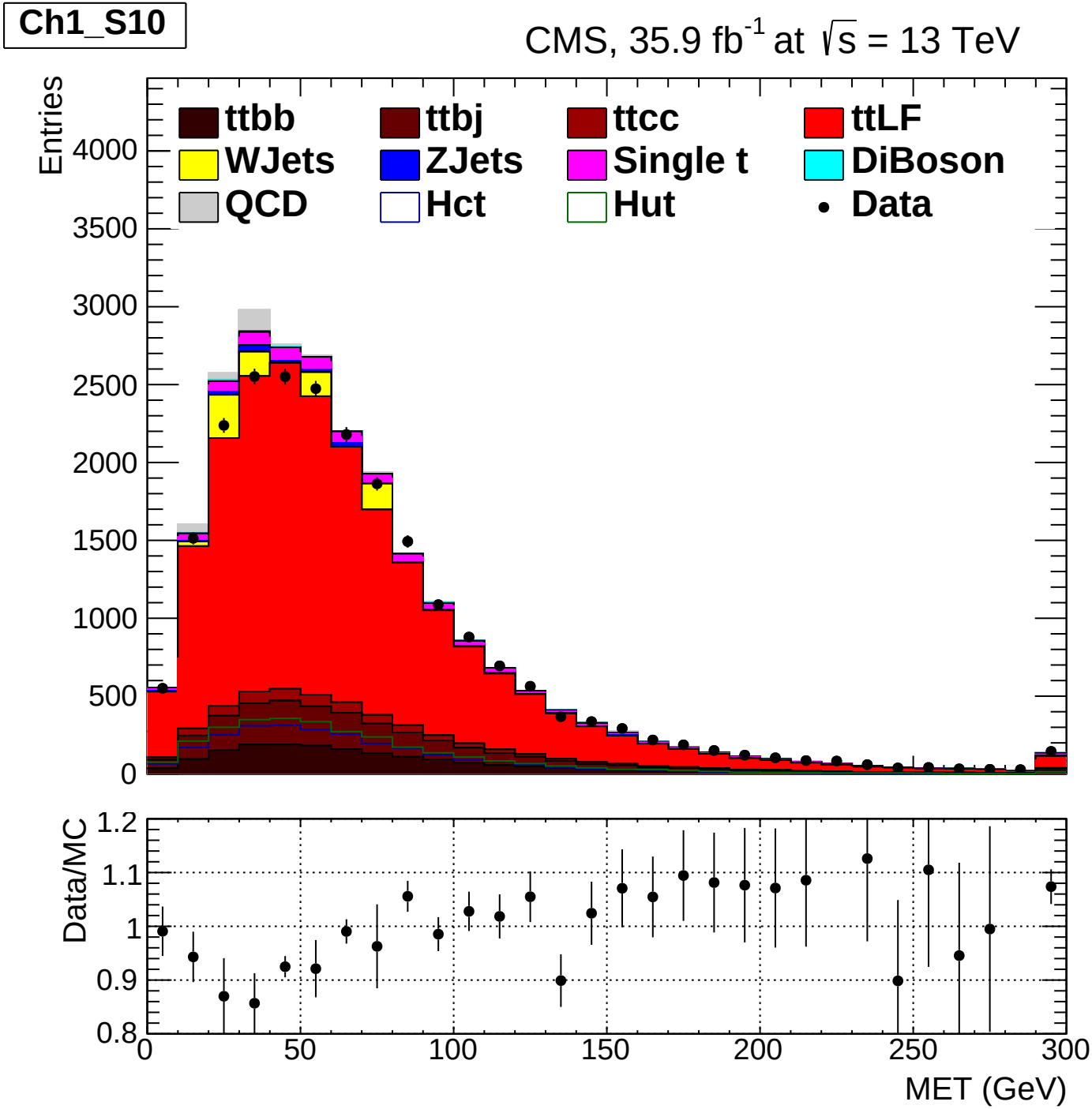

Ch1_S9
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

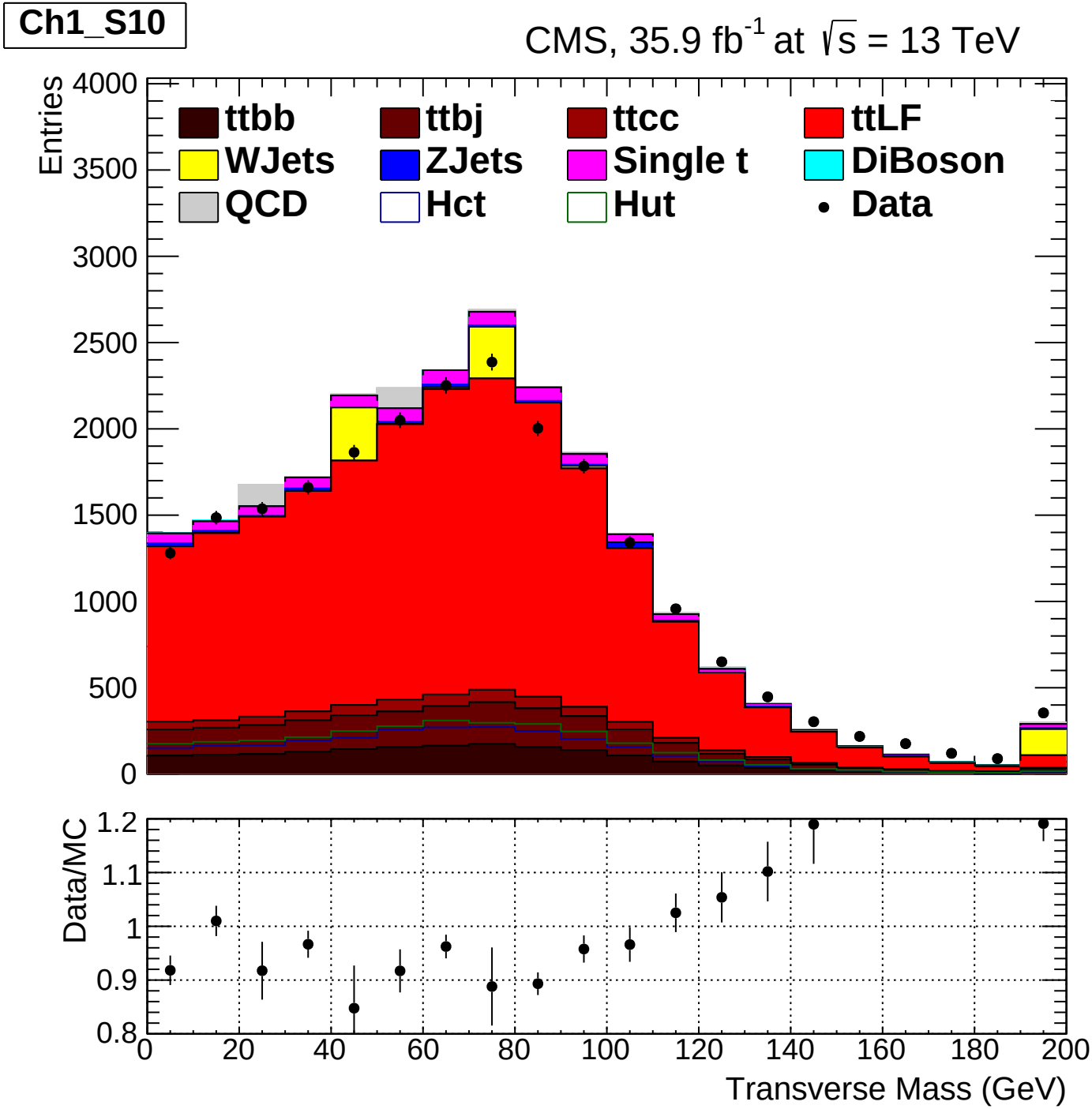

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

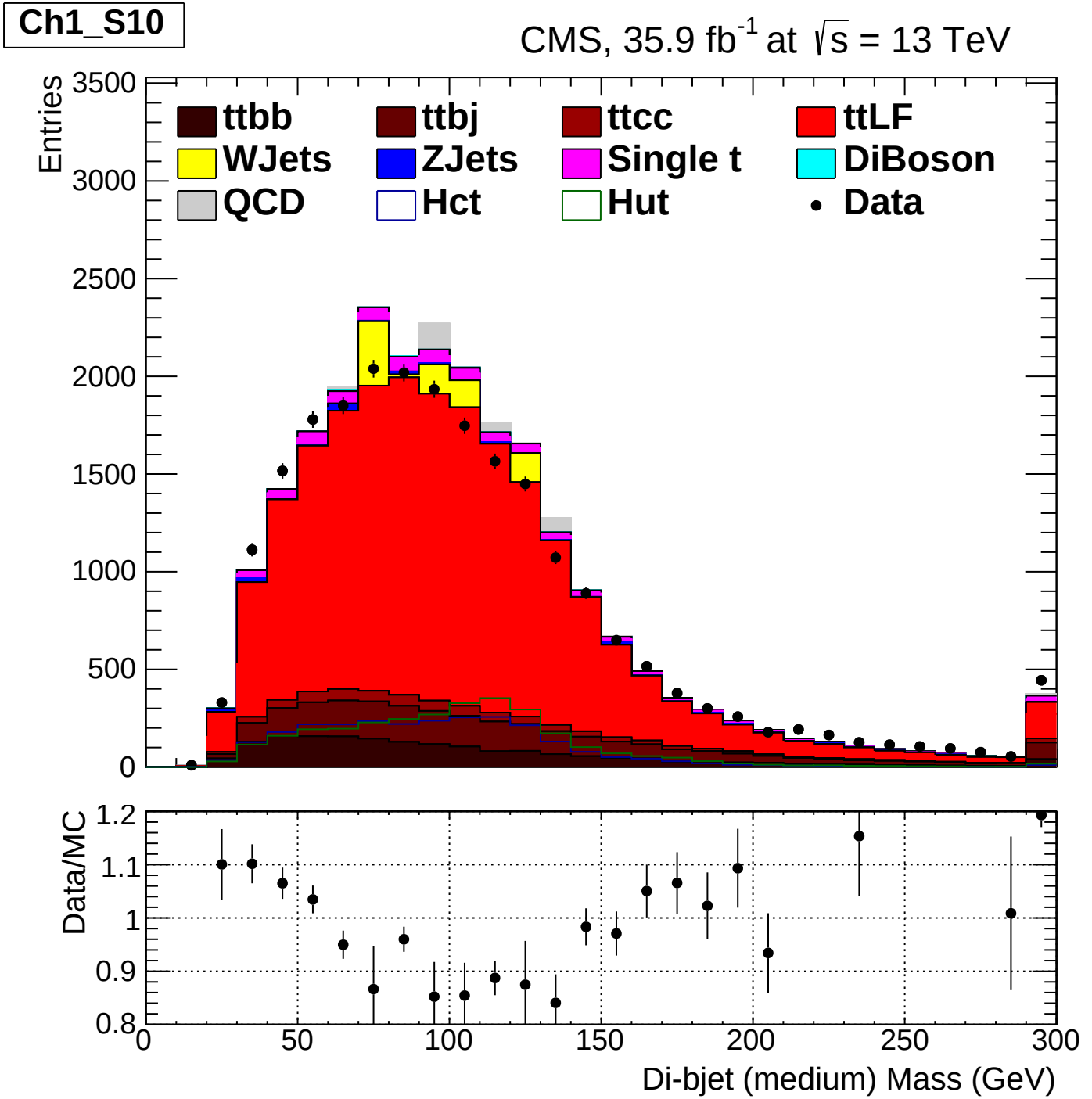

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

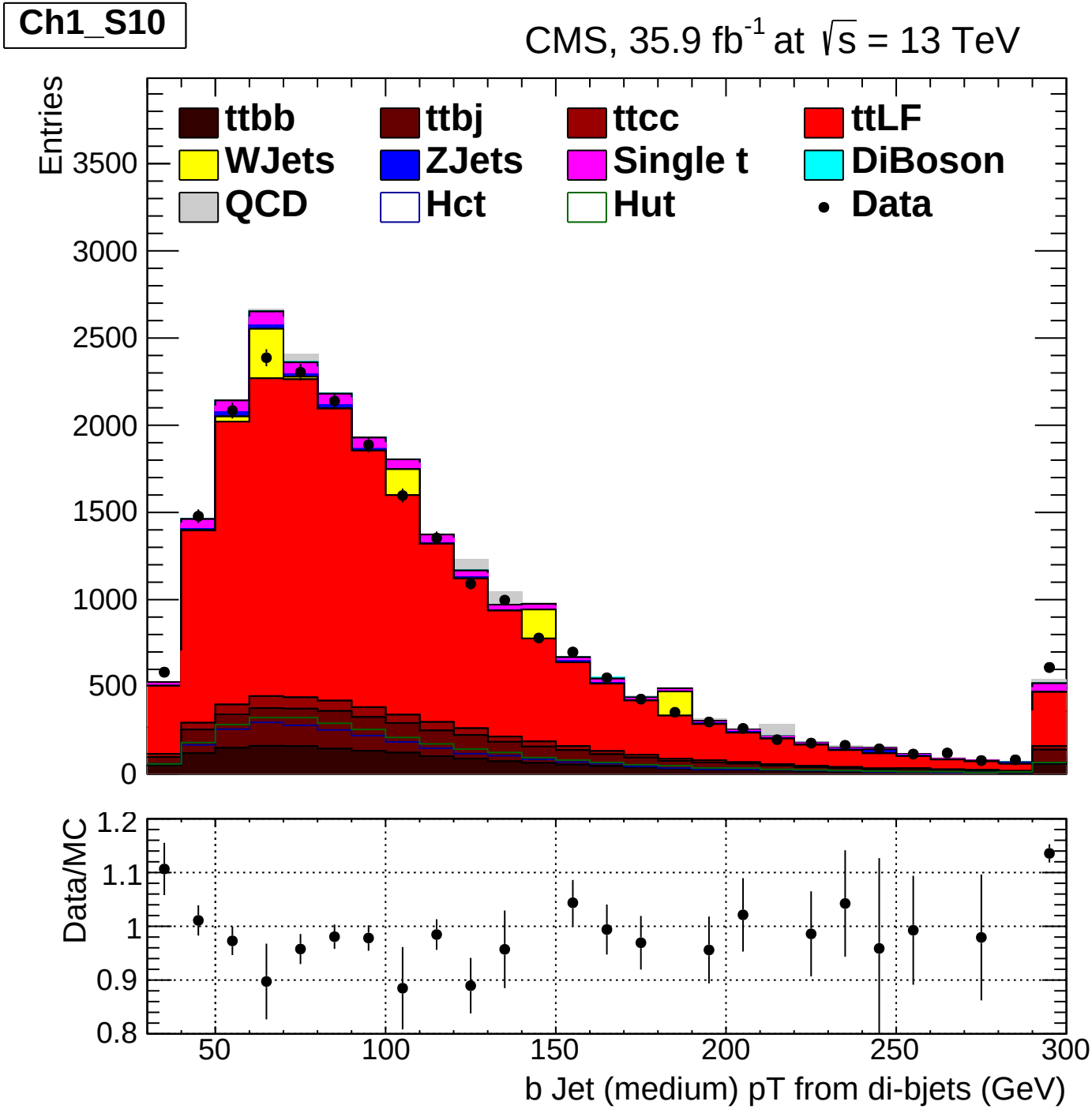

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
12000
14000
Data/MC
0.8
0.9
1
1.1
1.2
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

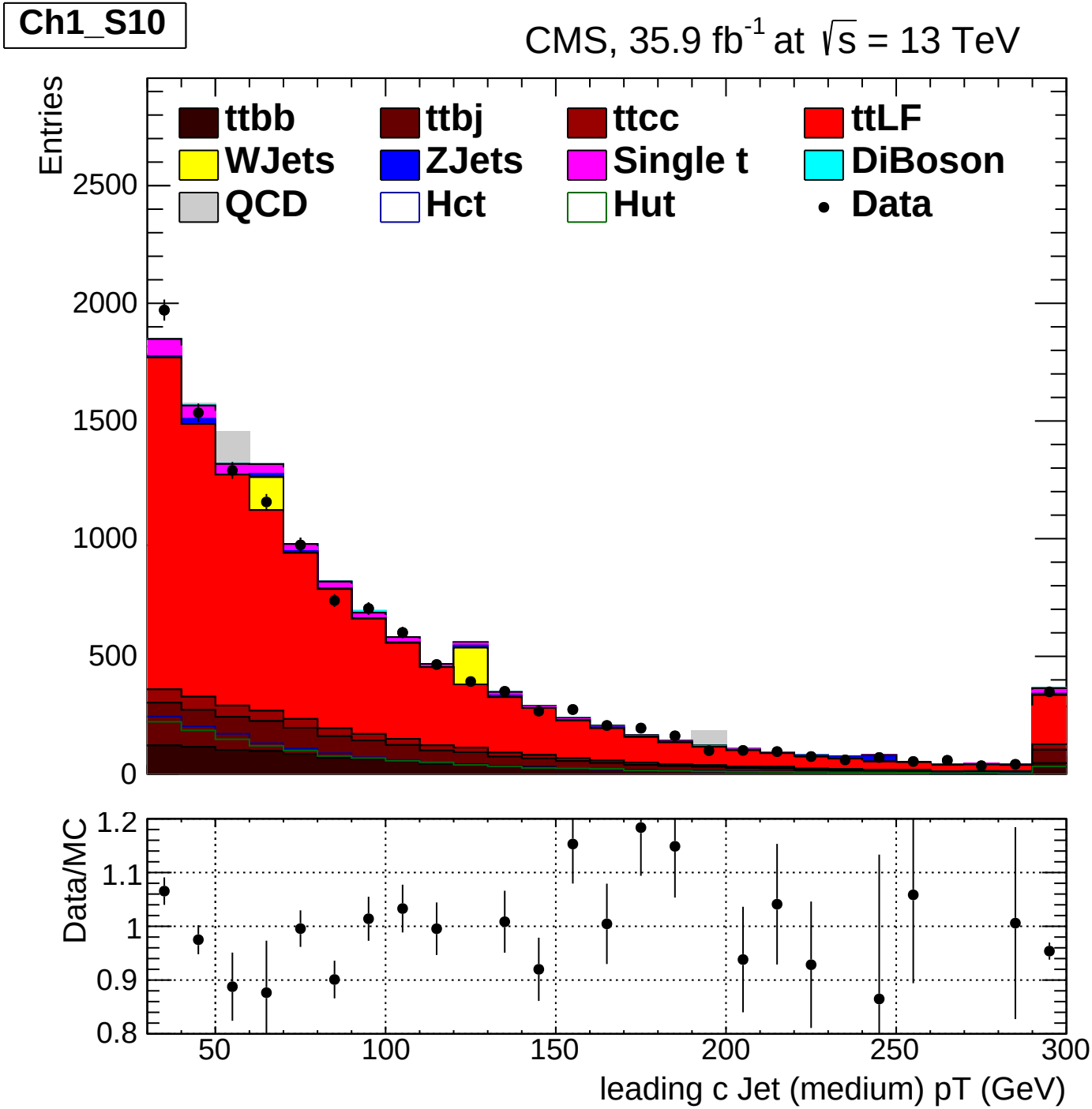

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

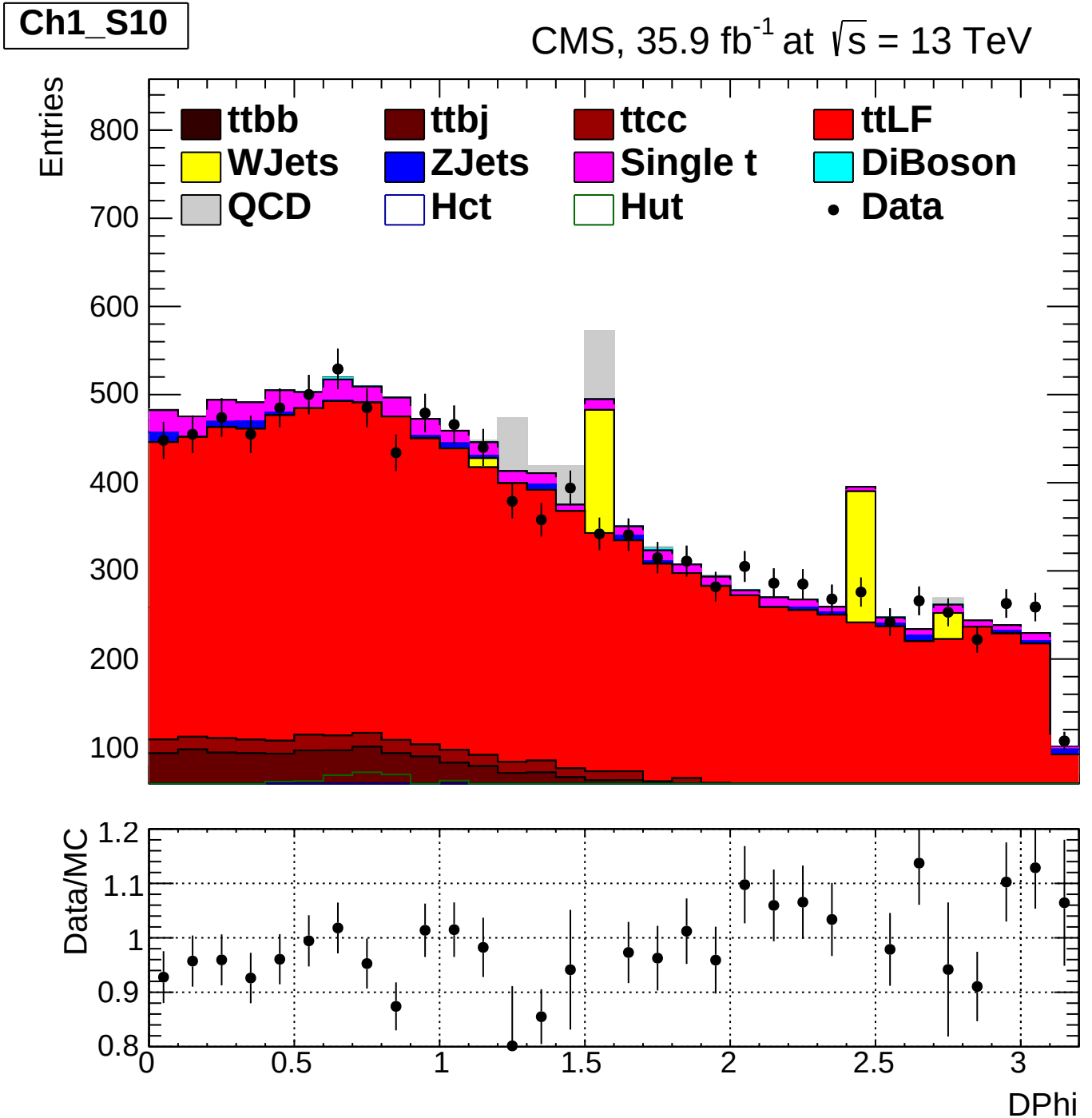

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

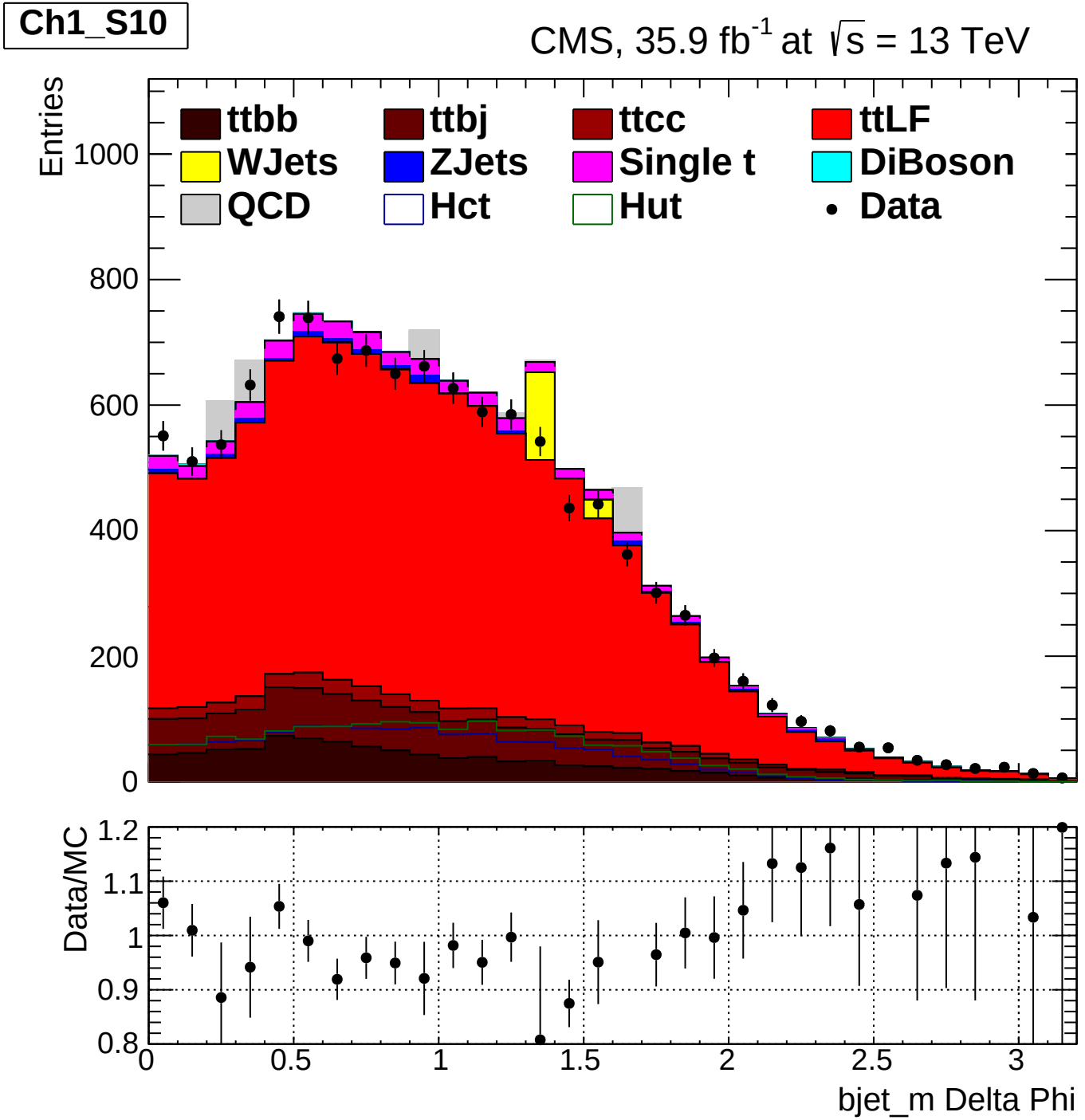

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

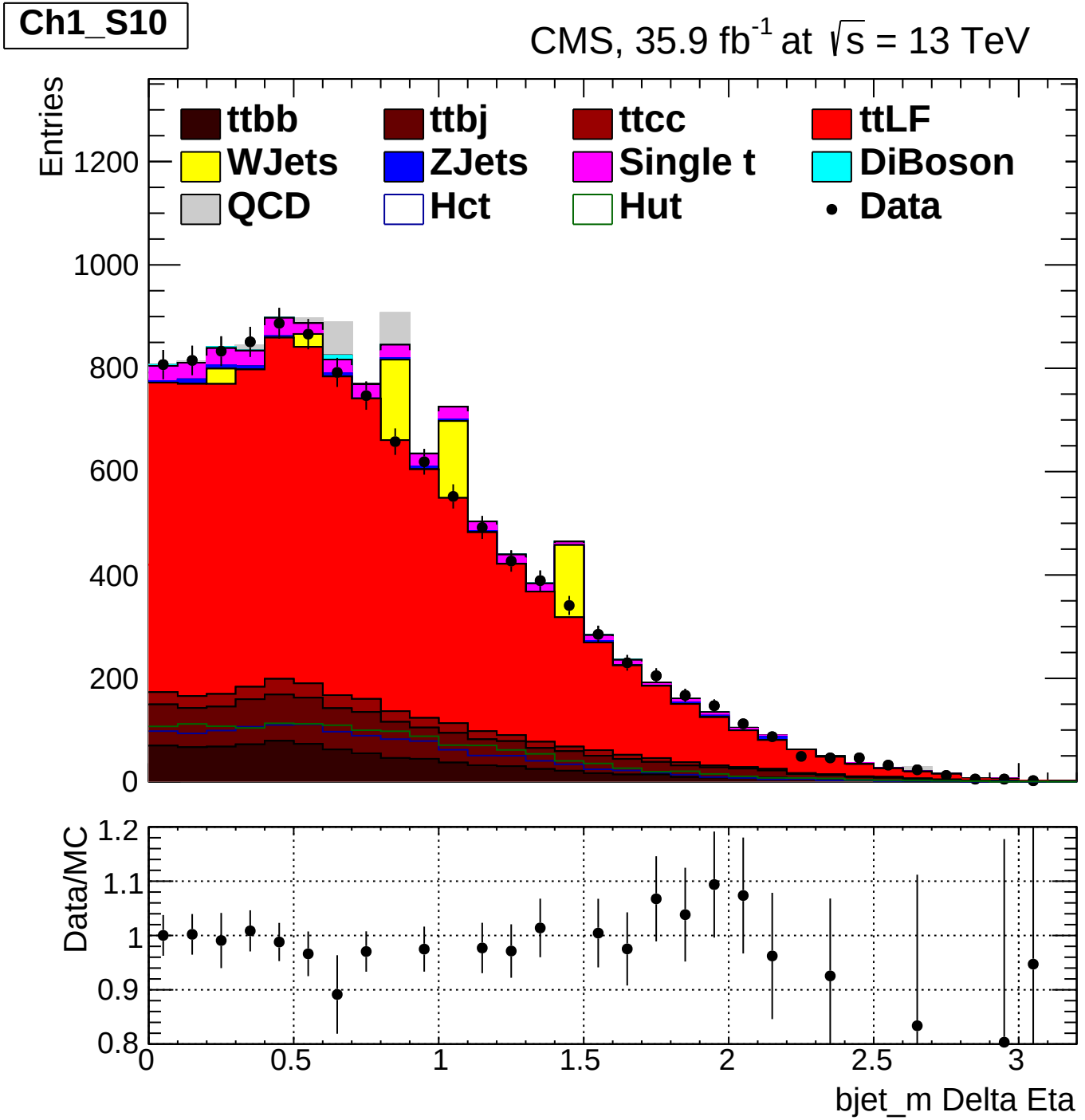

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

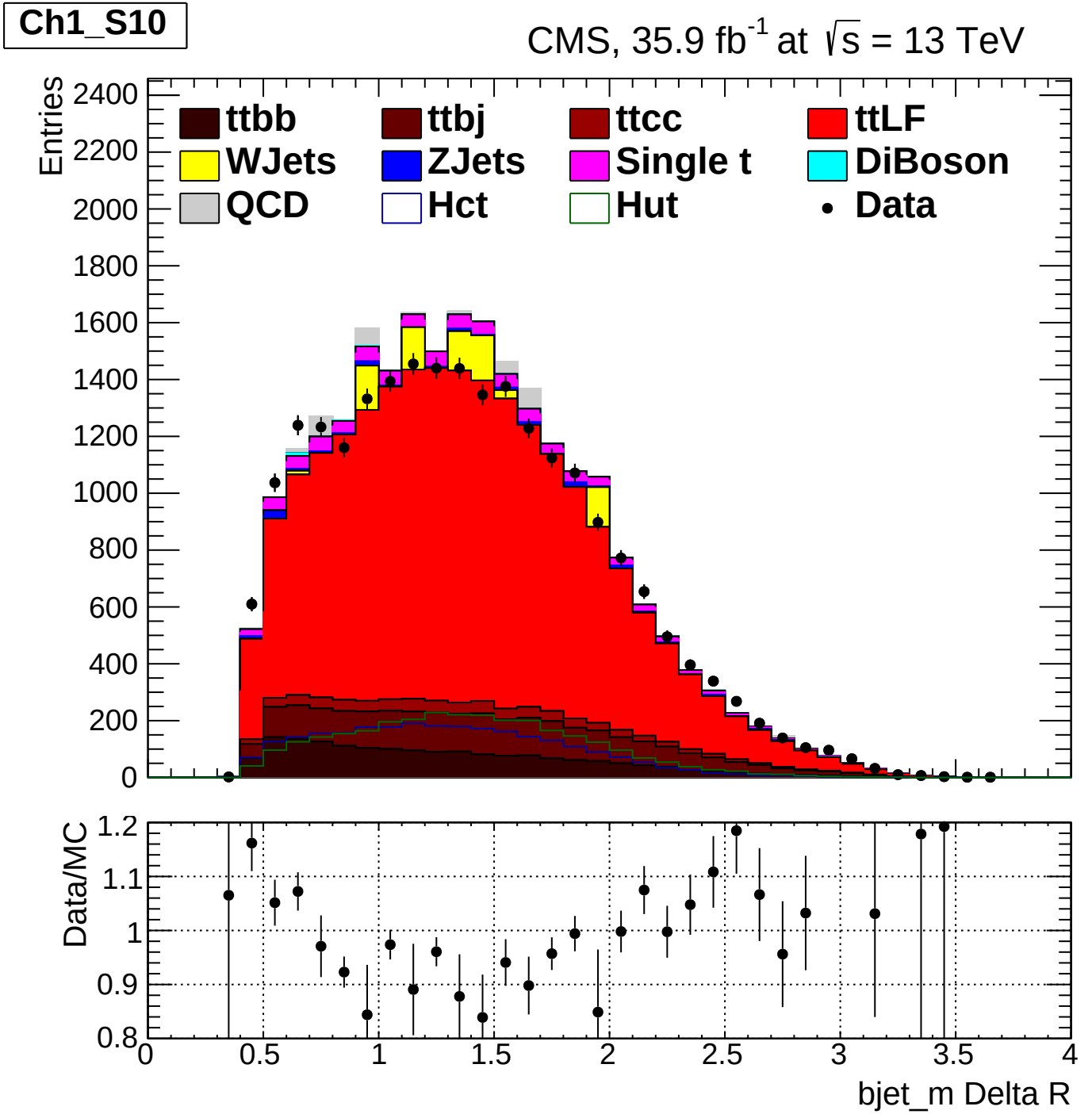

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

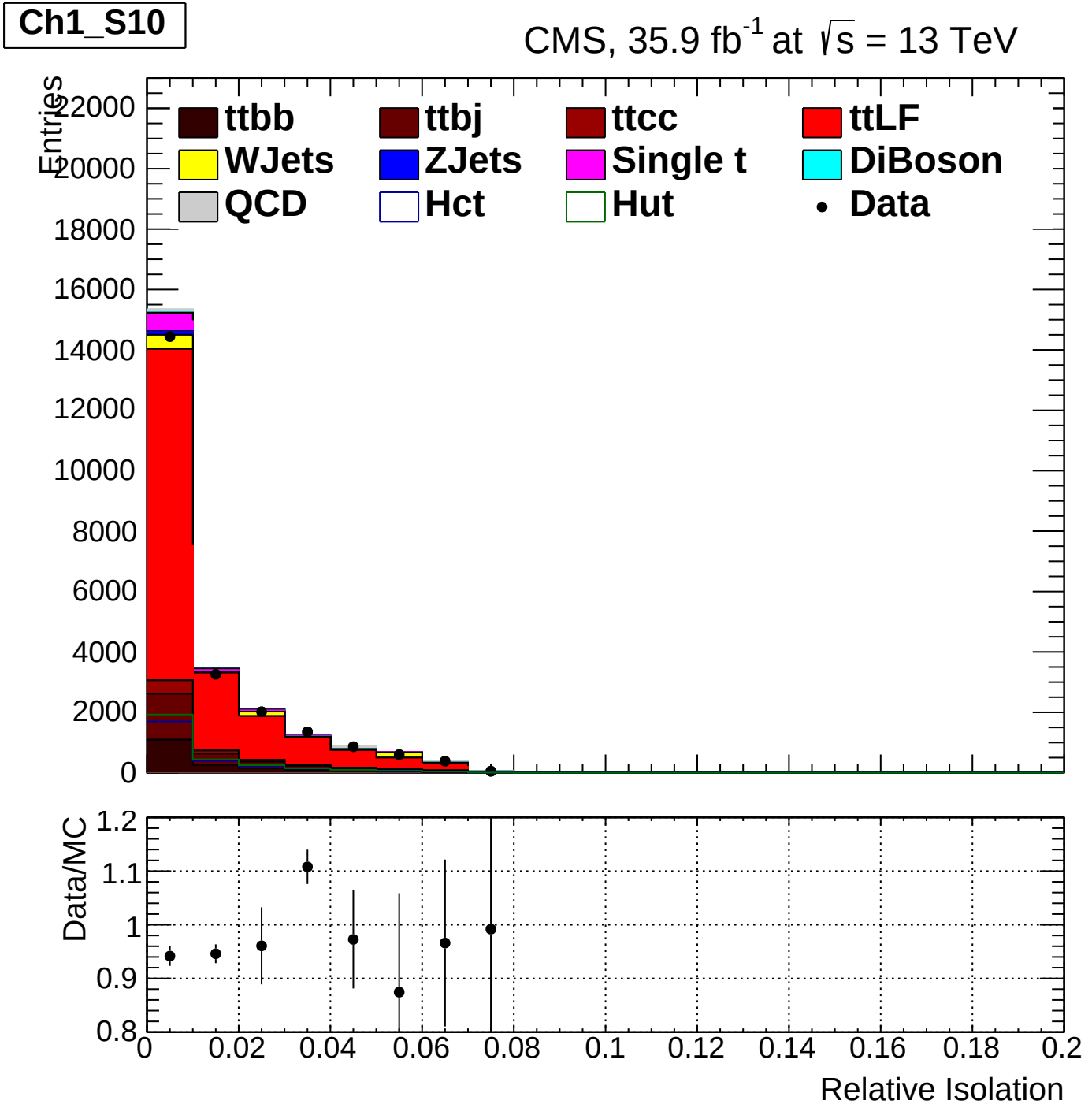

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

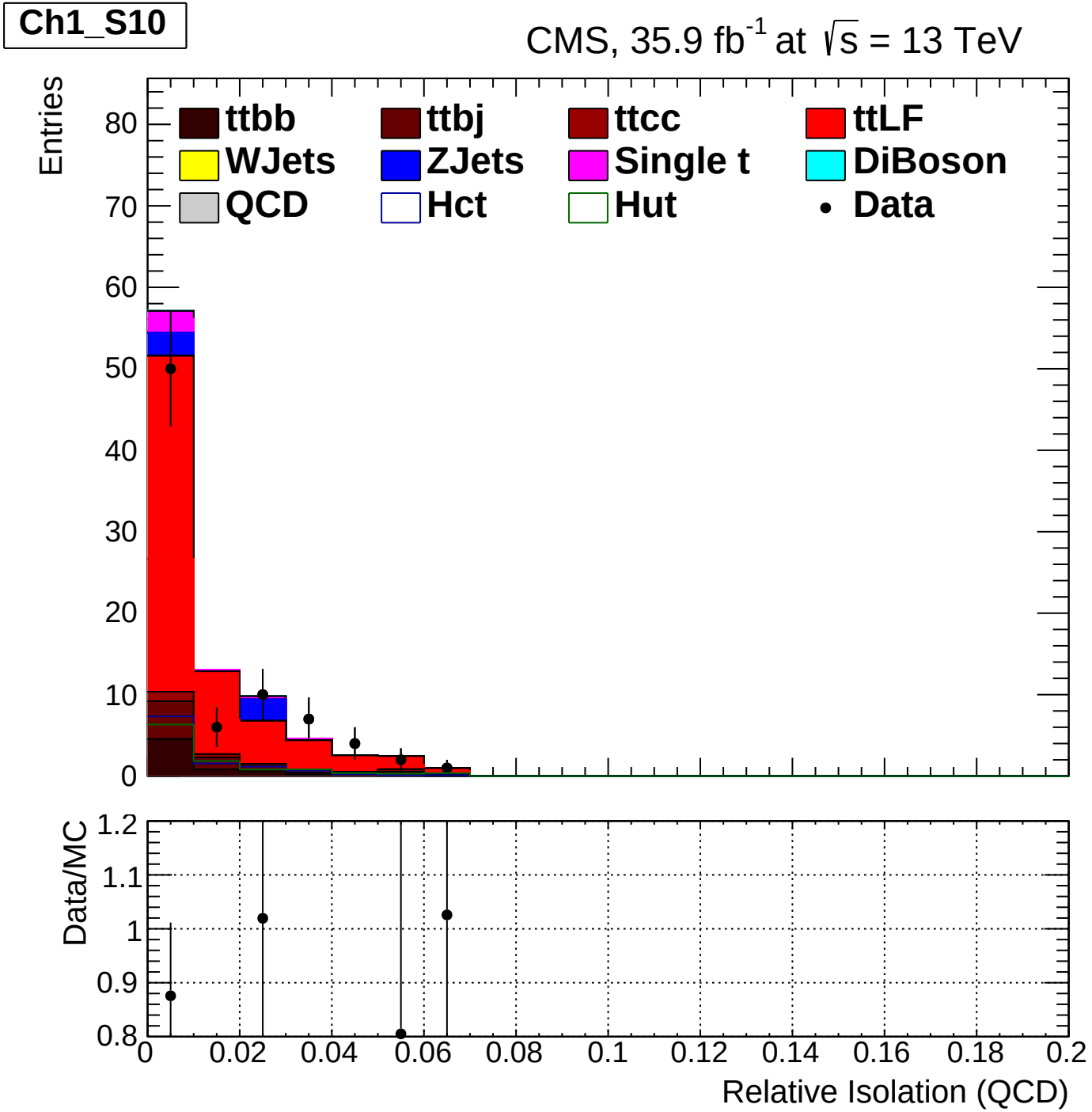

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
800
700
600
500
400
300
200
100
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

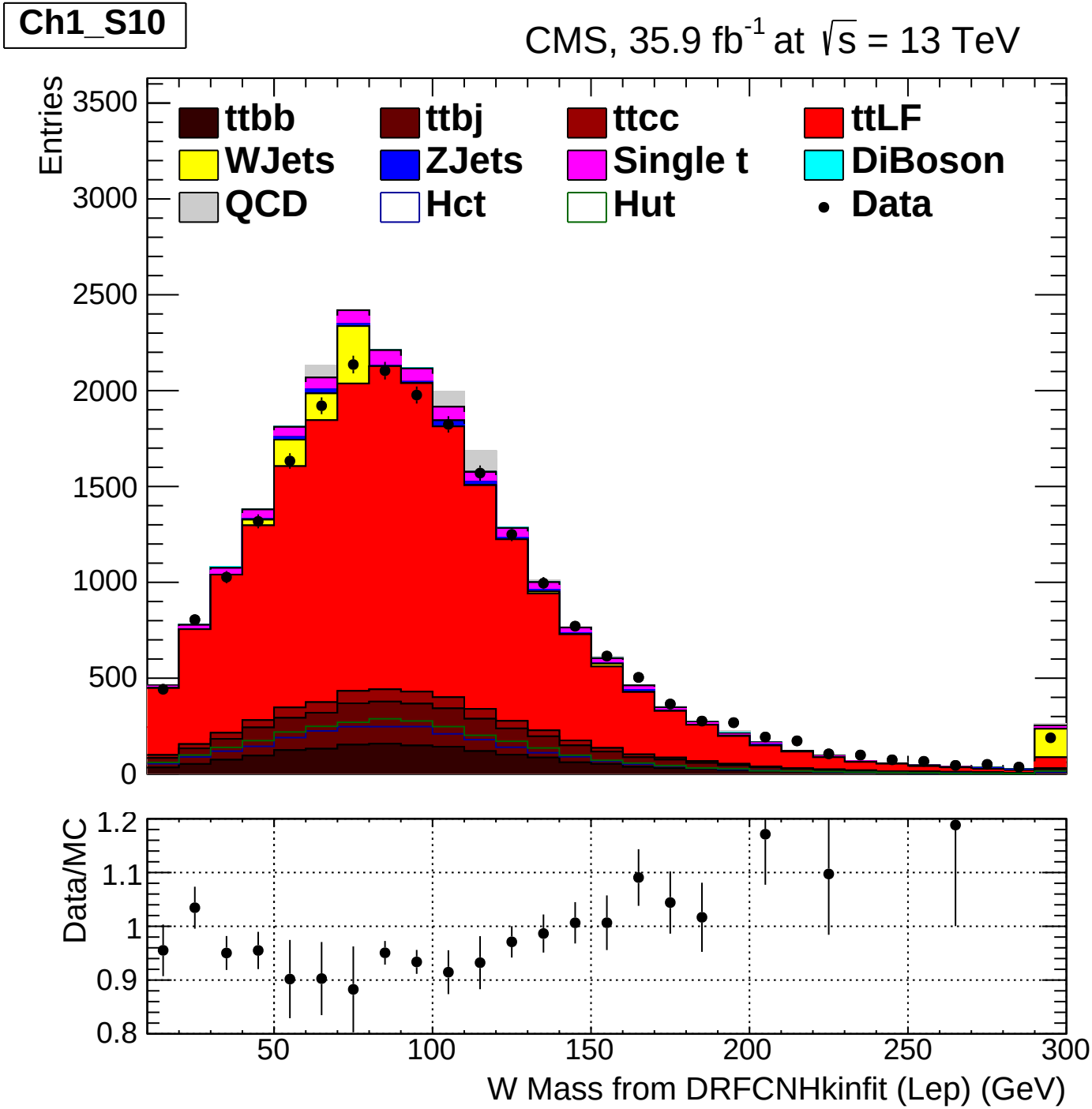

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

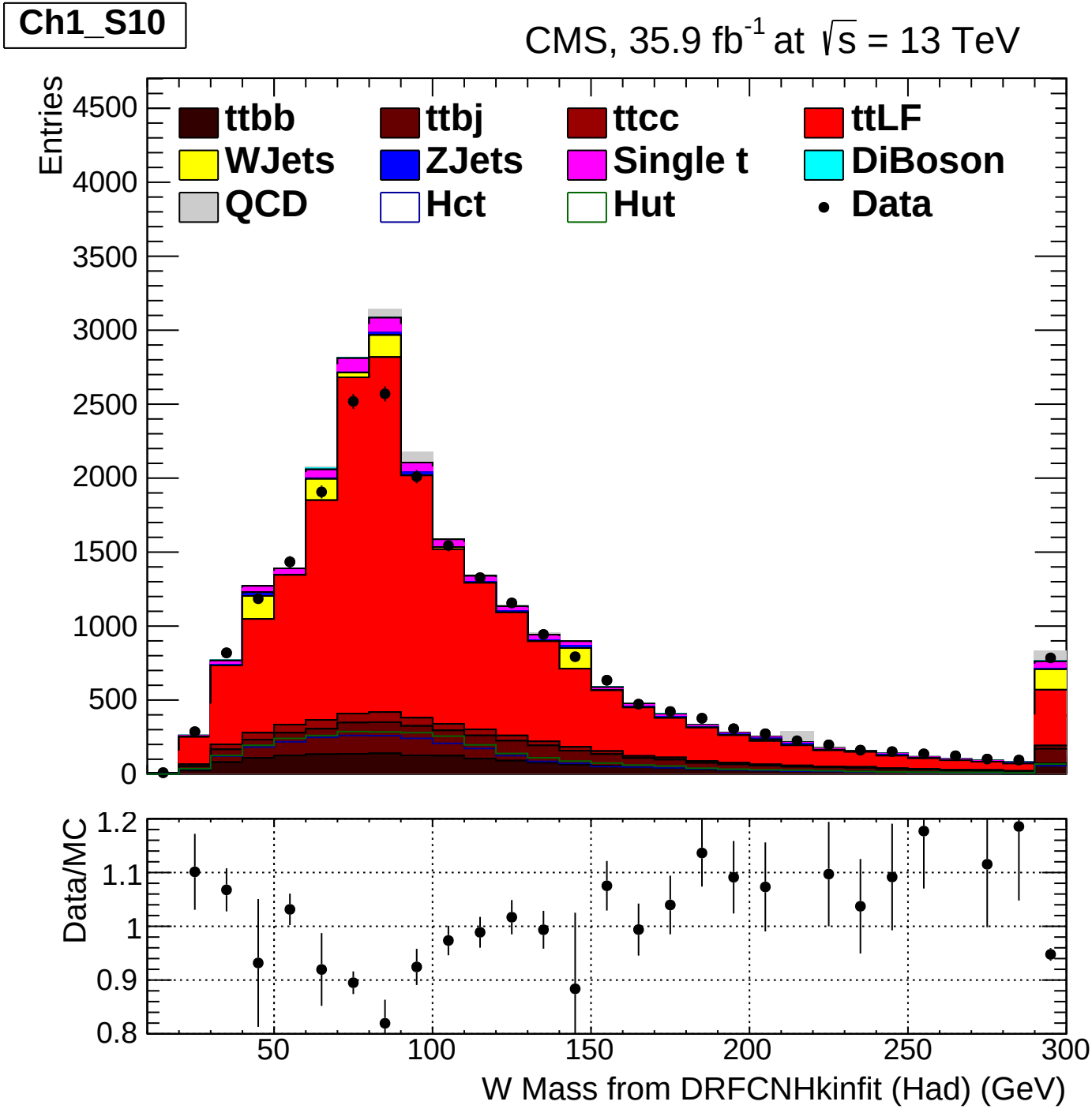

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
1200
Data/MC
0.8
0.9
1
1.1
1.2
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Eta

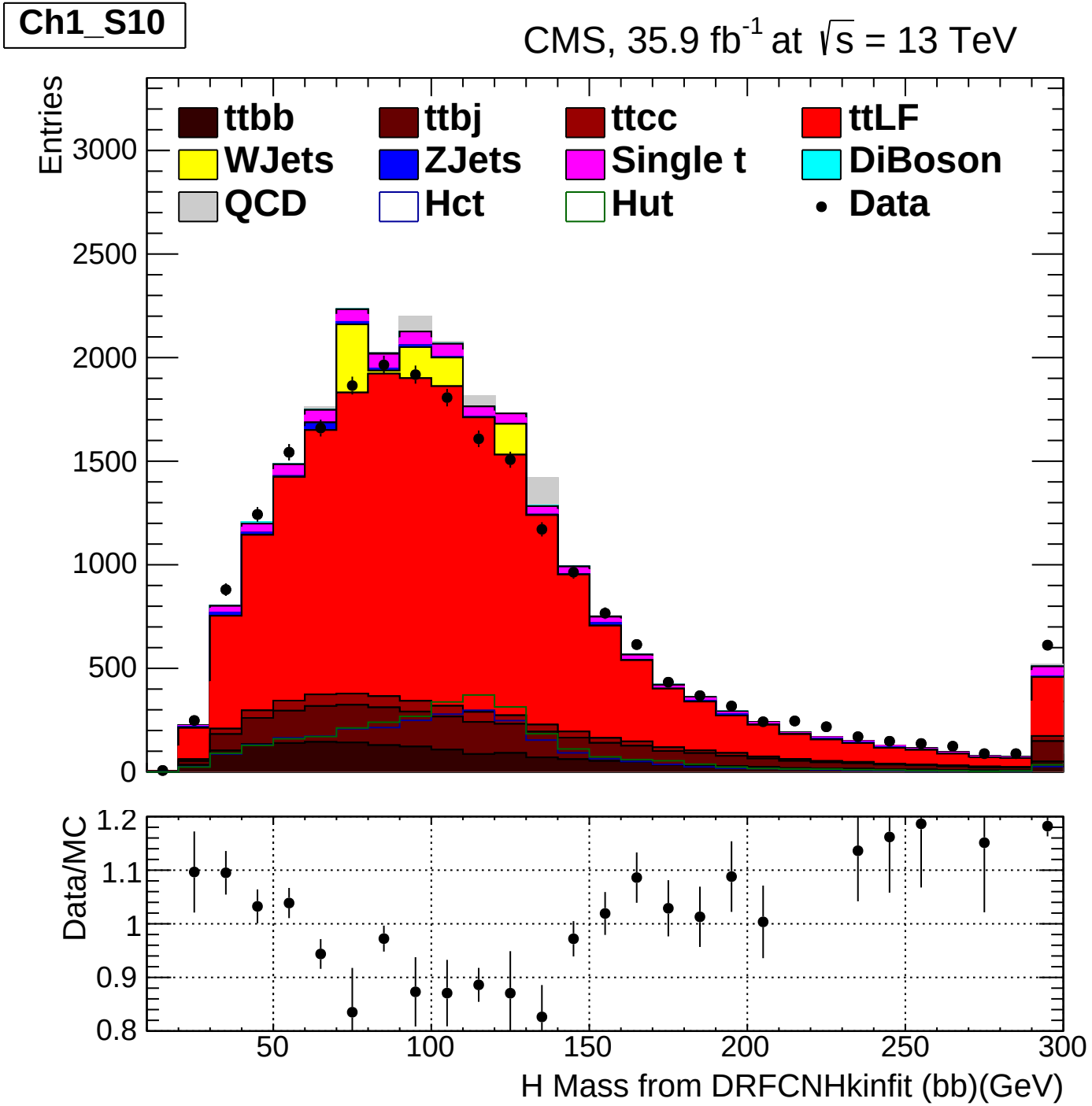

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

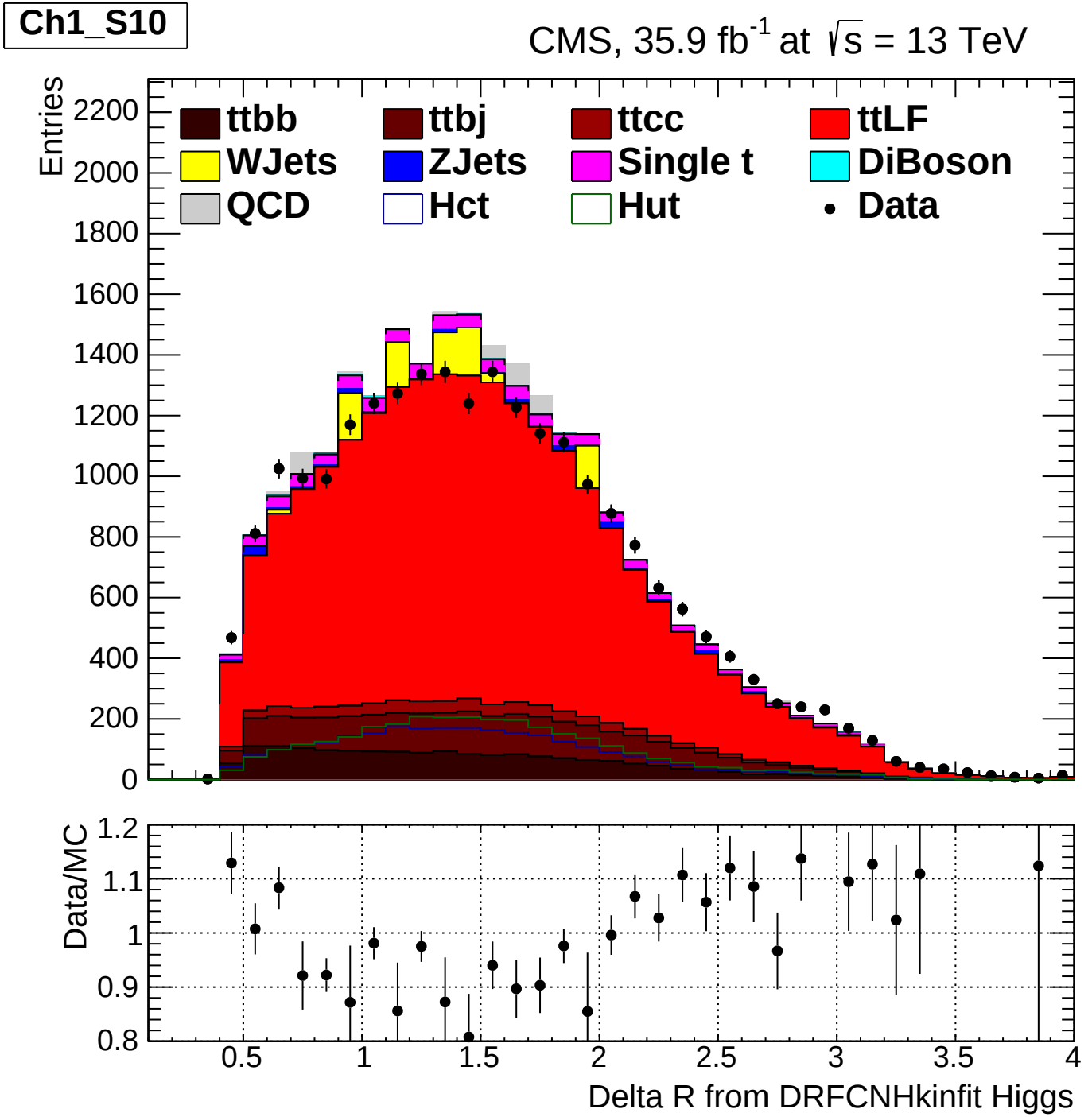

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

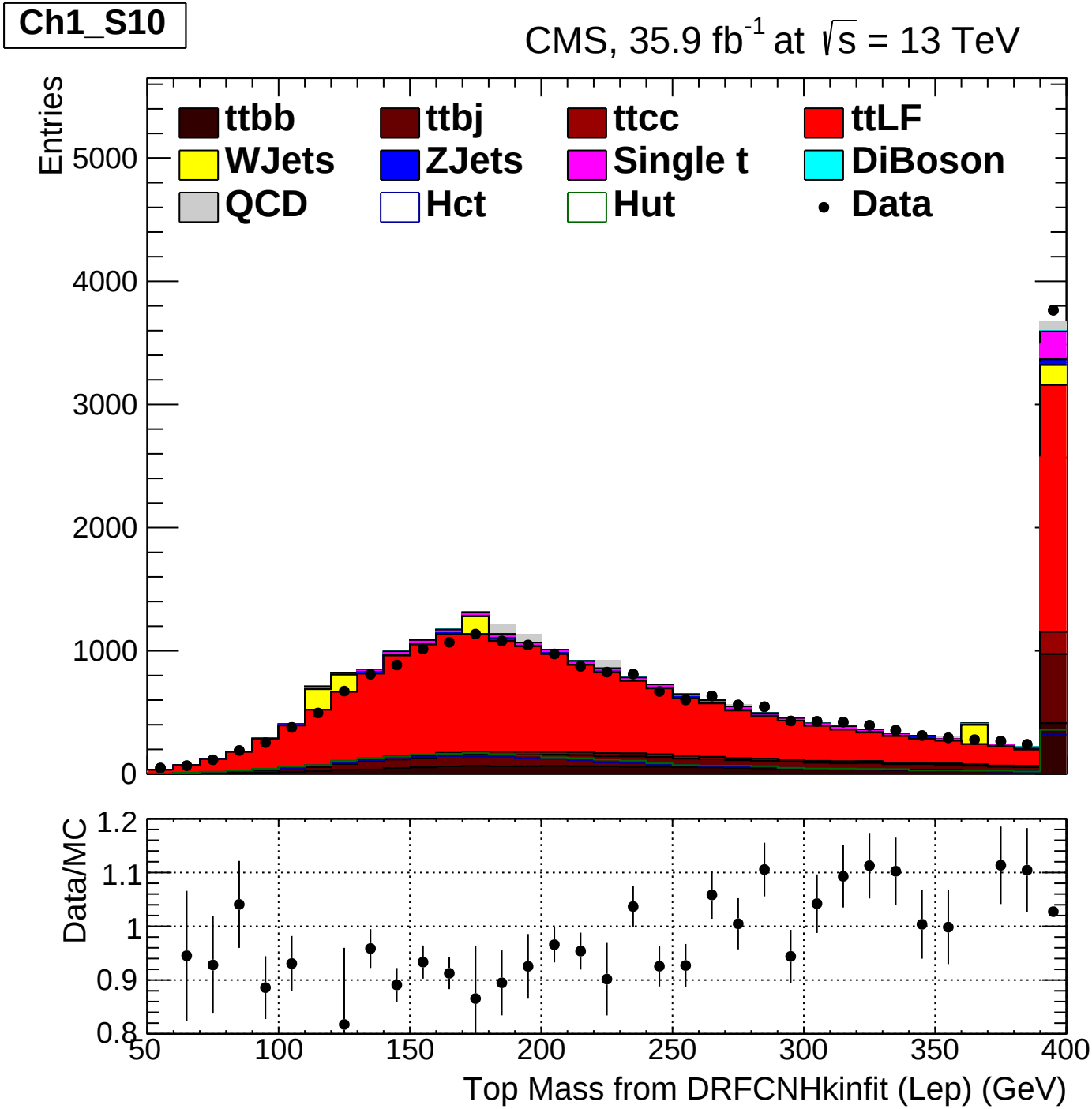

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

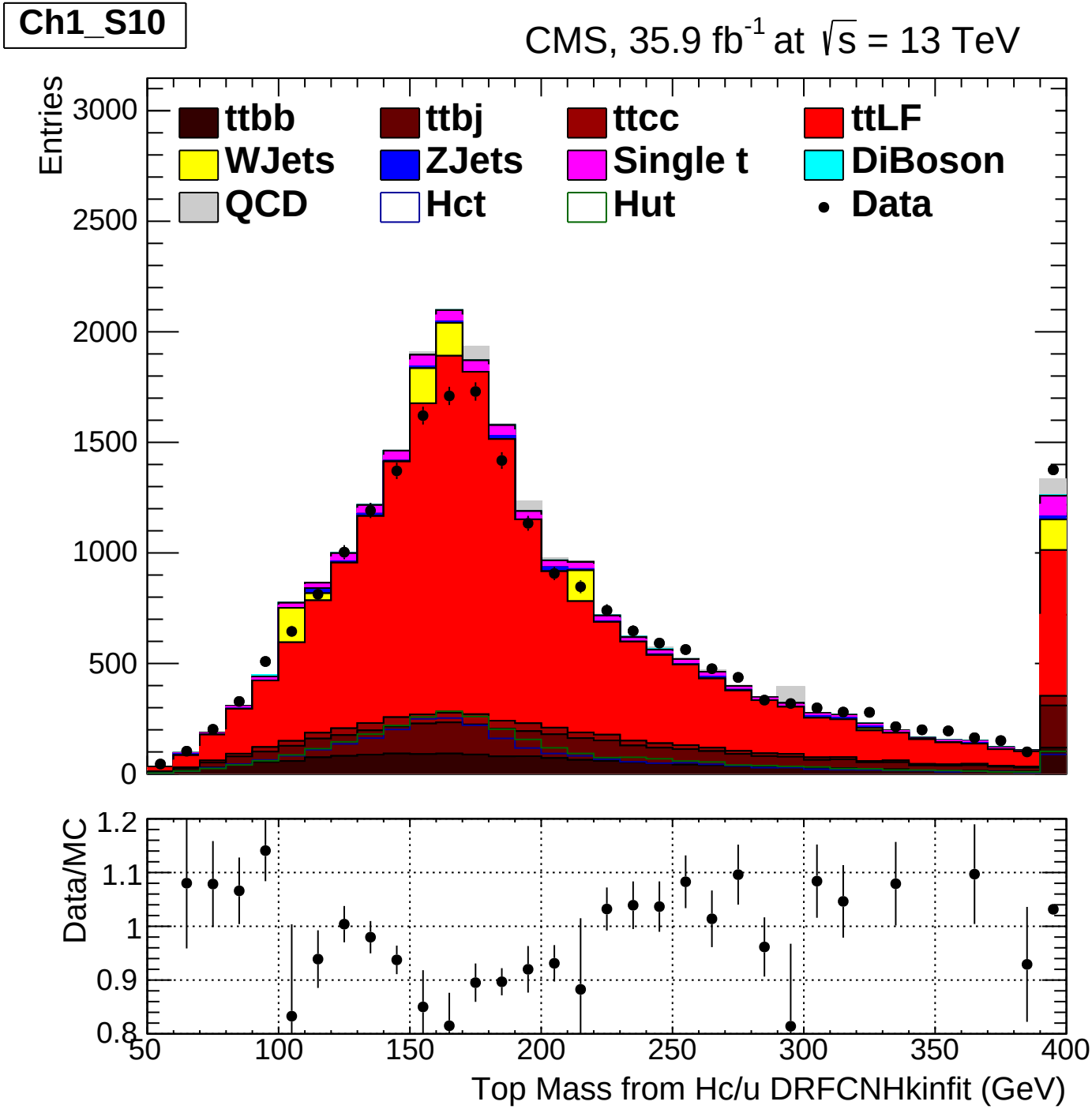

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

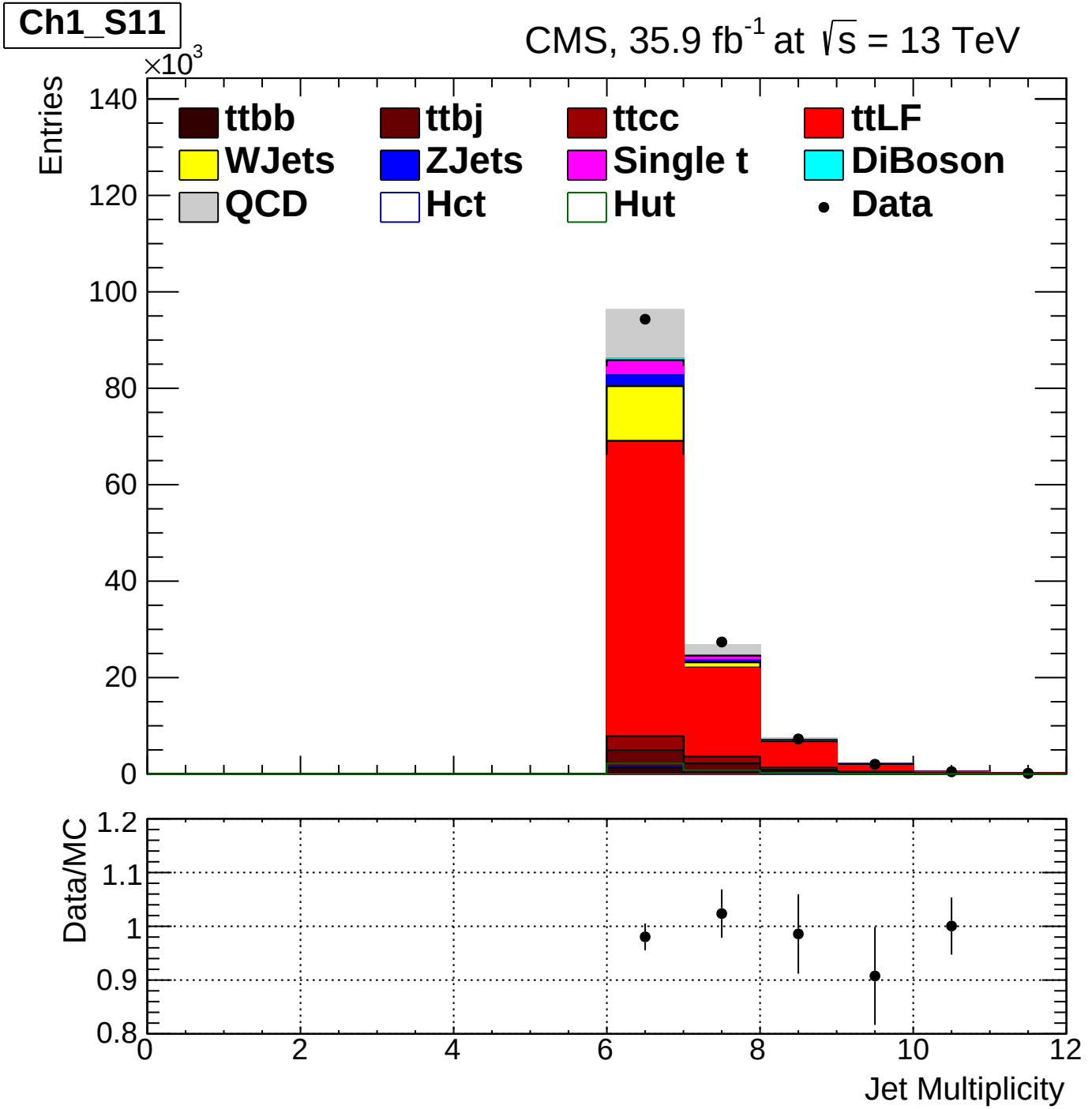

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

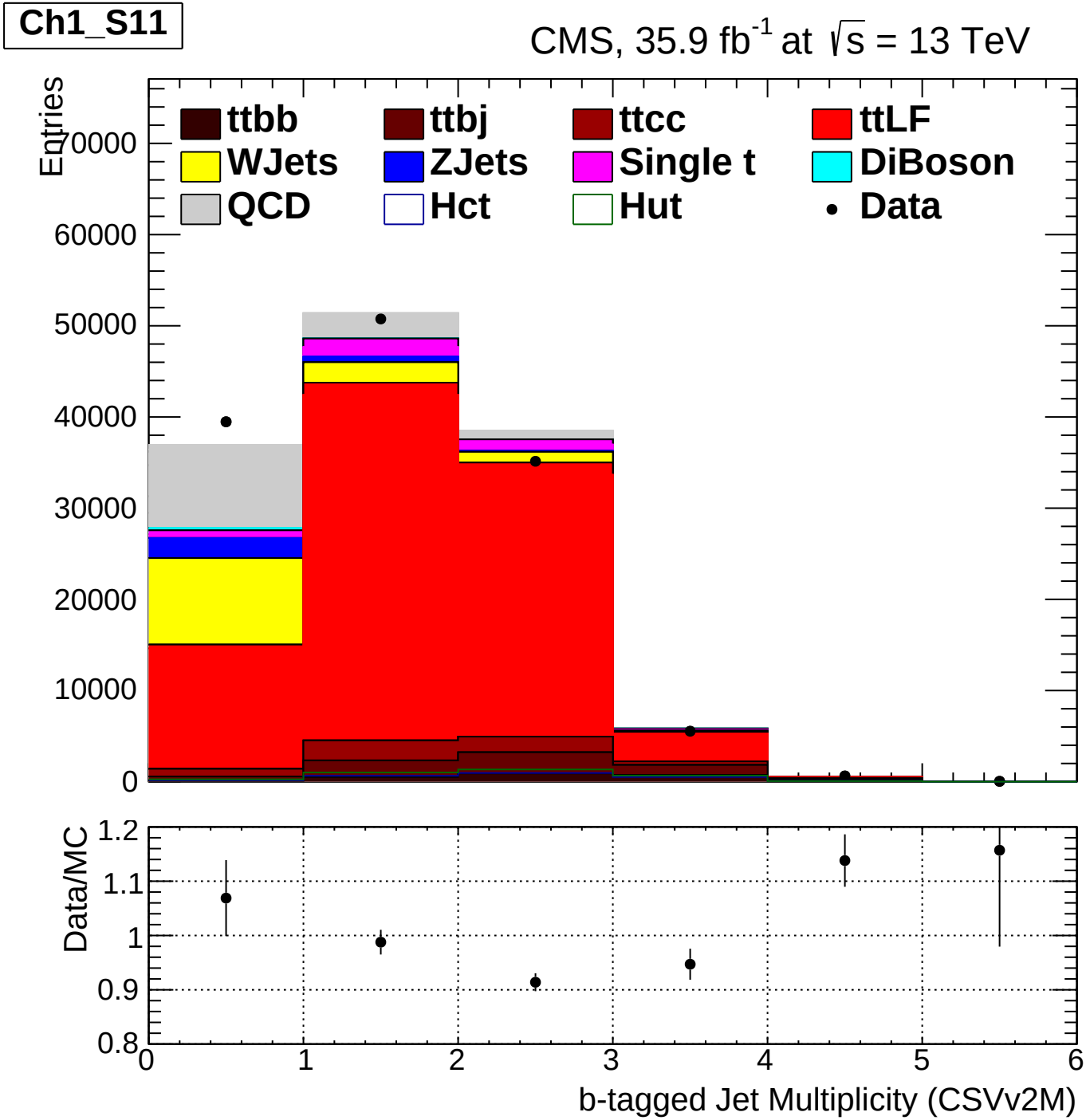

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

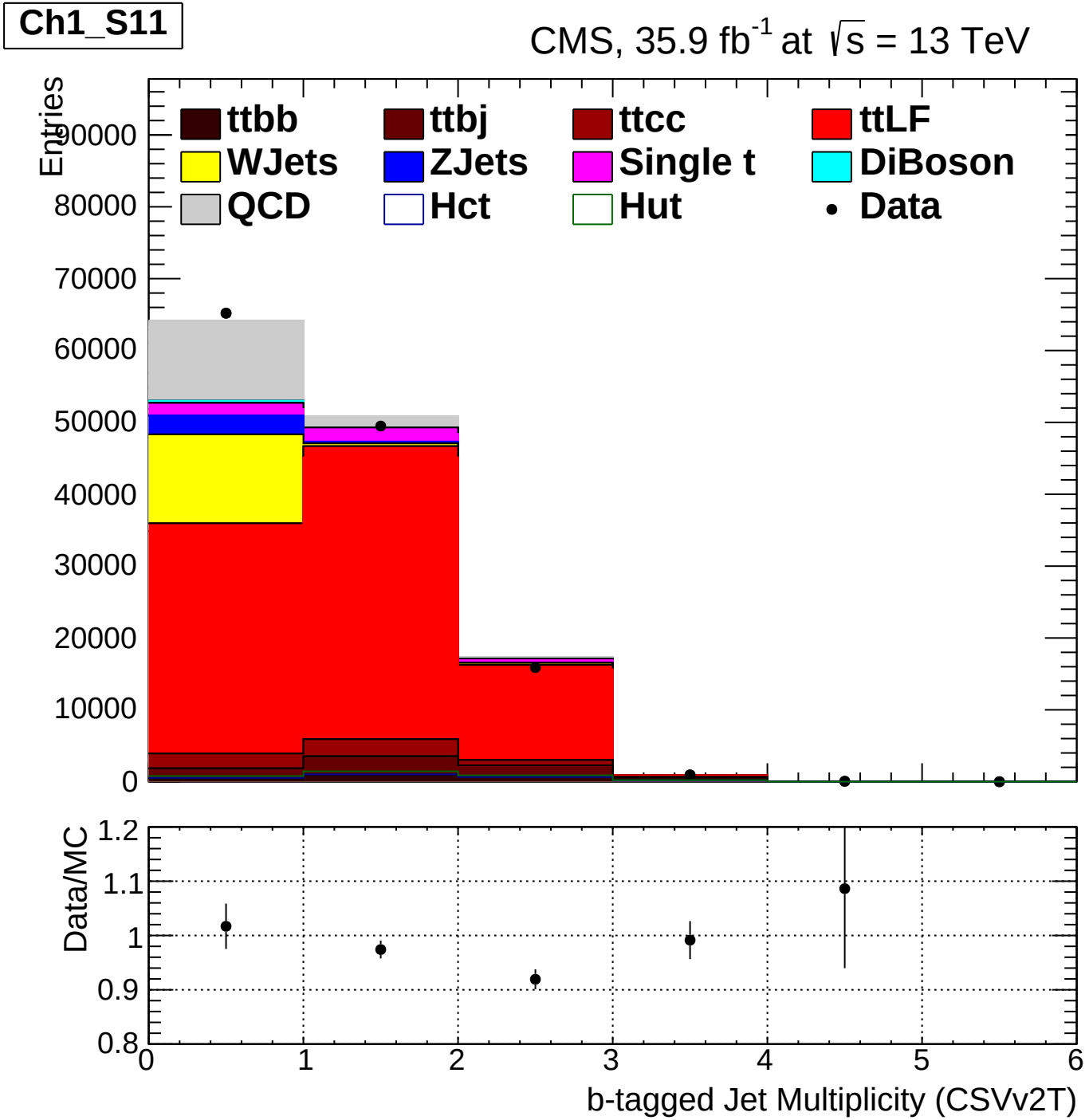

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

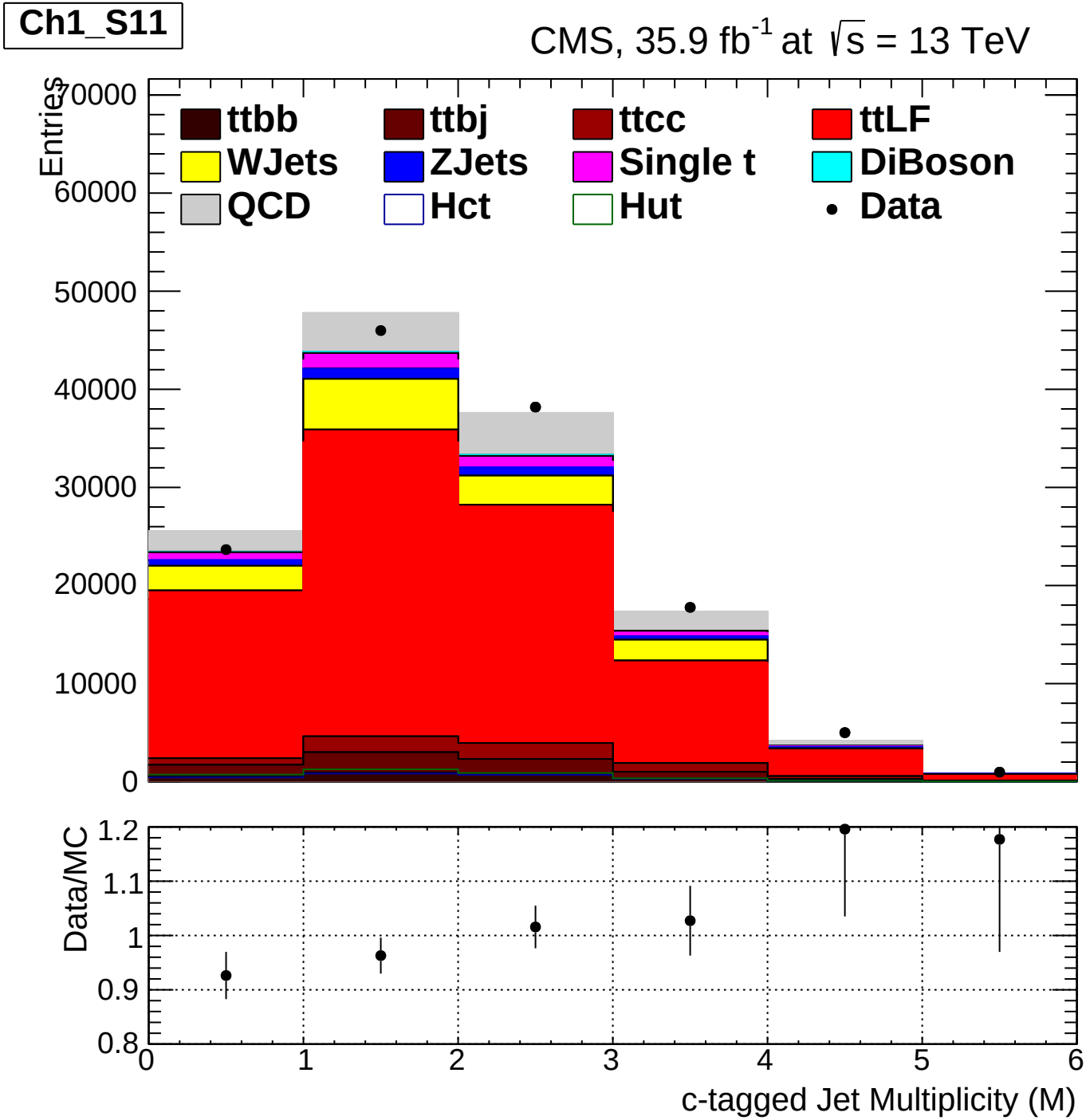

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

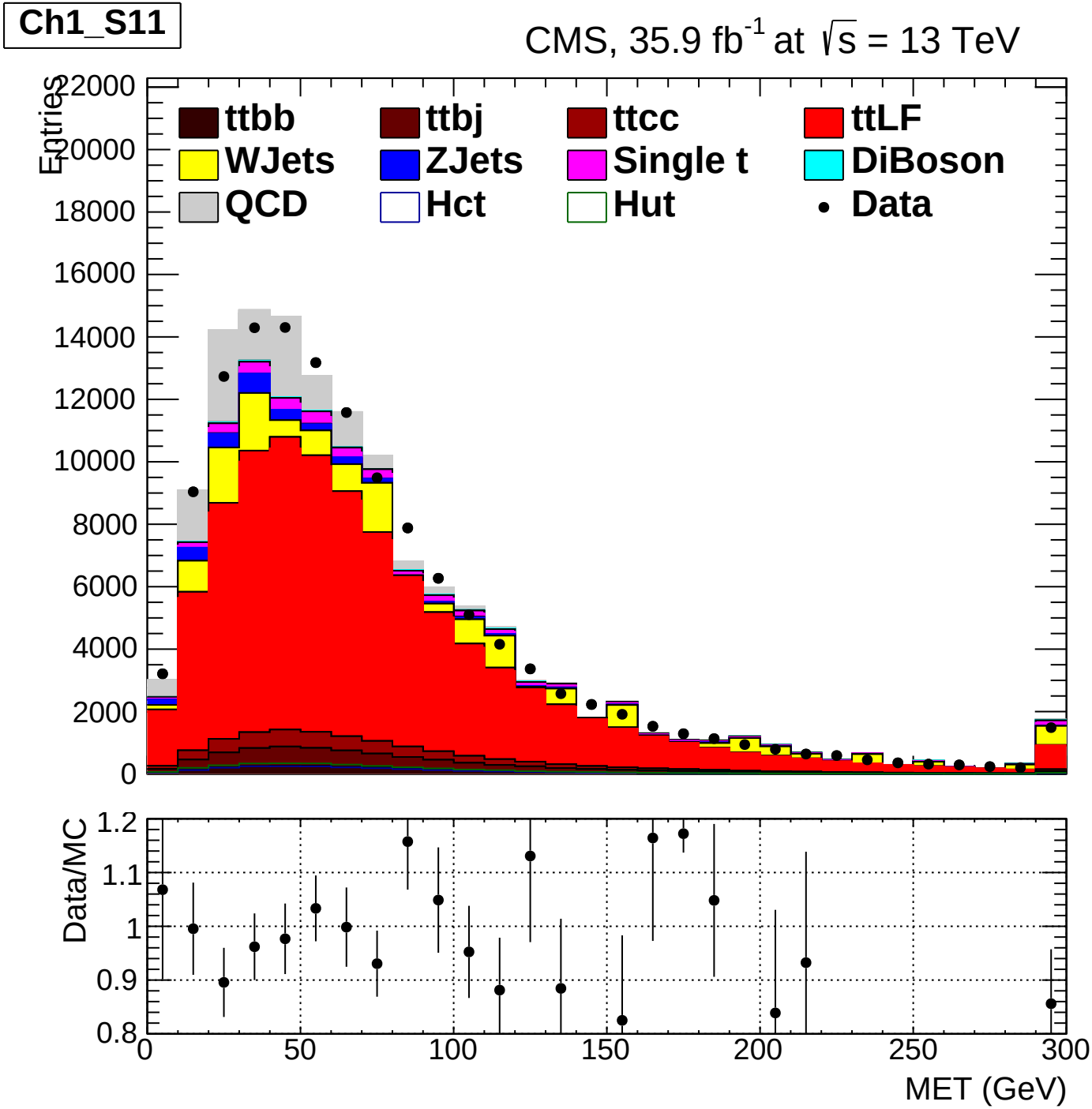

Ch1_S10
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

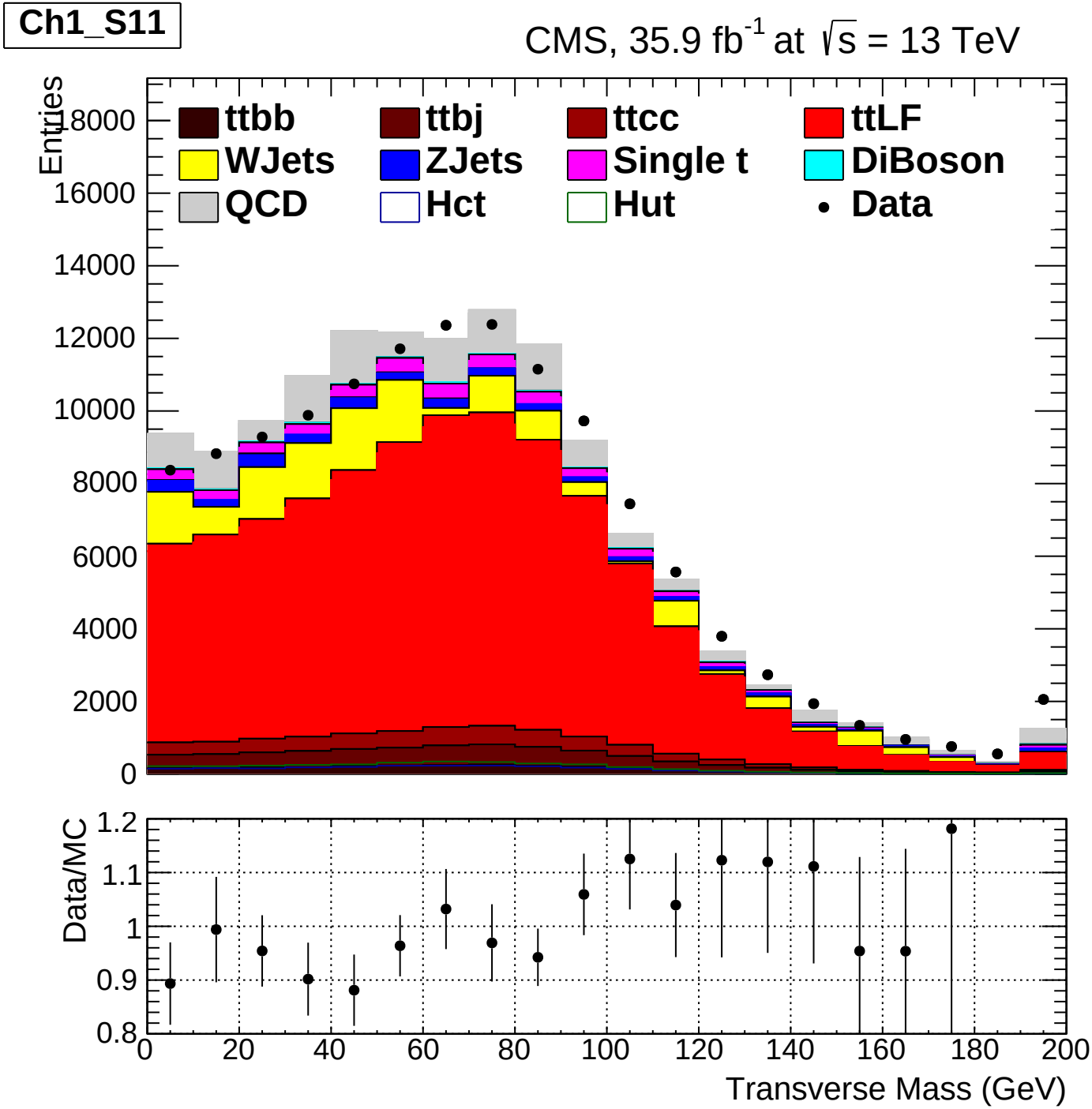

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Jet Multiplicity

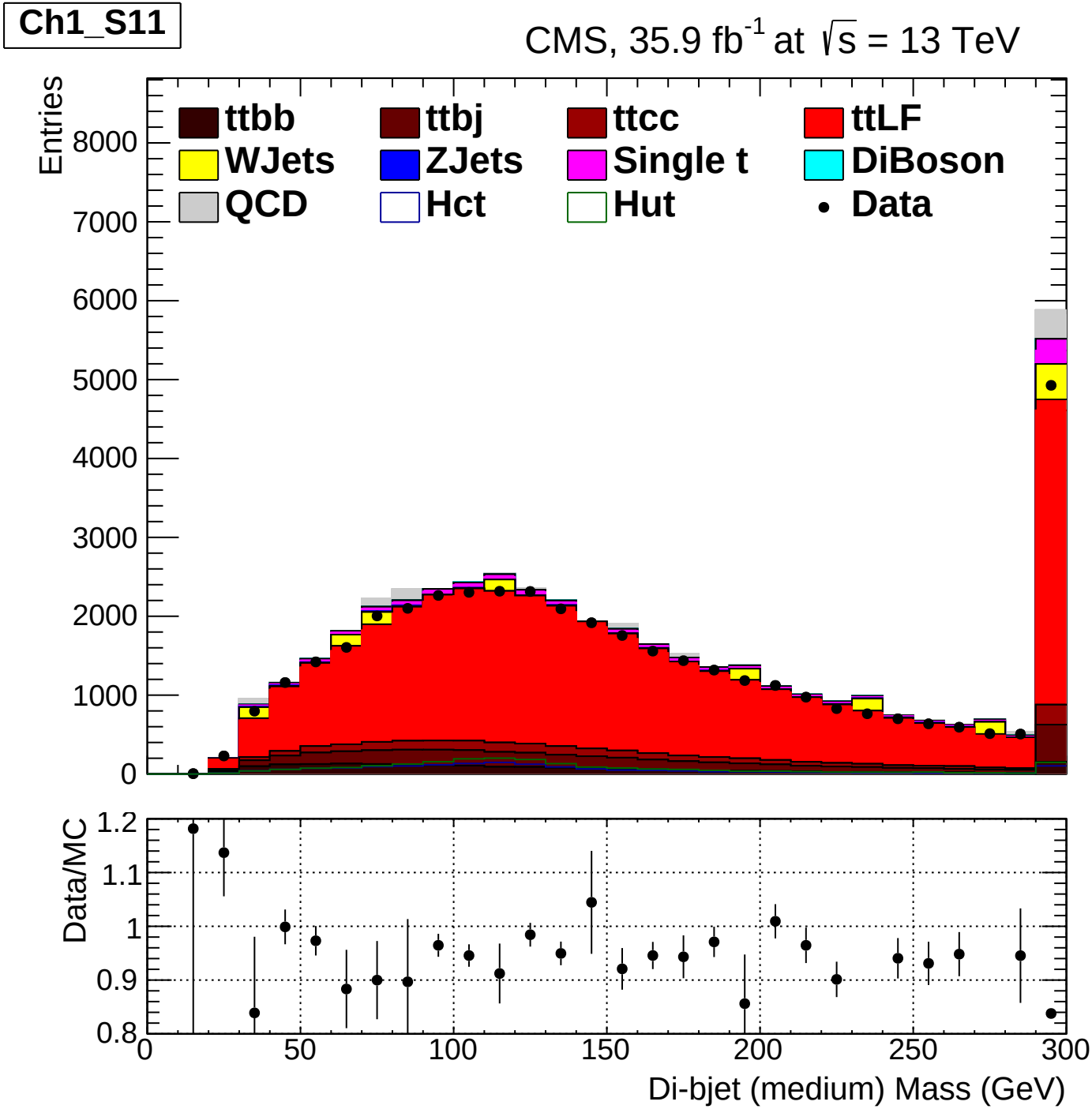

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
10000
20000
30000
40000
50000
60000
70000
Data/MC
0.8
0.9
1
1.1
1.2
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

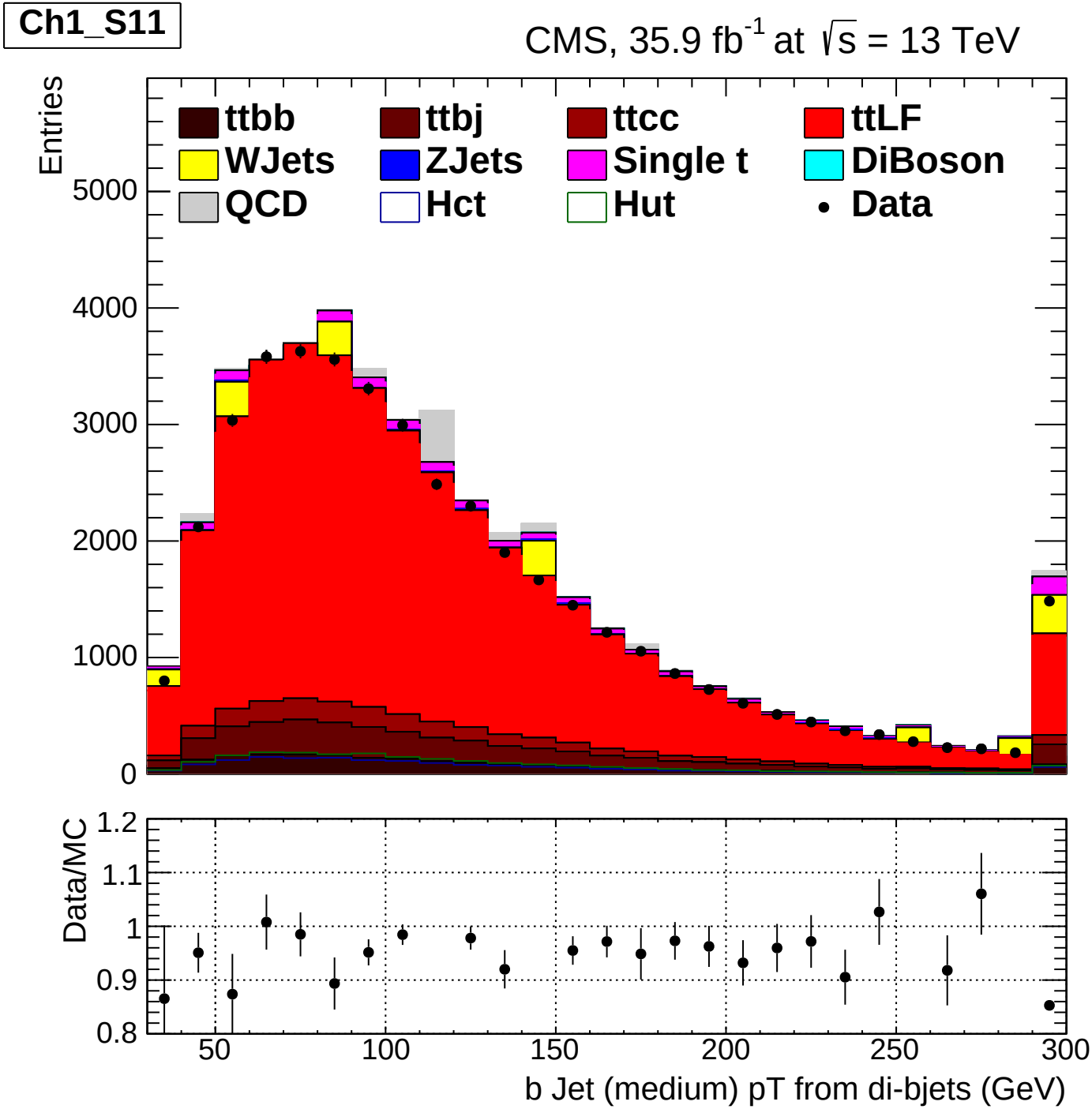

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

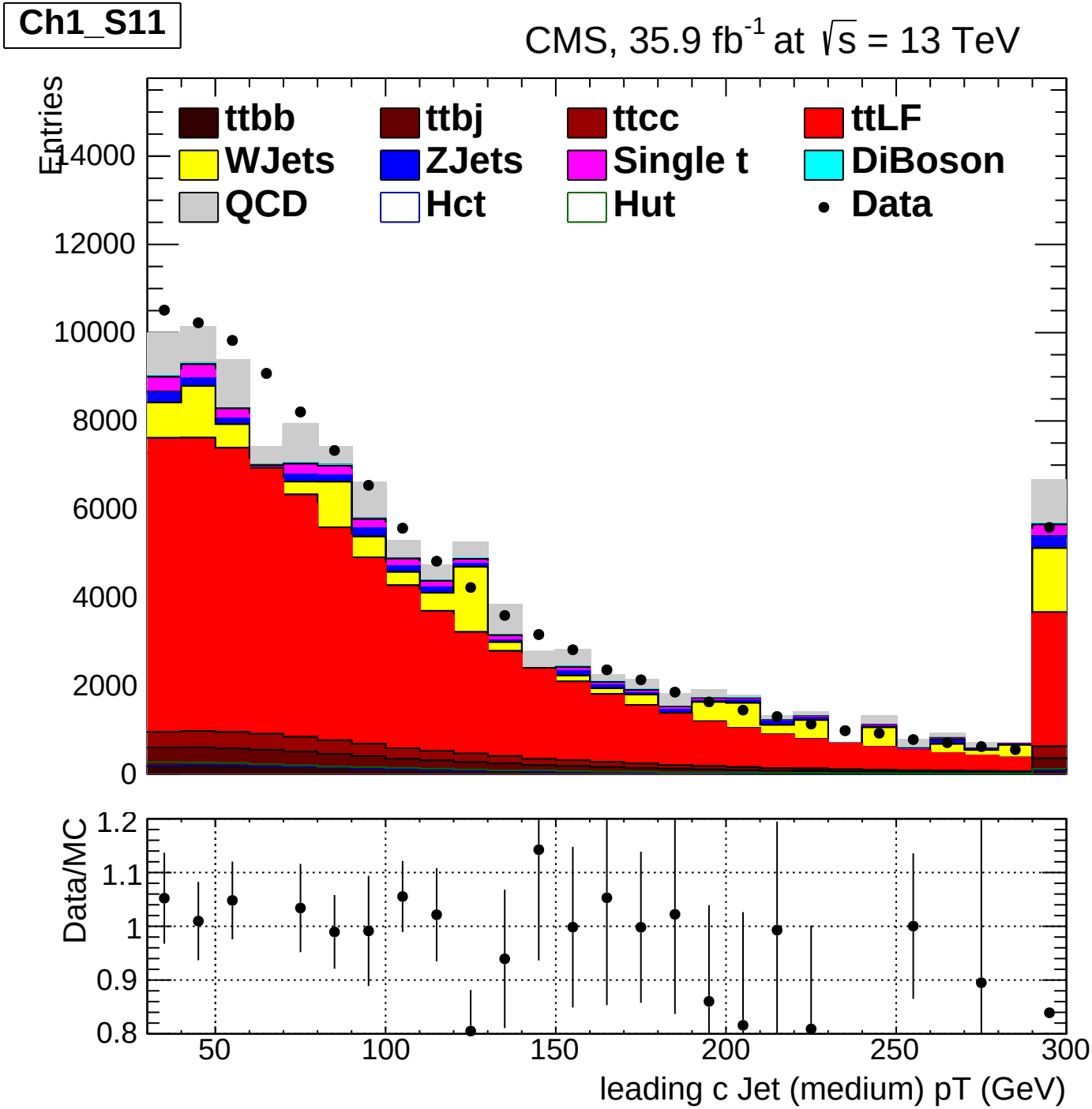

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
70000
60000
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
c-tagged Jet Multiplicity (M)

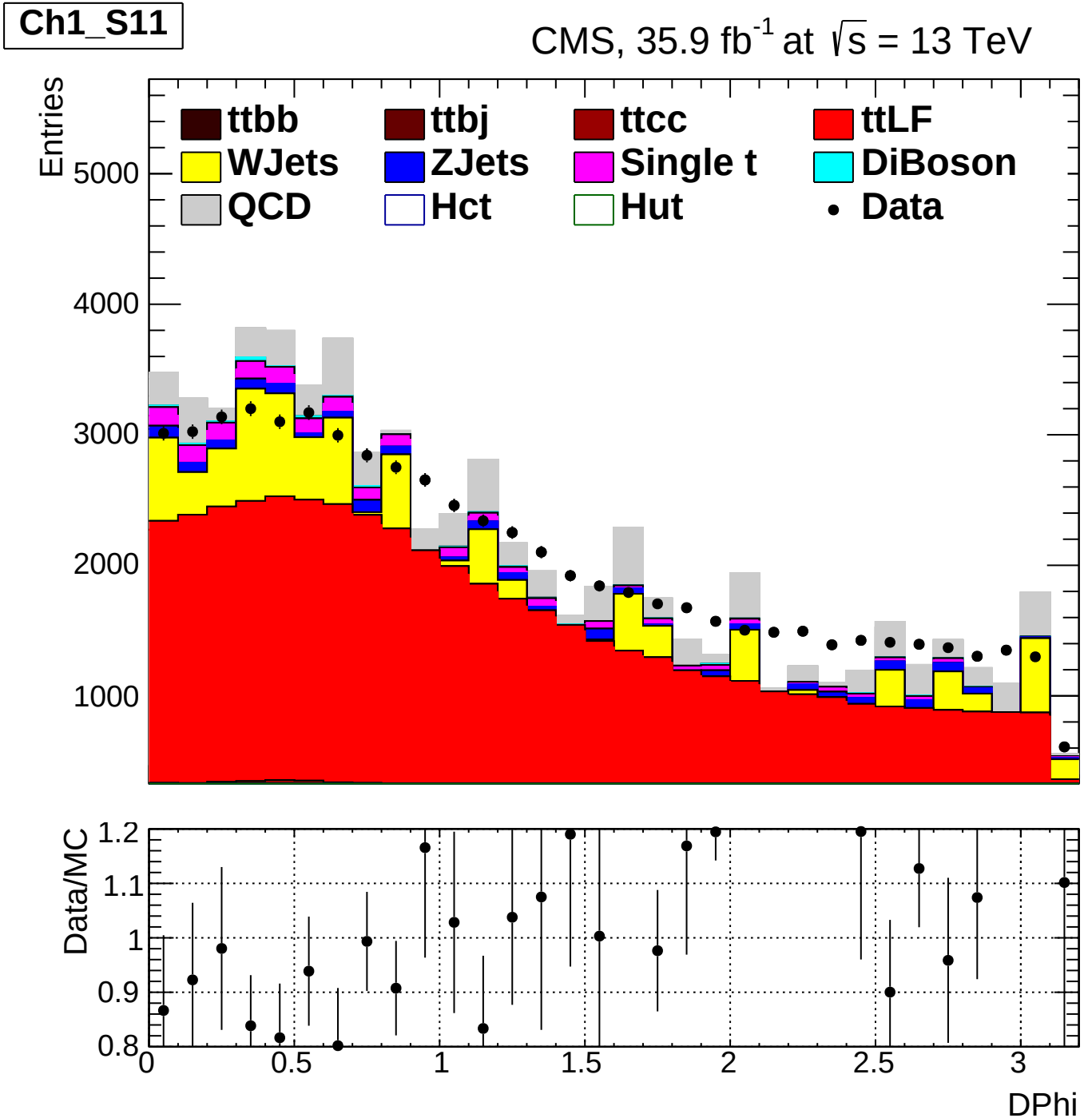

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

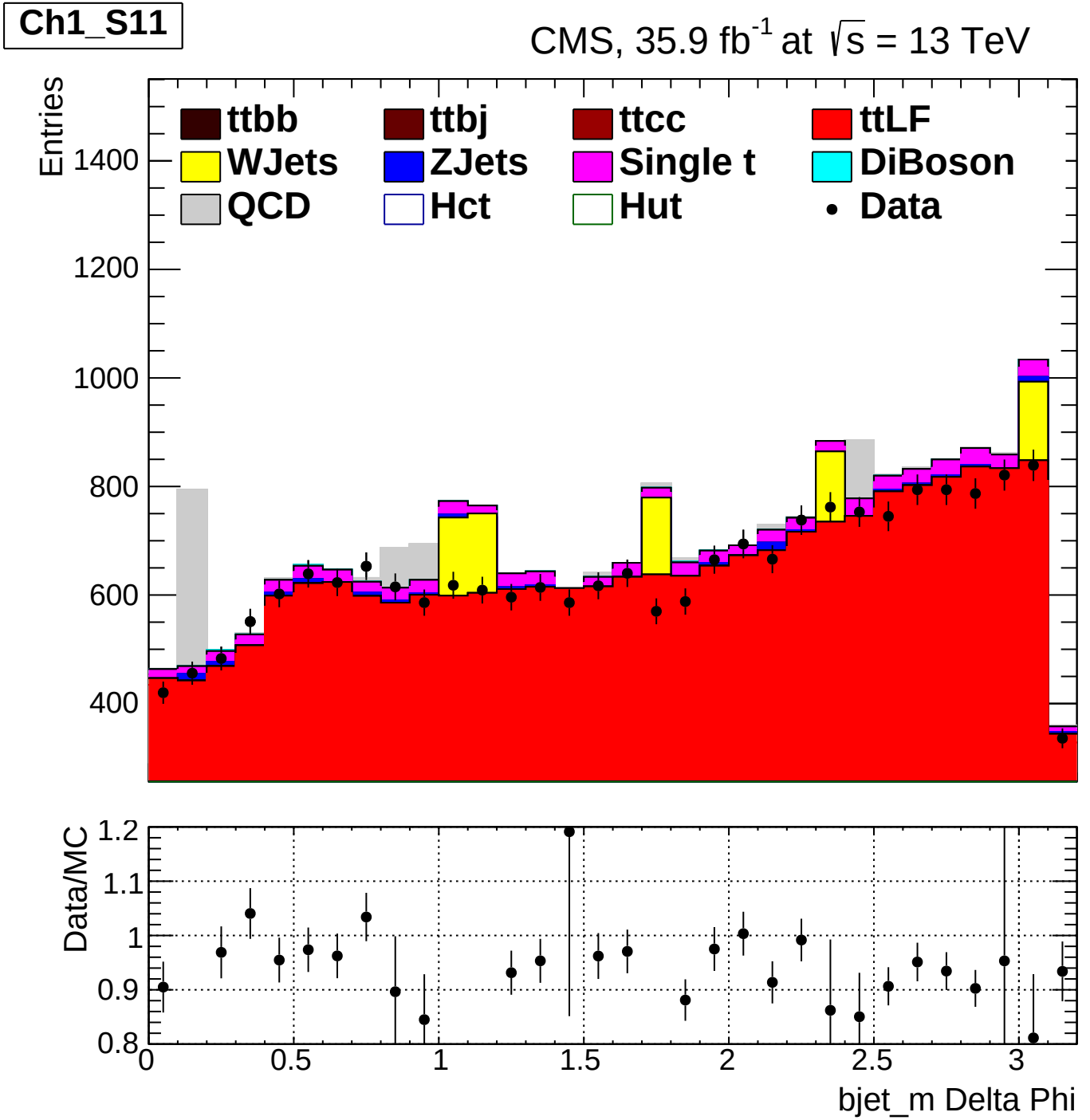

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

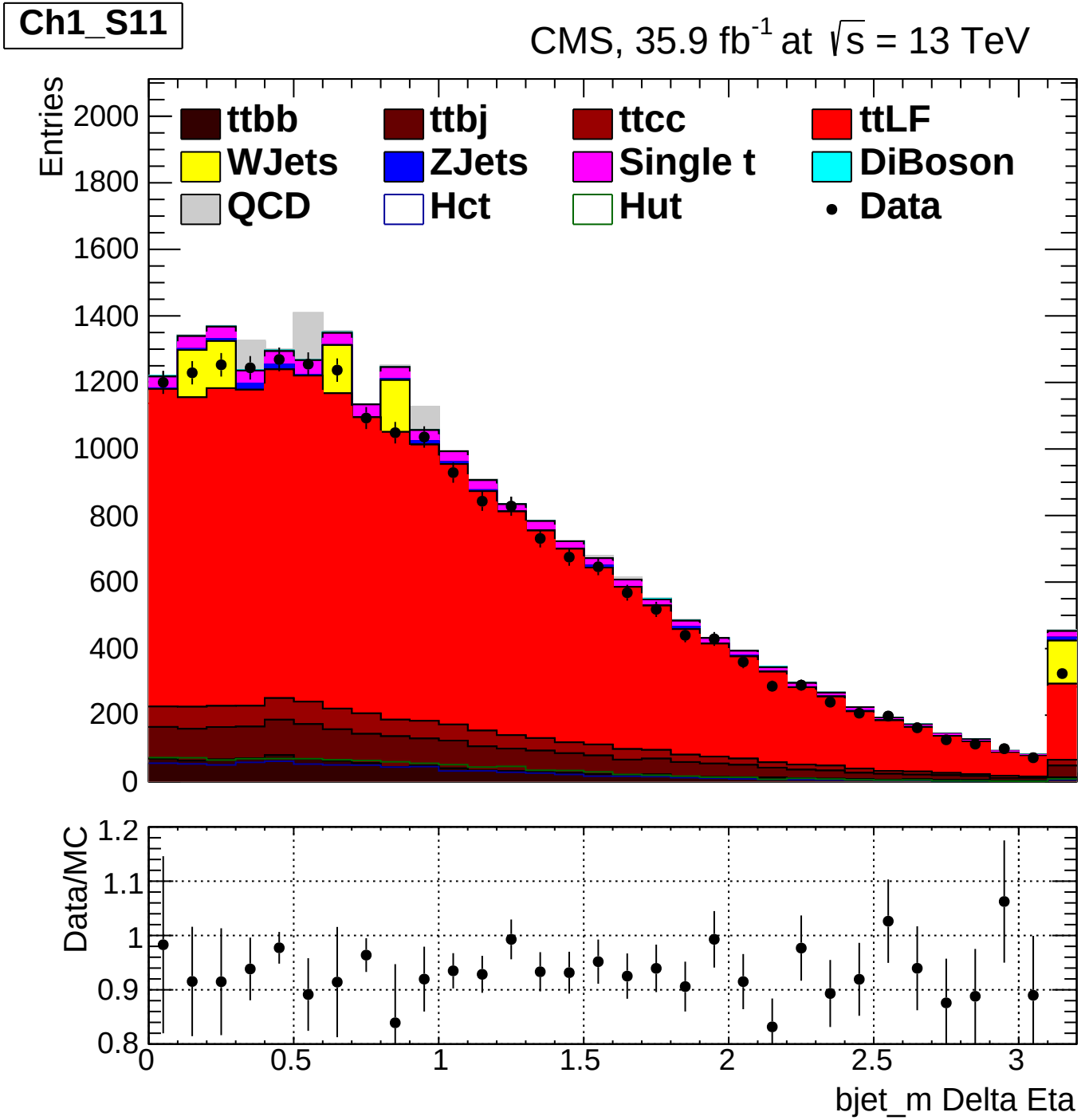

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

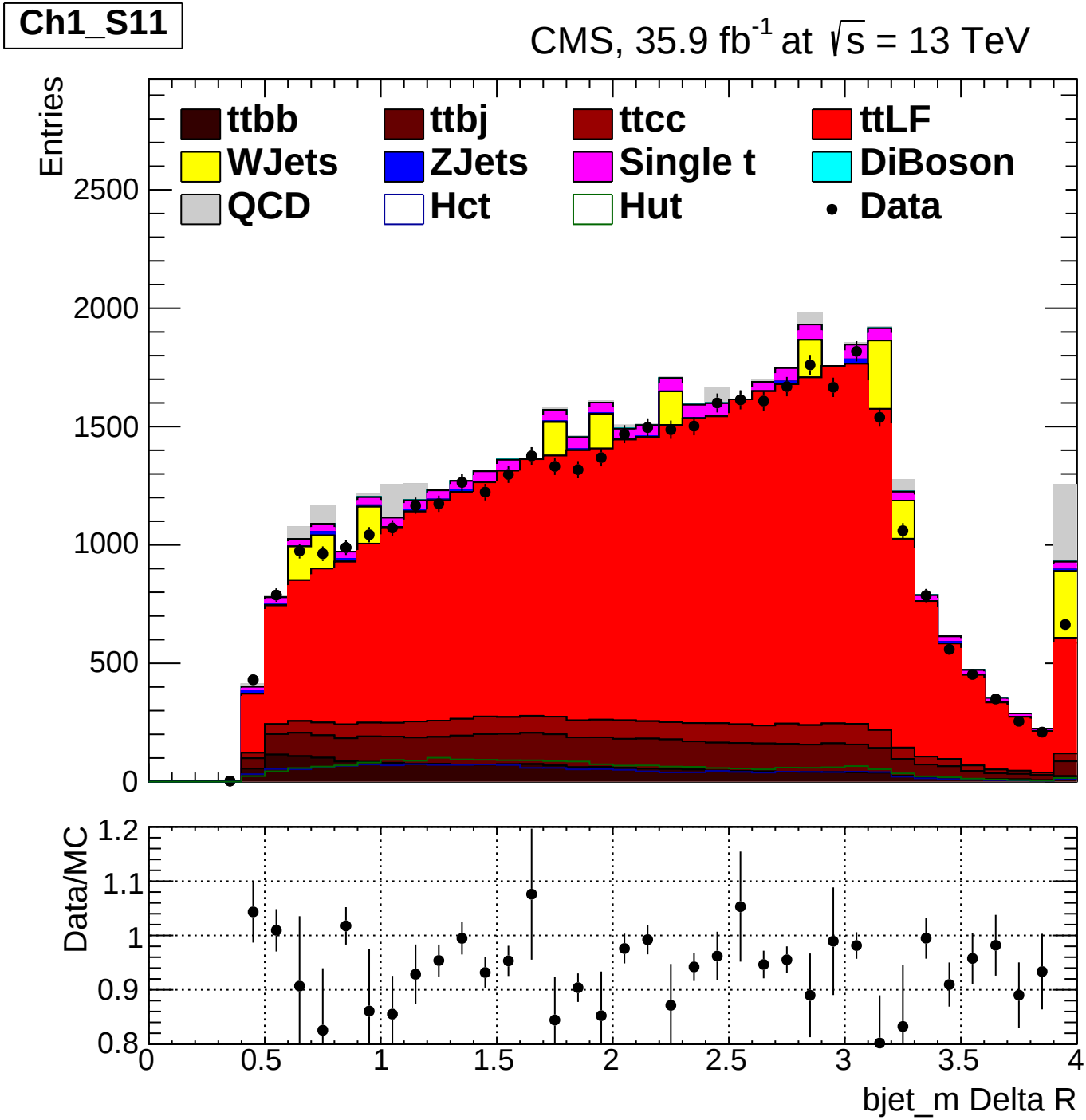

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)

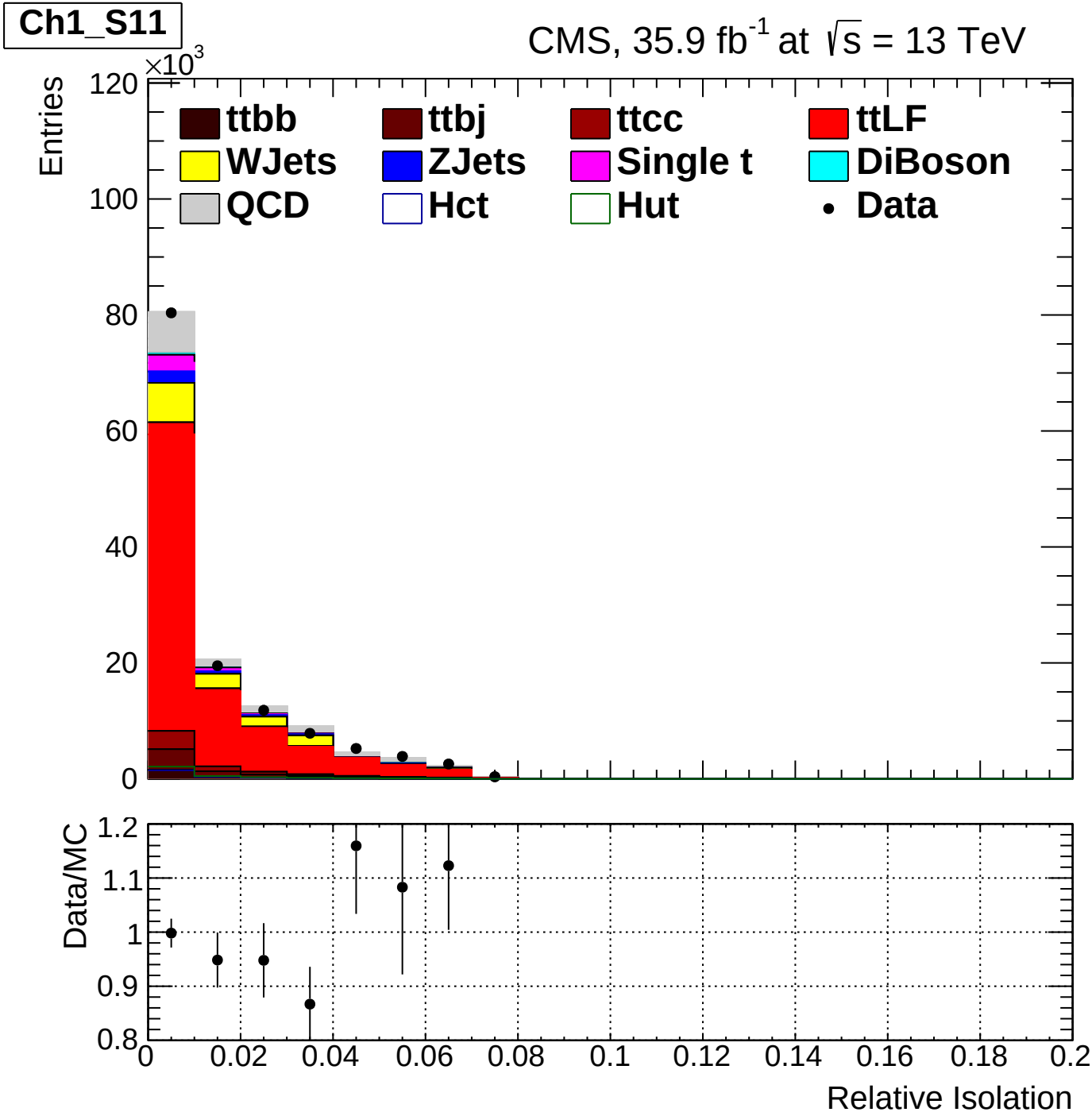

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
12000
14000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

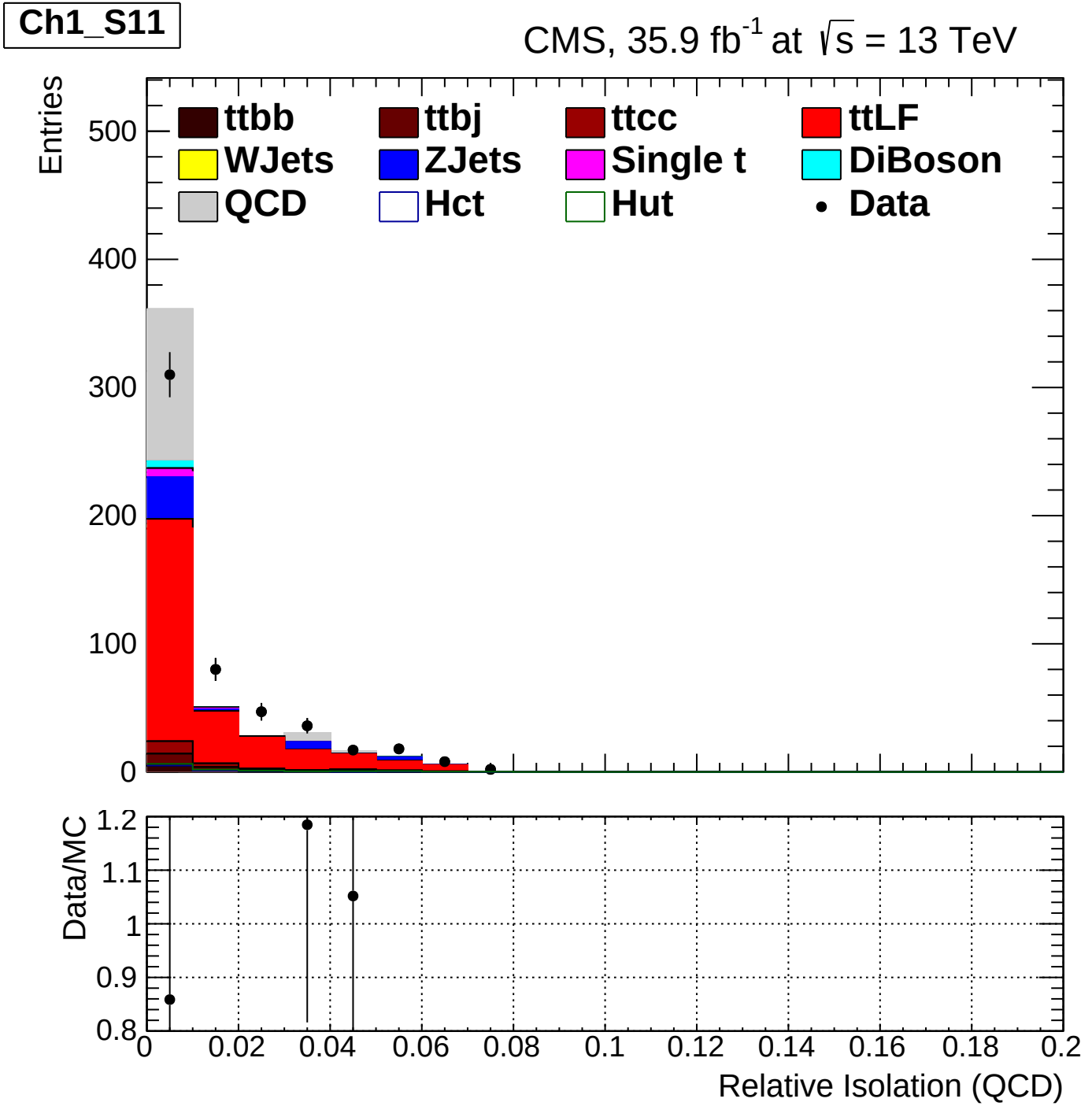

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
5000
4000
3000
2000
1000
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

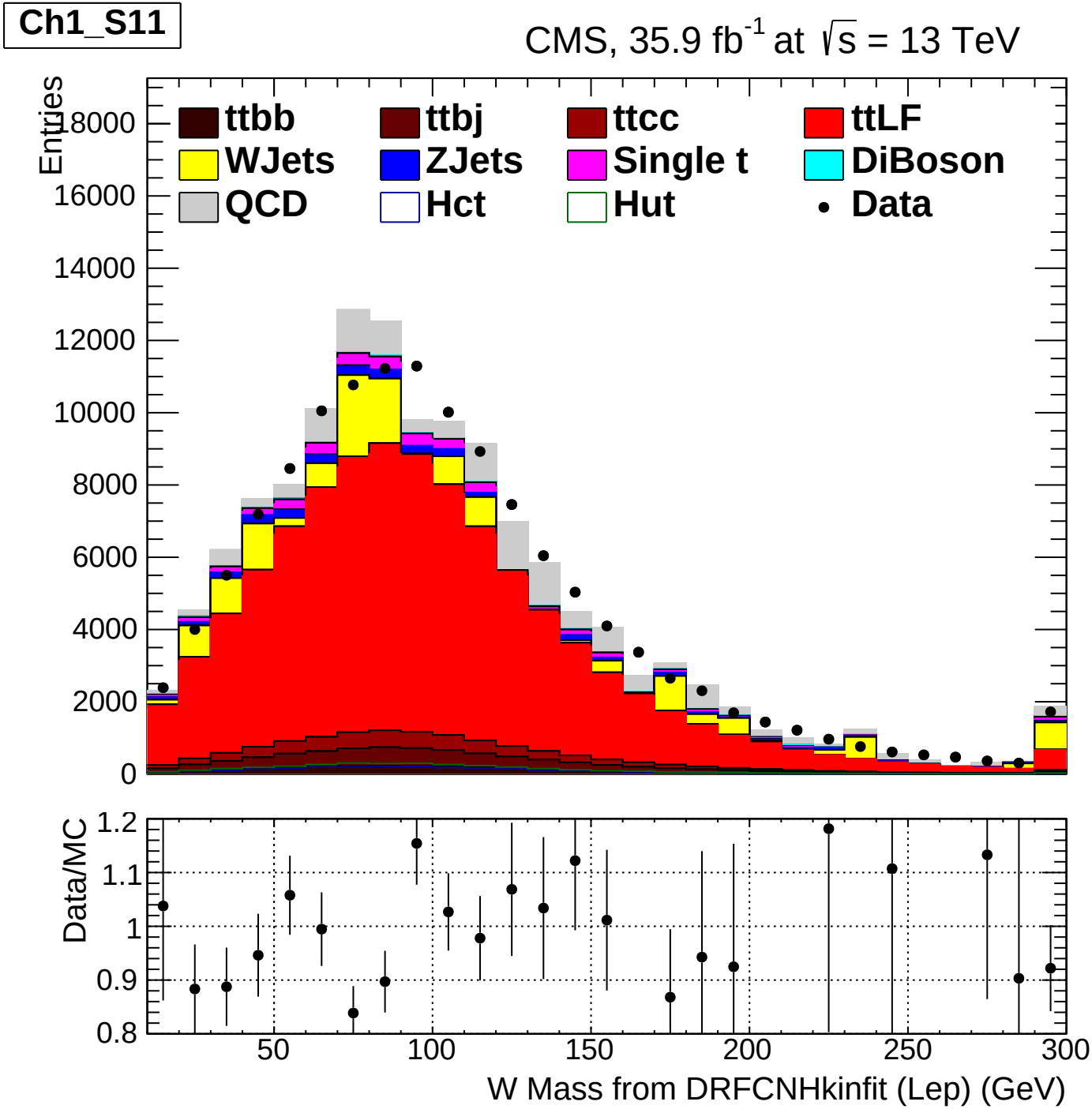

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1400
1200
1000
800
600
400
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

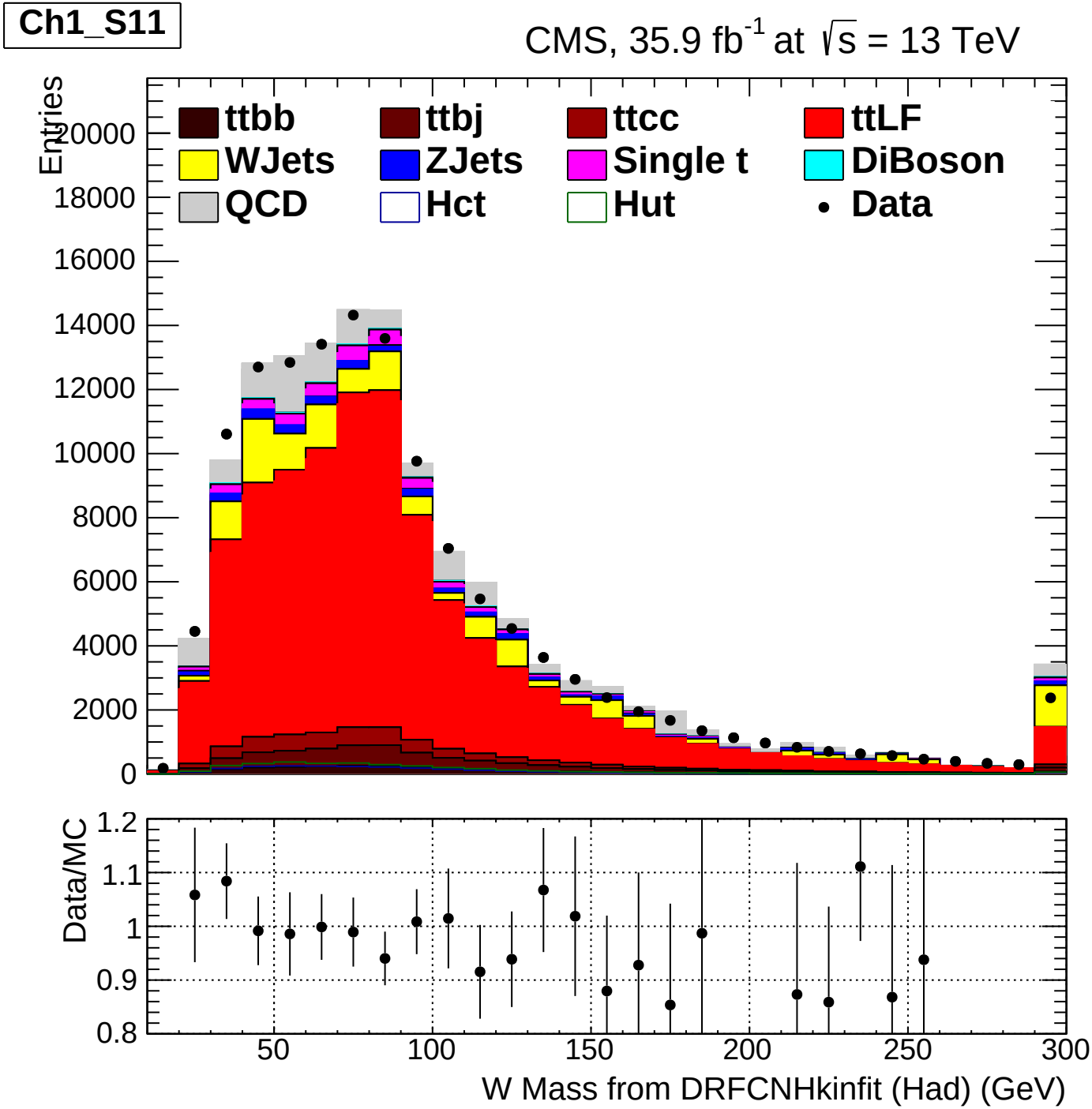

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

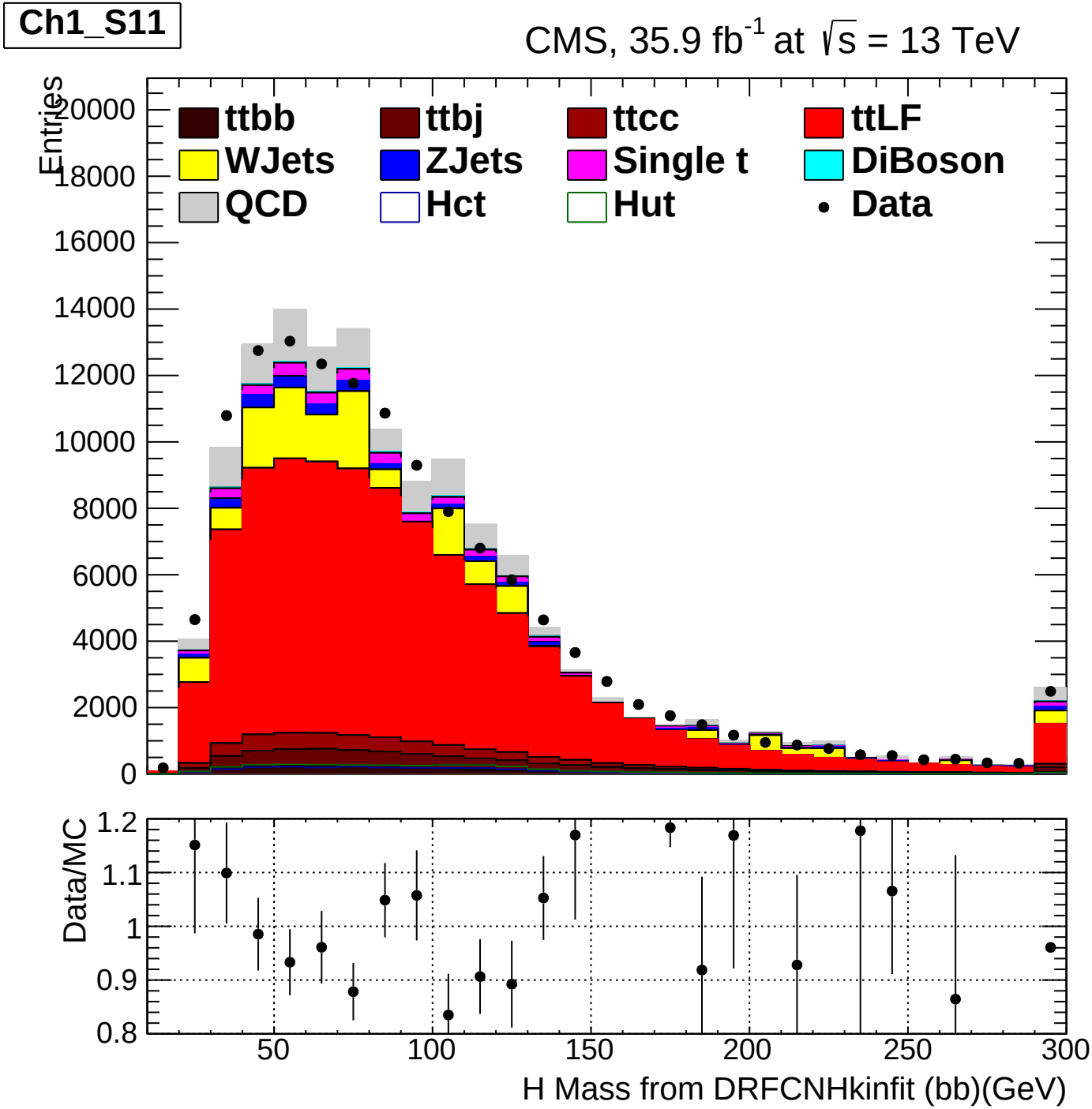

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R

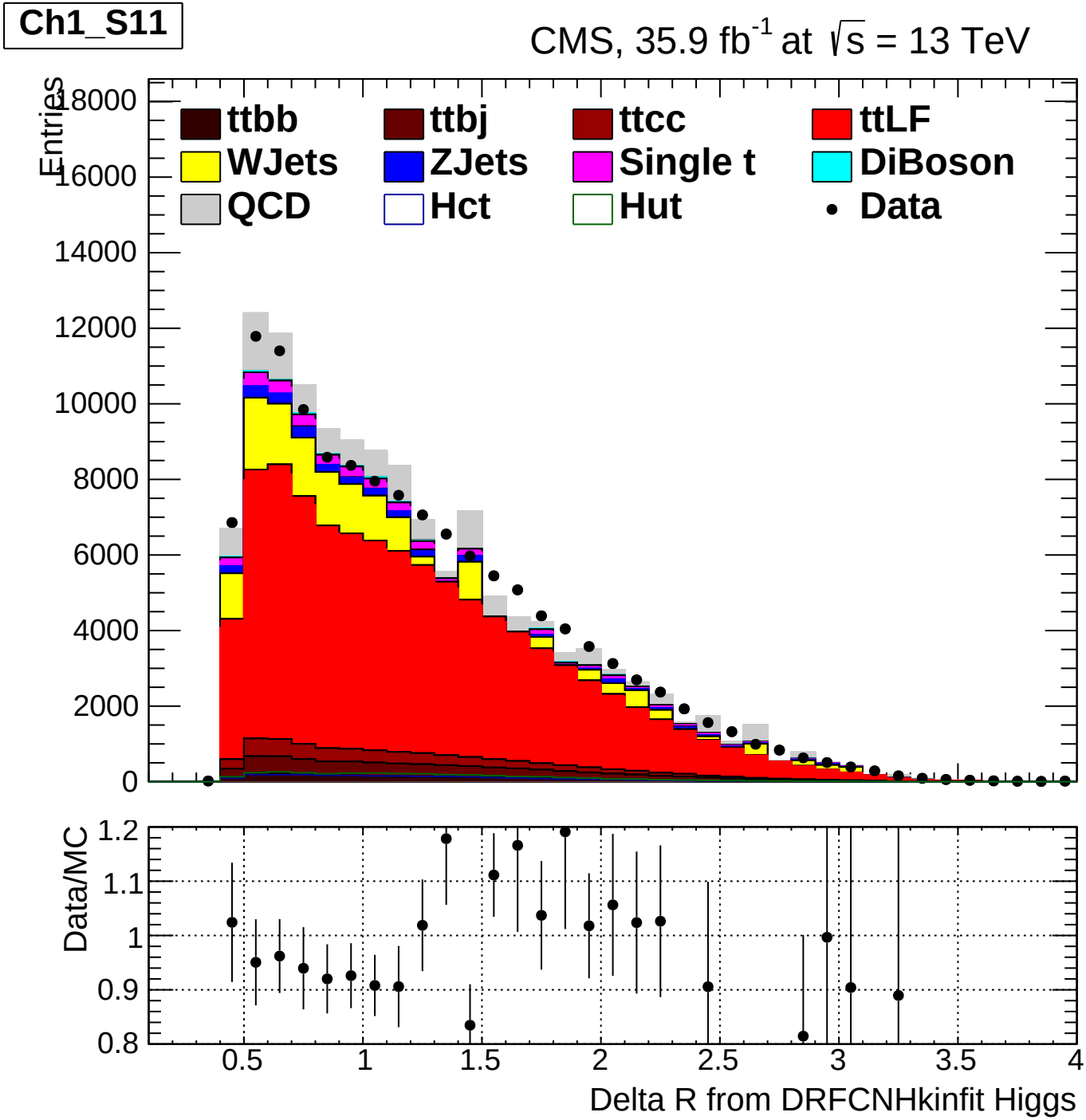

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
×10^3
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

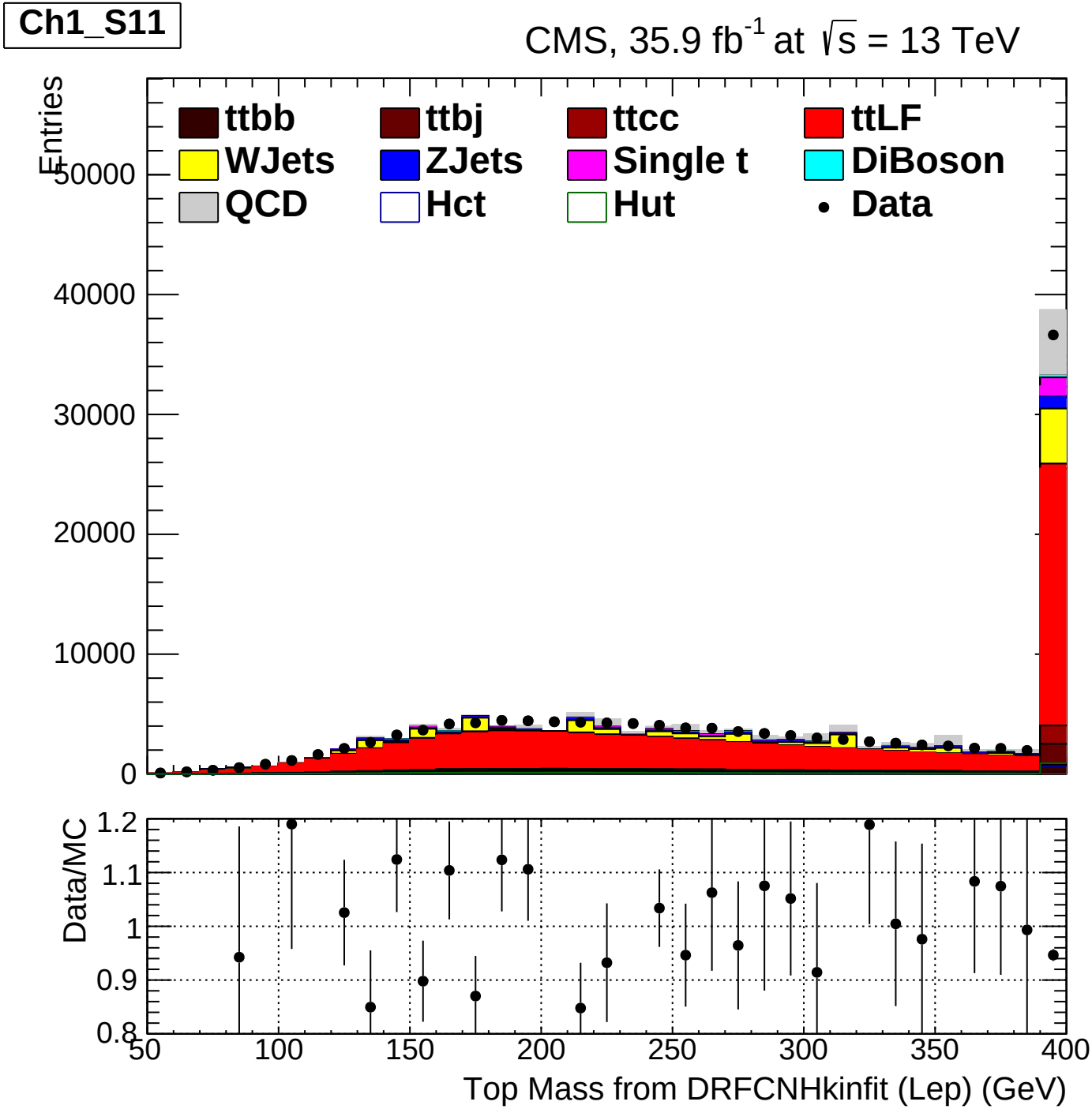

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

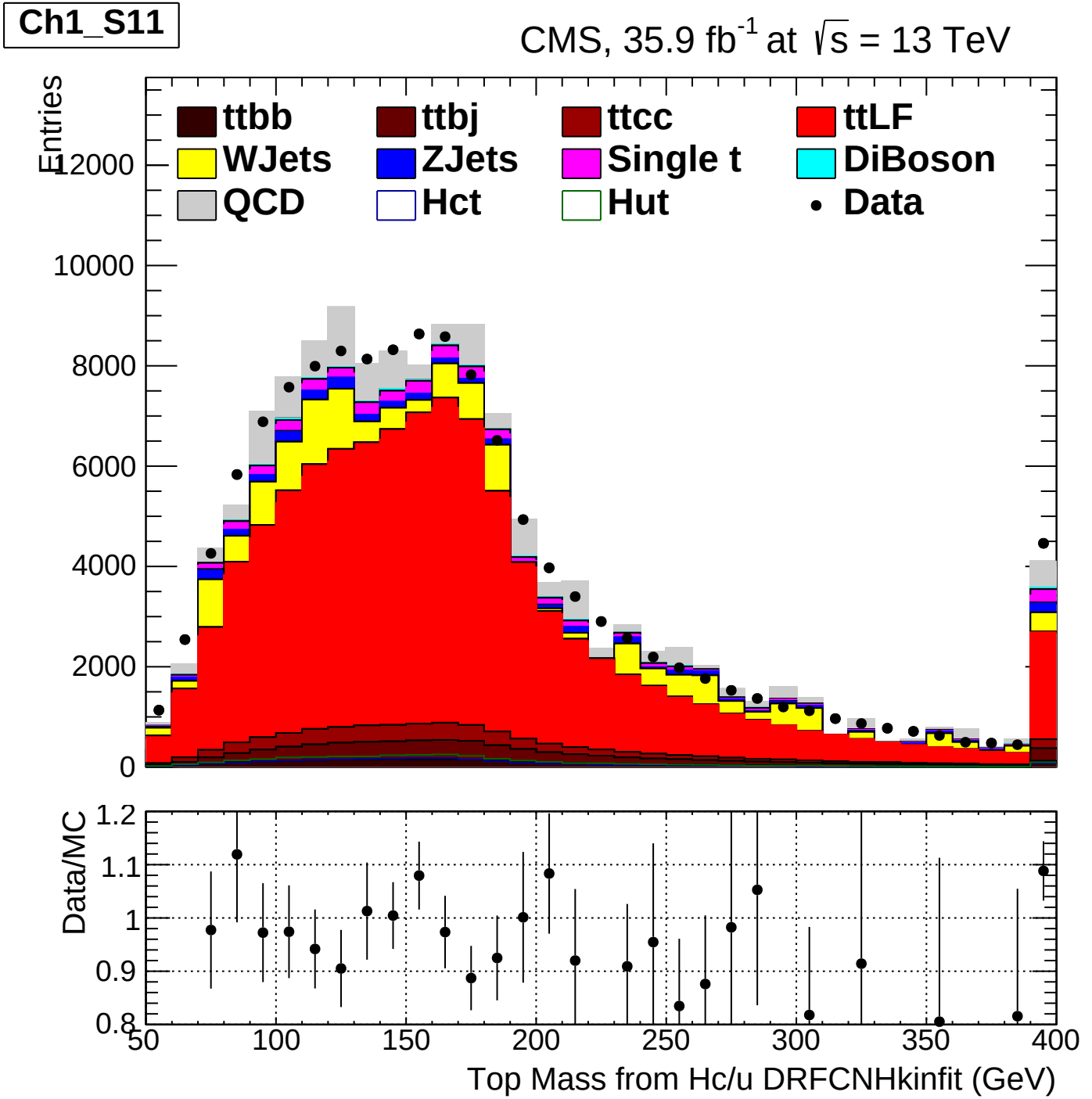

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

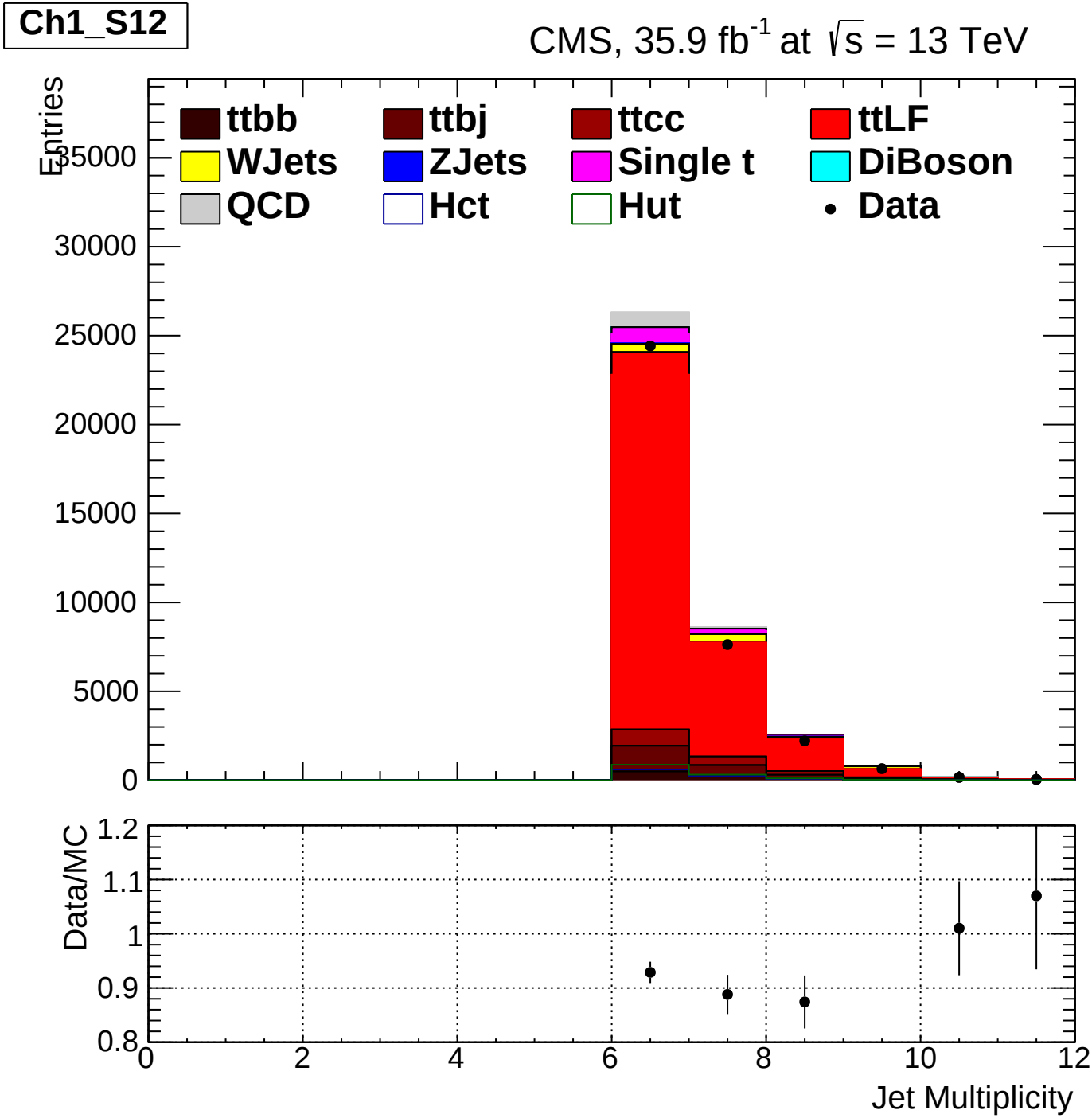

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

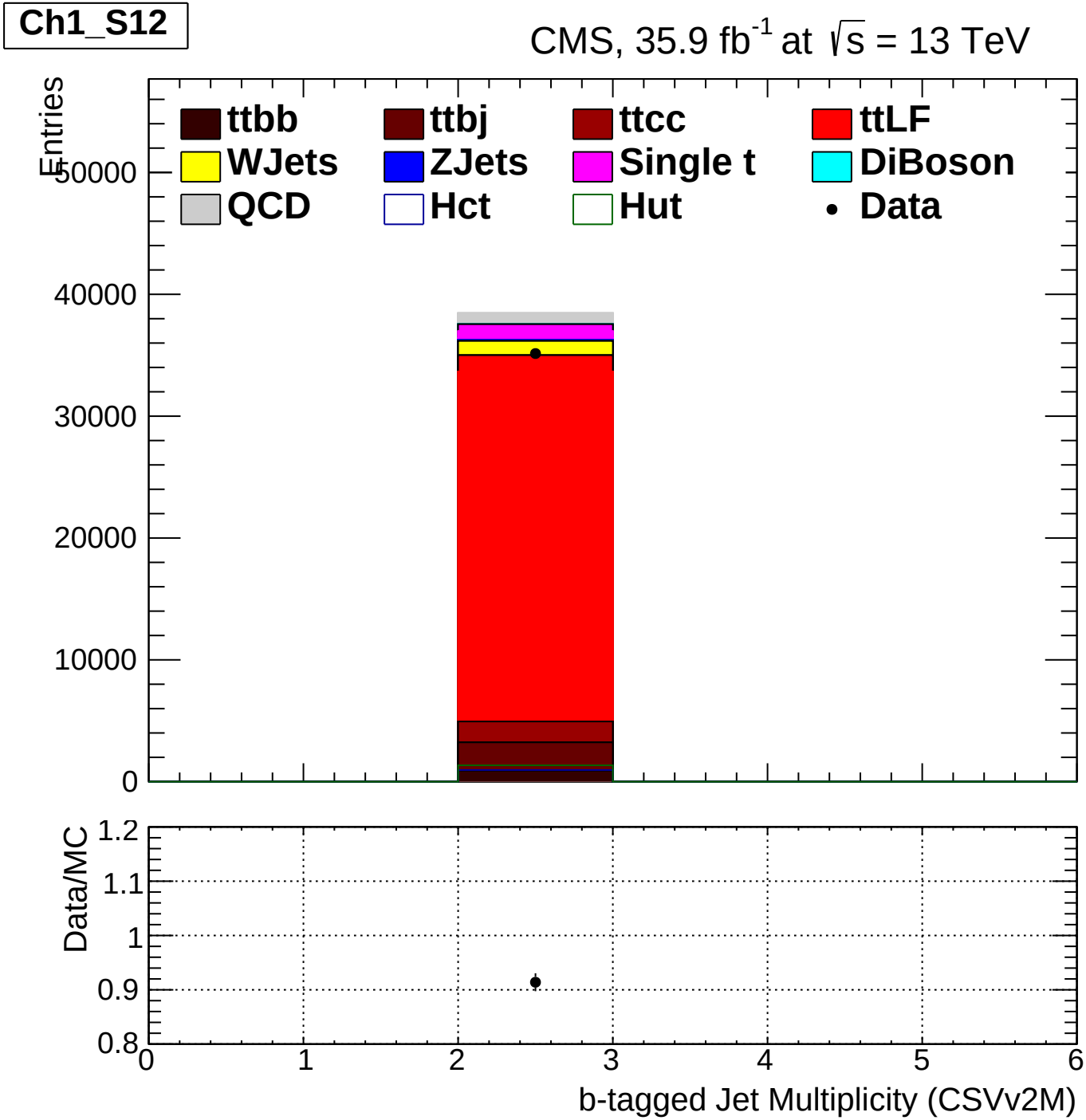

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

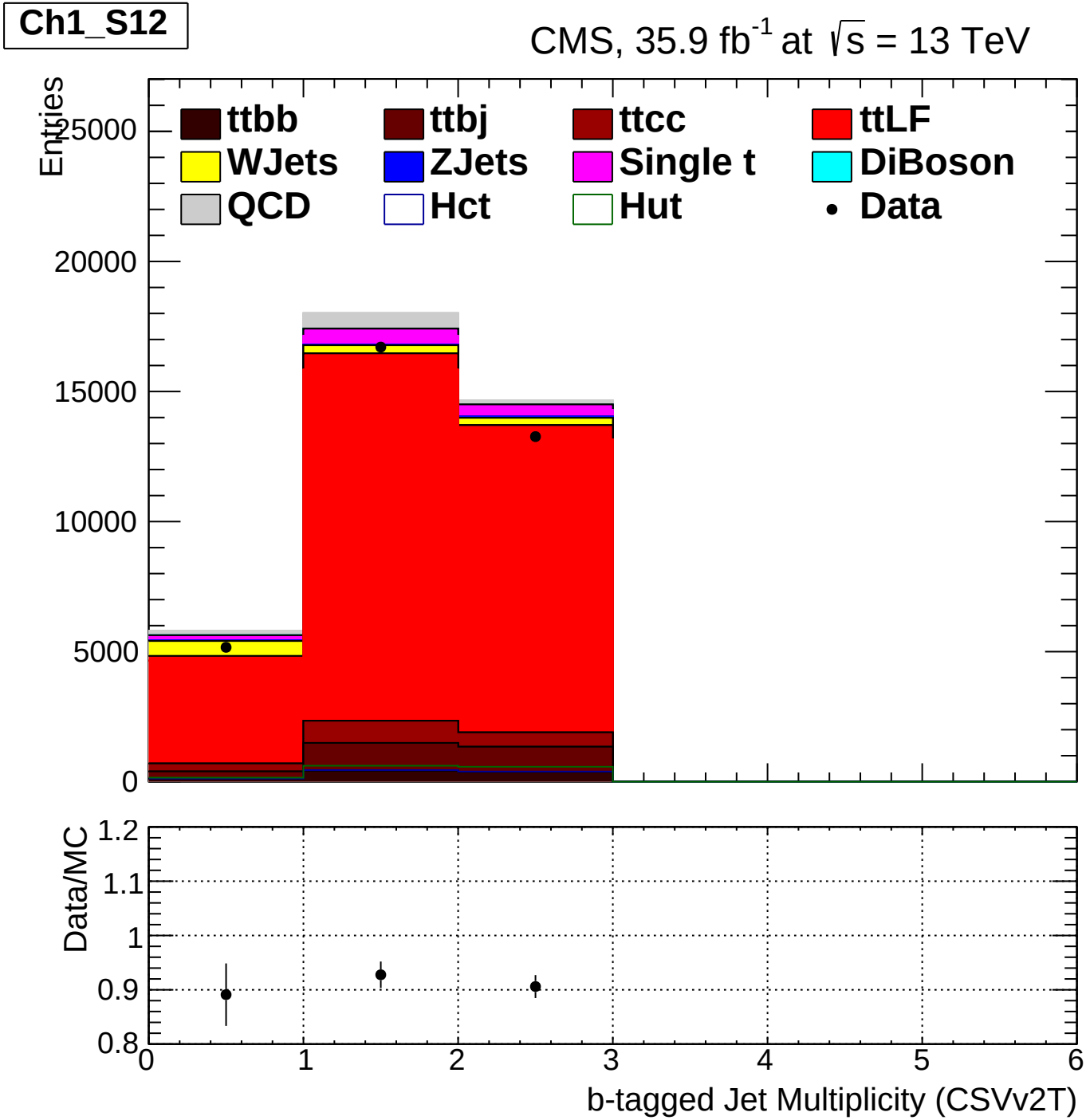

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

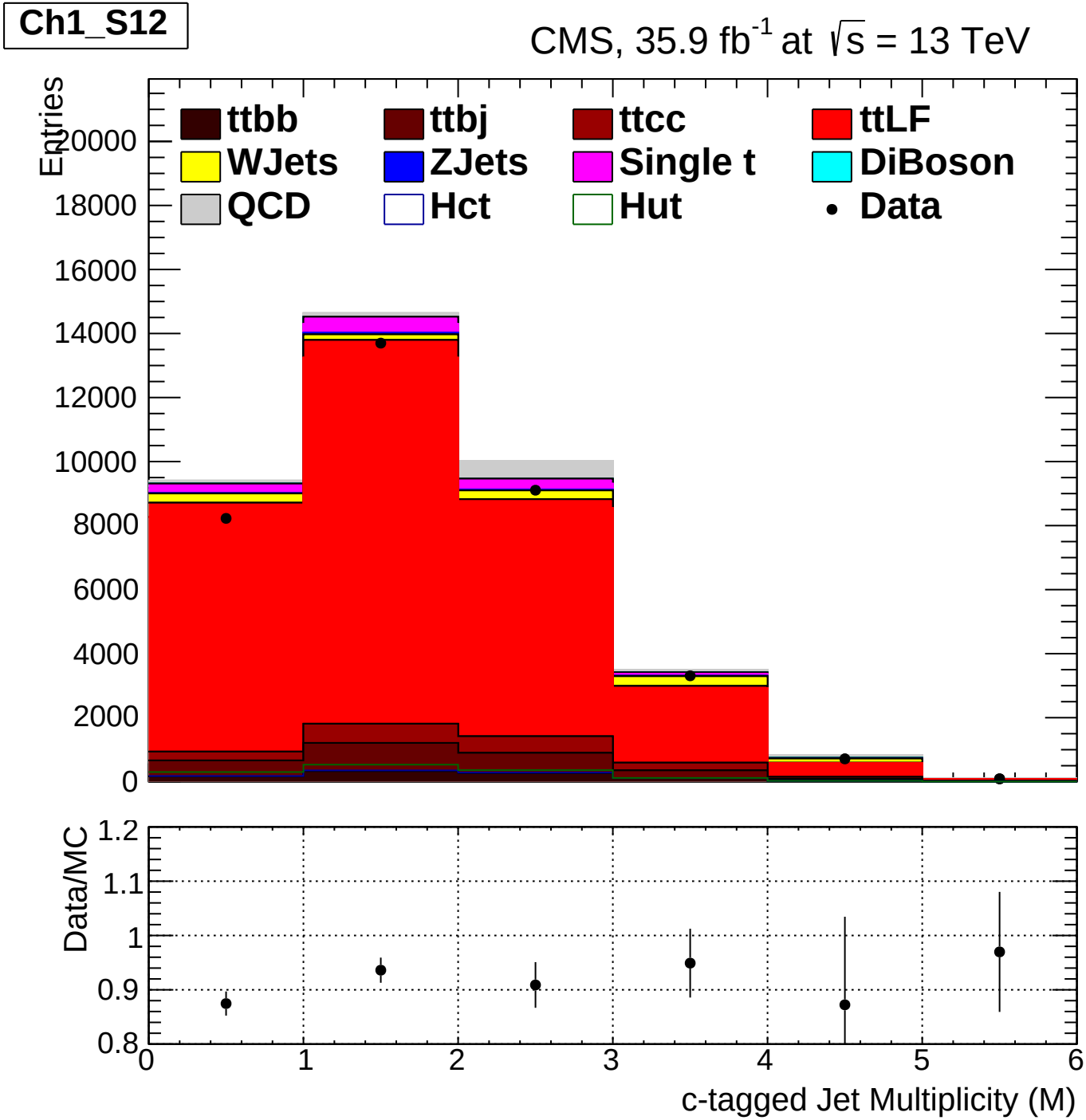

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
50
100
150
200
250
300
350
400
Top Mass from DRFCNHkinfit (Lep) (GeV)

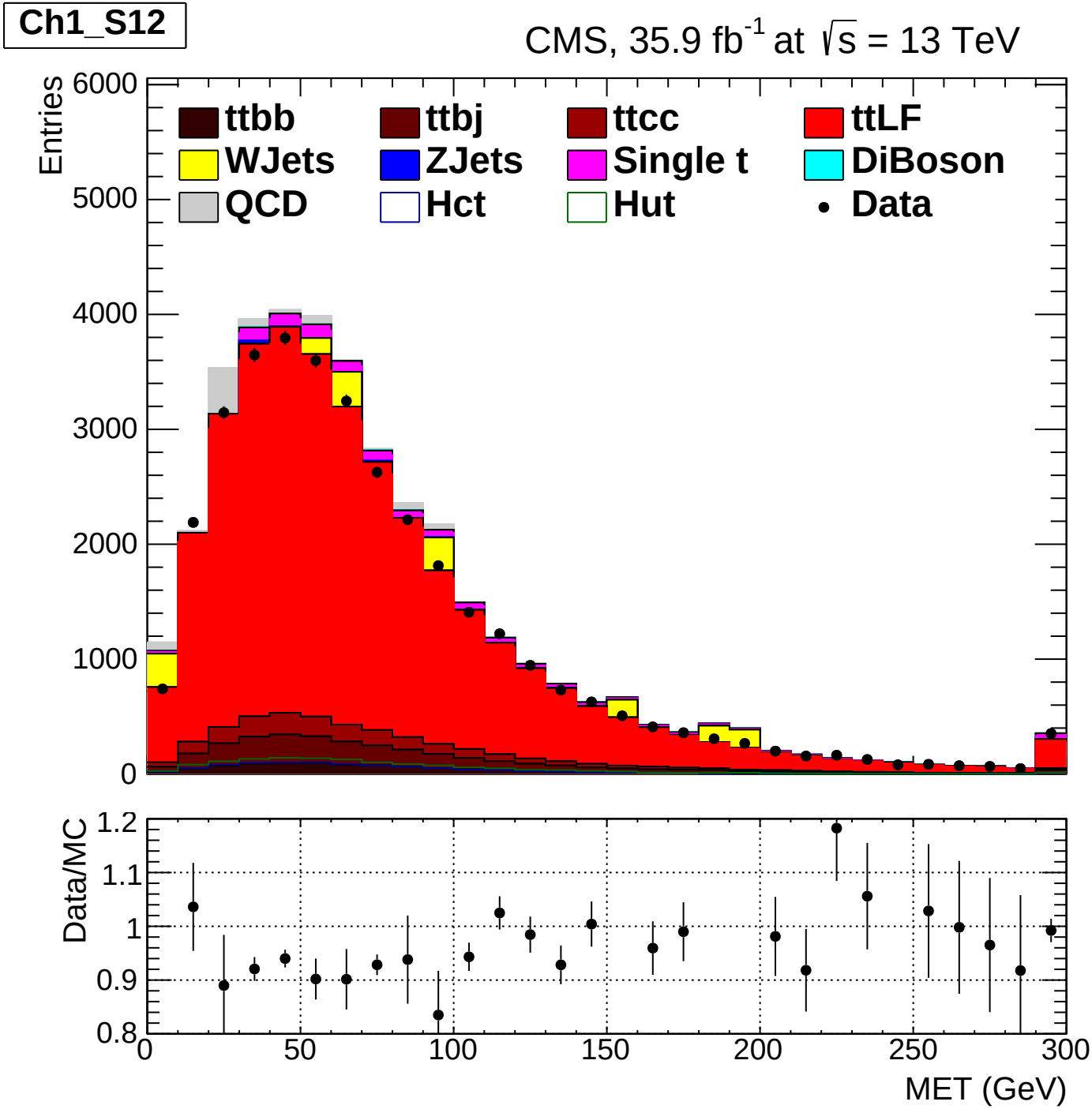

Ch1_S11
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
2000
4000
6000
8000
10000
12000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
350
400
Top Mass from Hc/u DRFCNHkinfit (GeV)

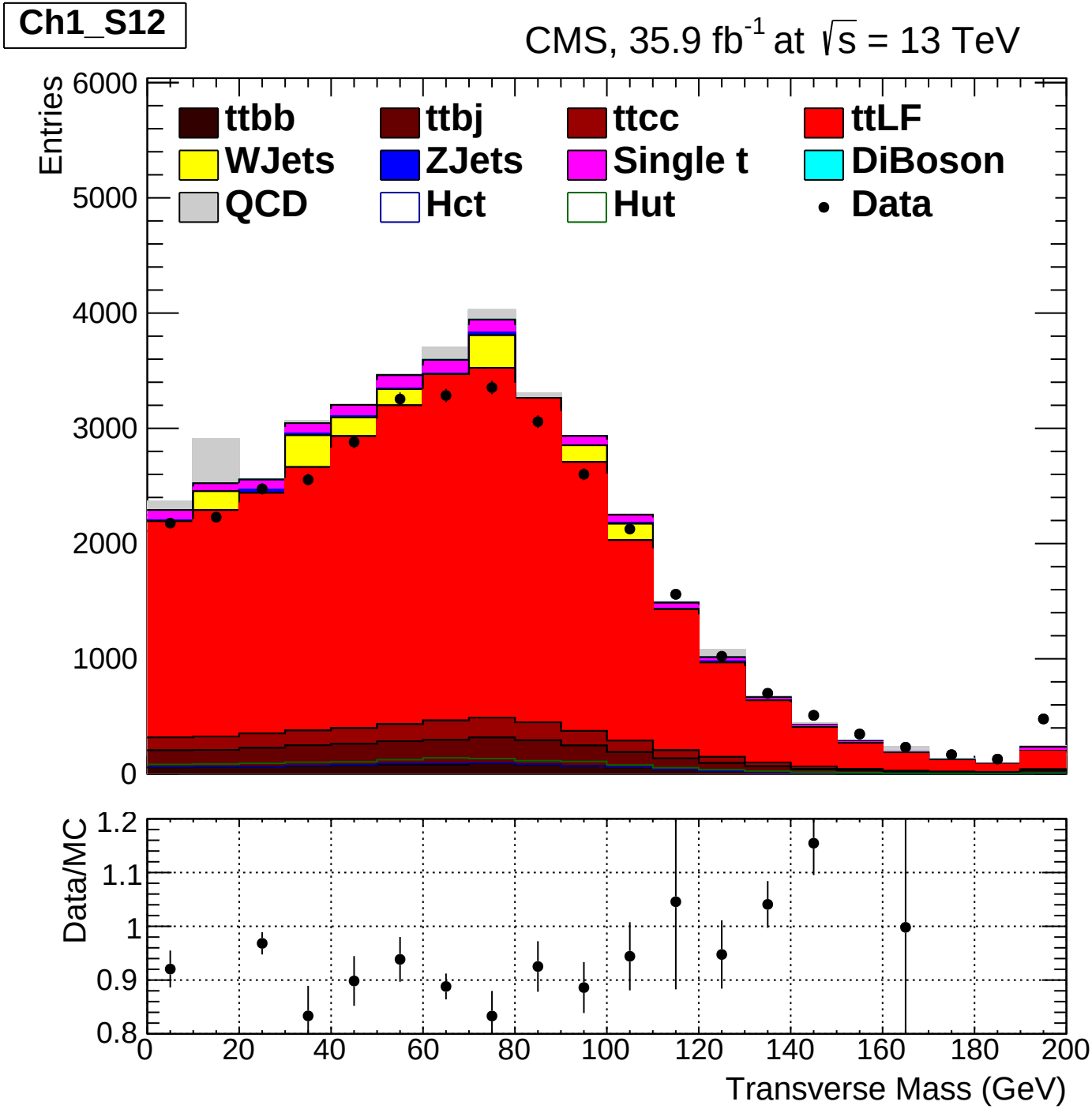

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

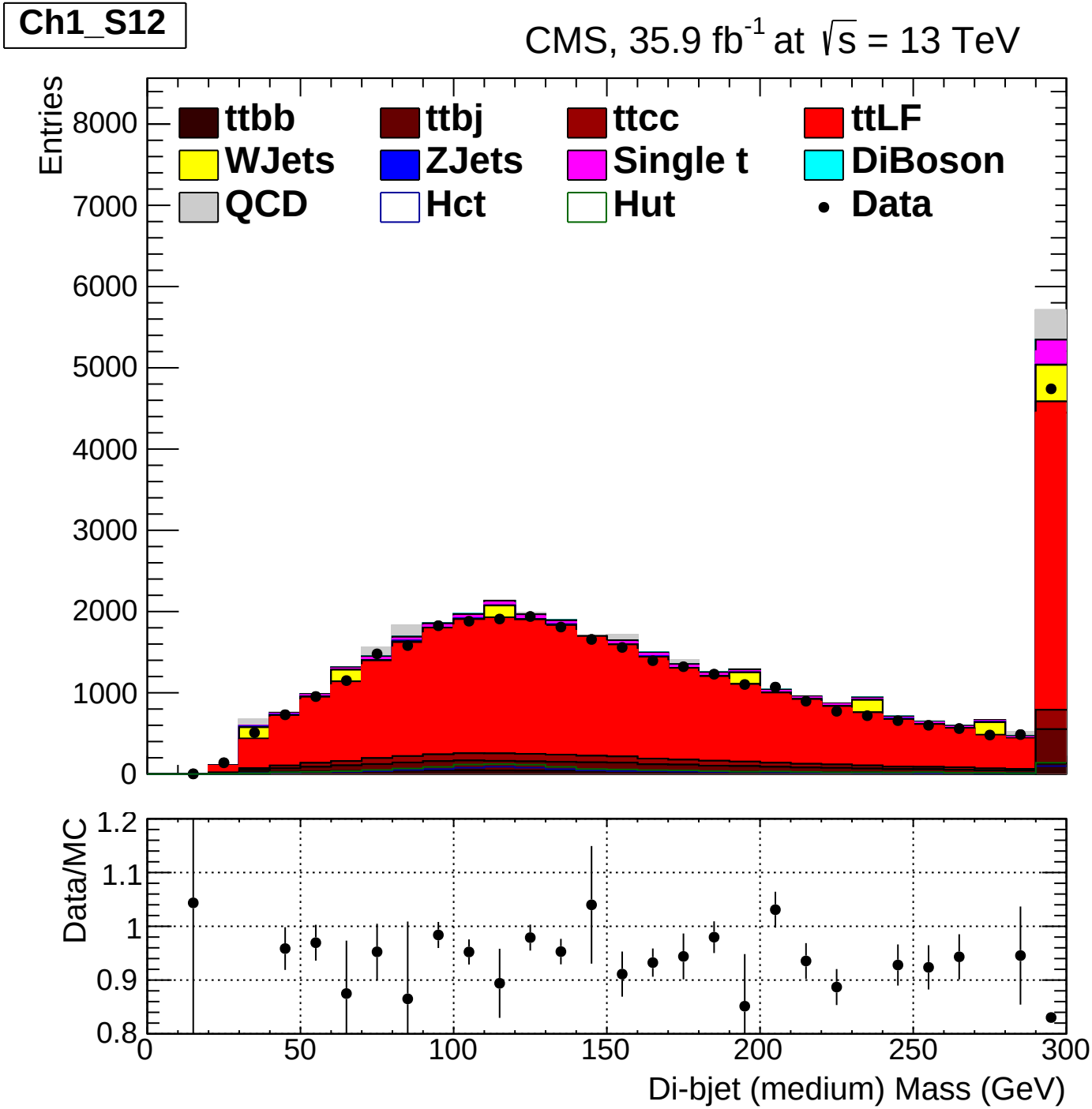

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

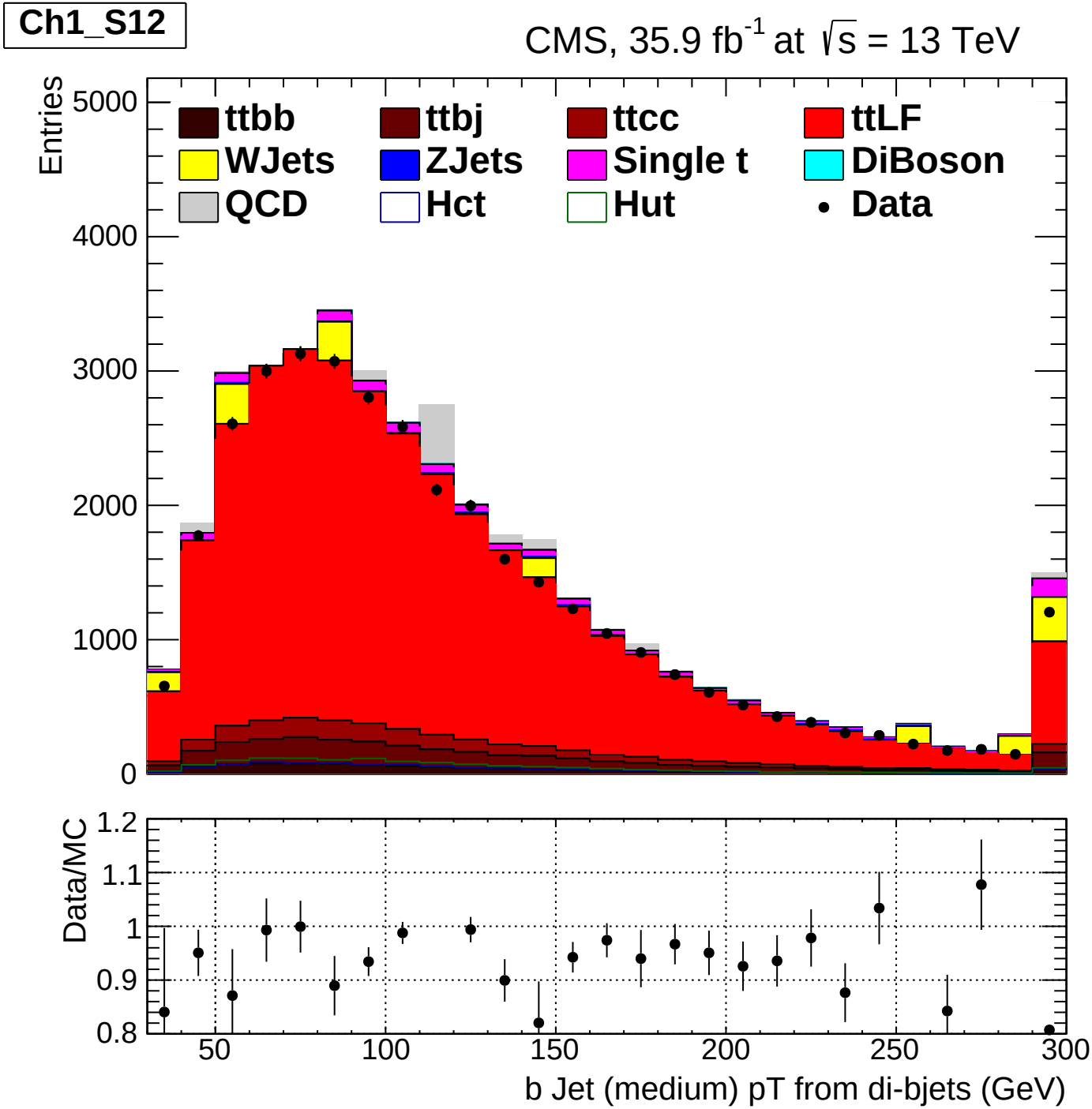

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

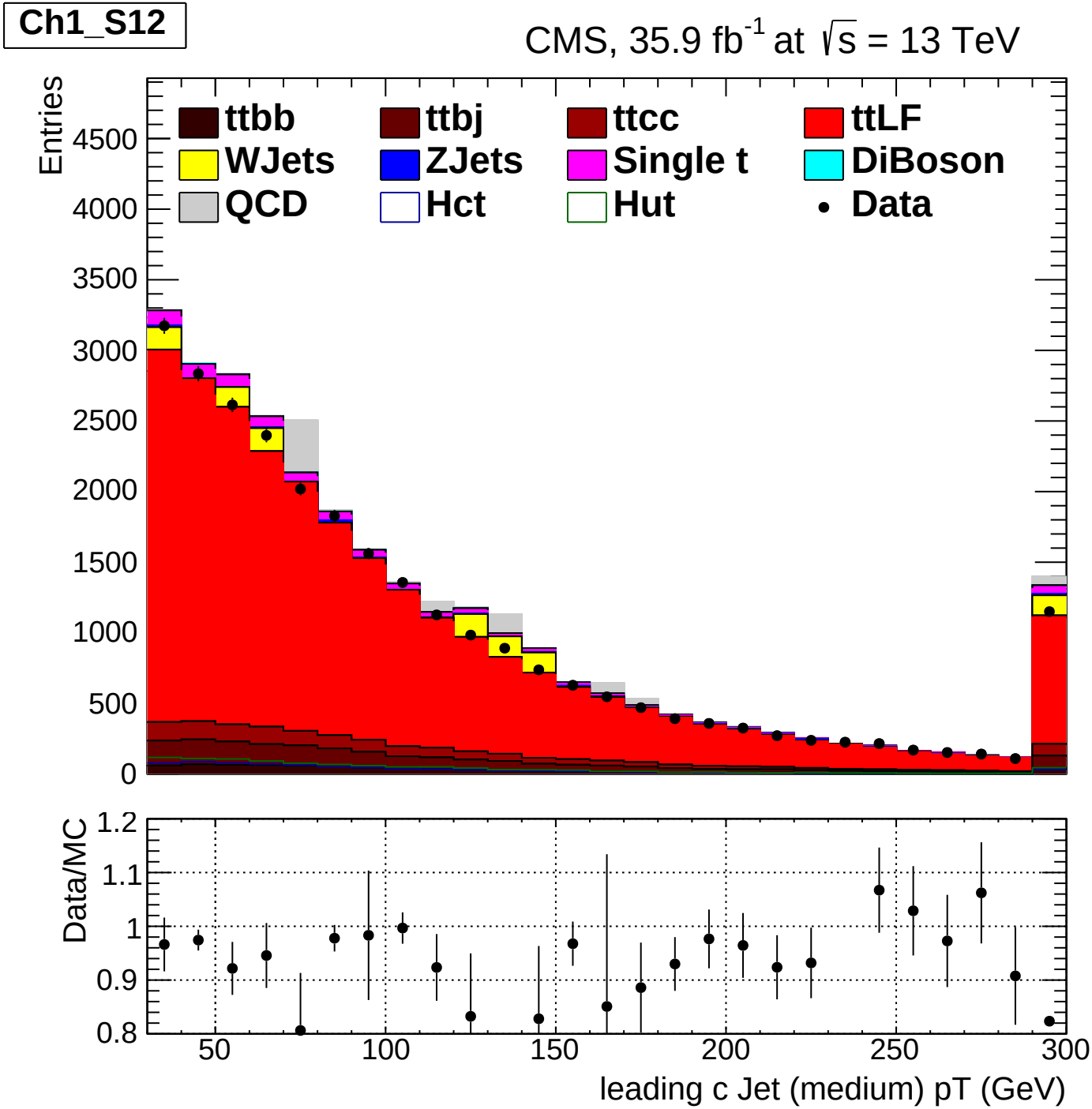

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

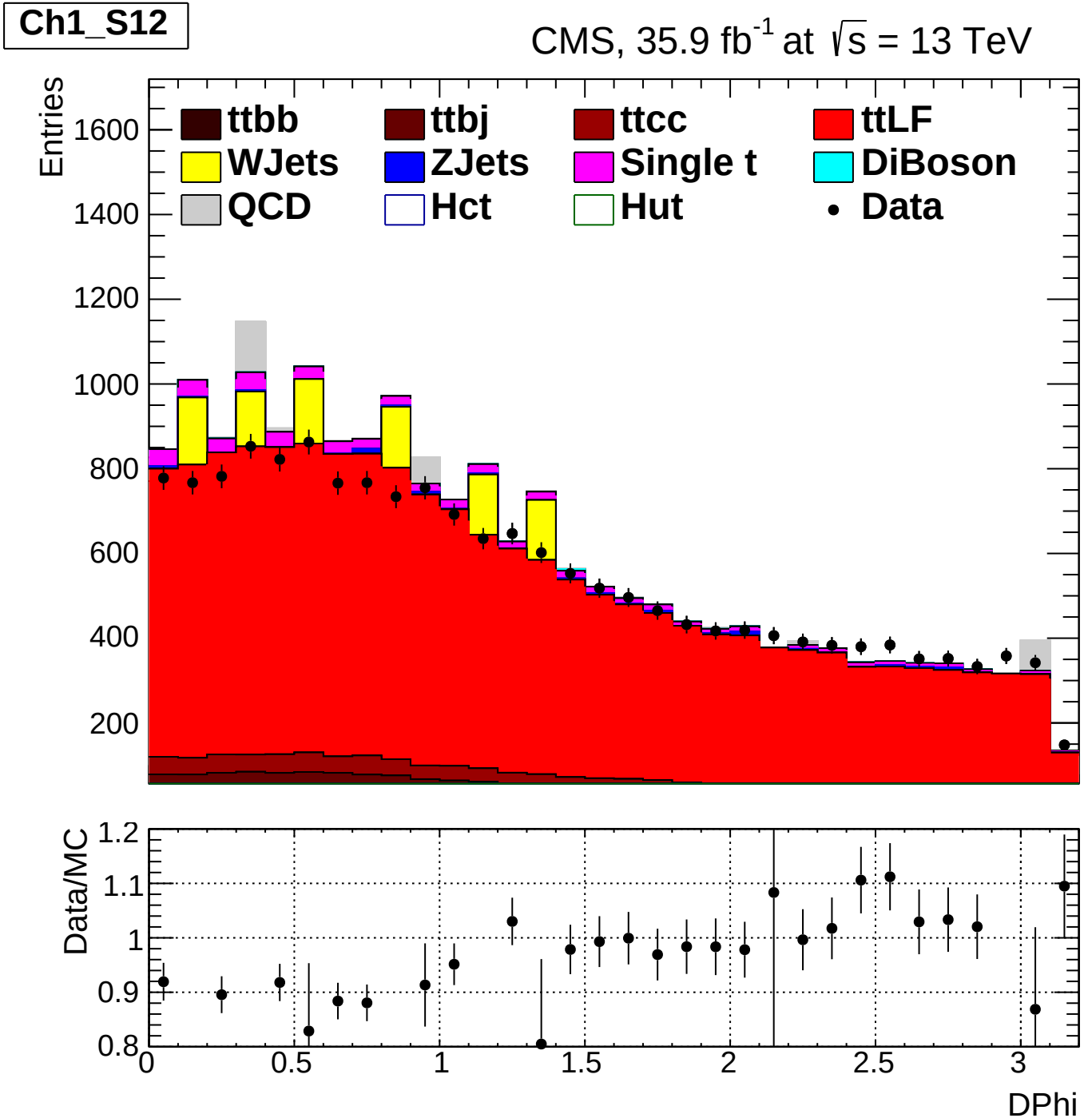

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

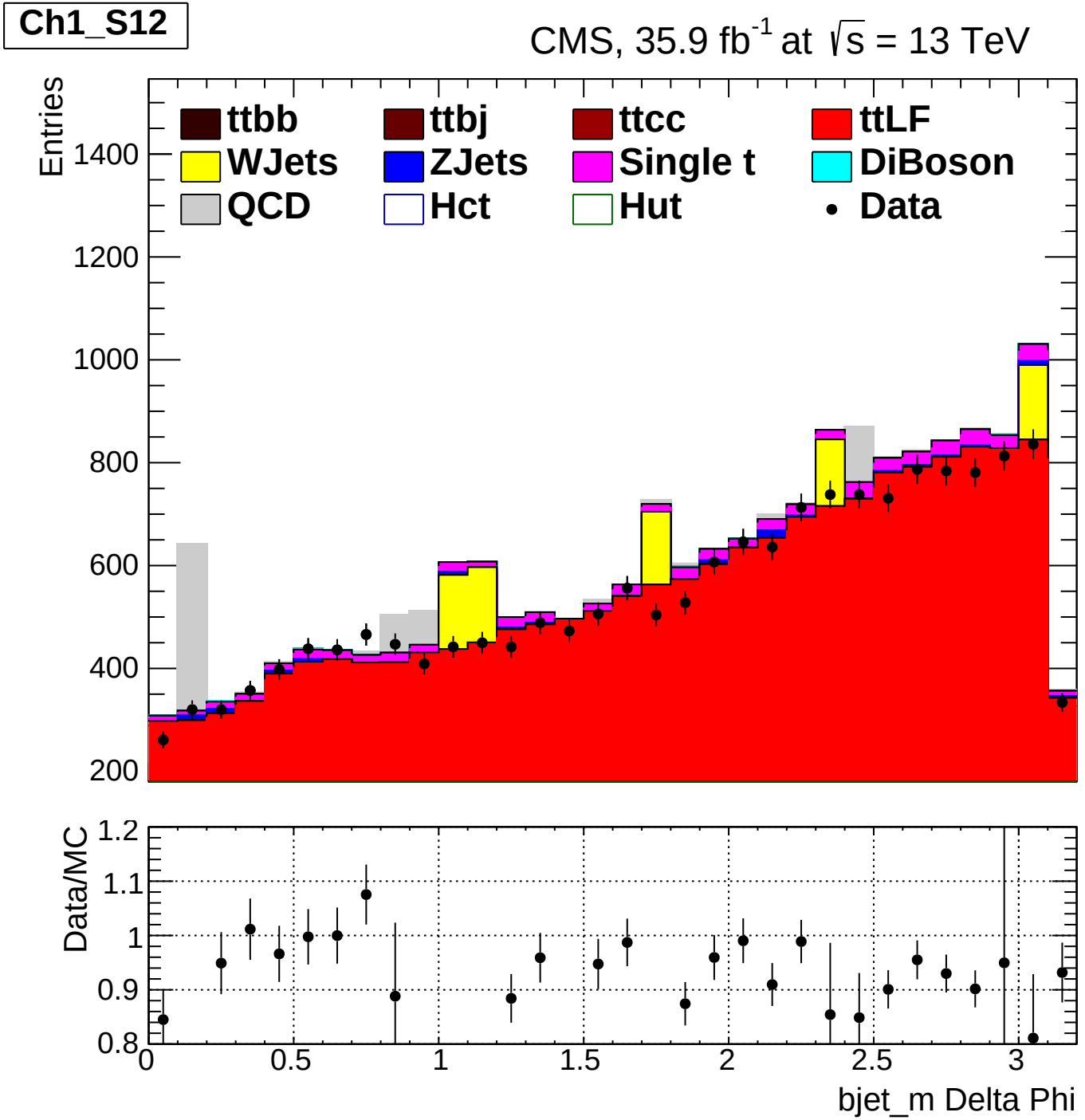

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

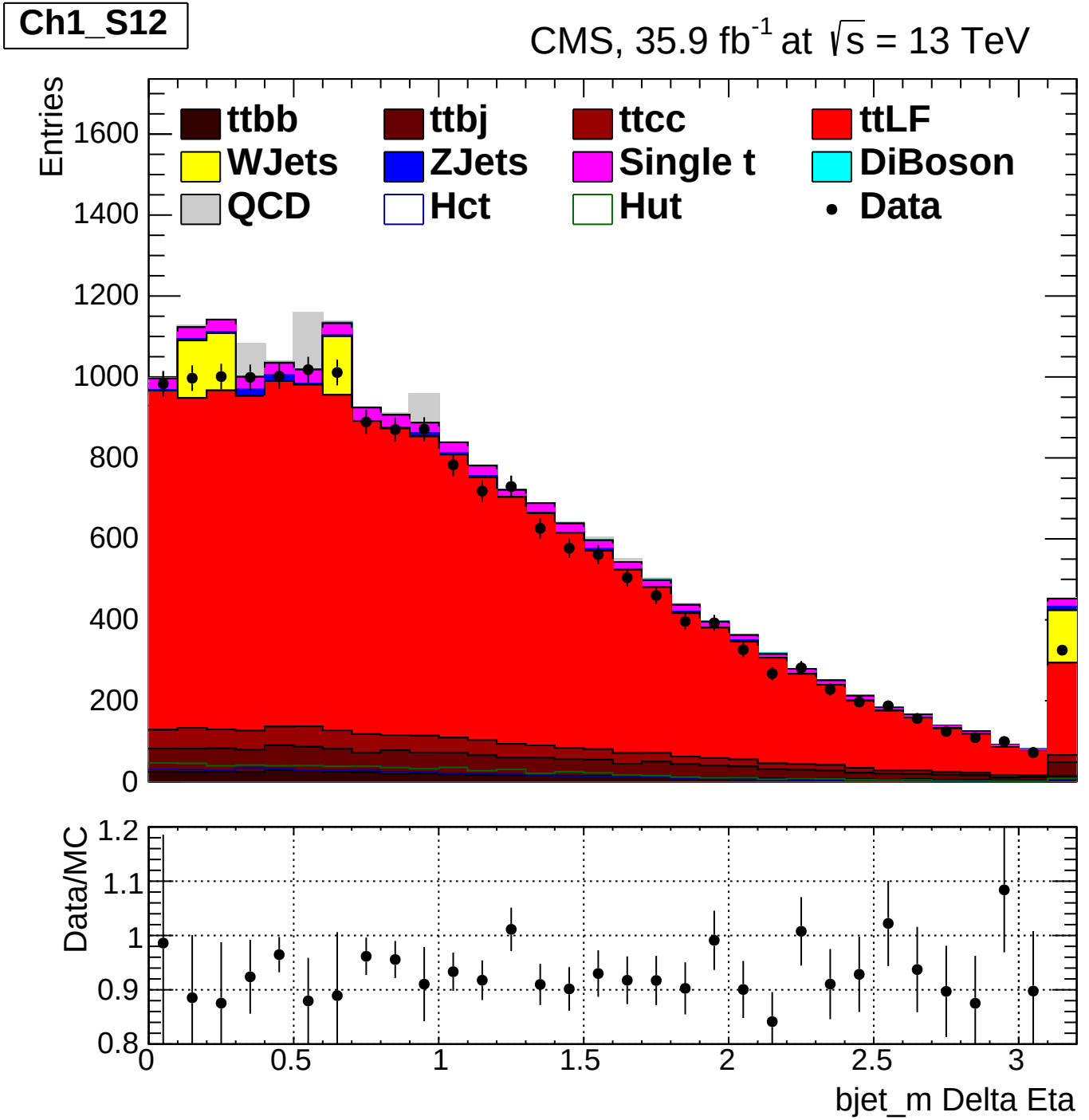

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

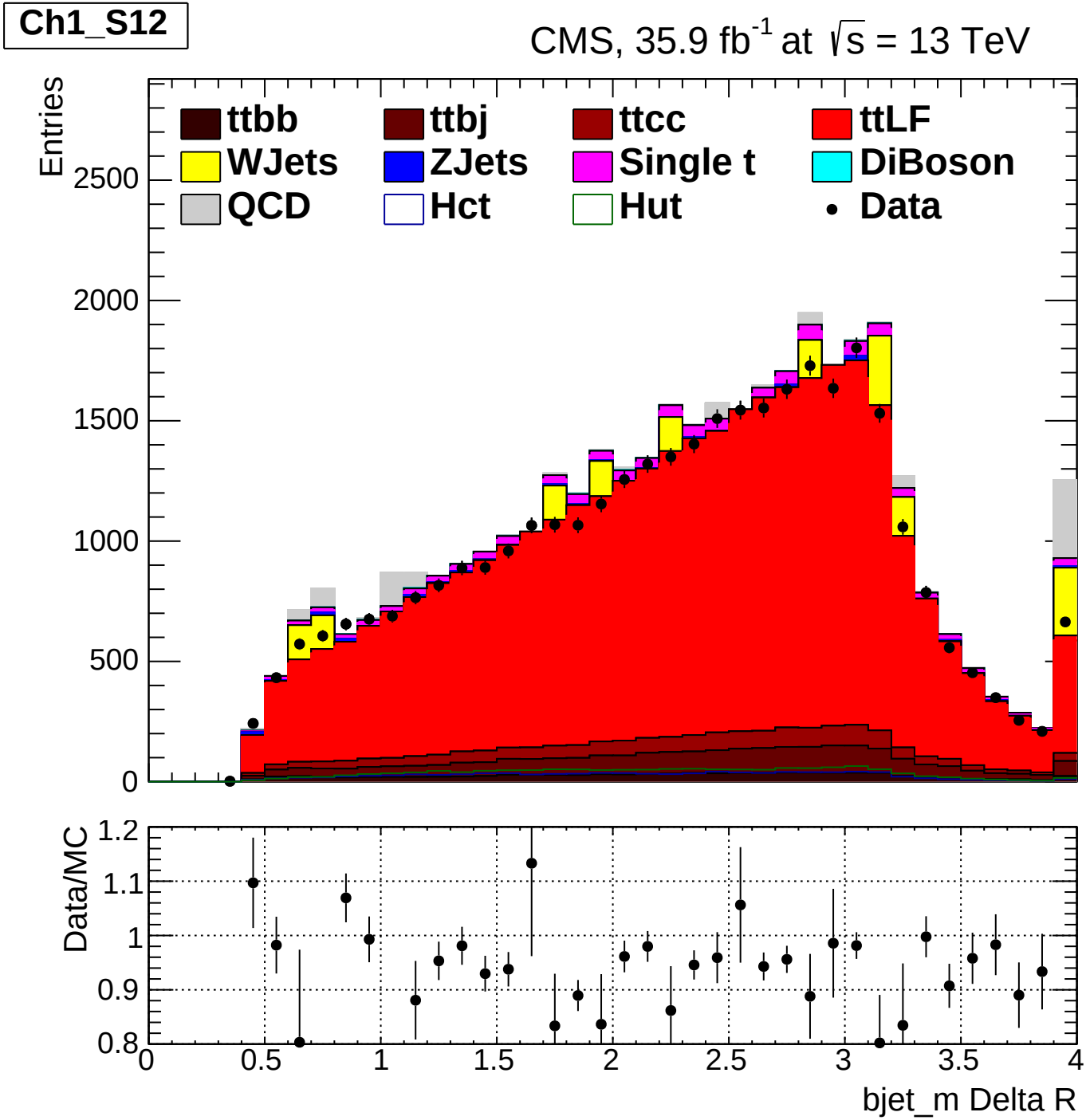

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

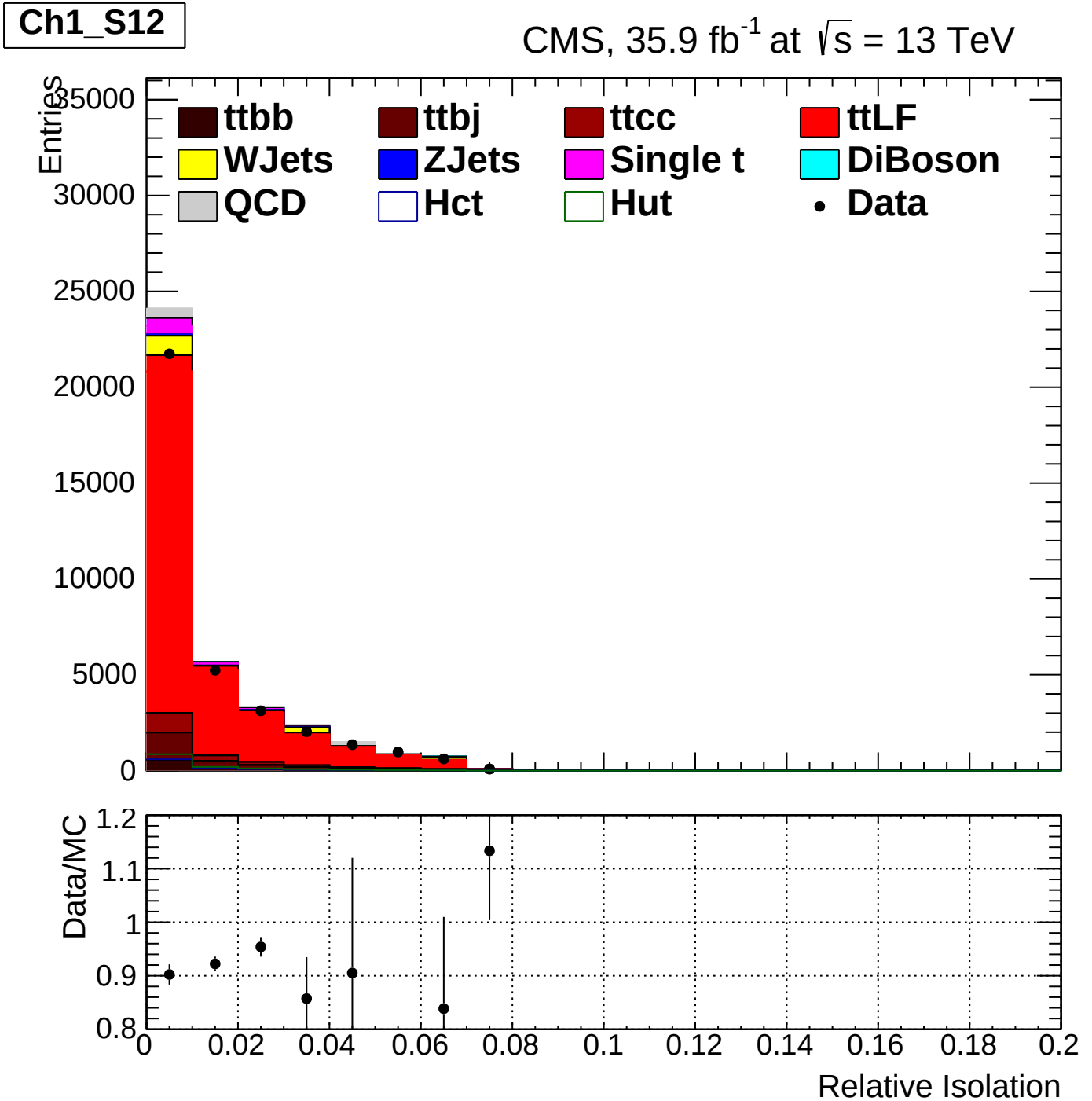

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)

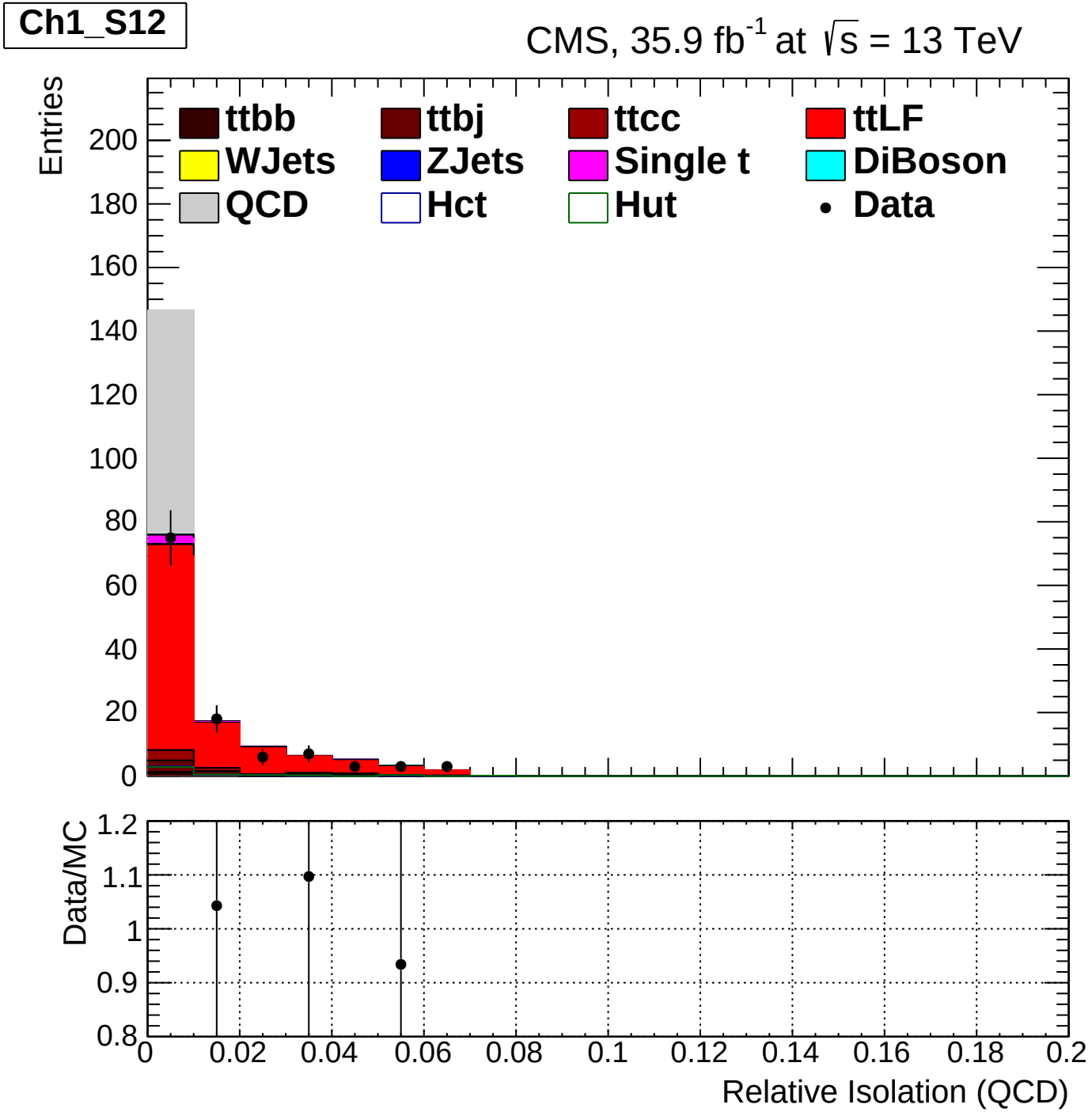

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1600
1400
1200
1000
800
600
400
200
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
DPhi

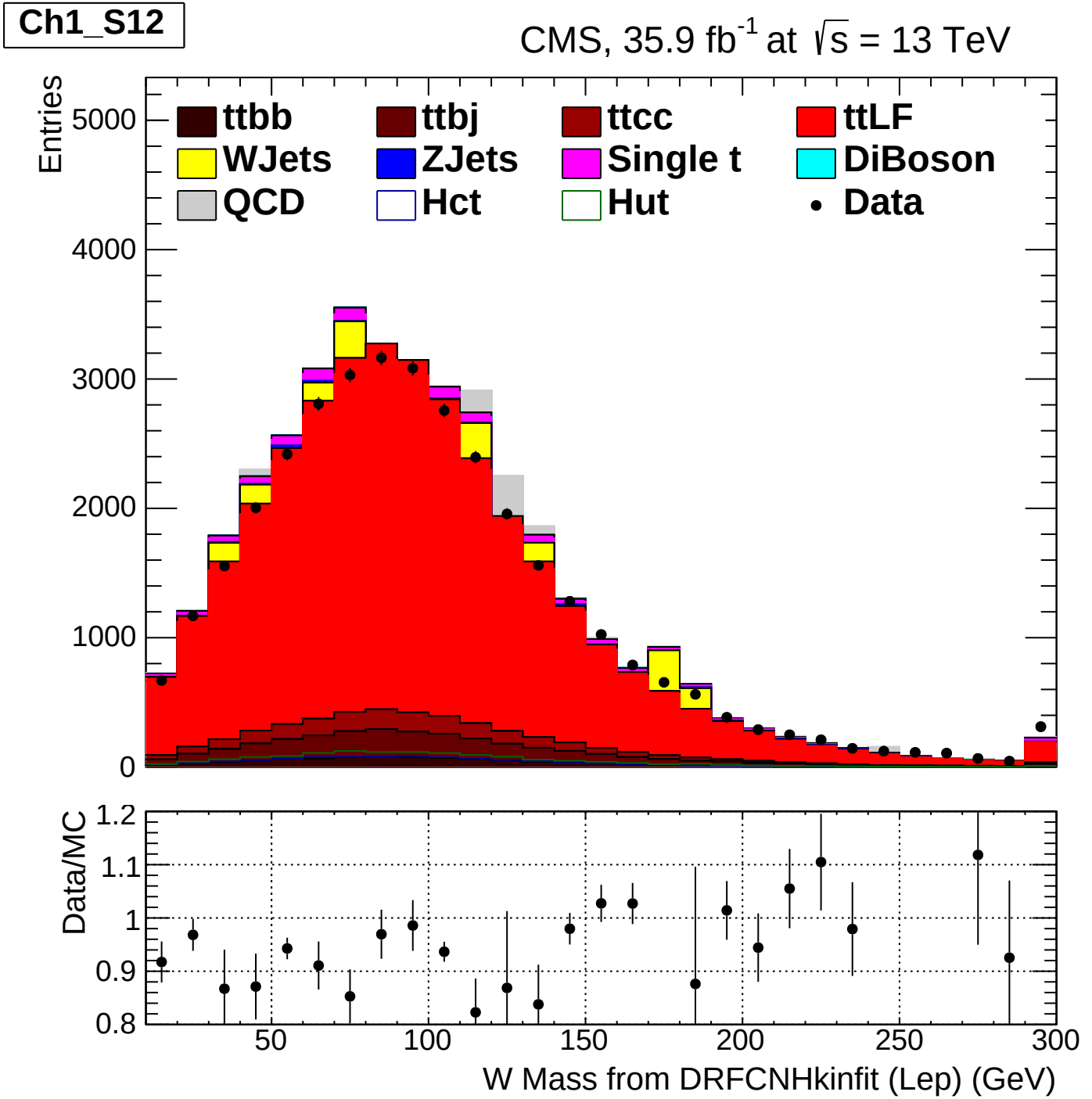

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1400
1200
1000
800
600
400
200
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

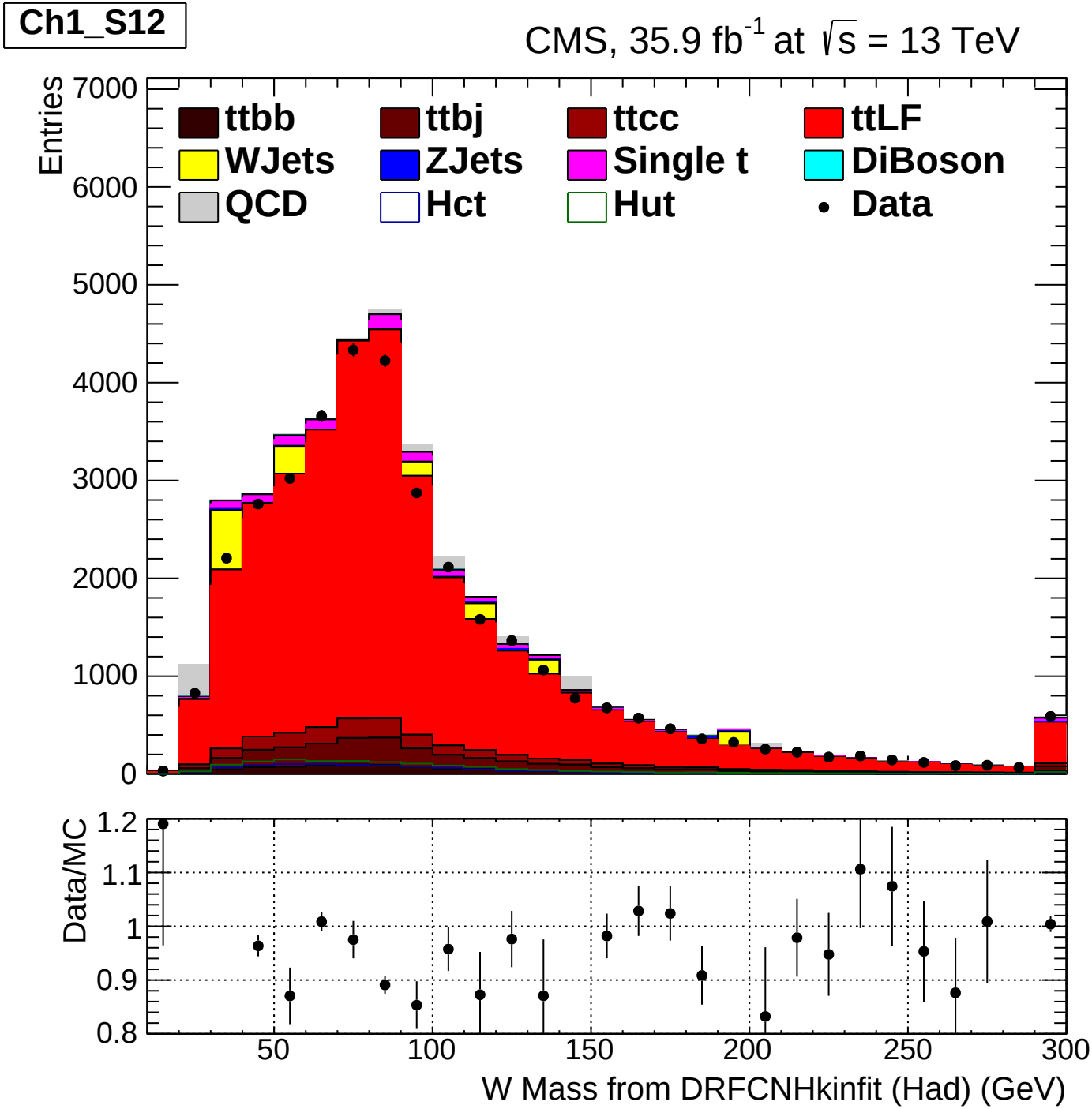

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

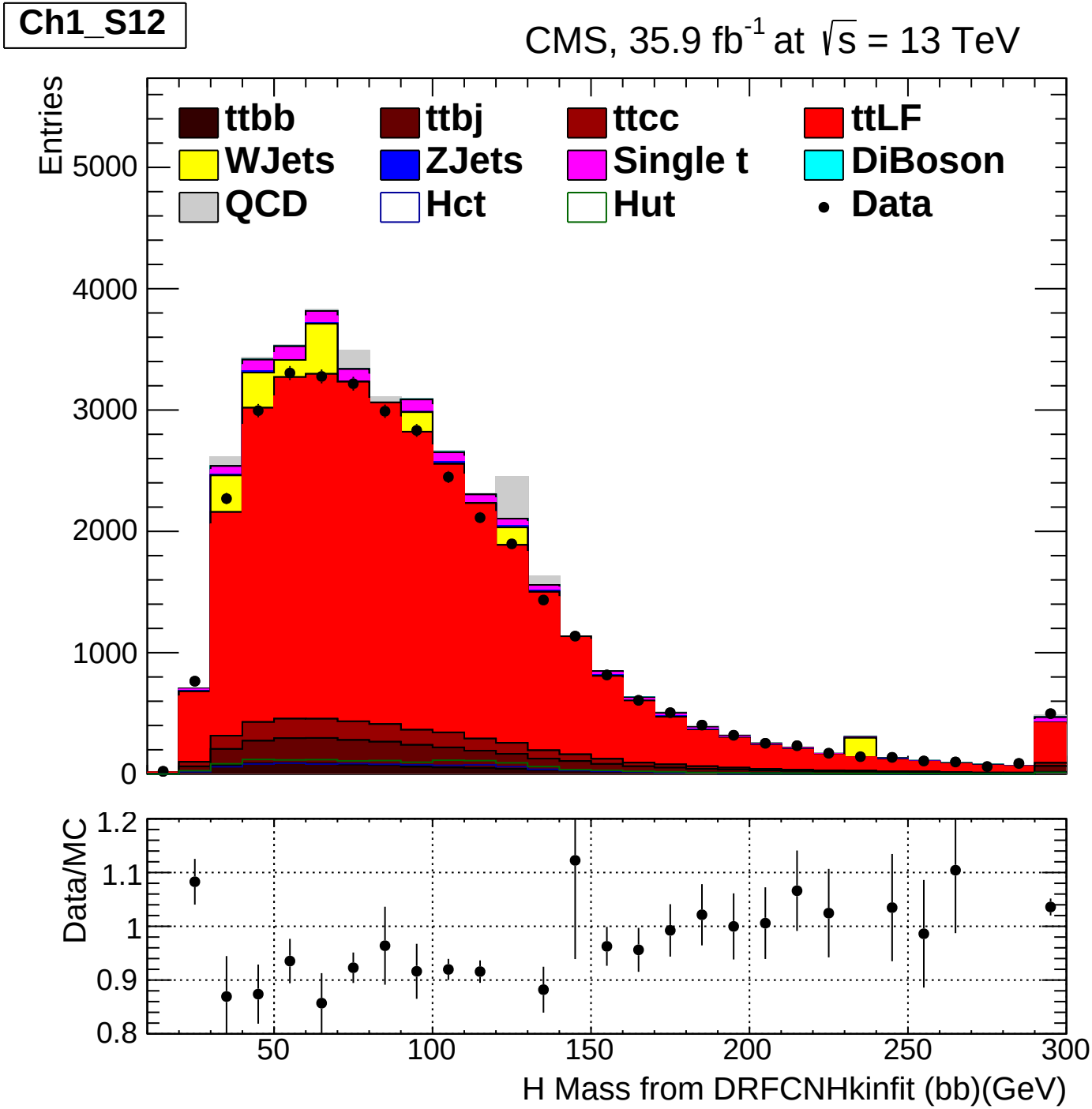

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

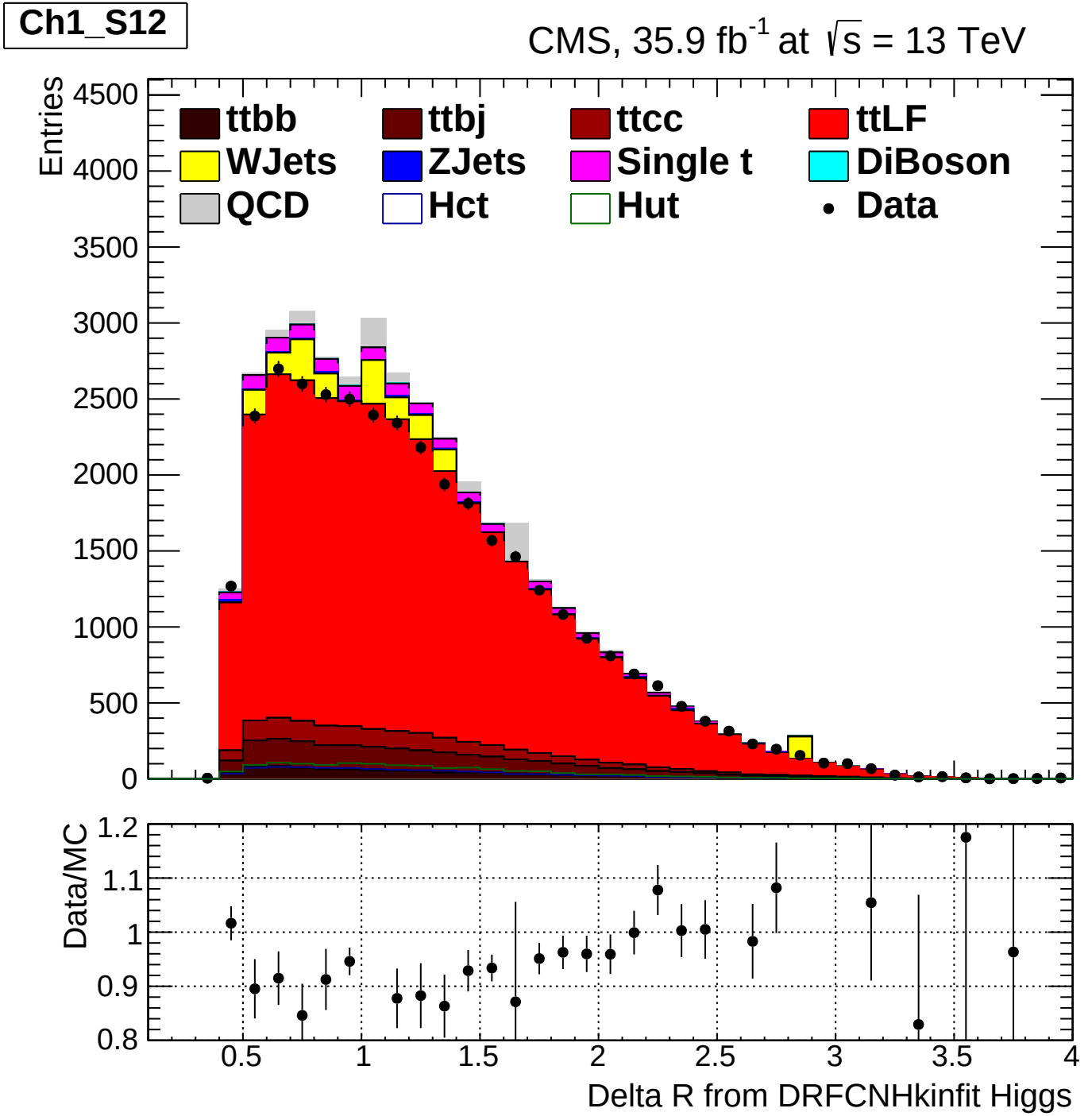

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

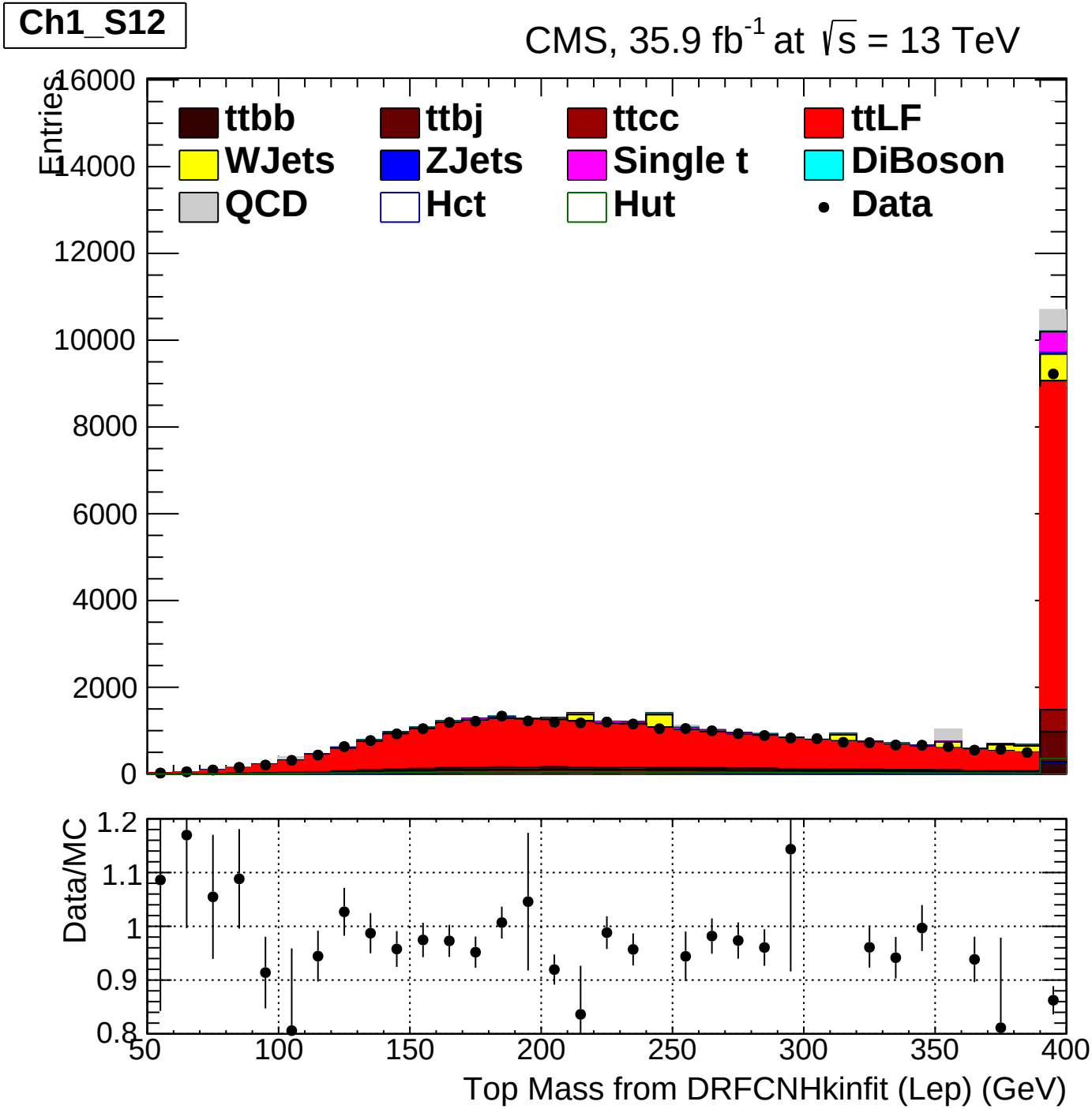

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

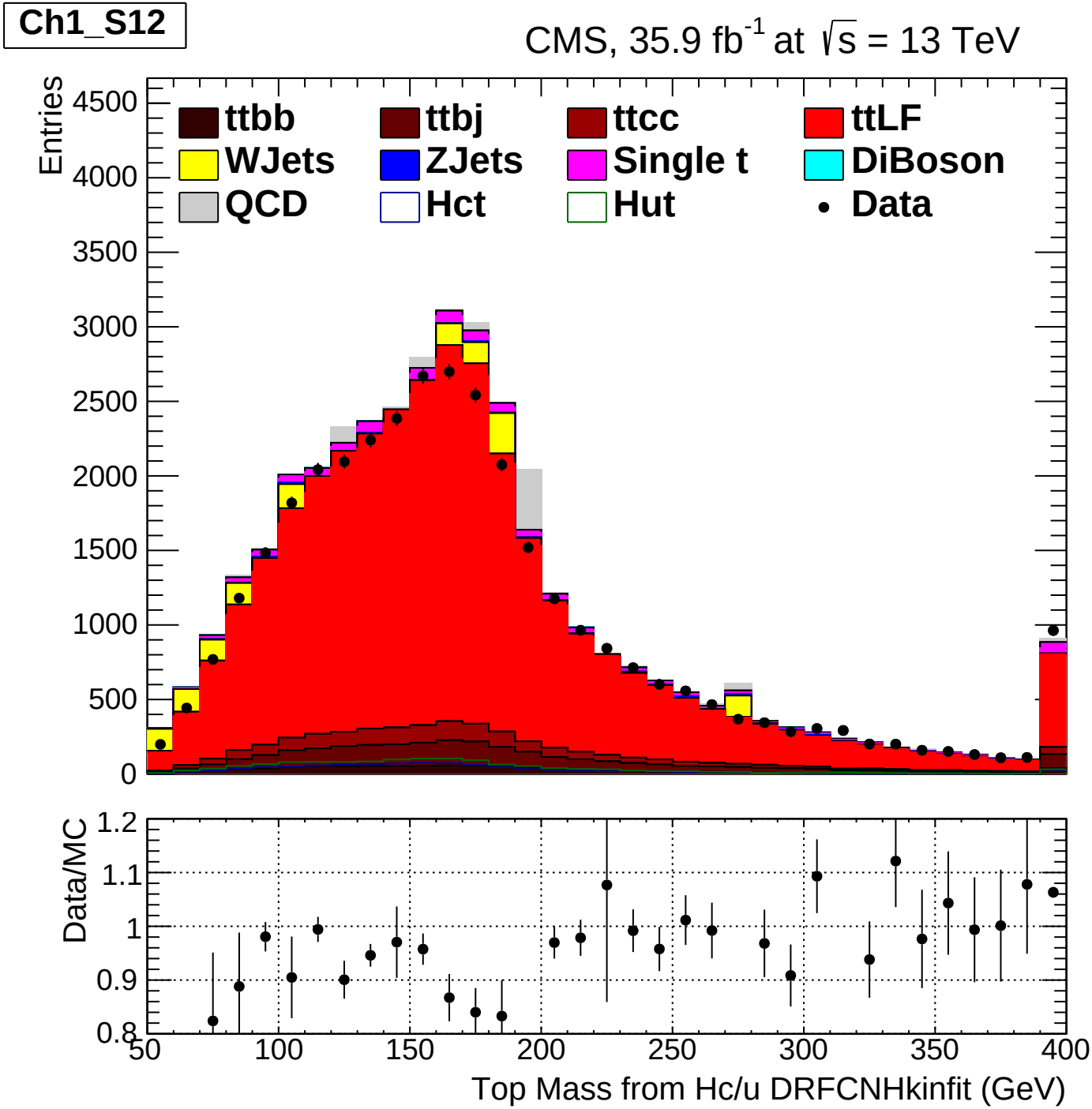

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

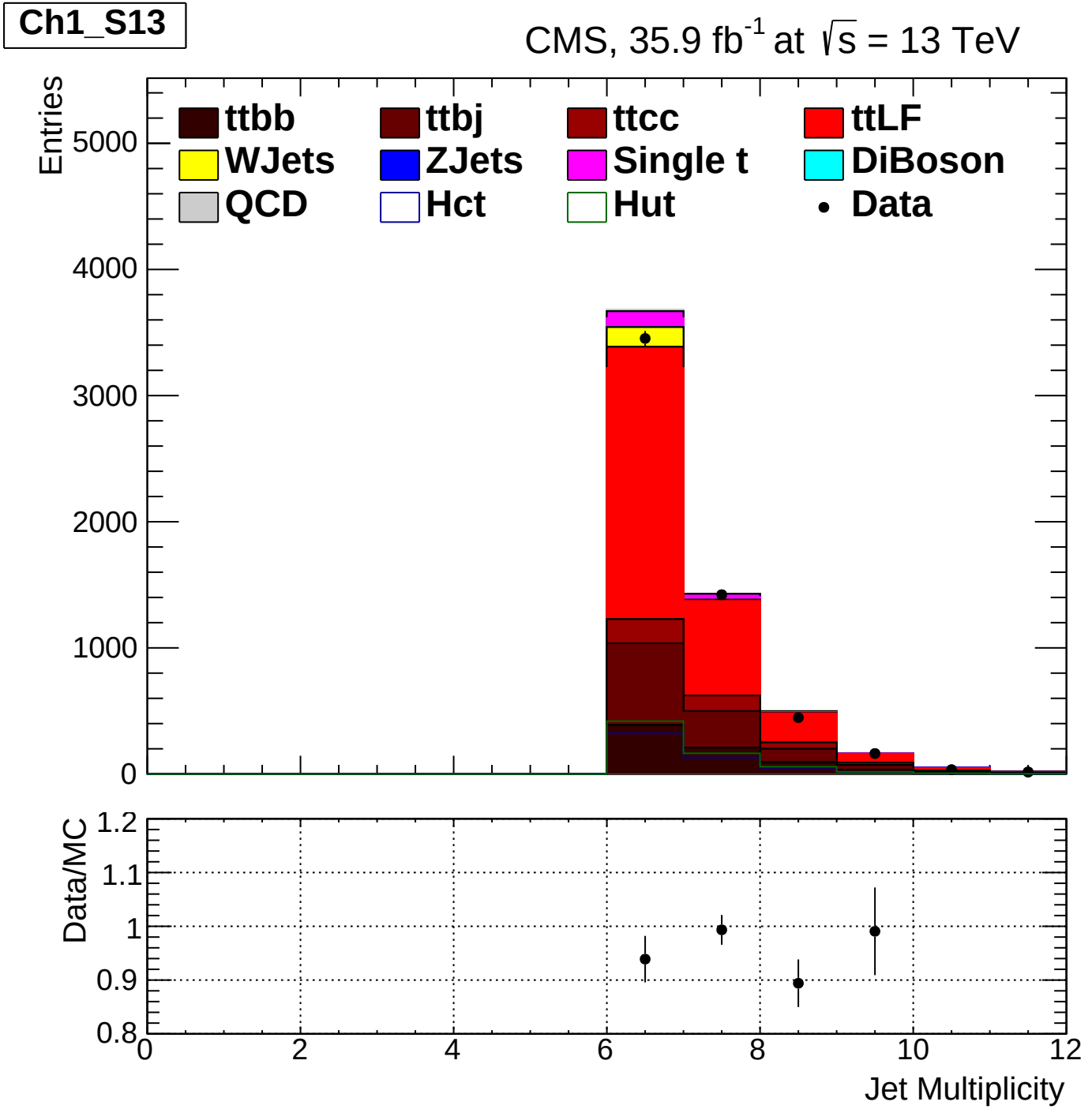

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

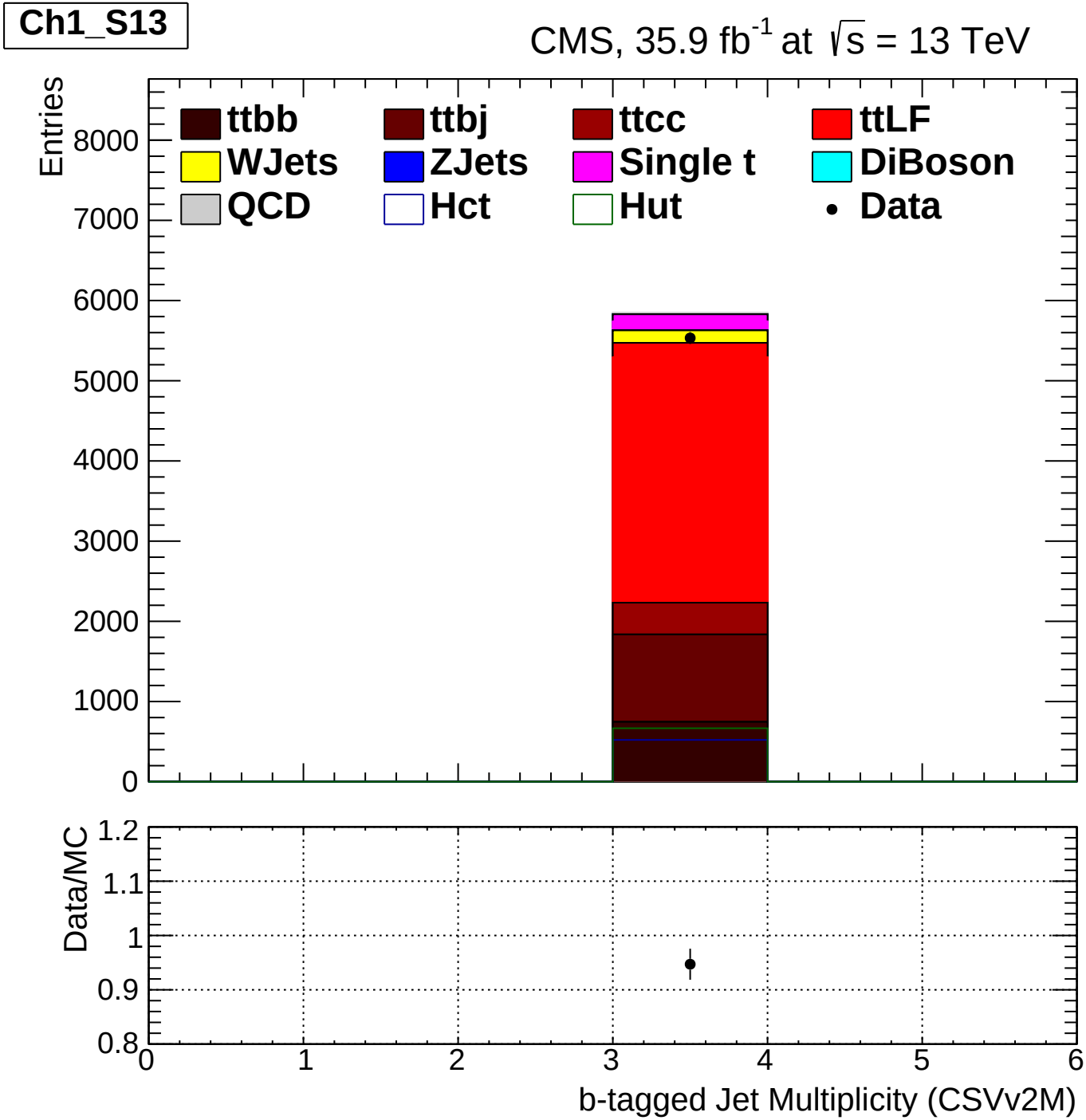

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
H Mass from DRFCNHkinfit (bb)(GeV)

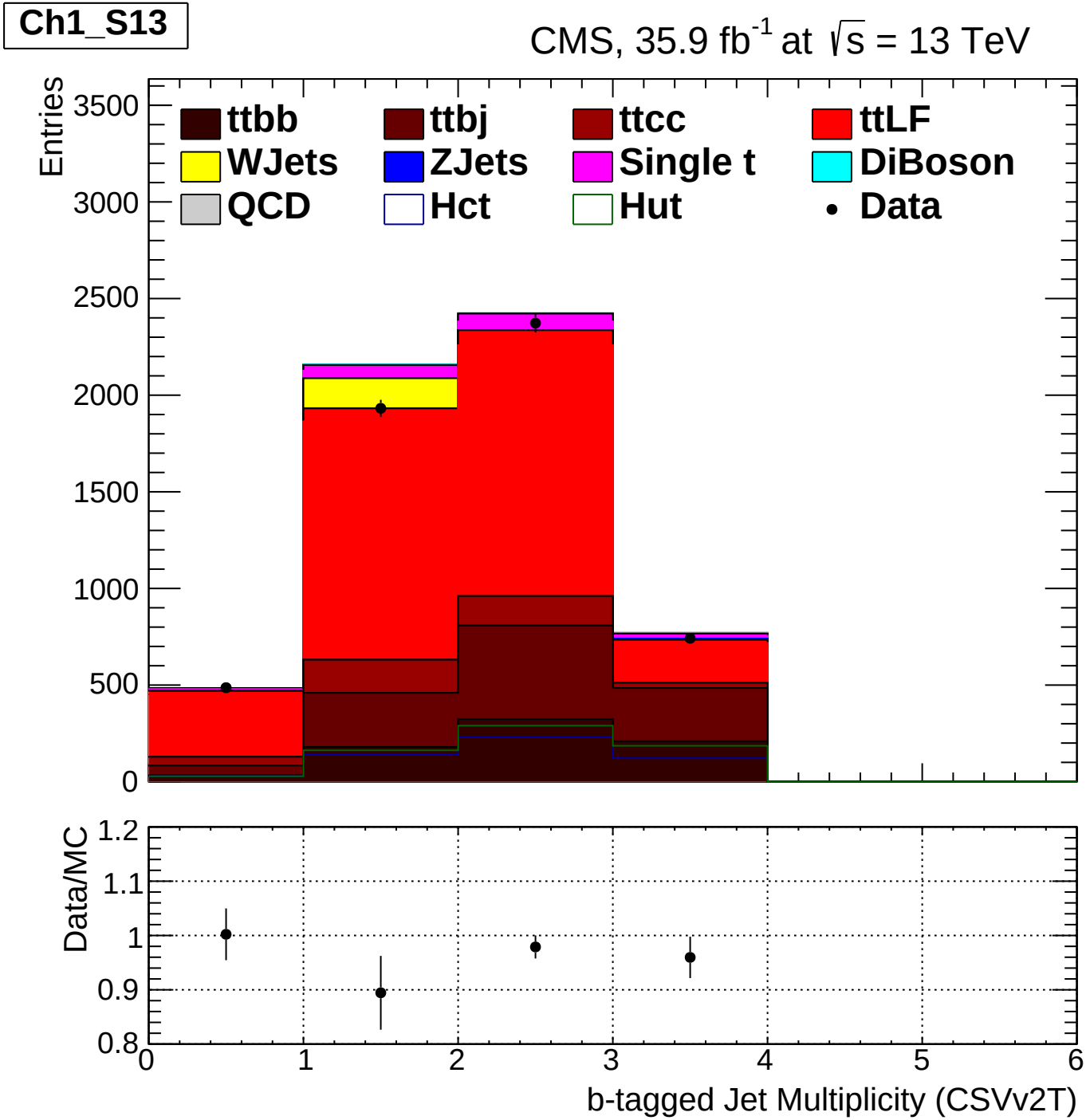

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

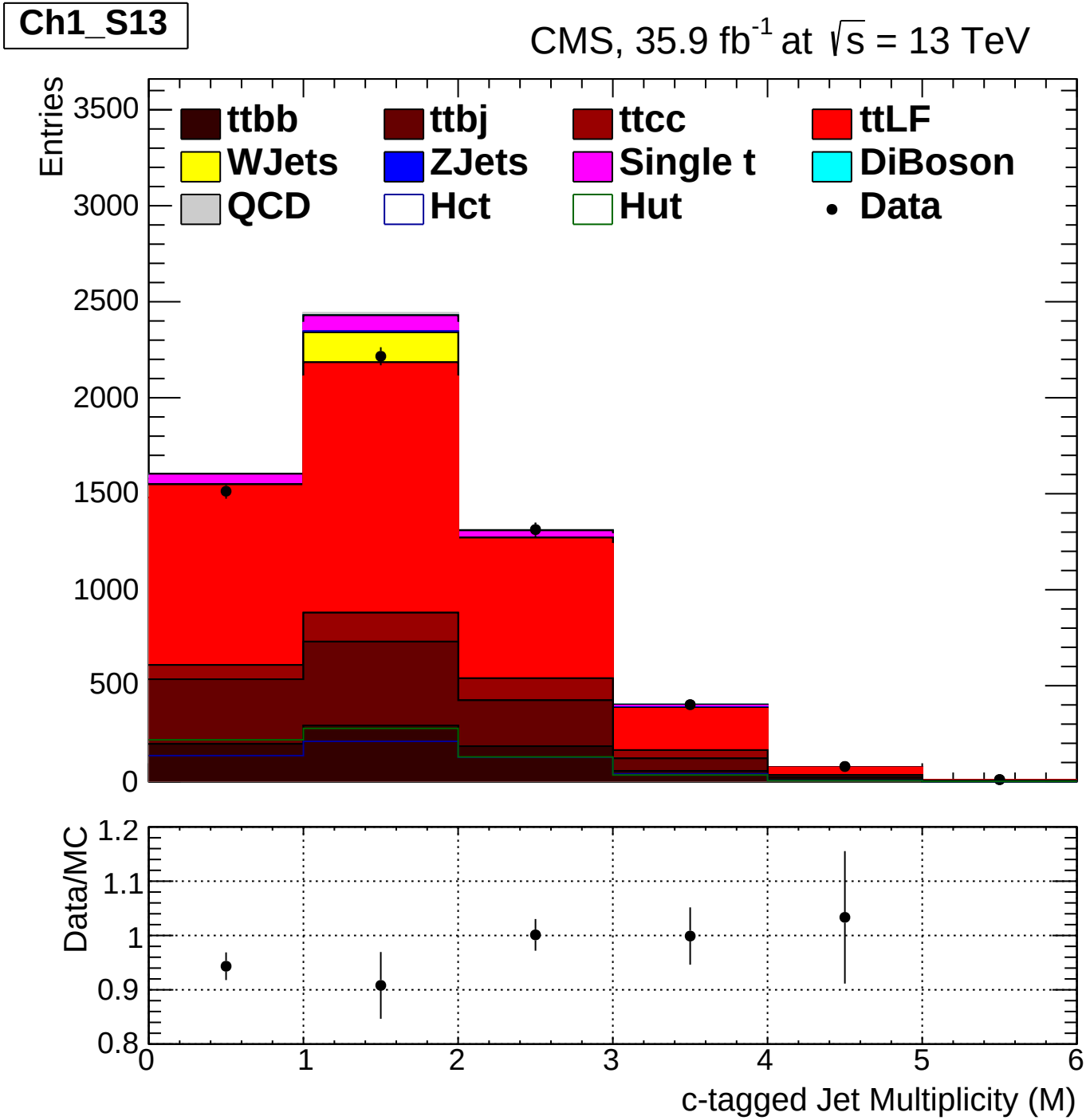

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

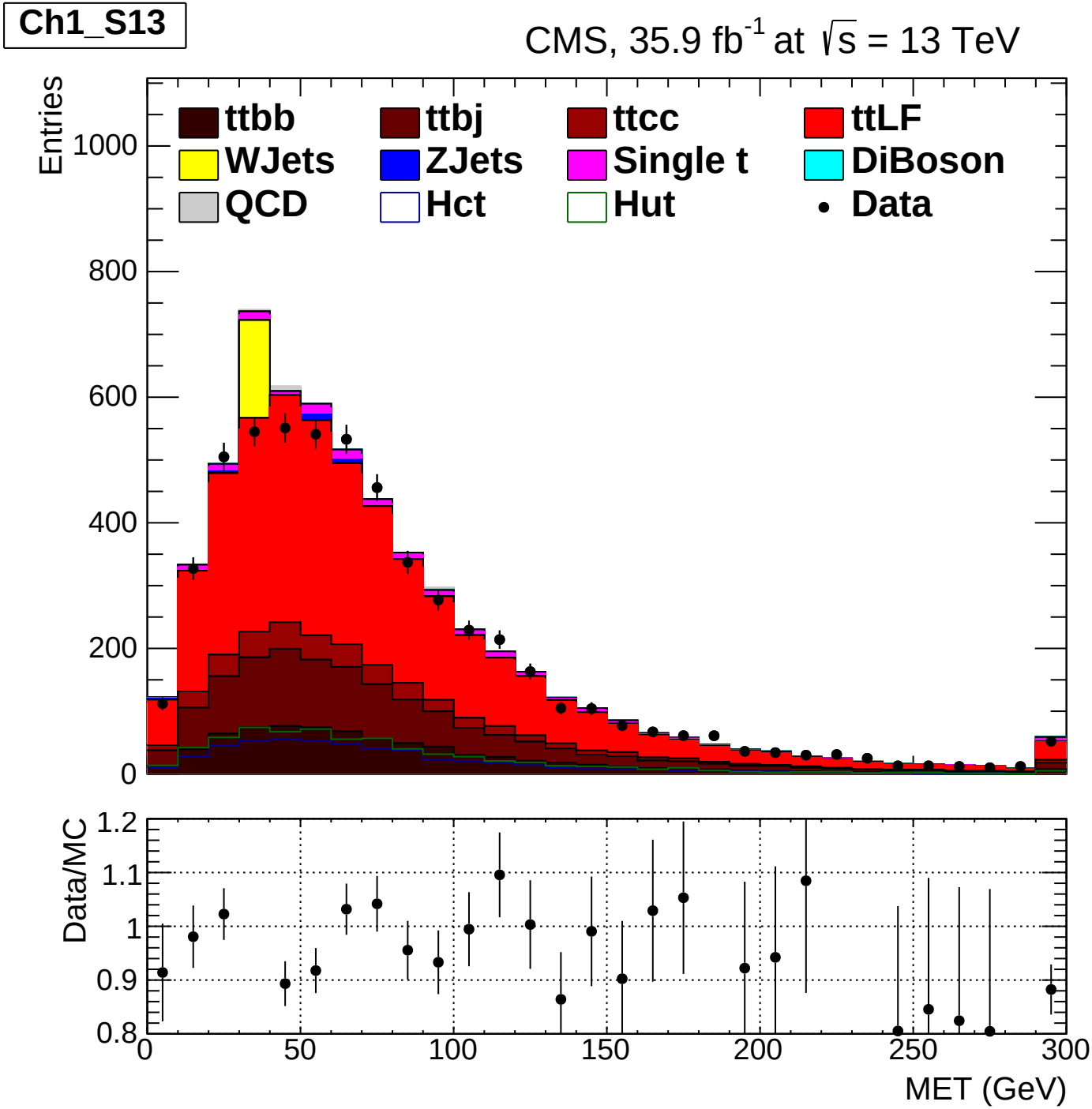

Ch1_S12
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

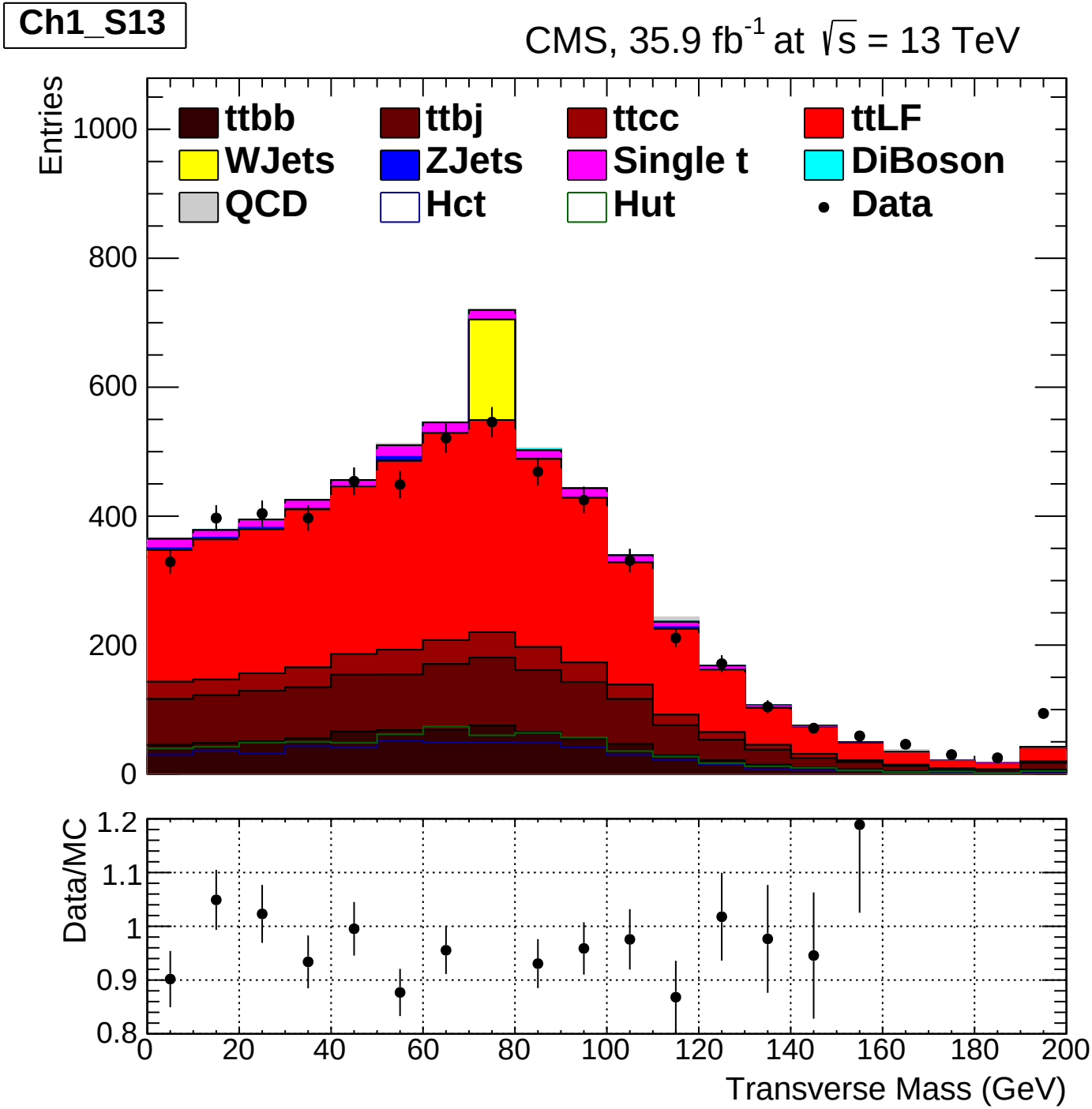

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
5000
4000
3000
2000
1000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

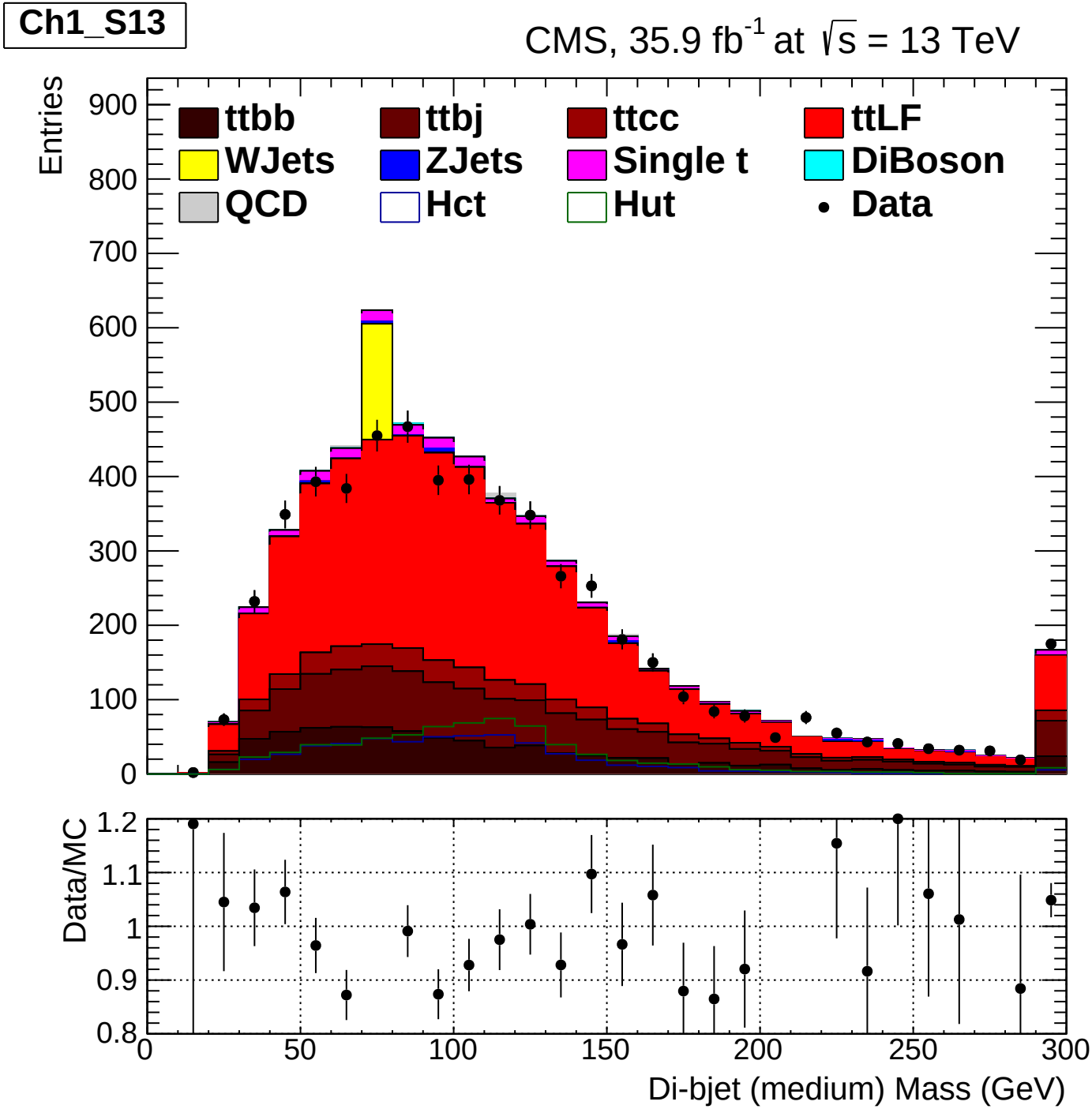

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

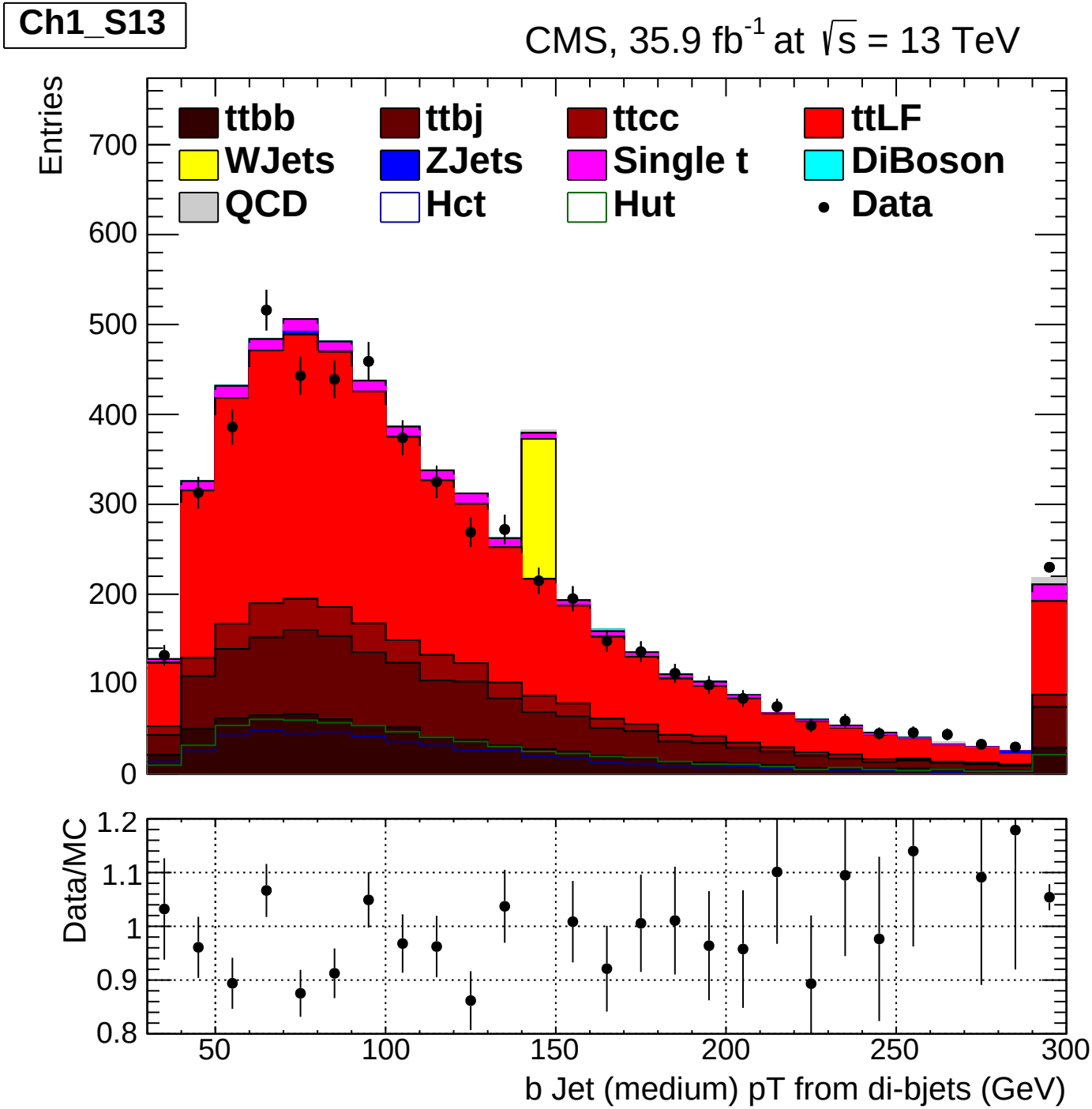

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

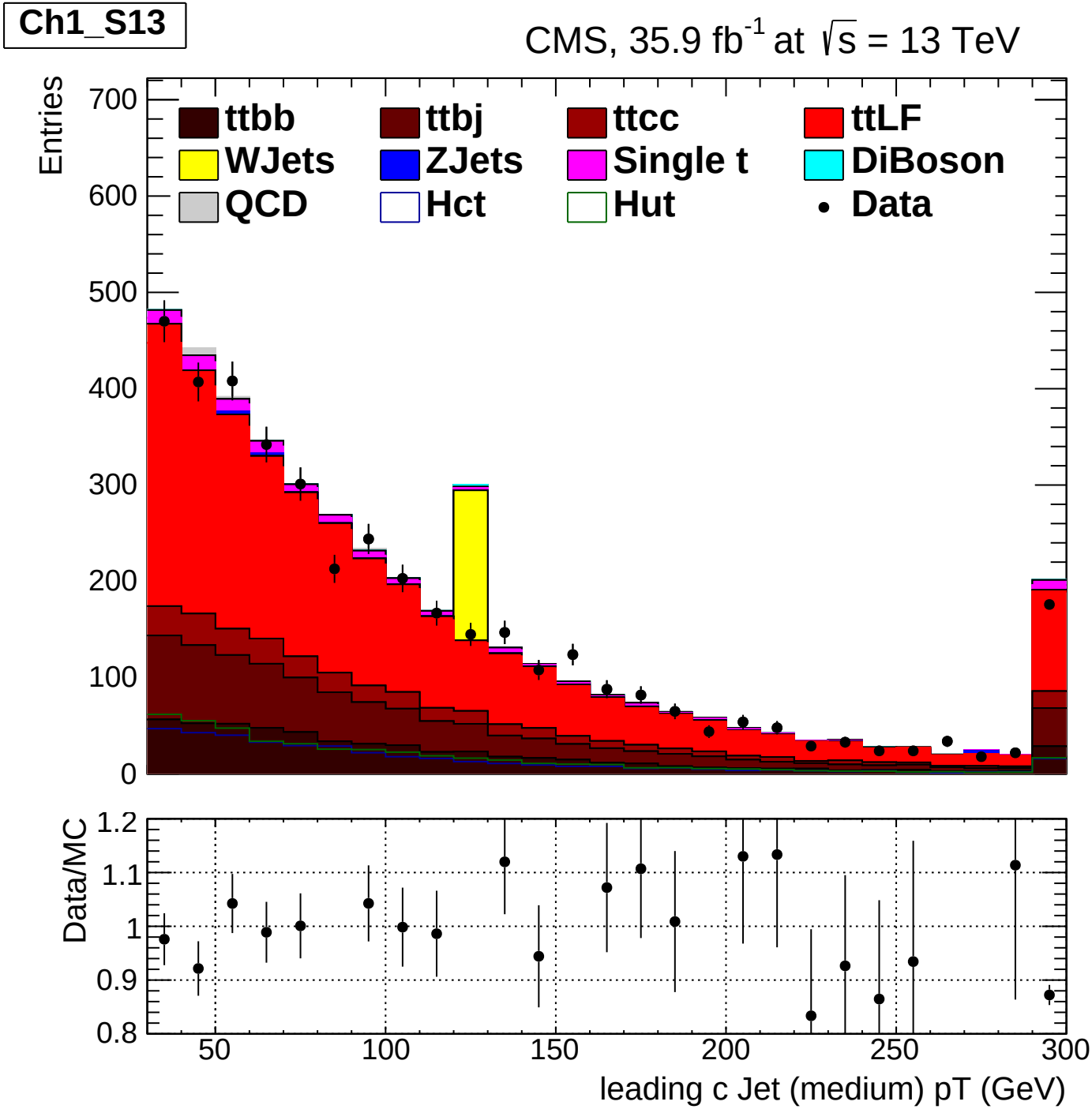

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

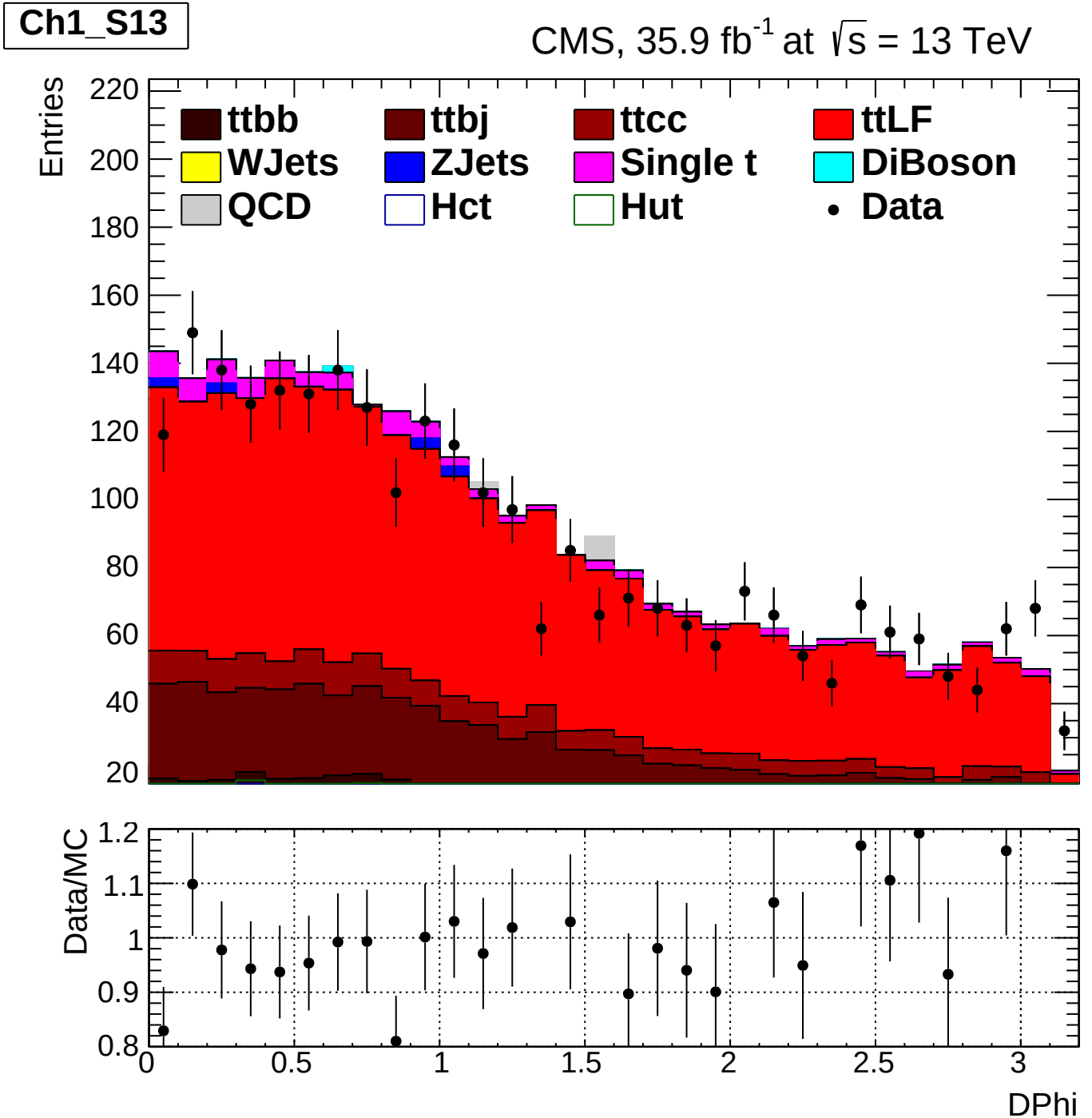

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
leading c Jet (medium) pT (GeV)


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
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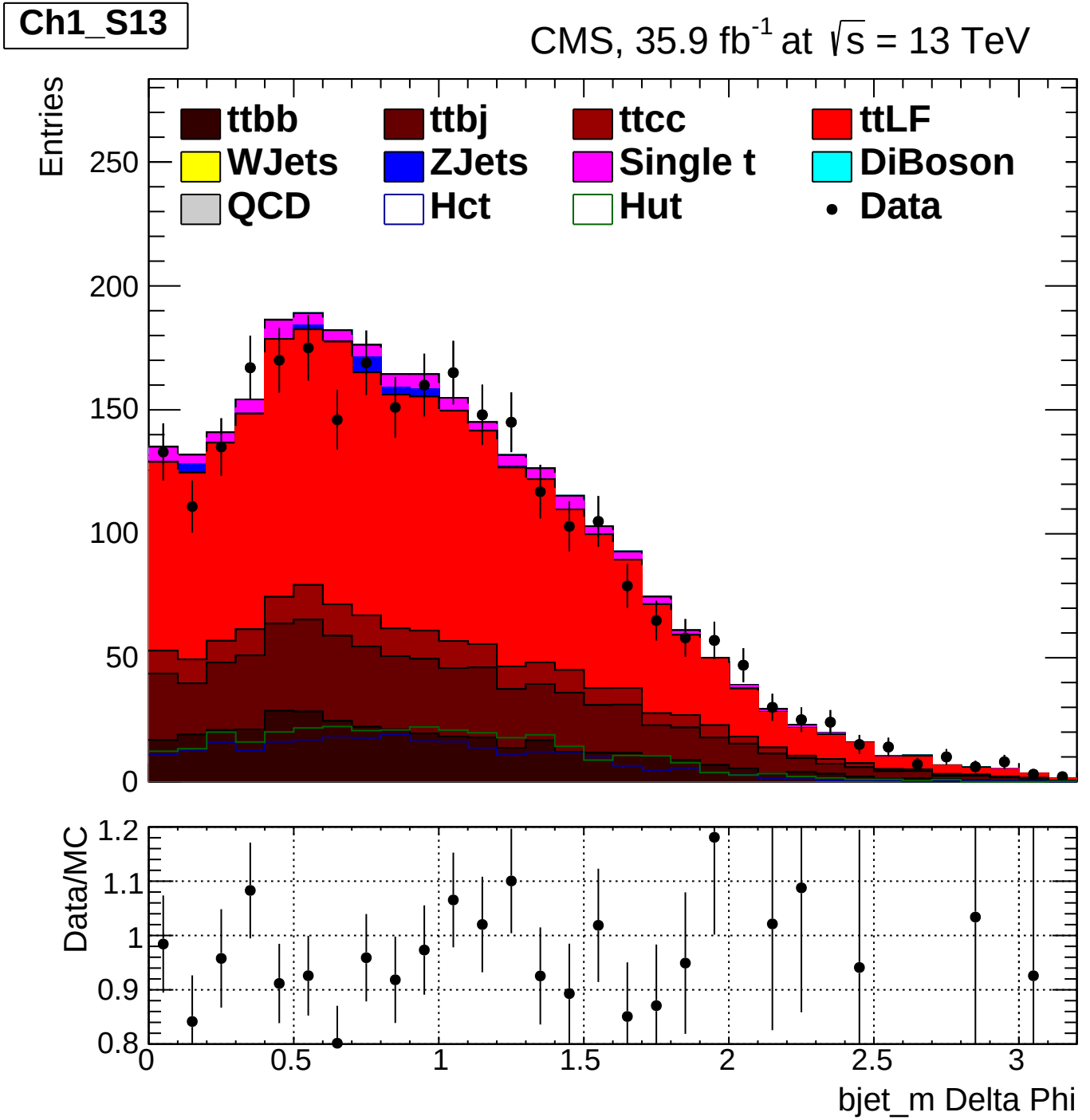
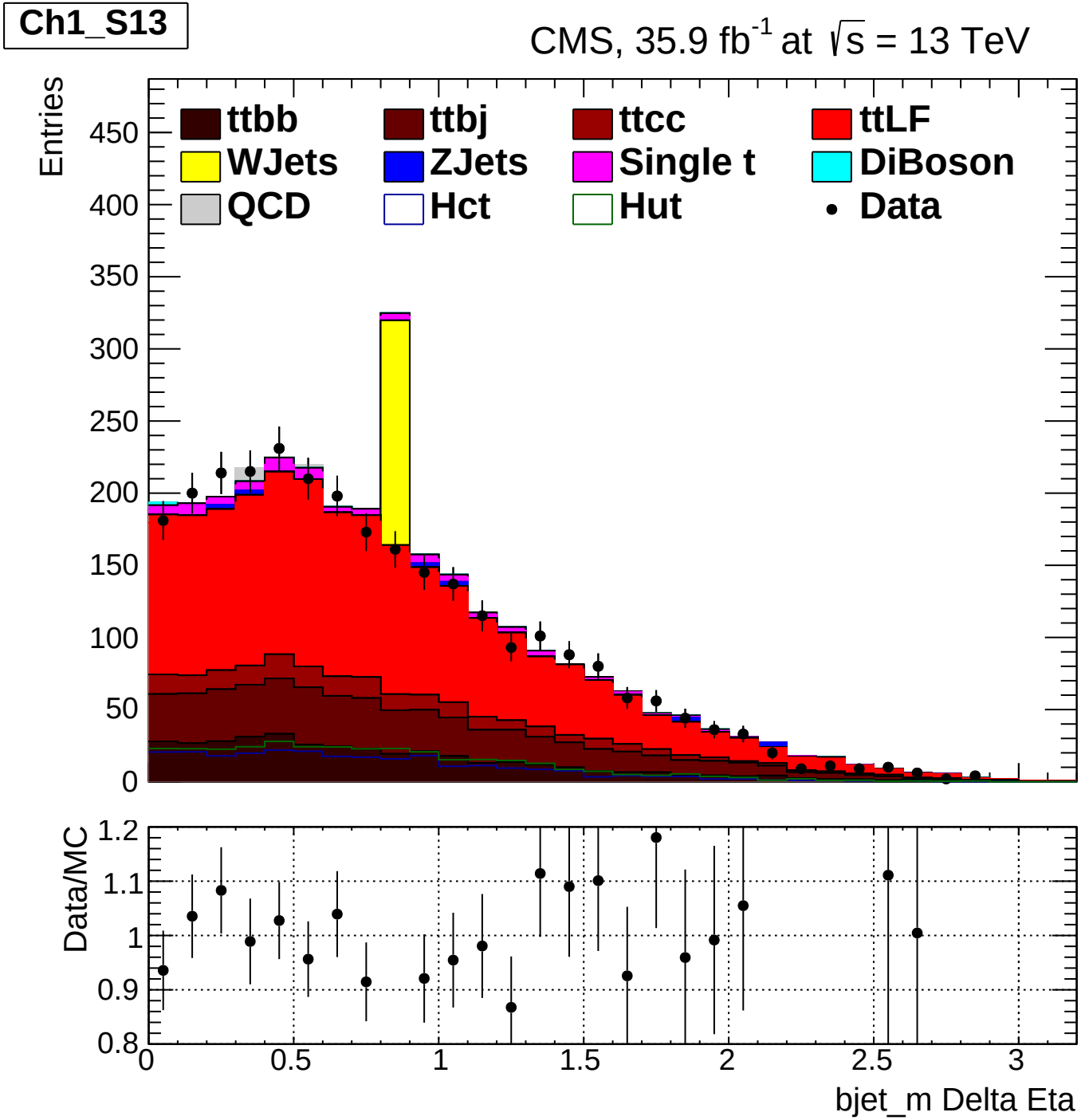
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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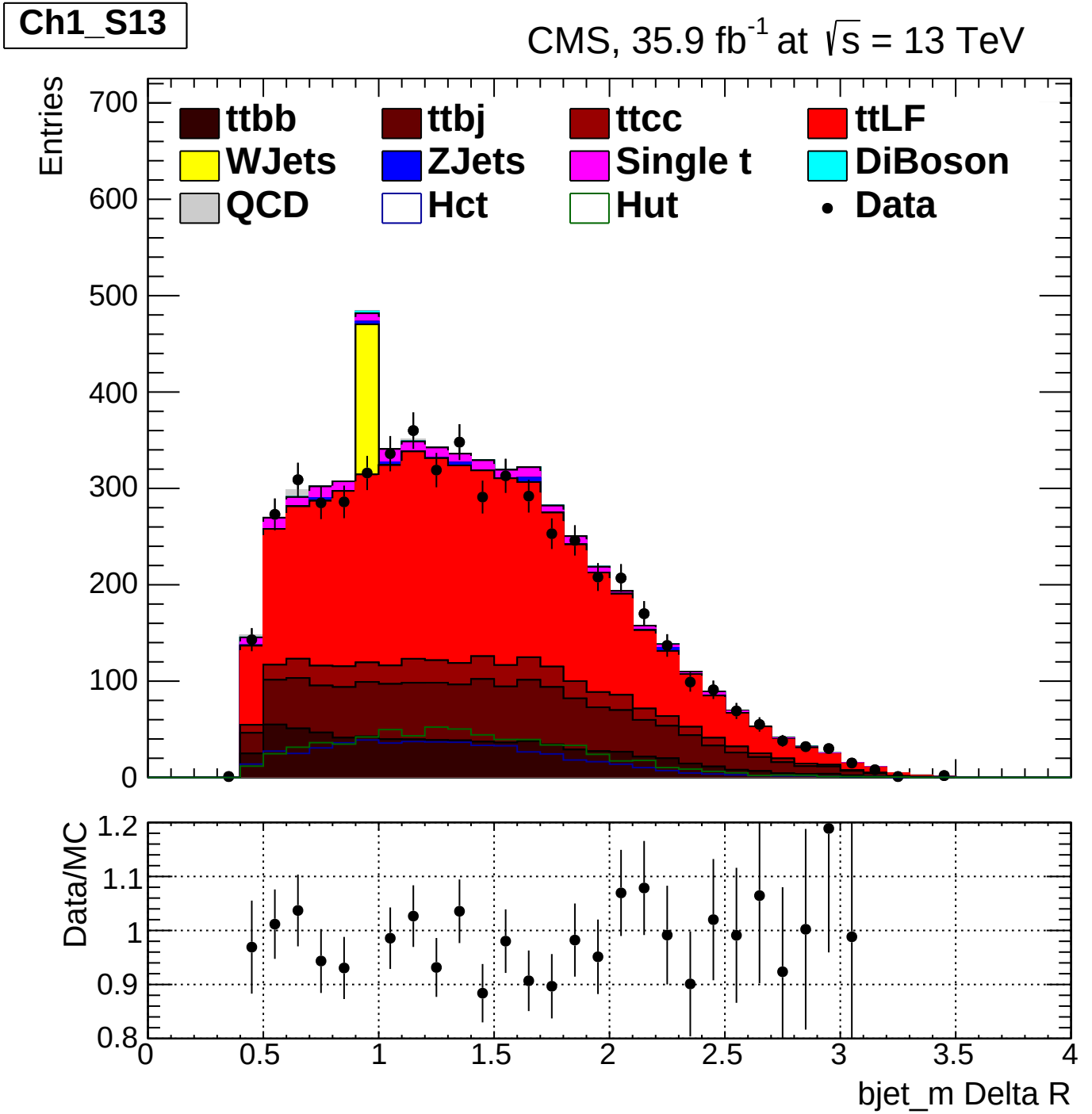
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta


Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
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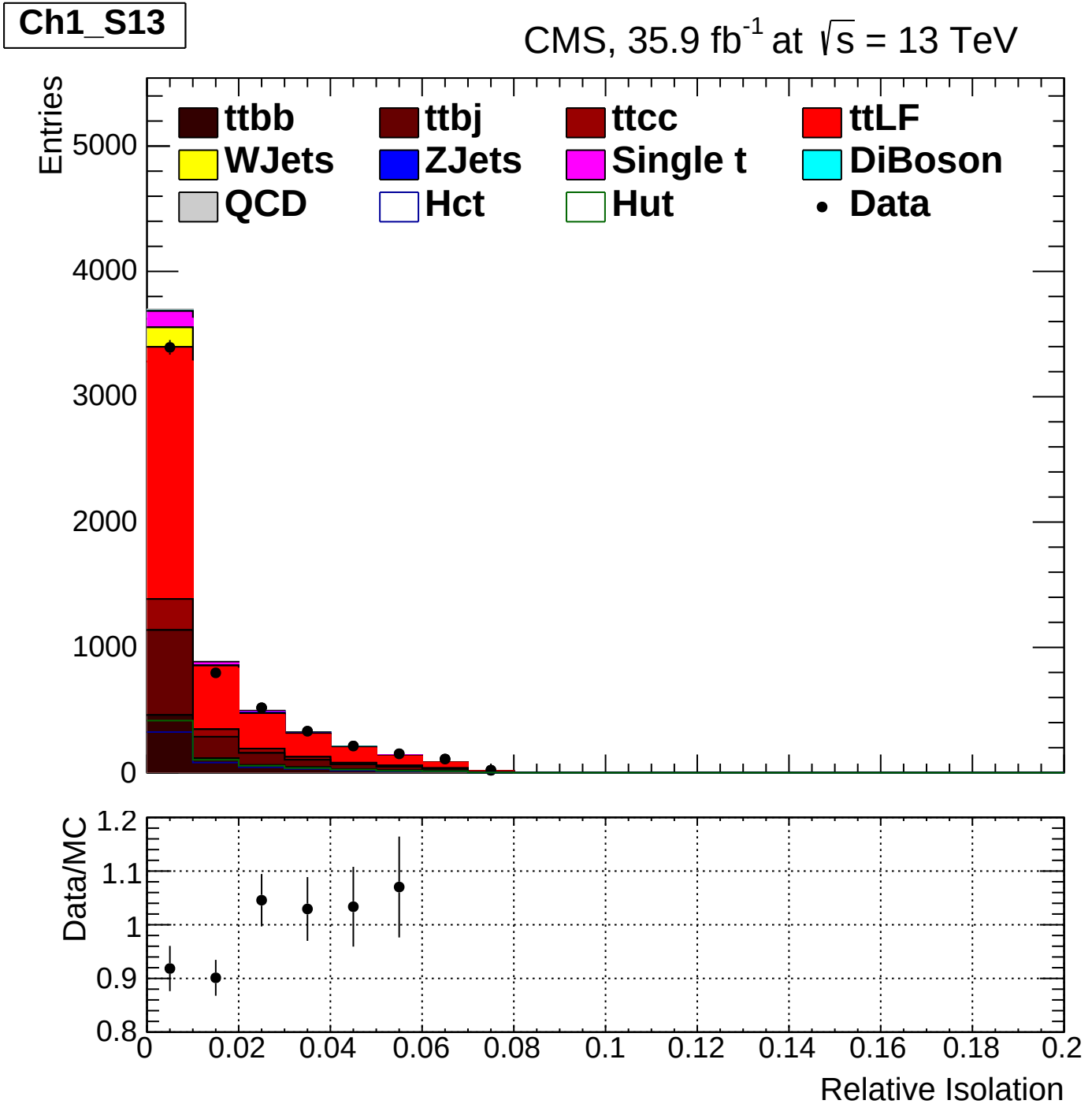
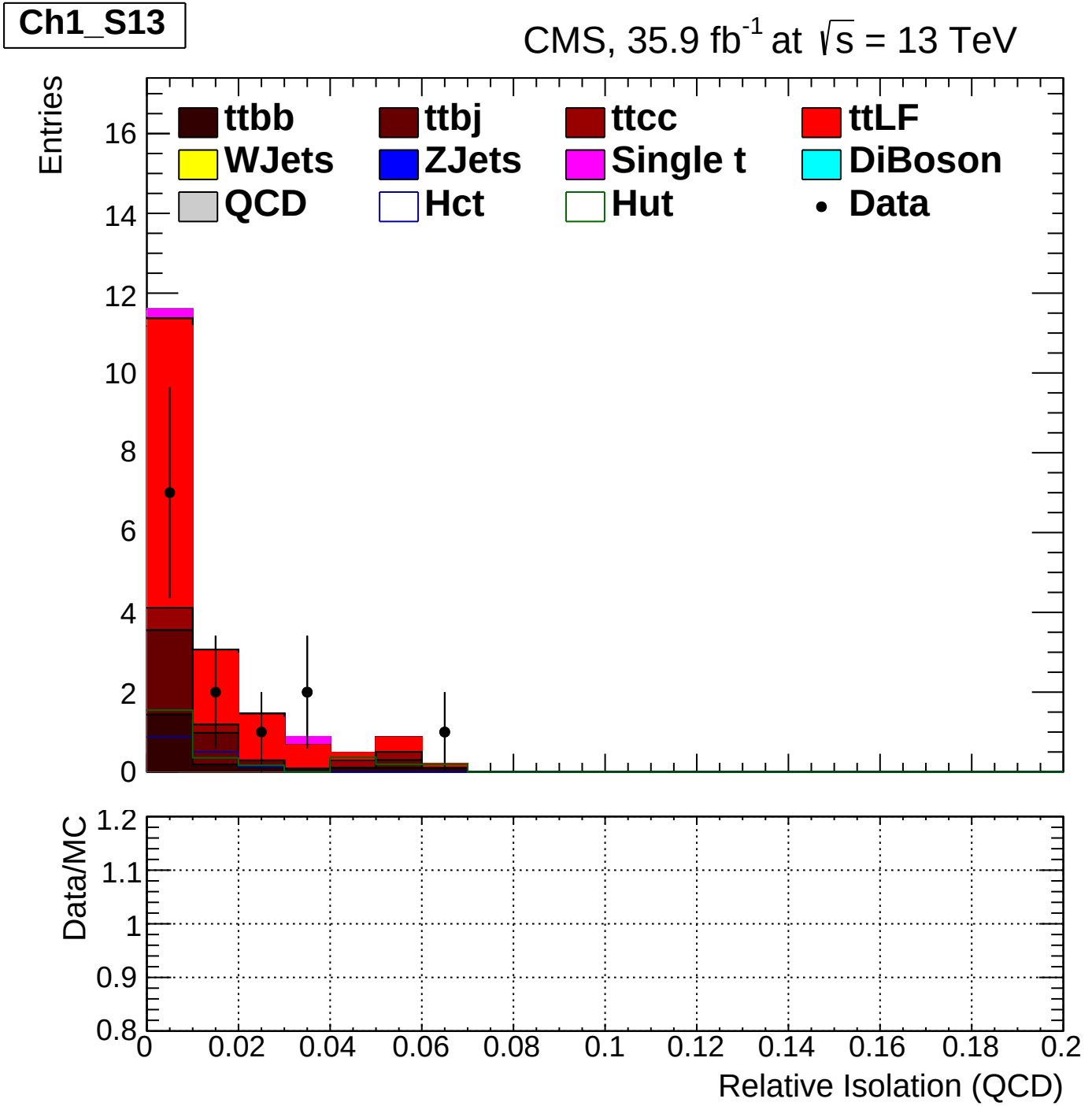
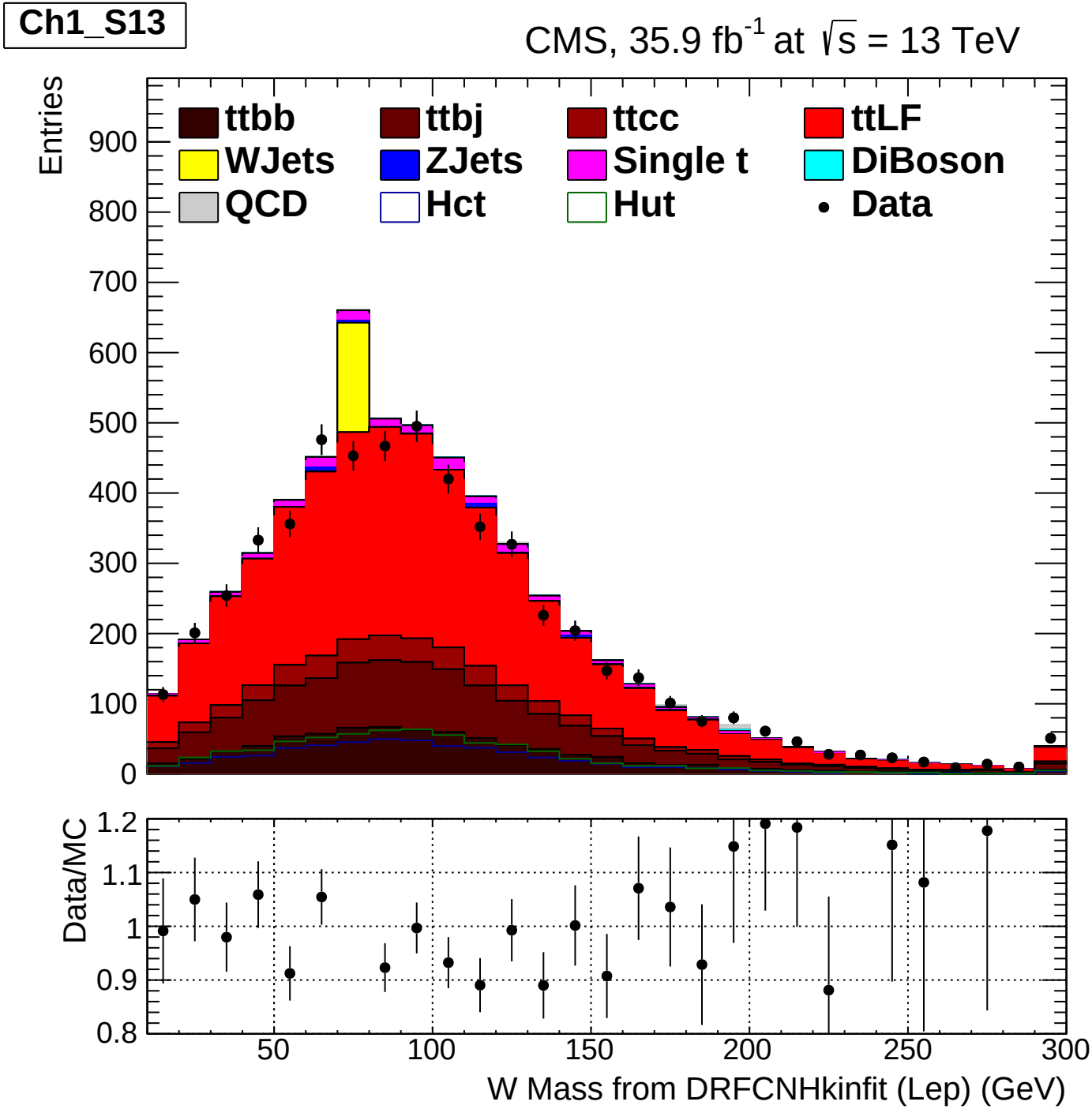
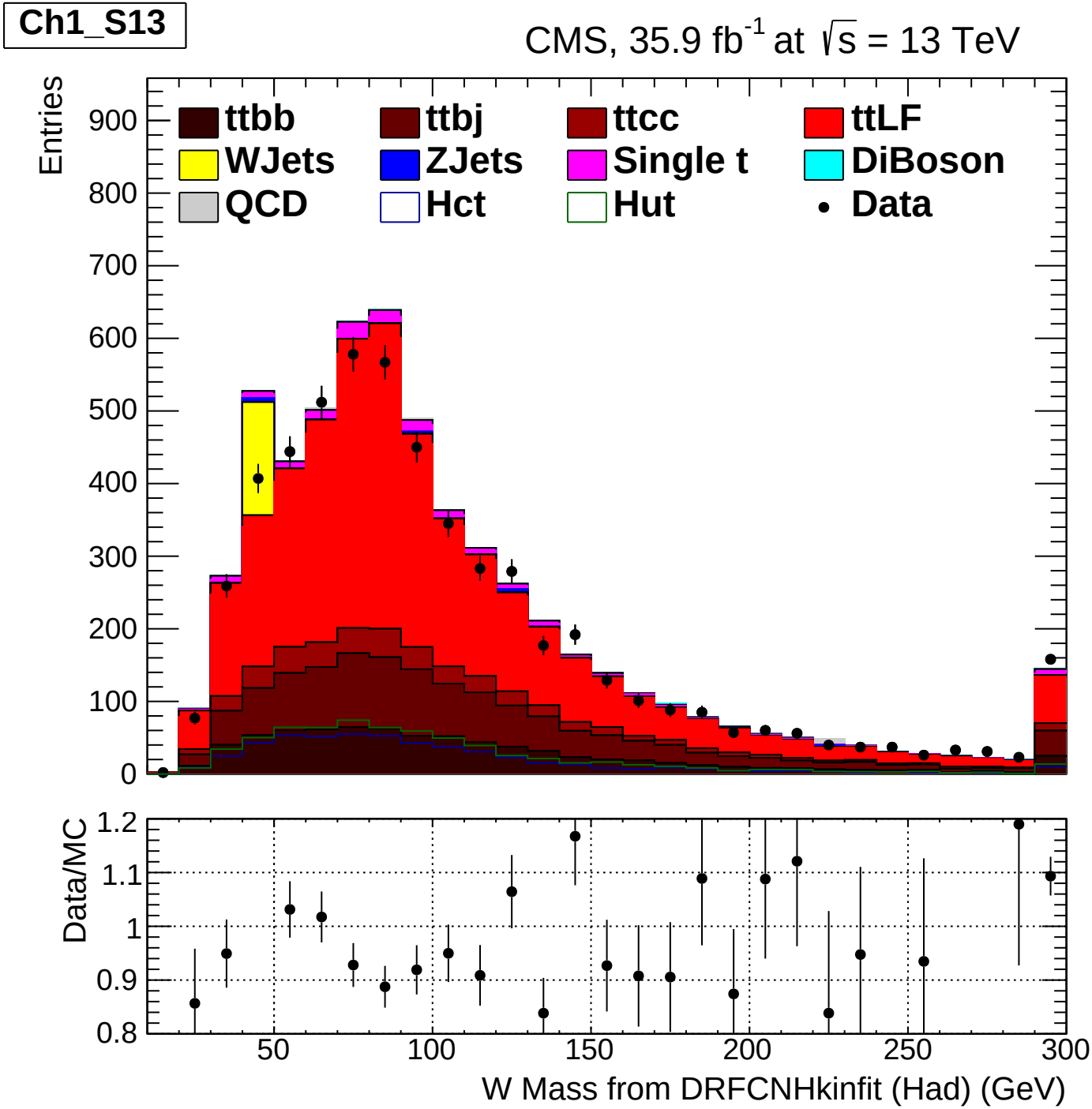
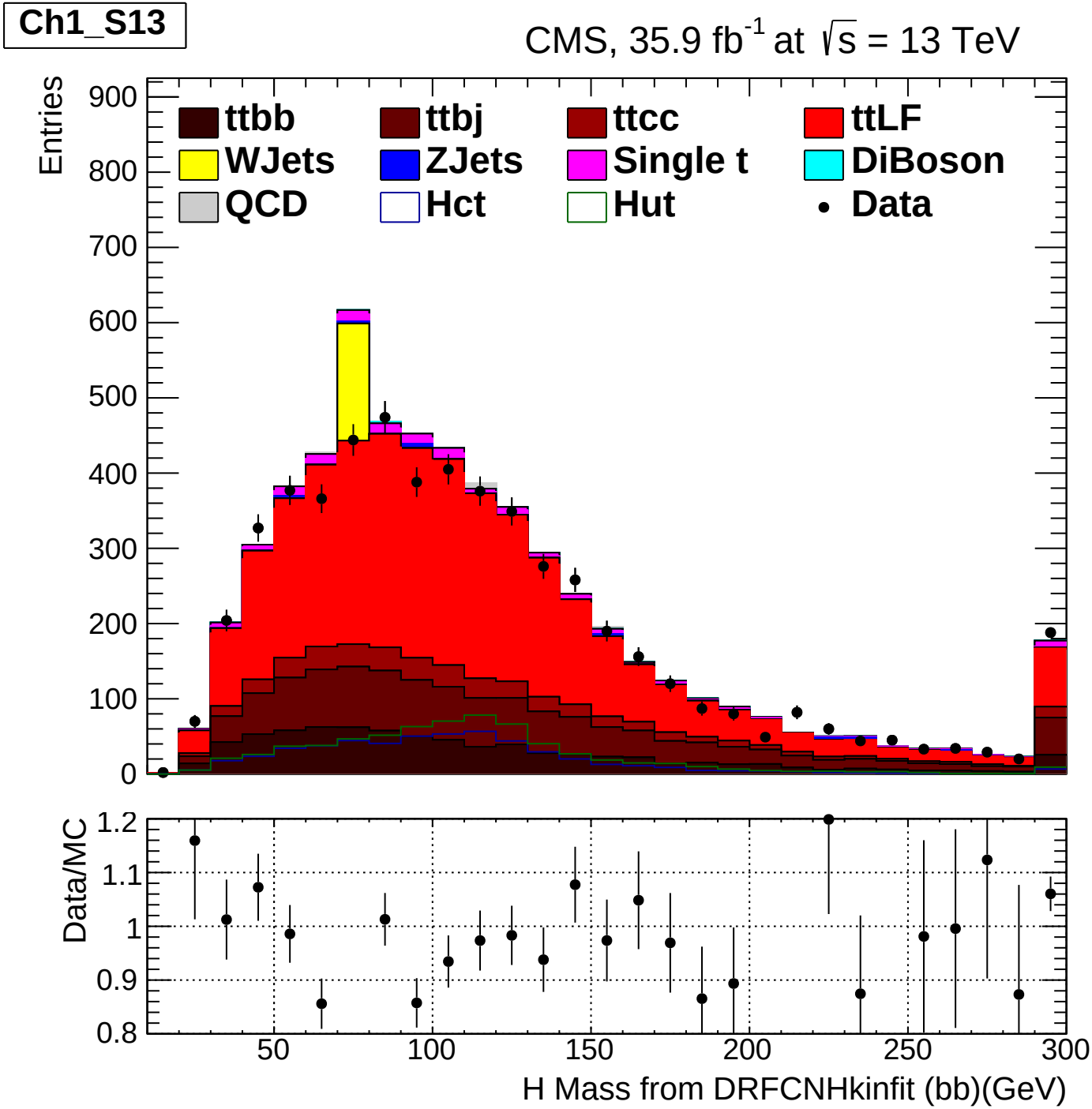
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

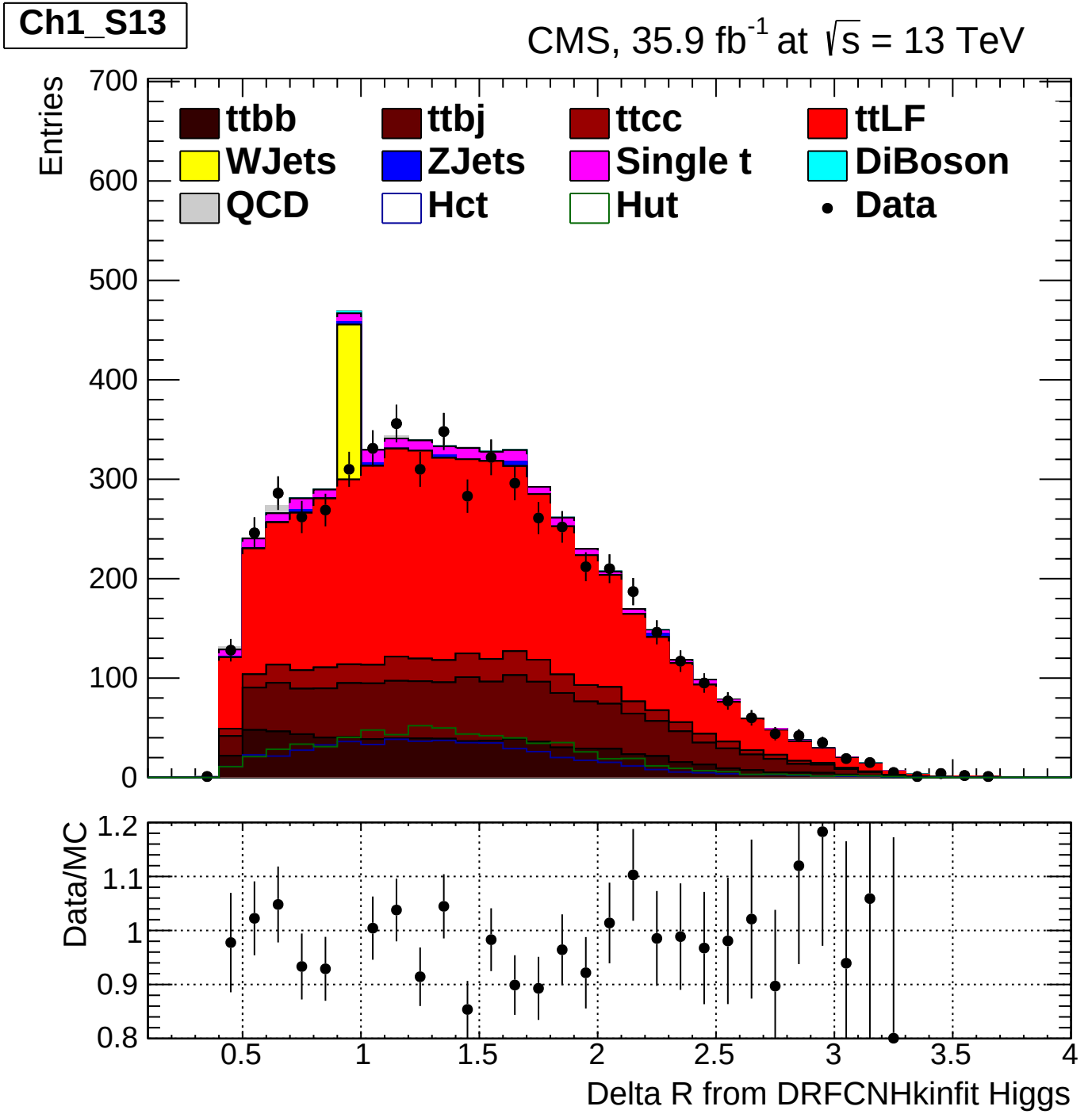

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
5000
4000
3000
2000
1000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Relative Isolation

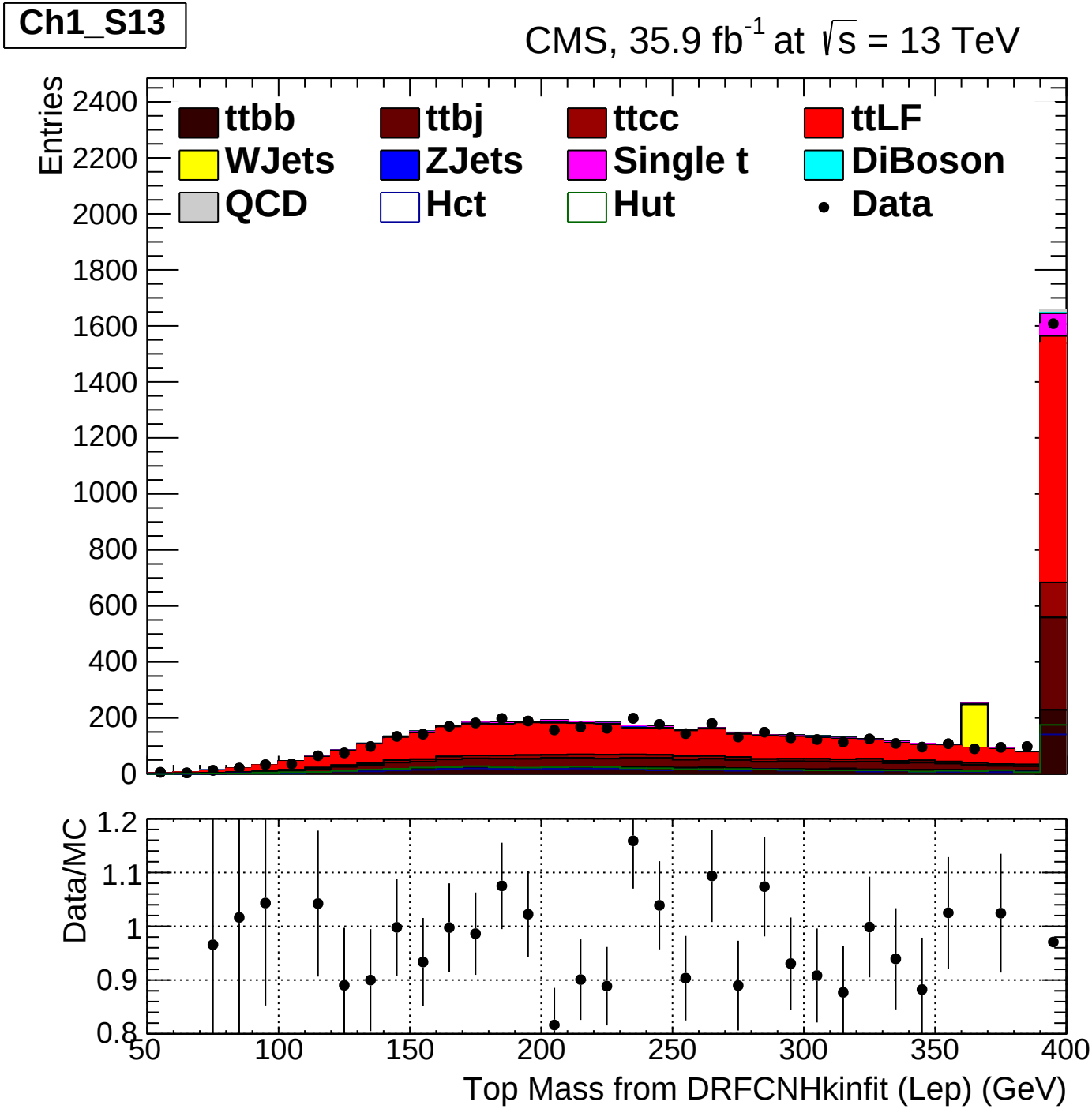

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

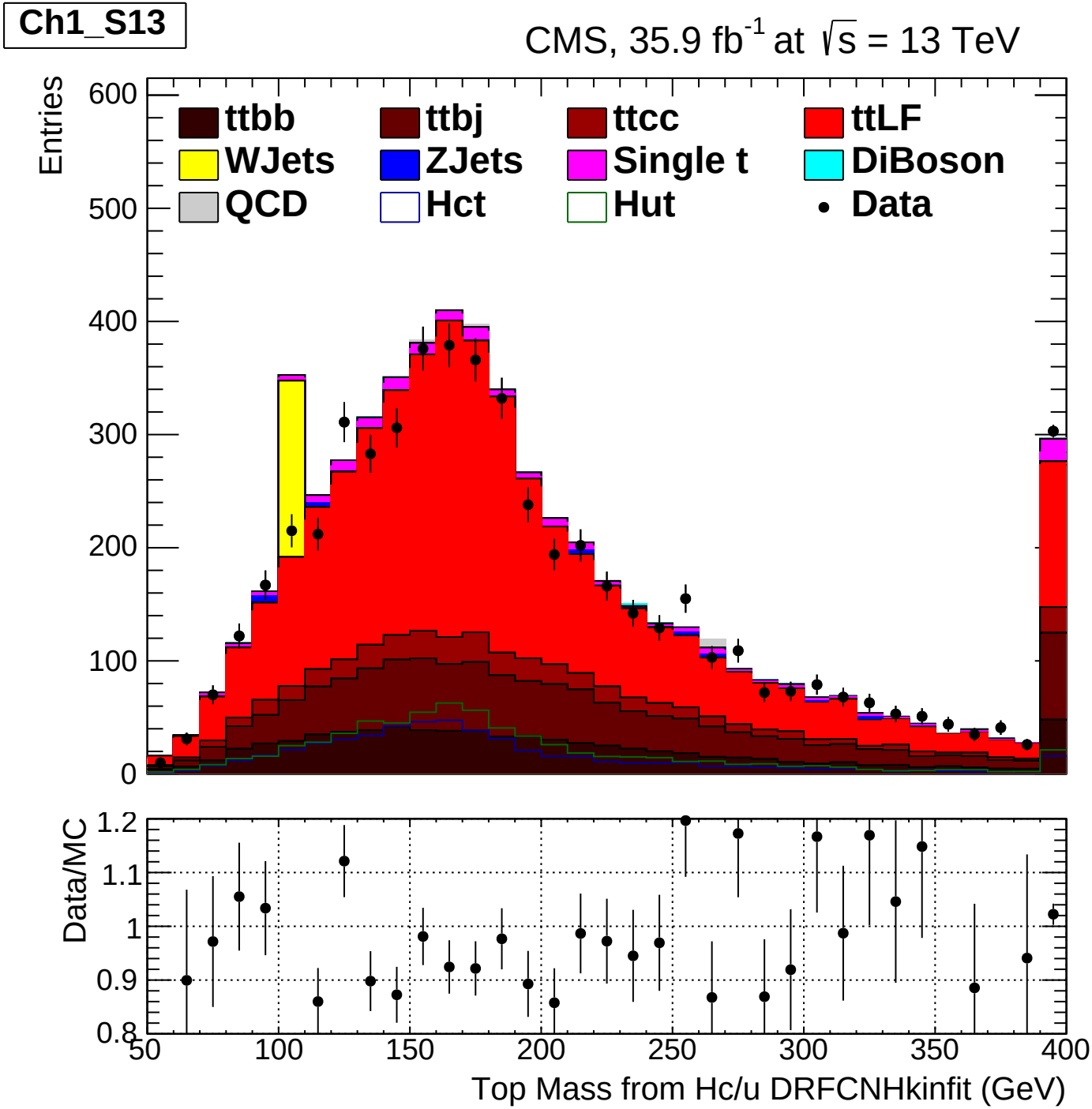

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

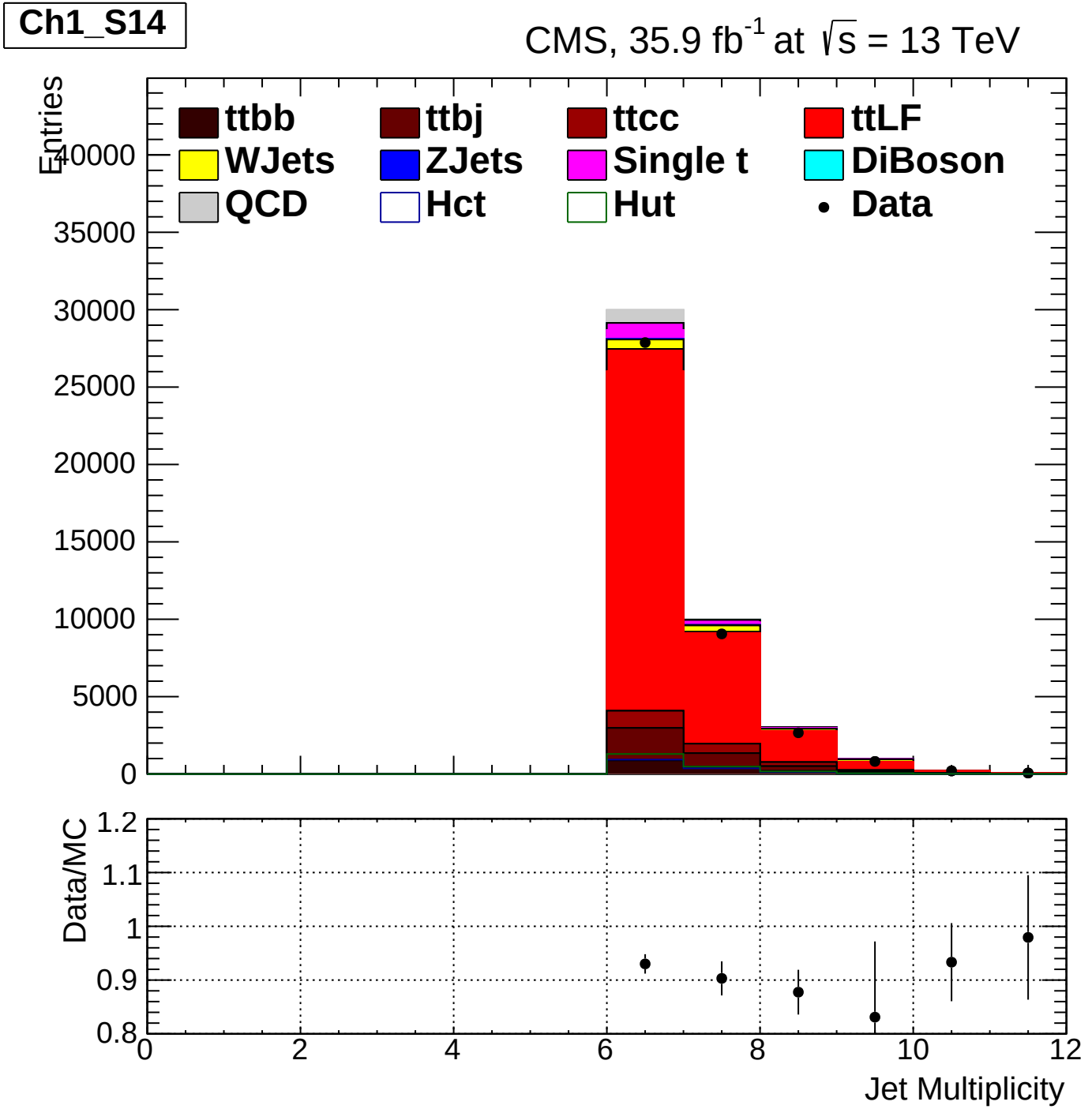

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

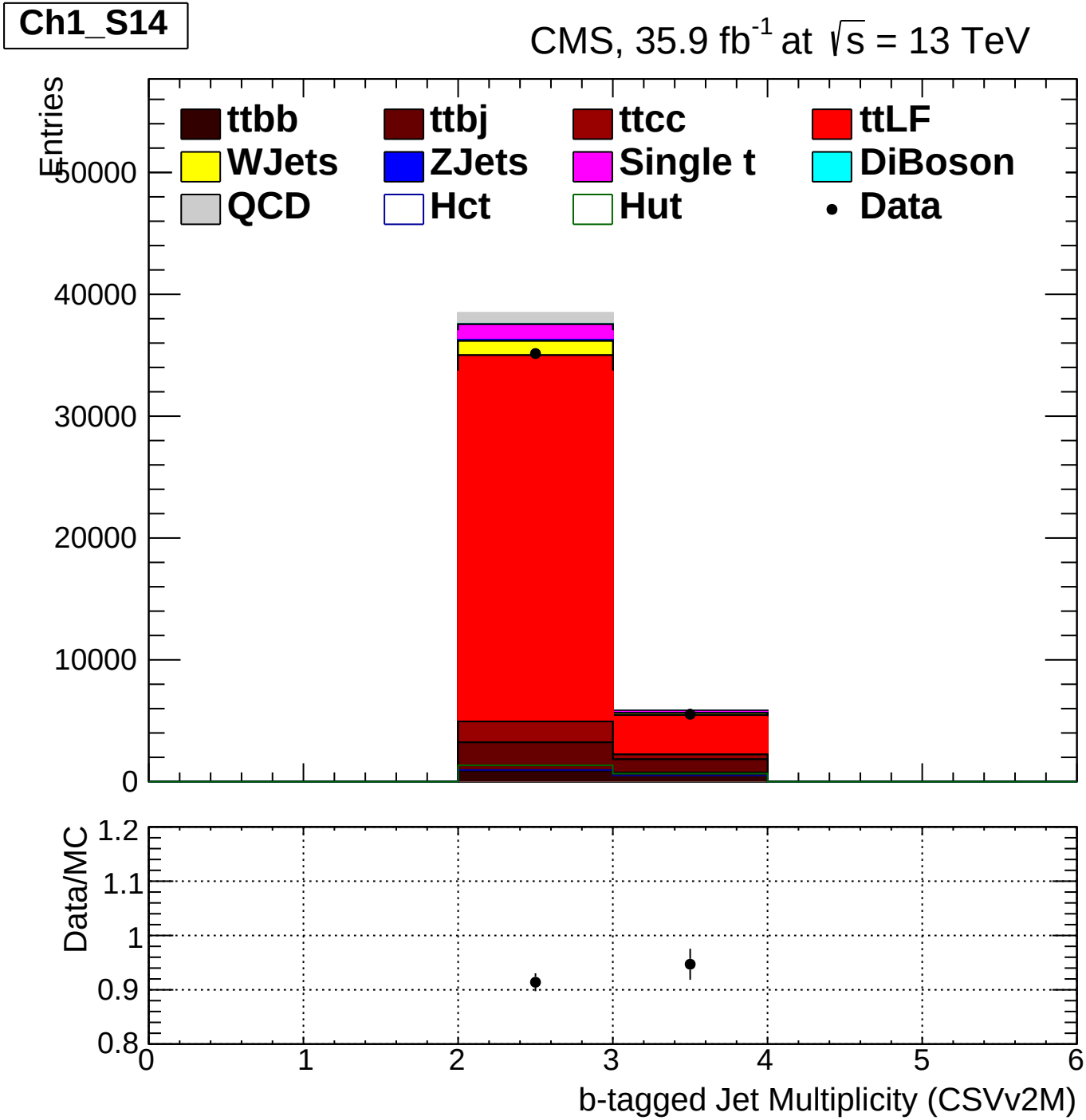

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

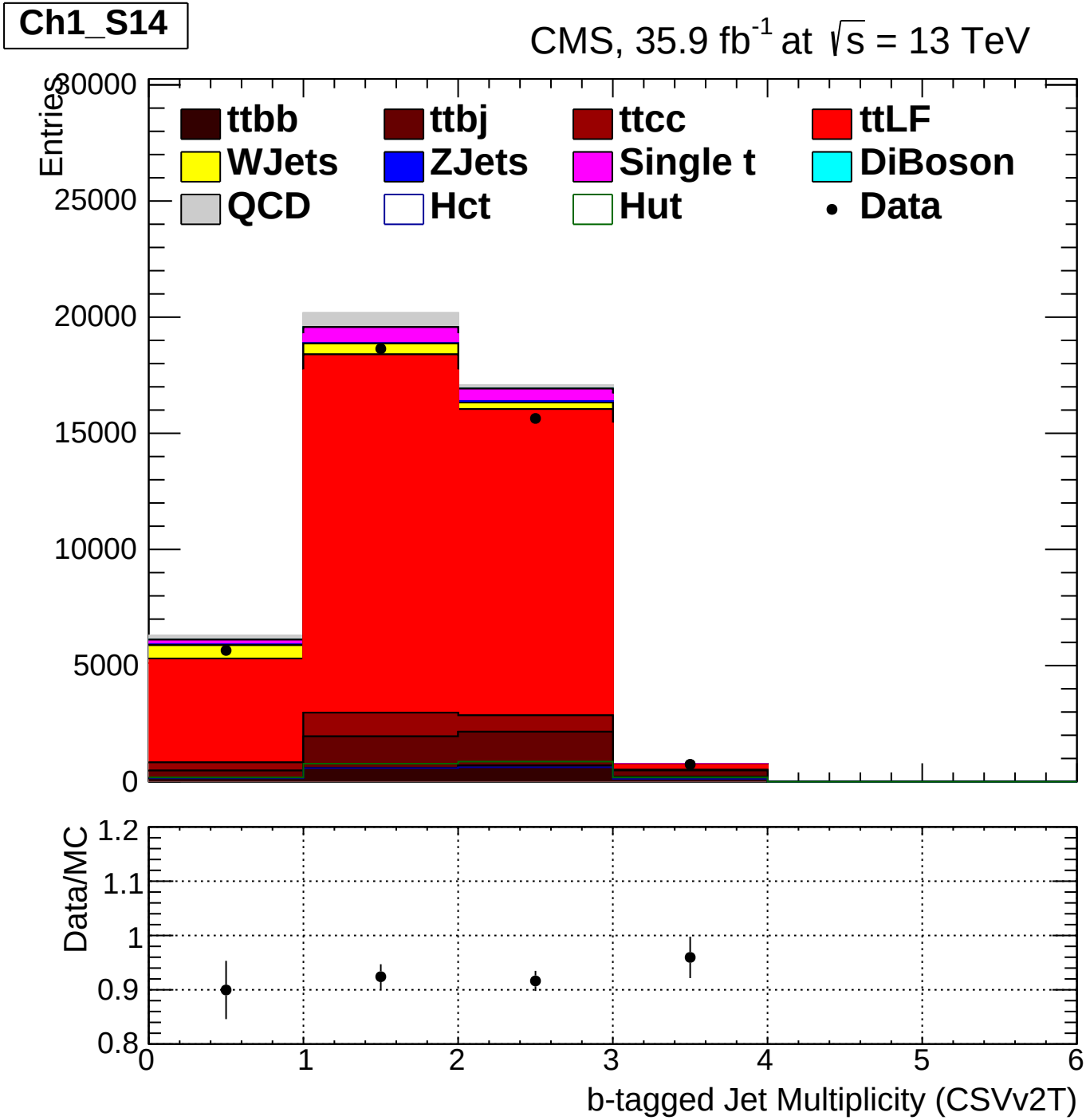

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

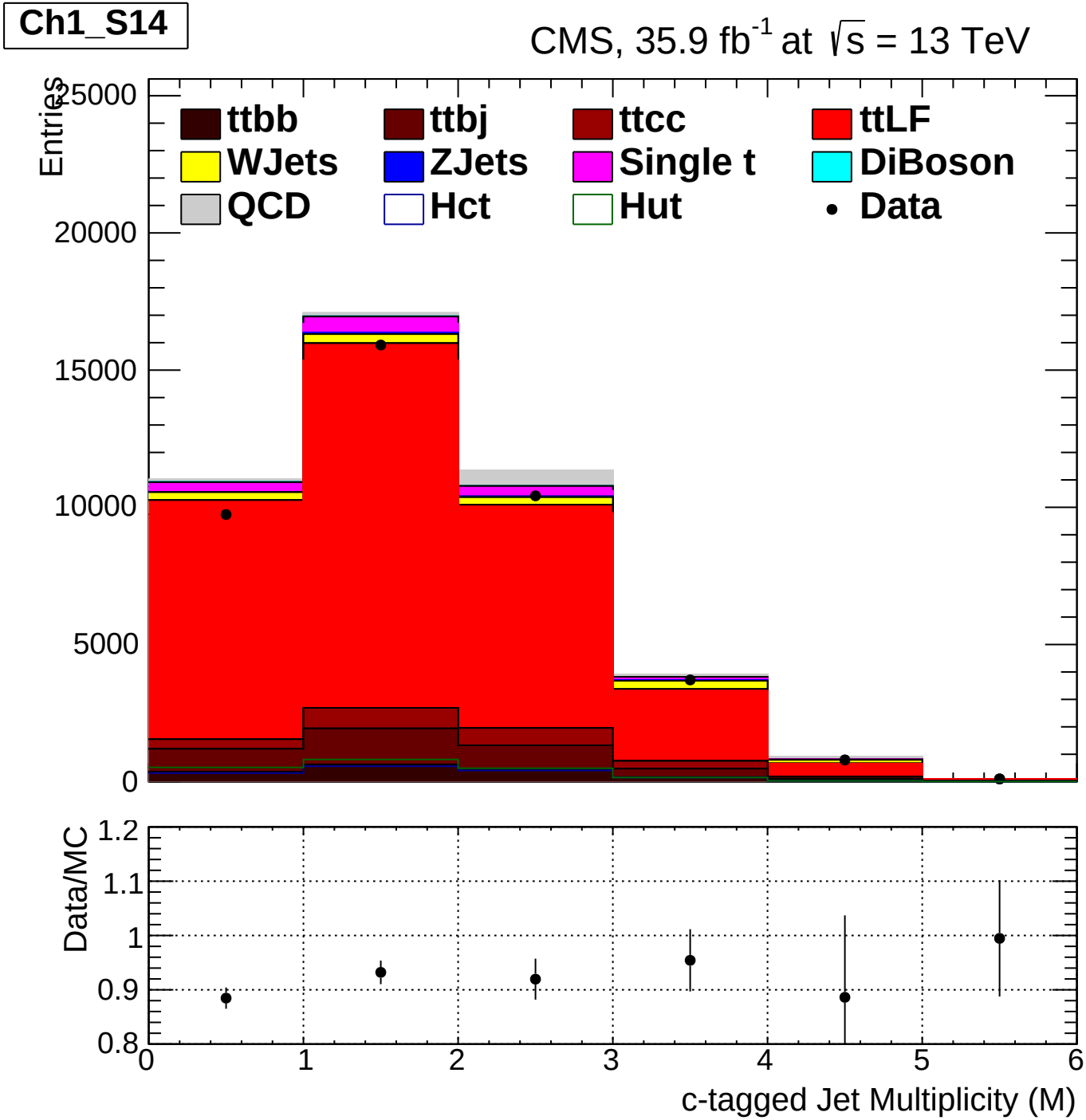

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

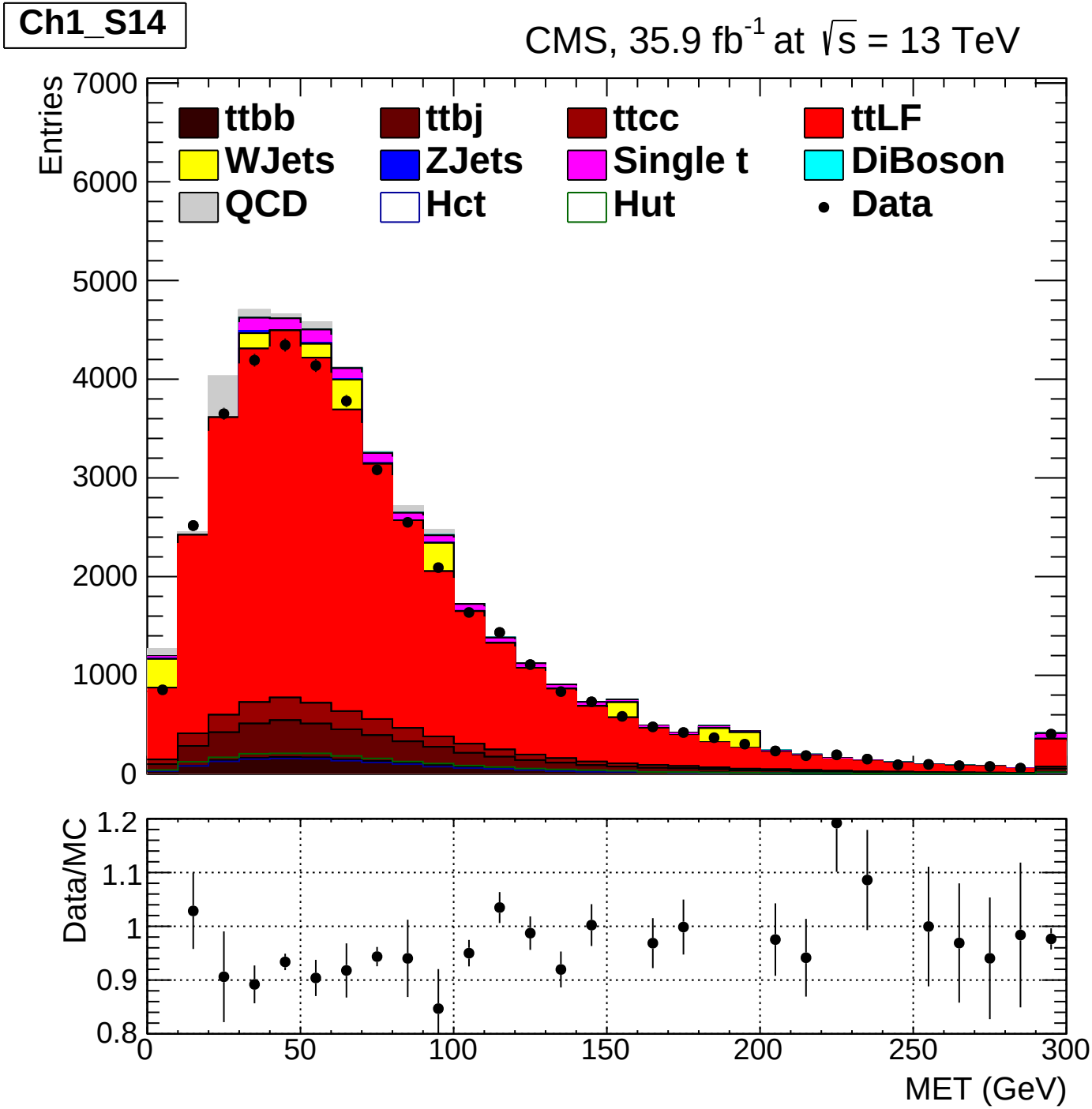

Ch1_S13
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

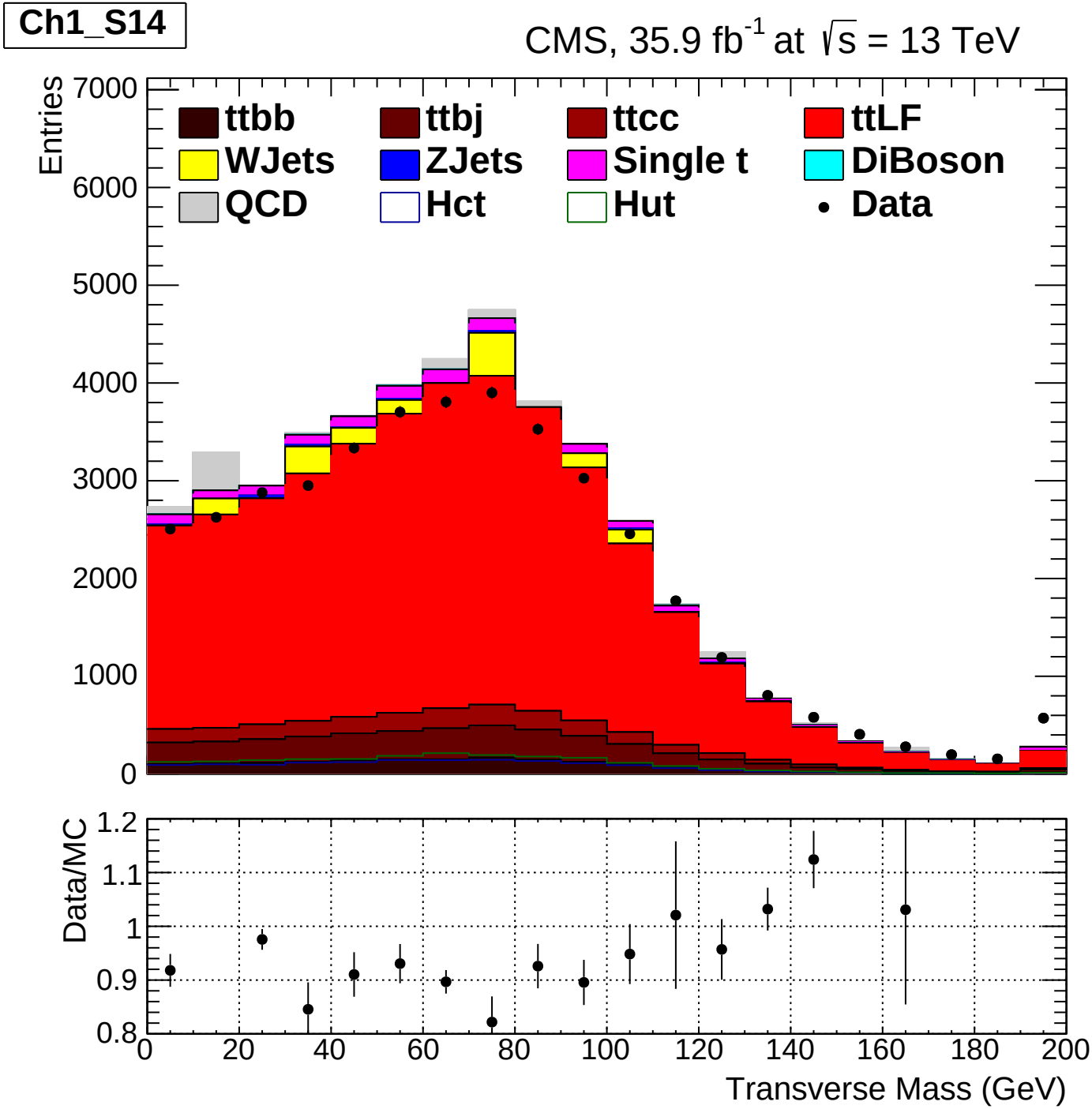

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
40000
35000
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

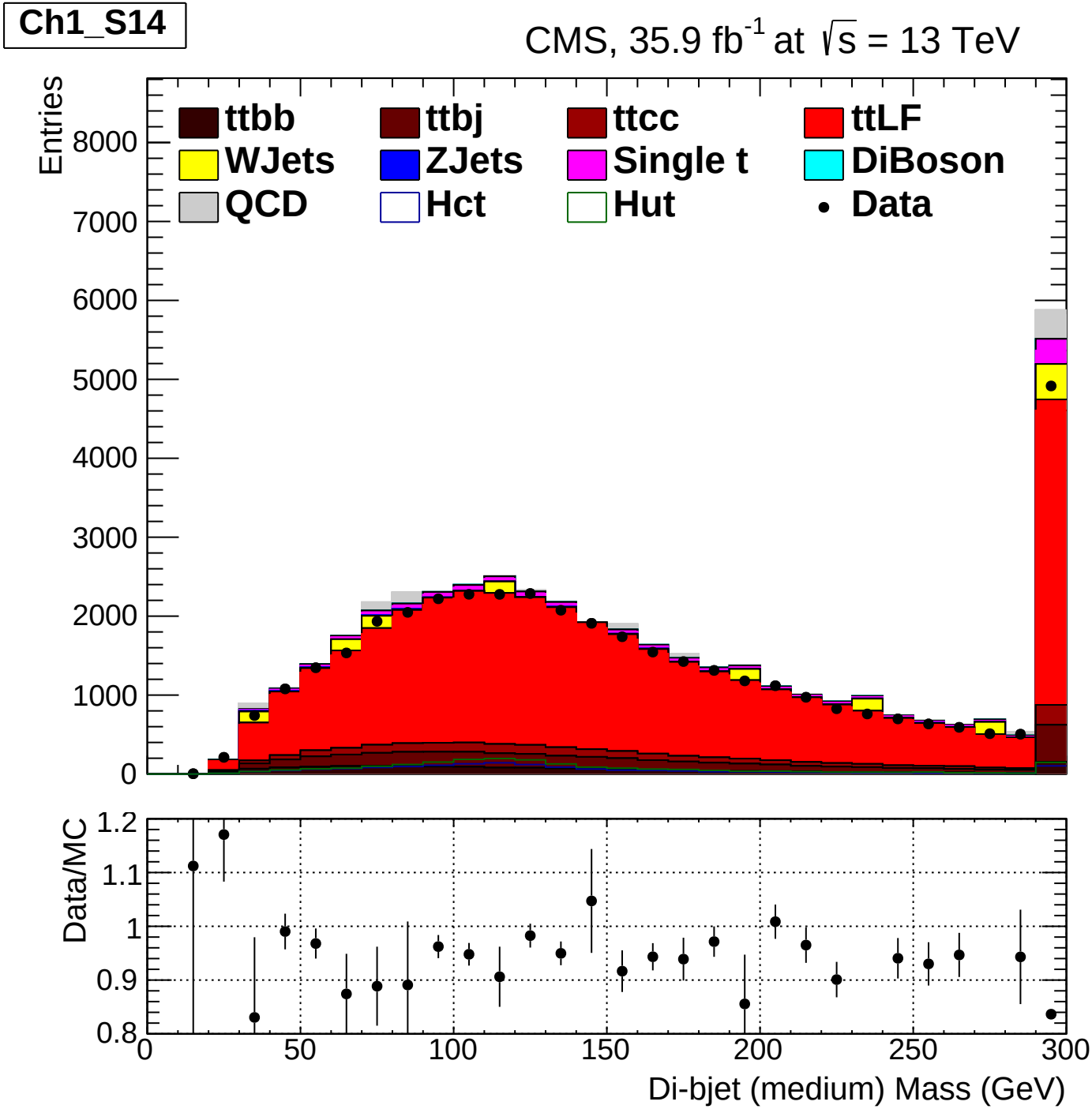

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
50000
40000
30000
20000
10000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2M)

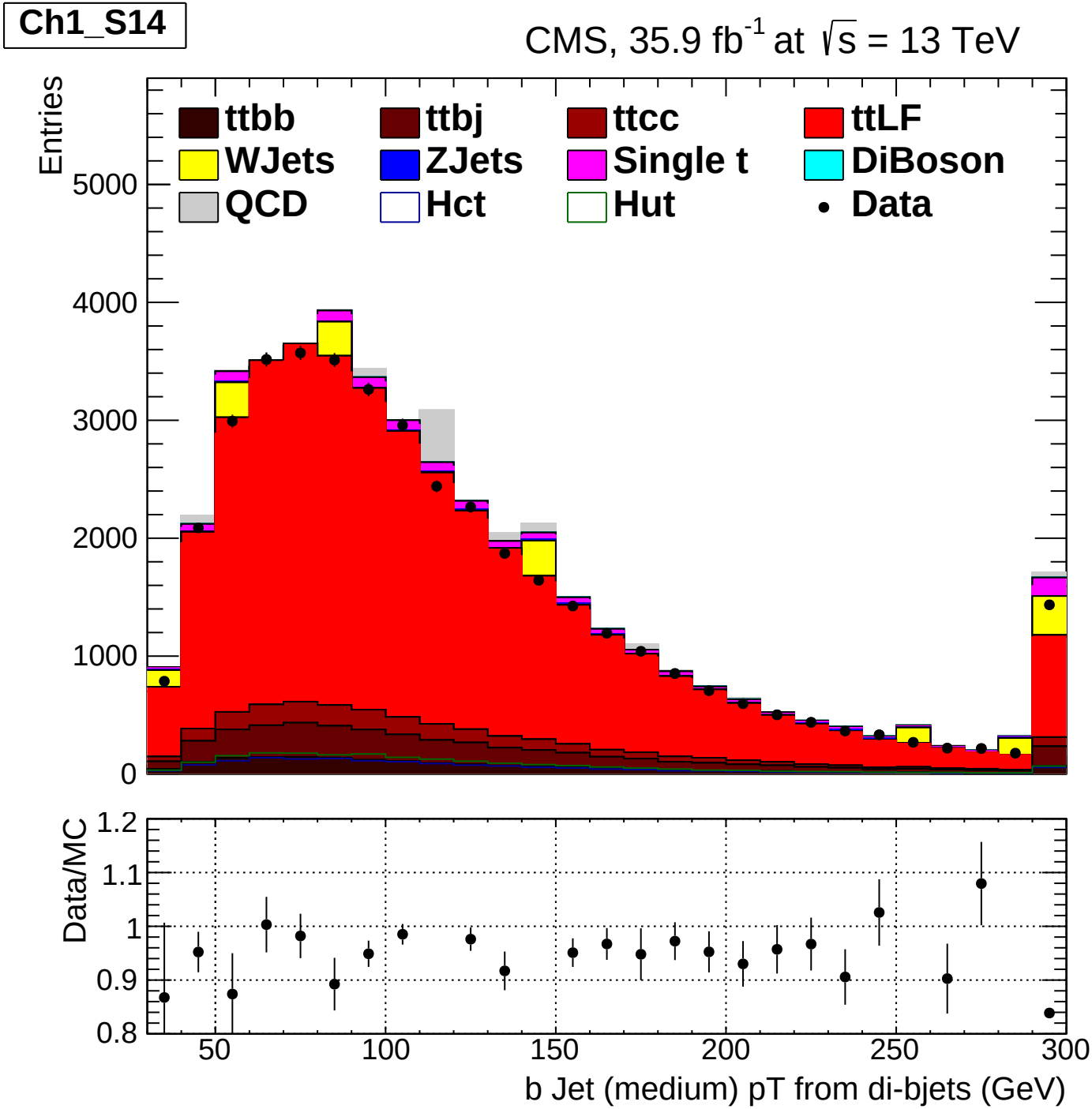

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
30000
25000
20000
15000
10000
5000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
1
2
3
4
5
6
b-tagged Jet Multiplicity (CSVv2T)

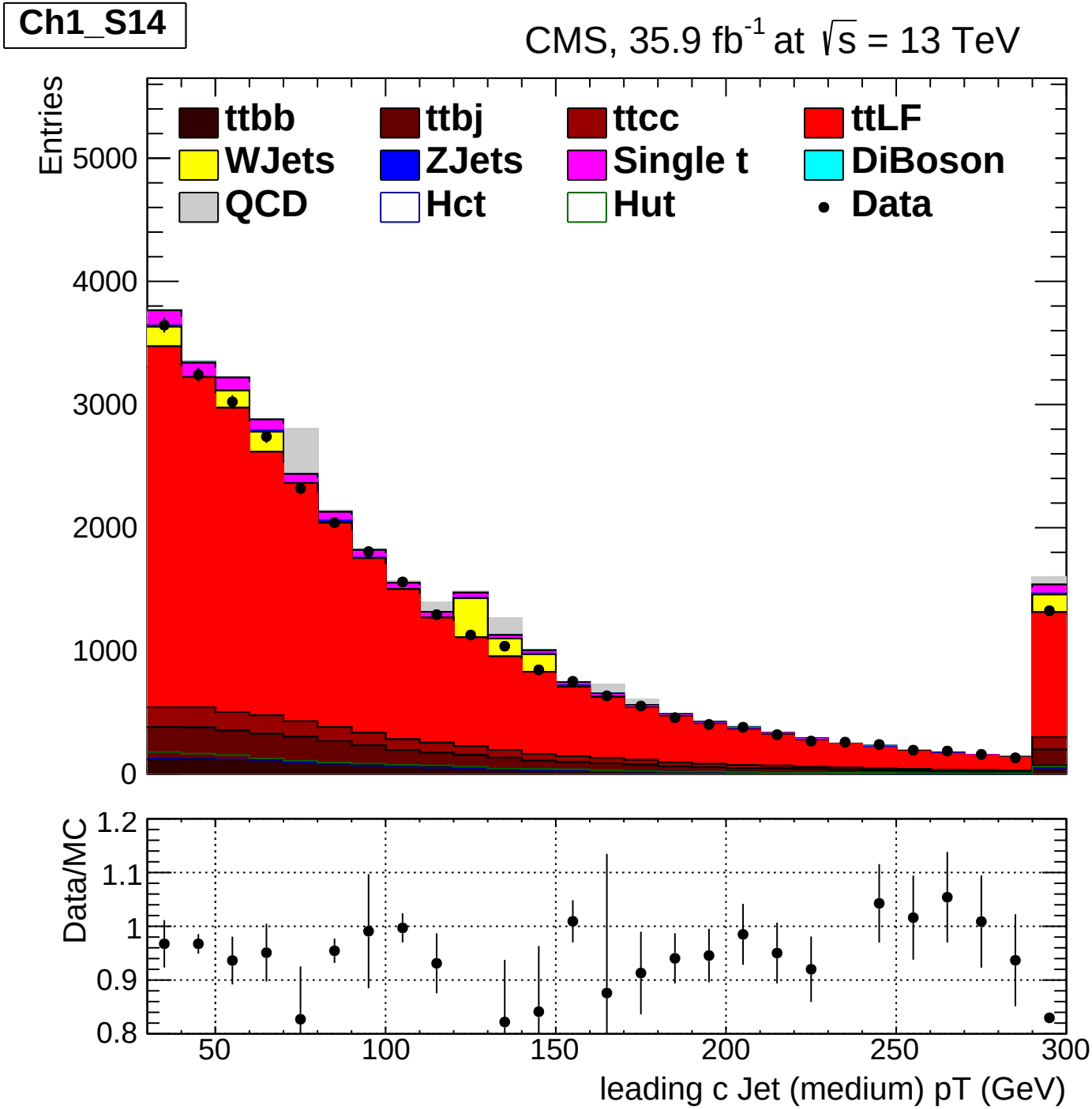

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

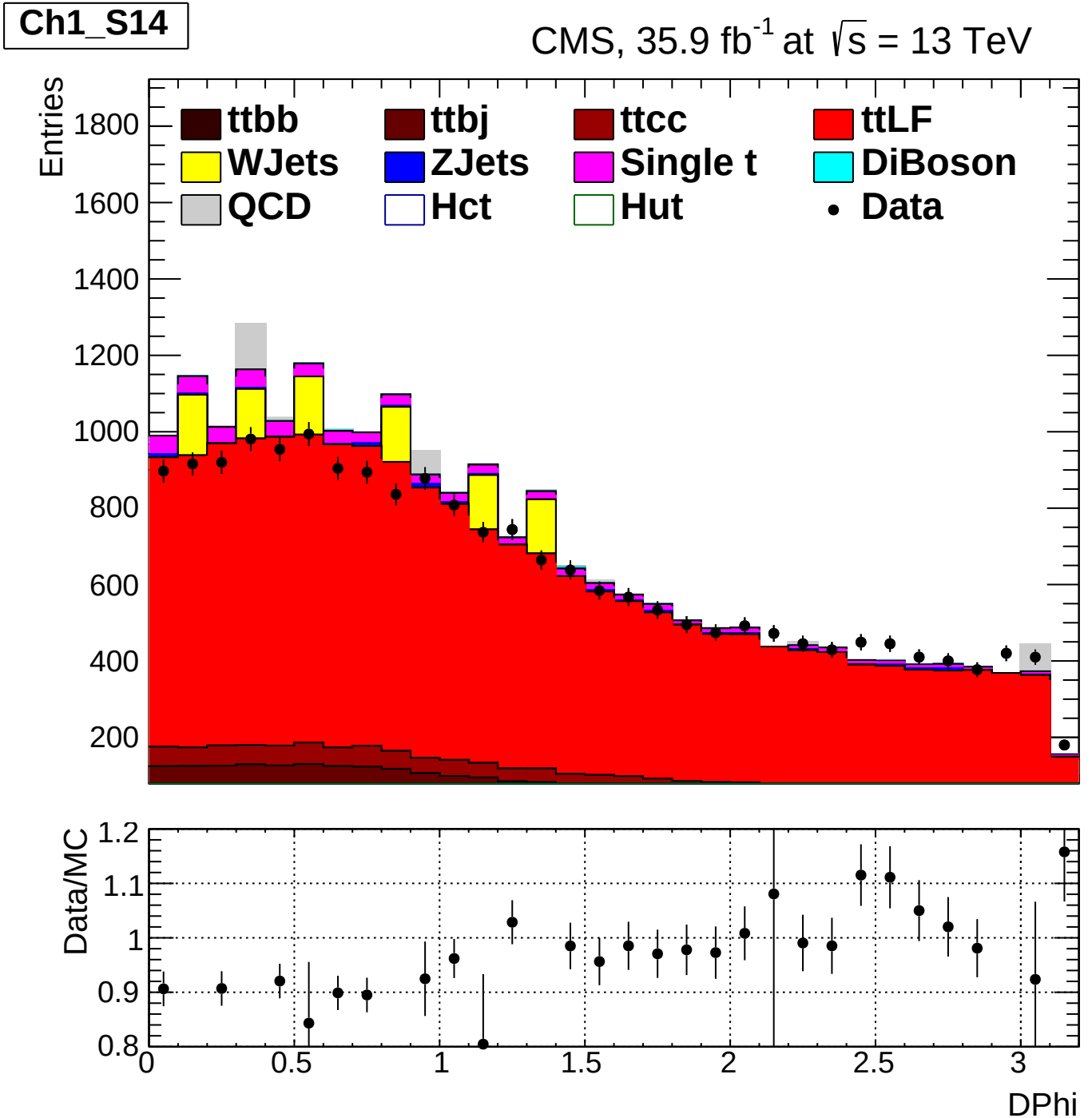

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

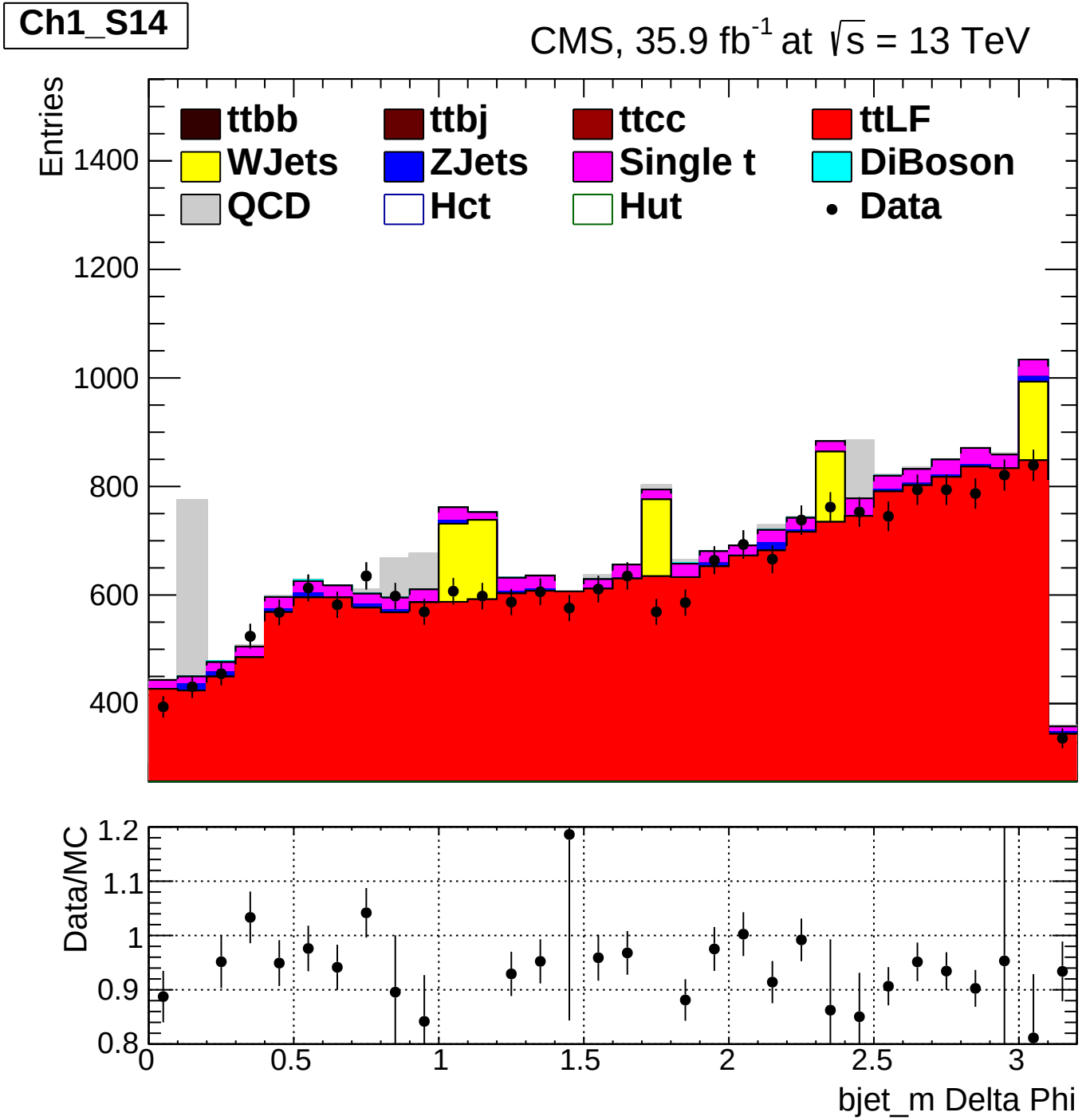

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Transverse Mass (GeV)

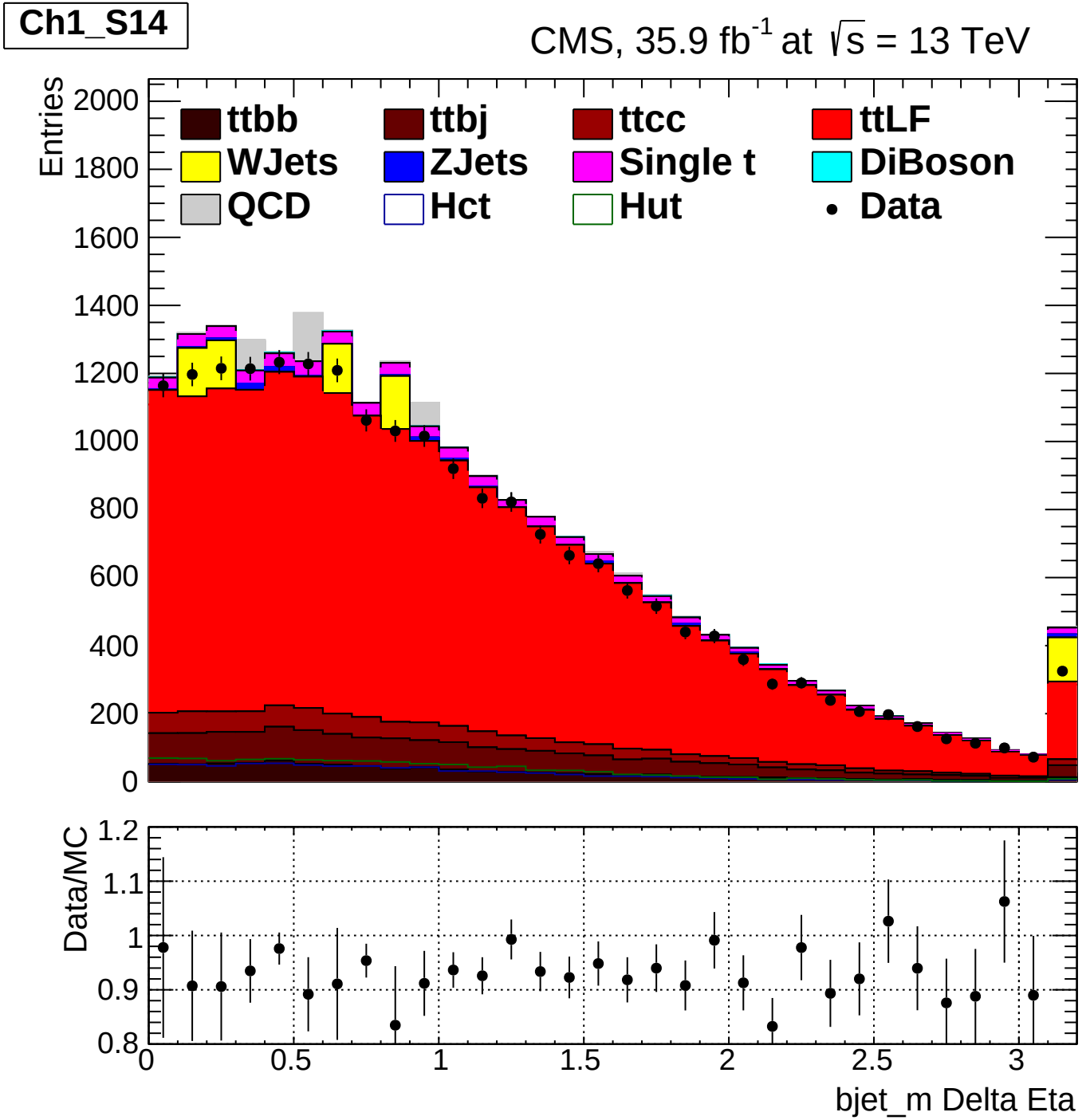

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

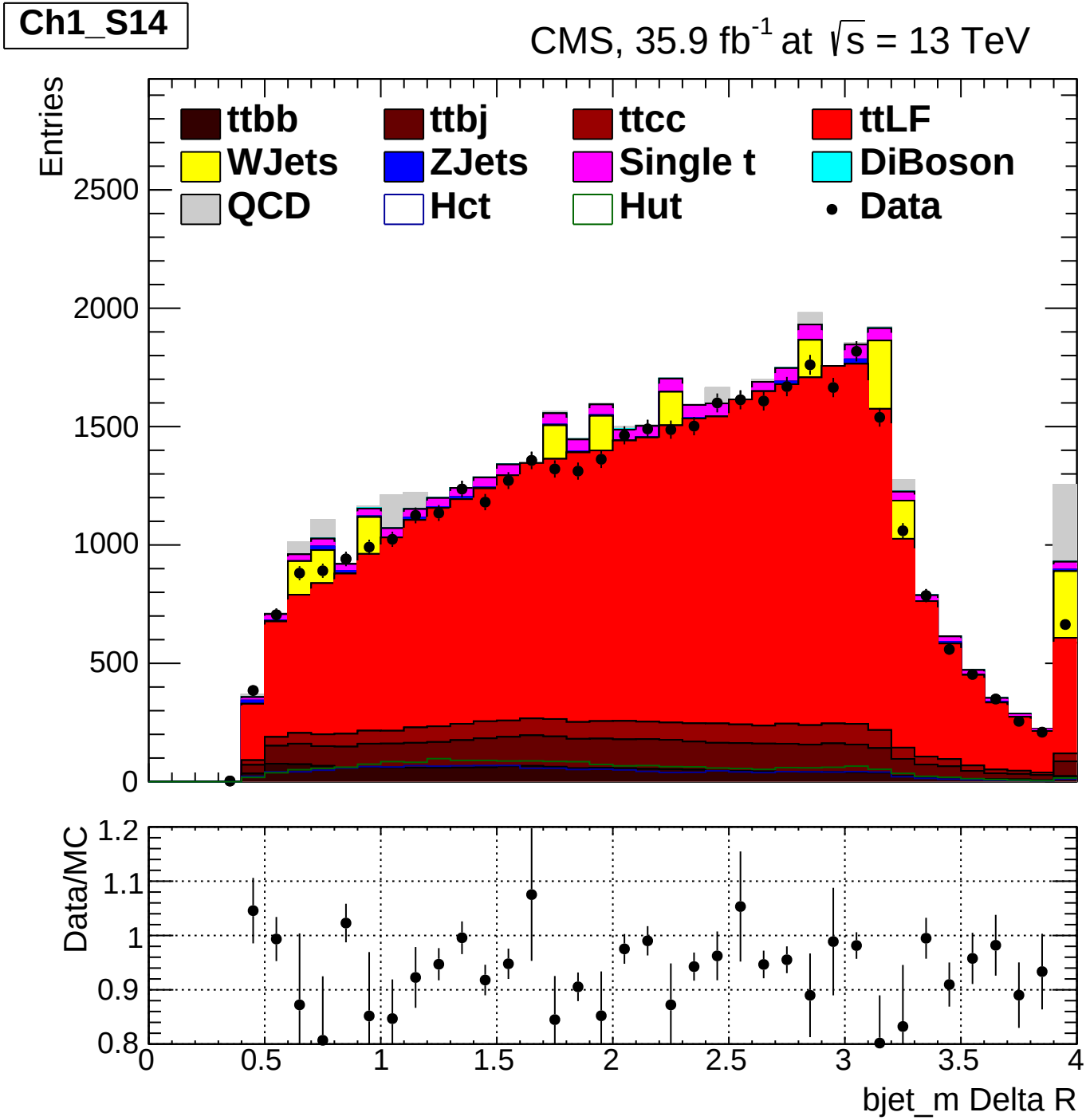

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
b Jet (medium) pT from di-bjets (GeV)

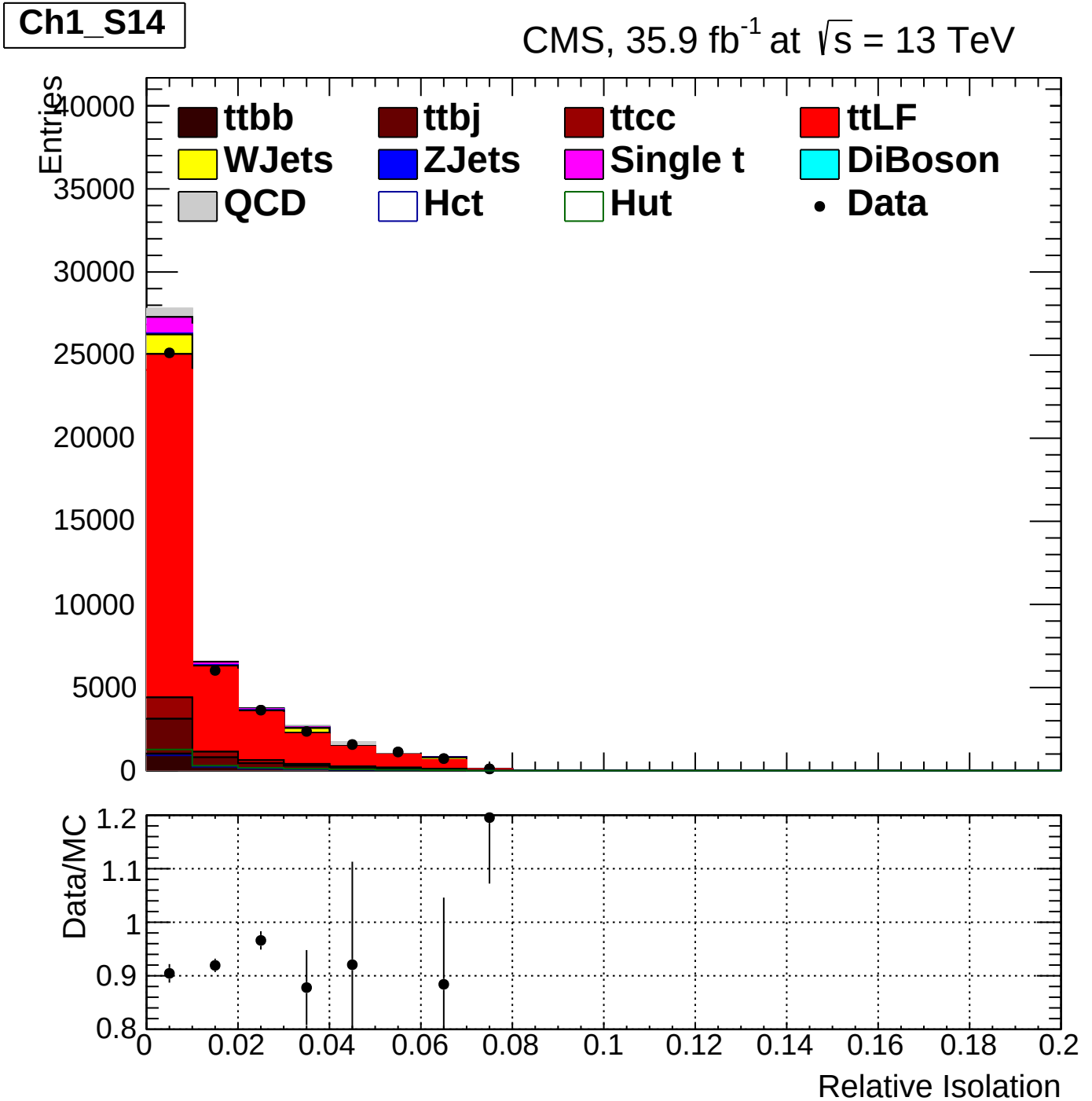

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
1000
2000
3000
4000
5000
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

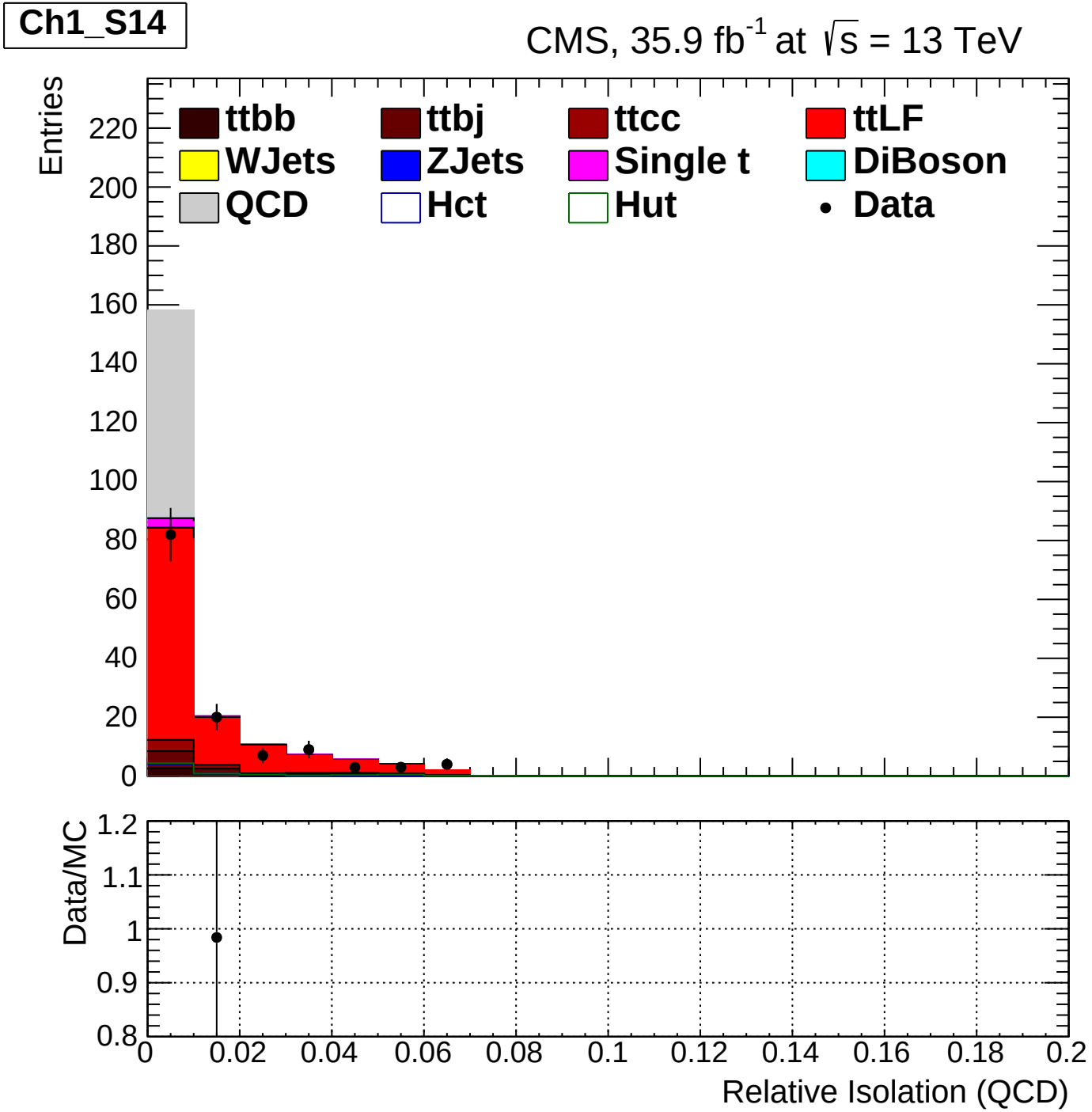

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi

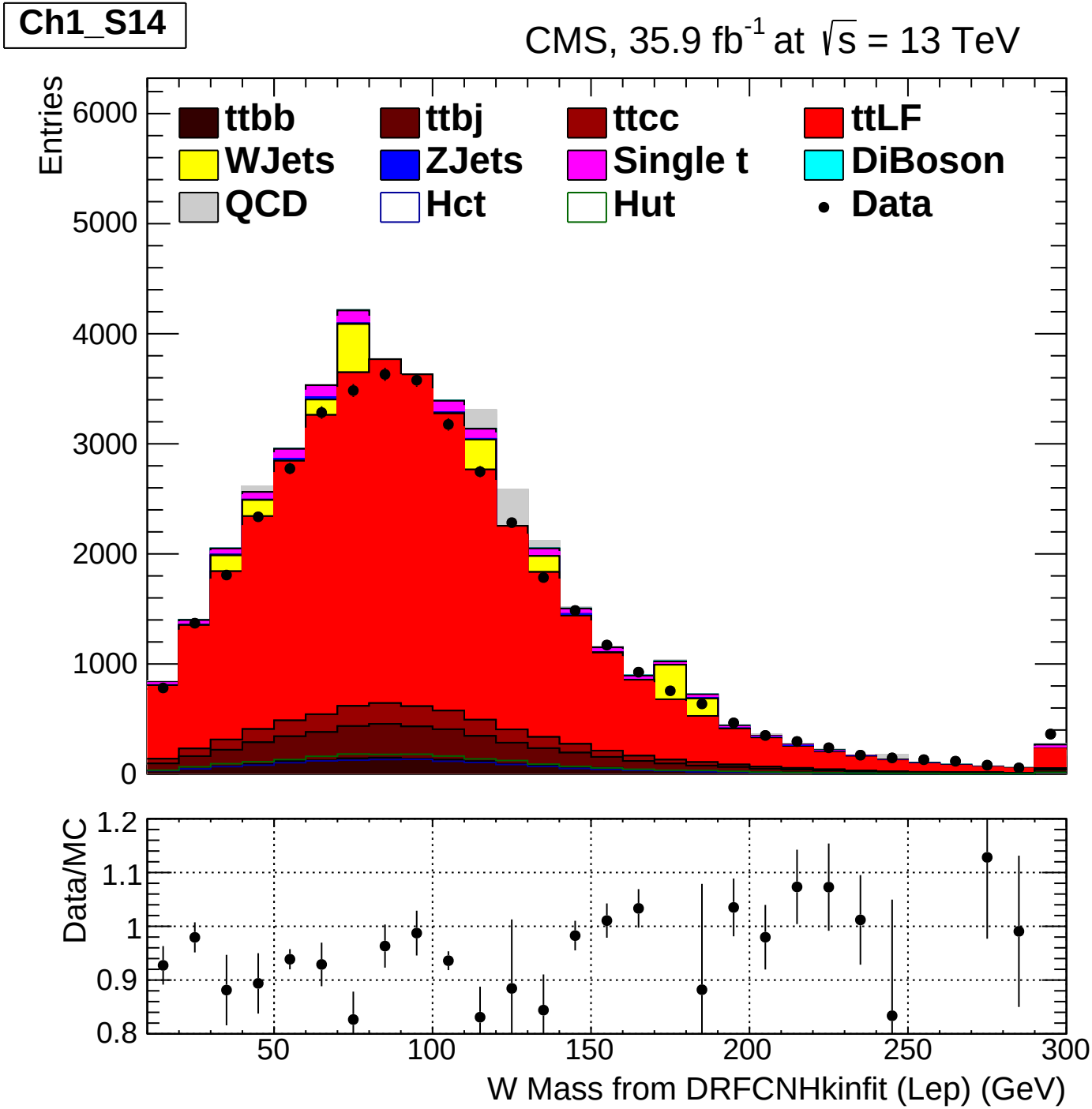

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
1400
1200
1000
800
600
400
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
bjet_m Delta Phi

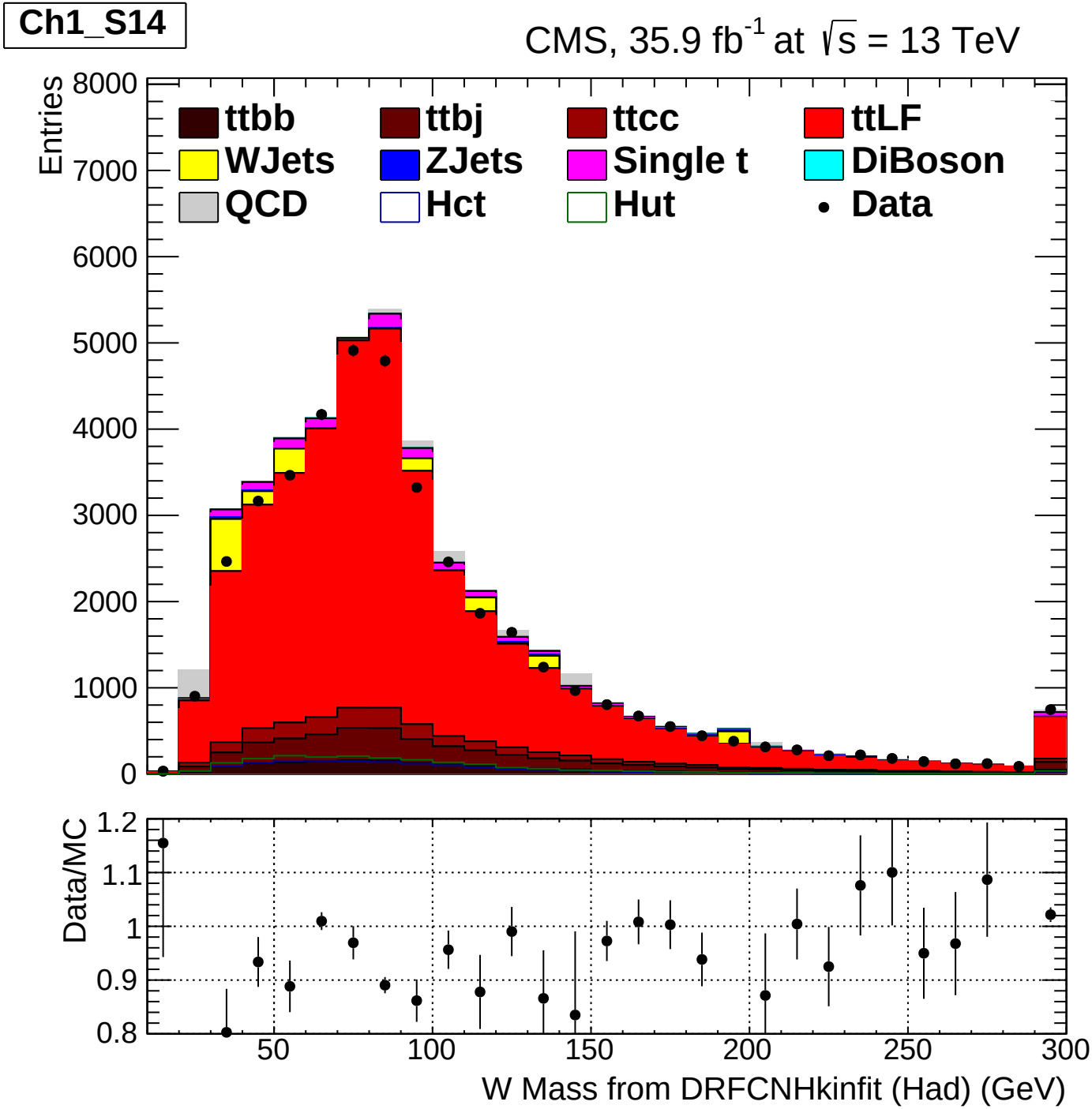

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

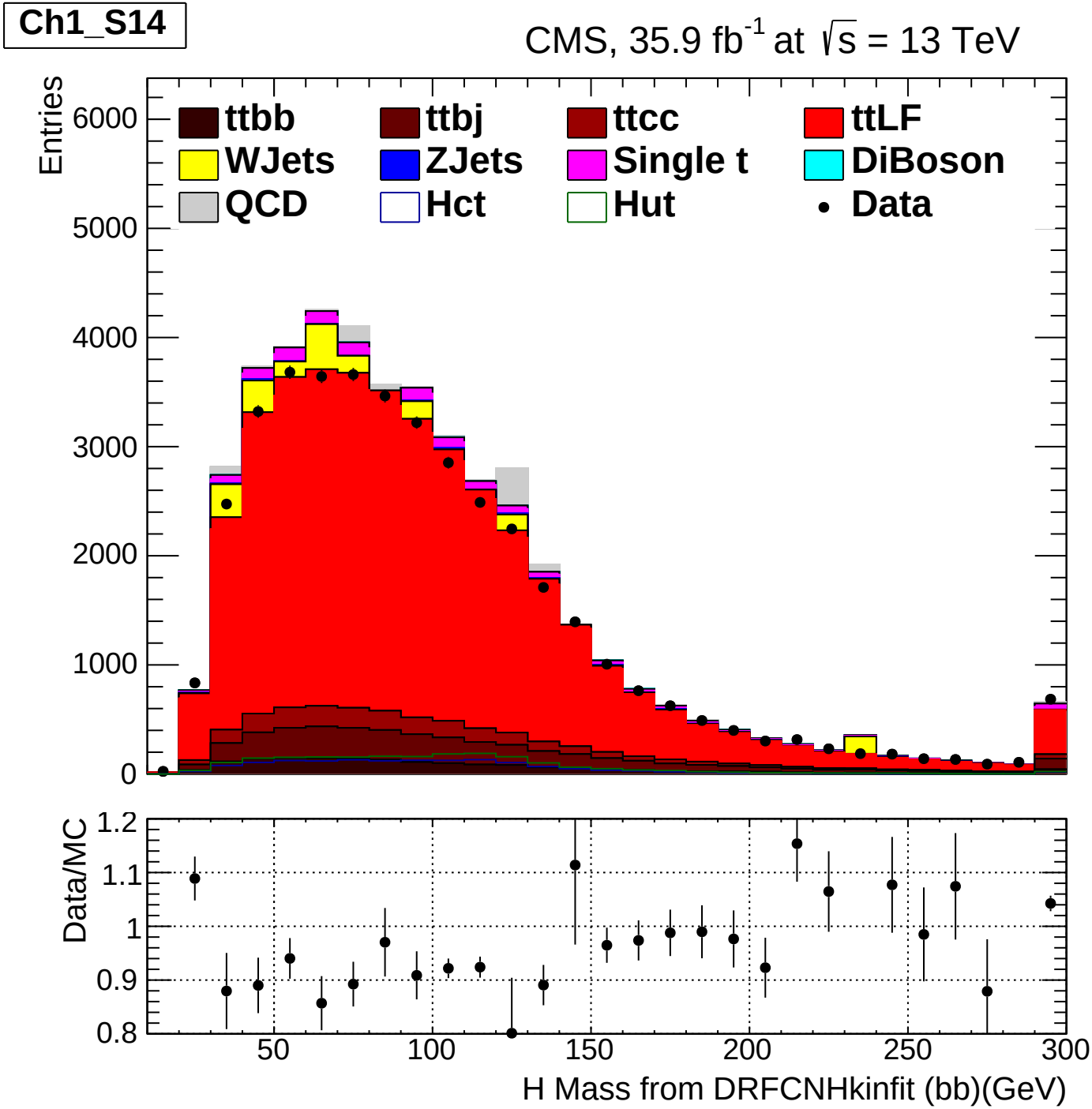

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
2500
2000
1500
1000
500
0
Data/MC
1.2
1.1
1
0.9
0.8
0
0.5
1
1.5
2
2.5
3
3.5
4
bjet_m Delta R

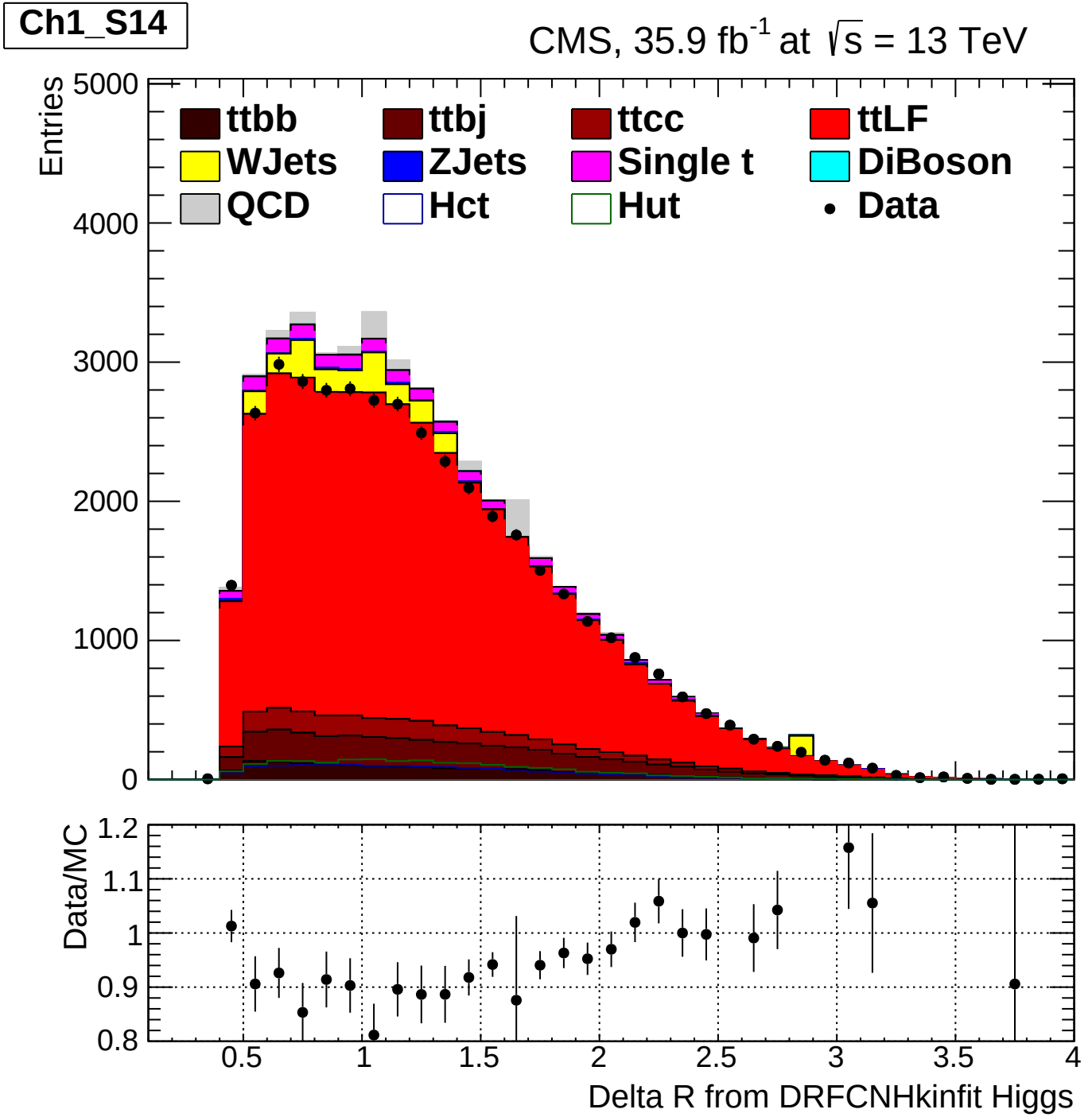

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

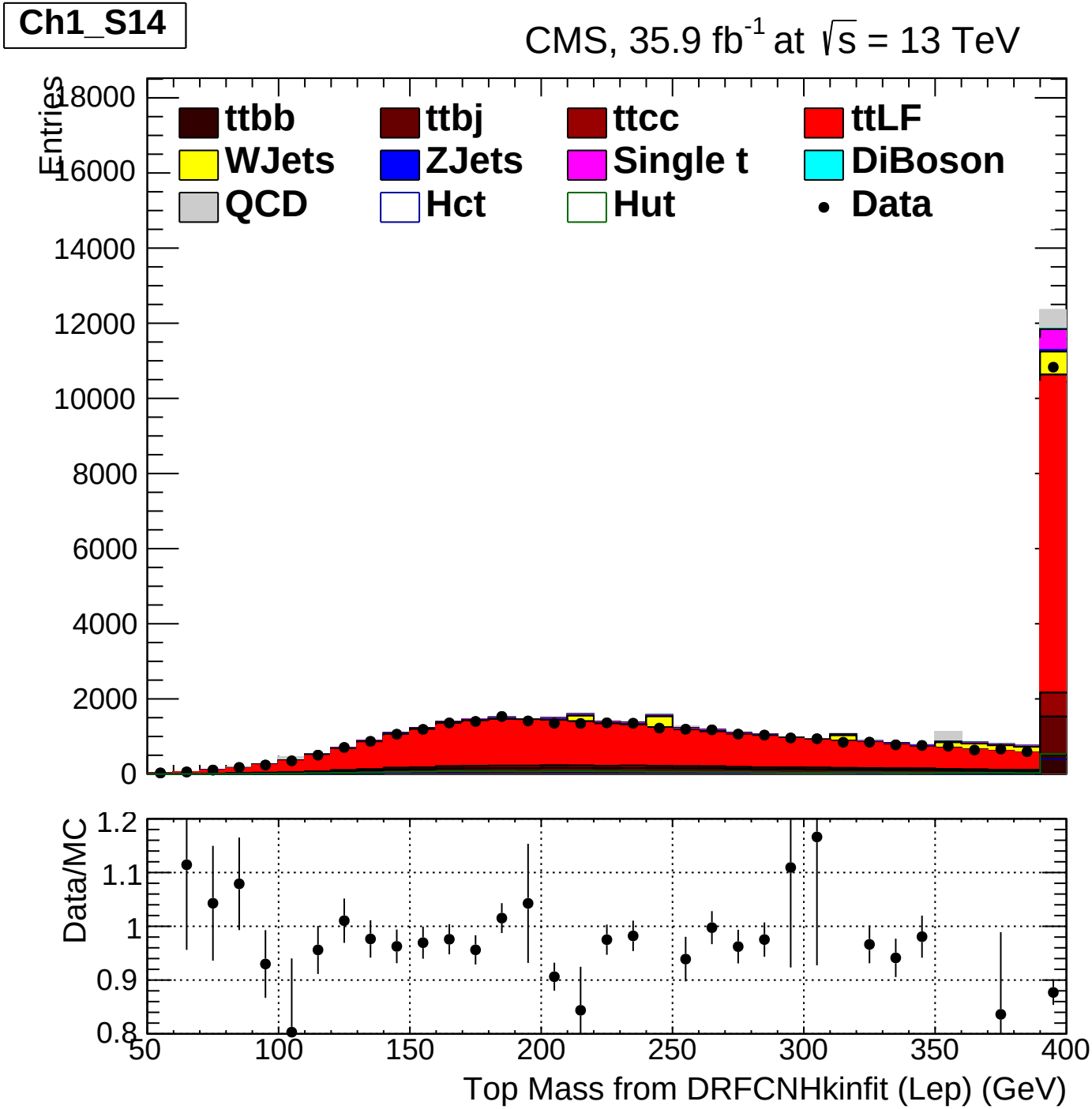

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

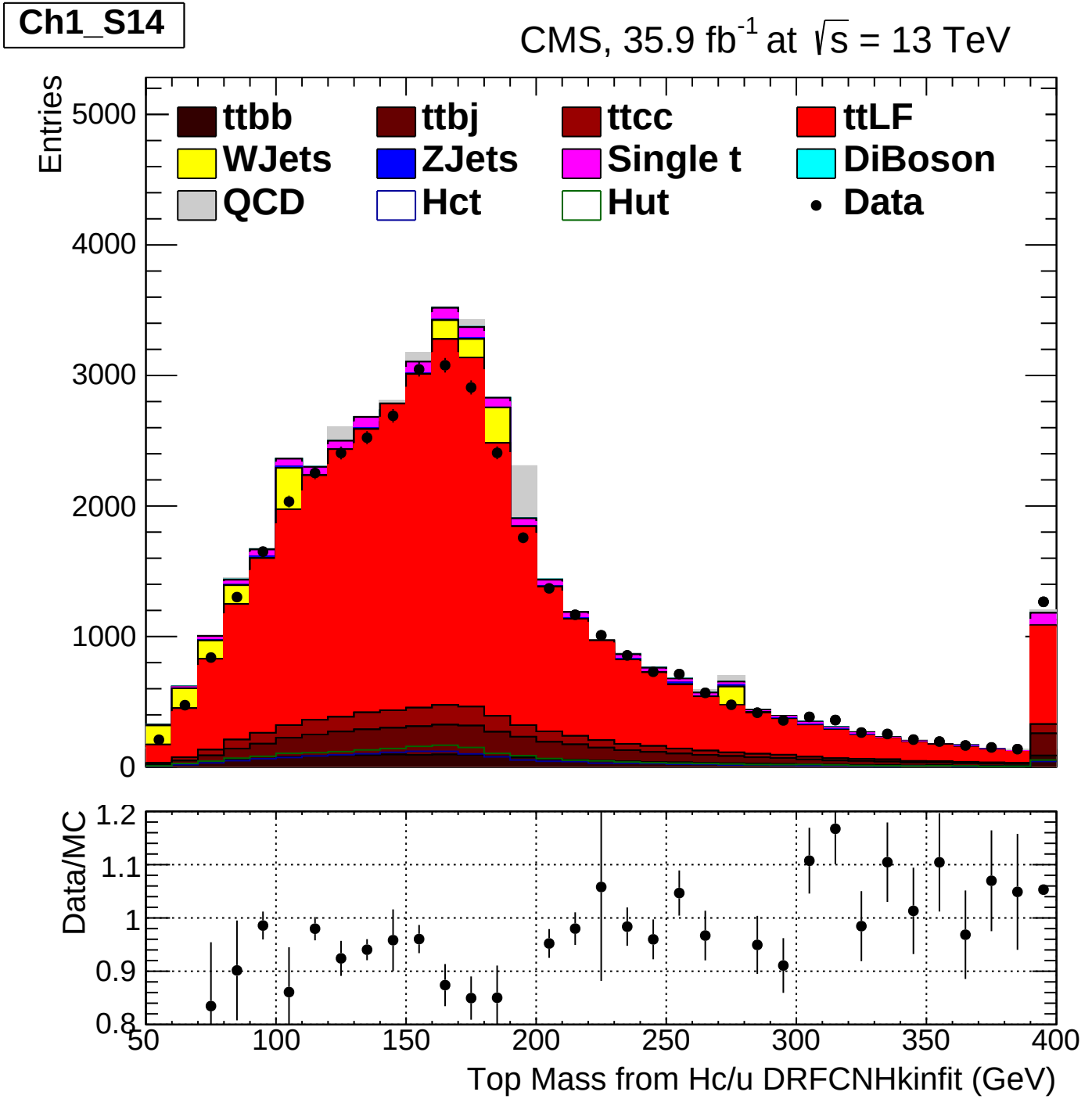

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)

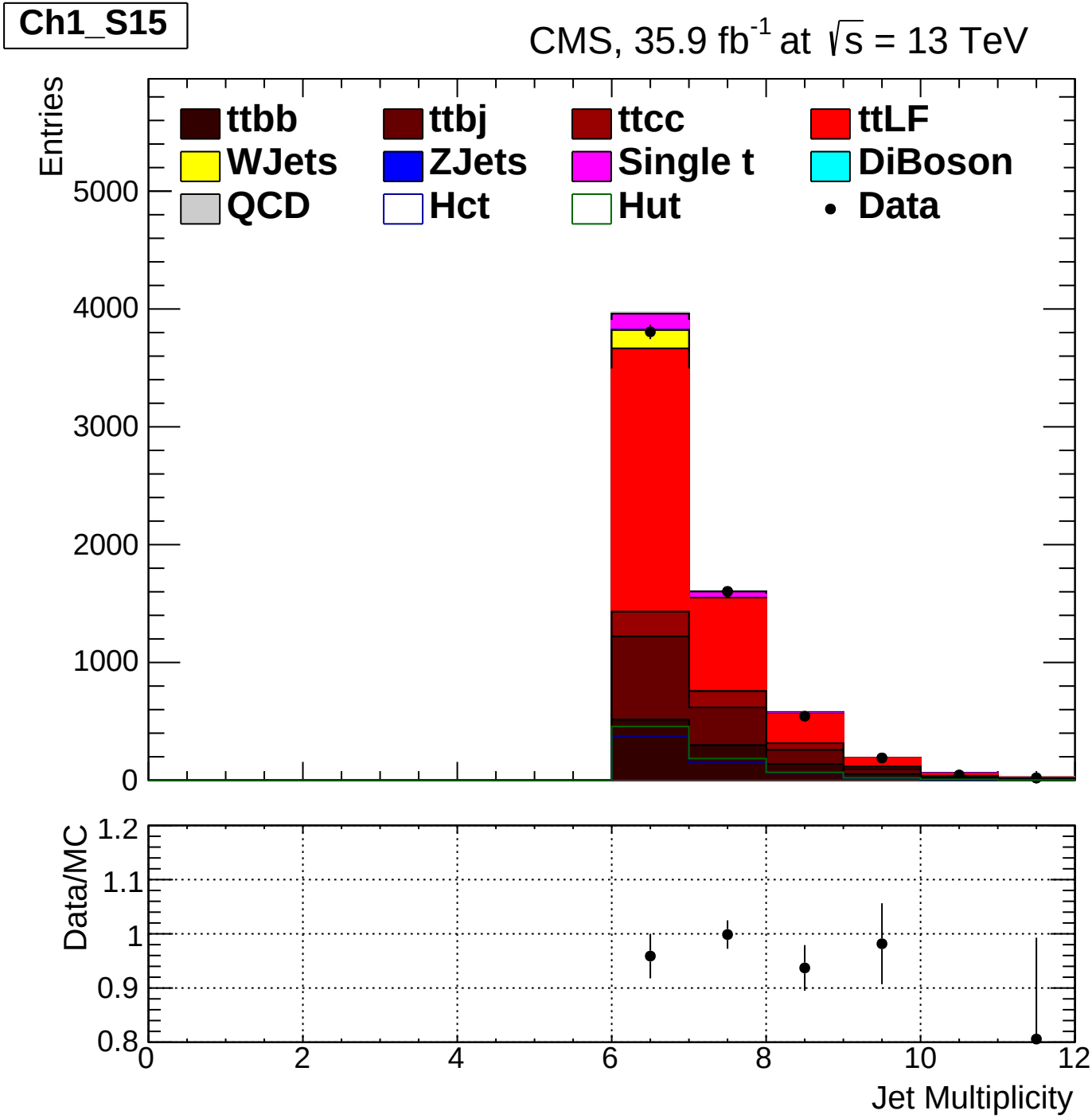

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)

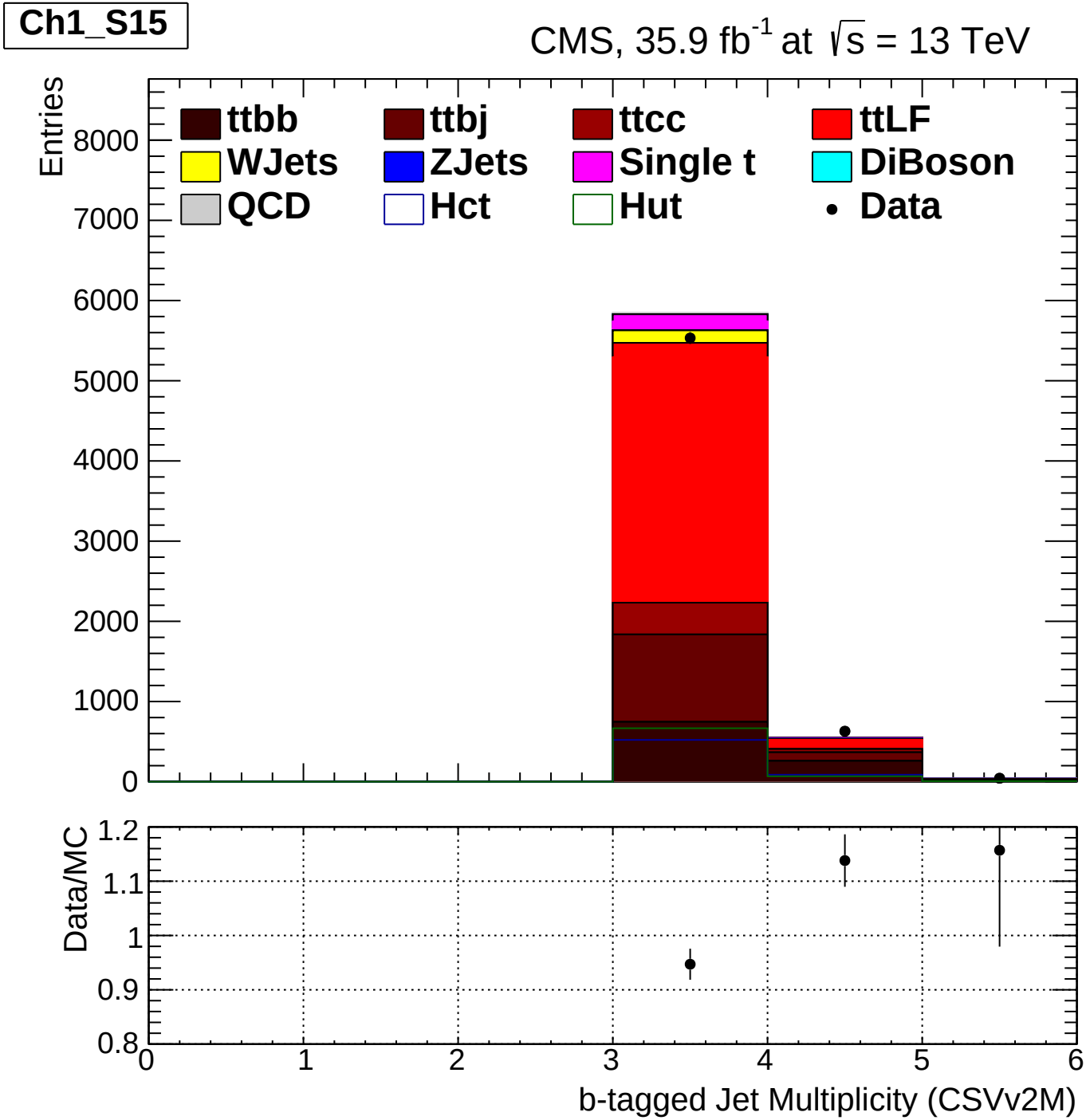

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)

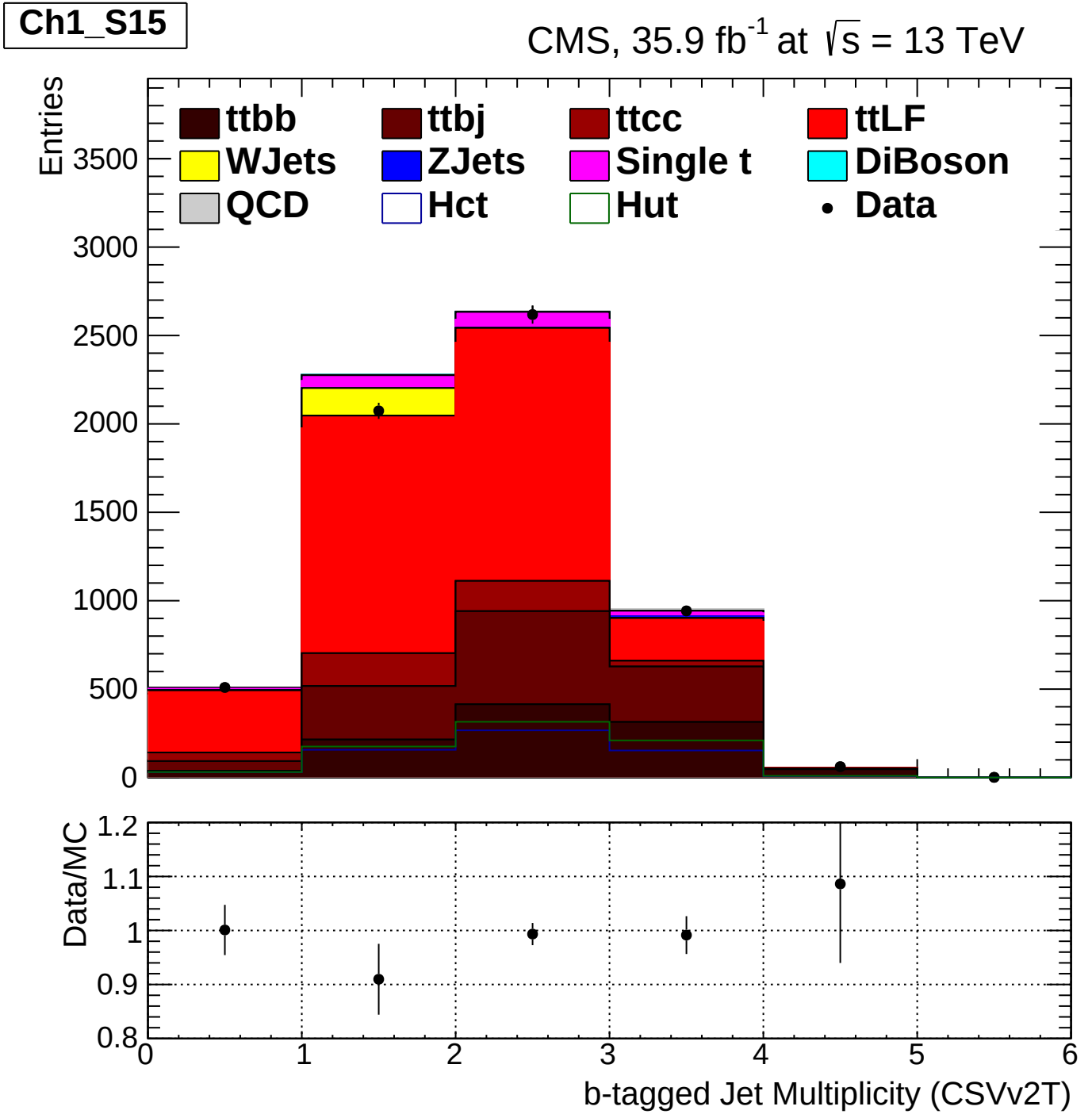

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs

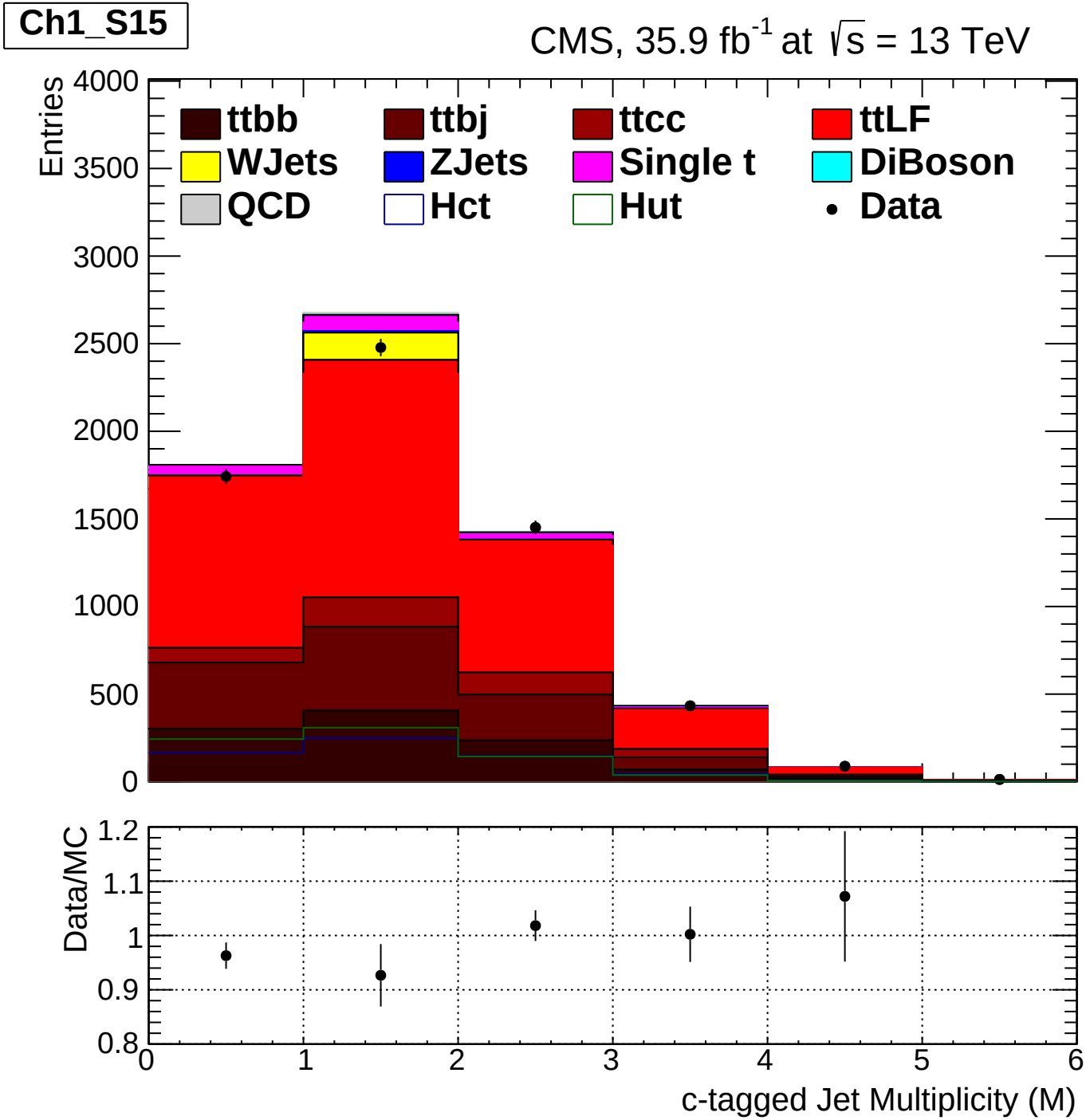

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)

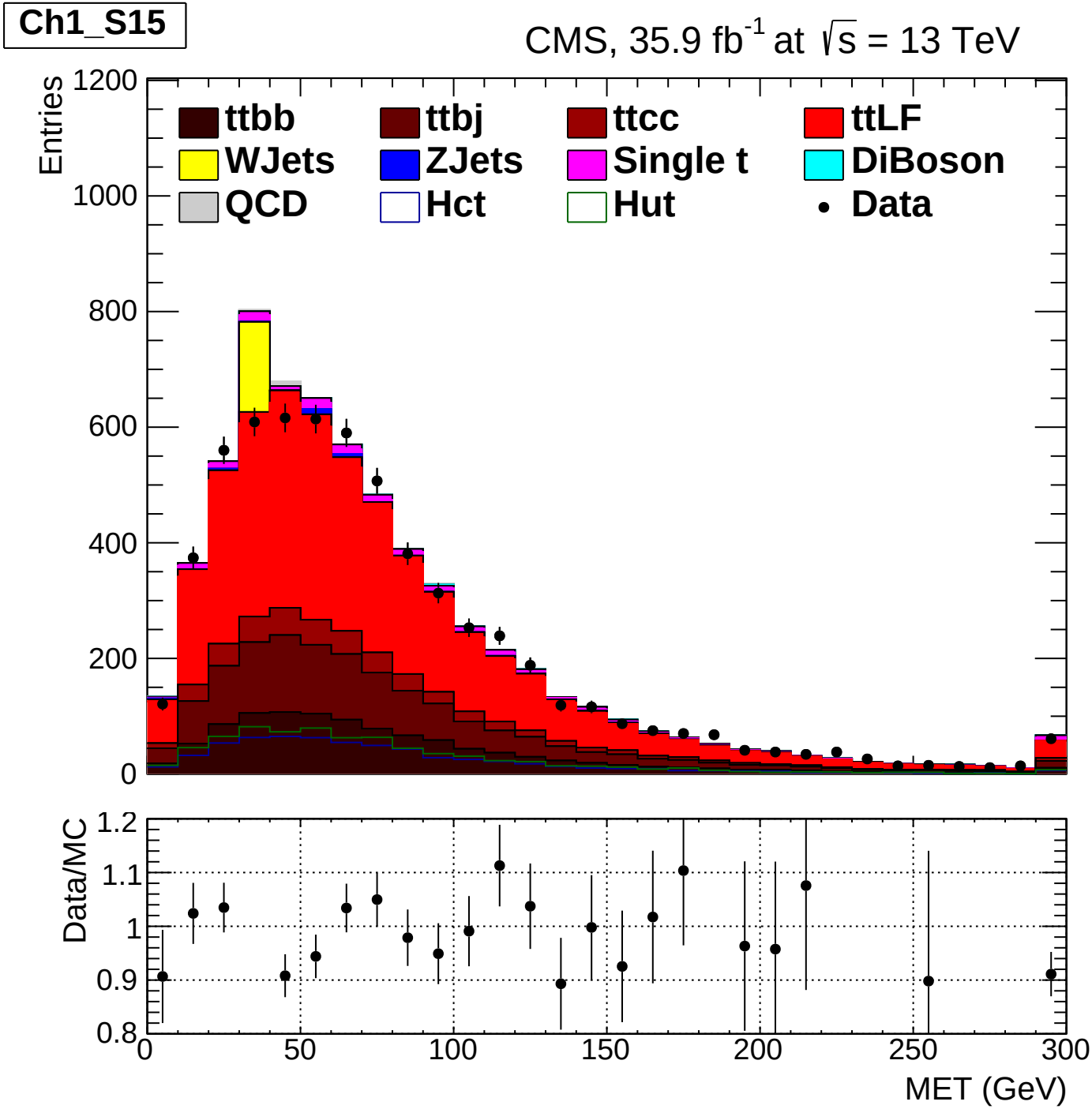

Ch1_S14
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)

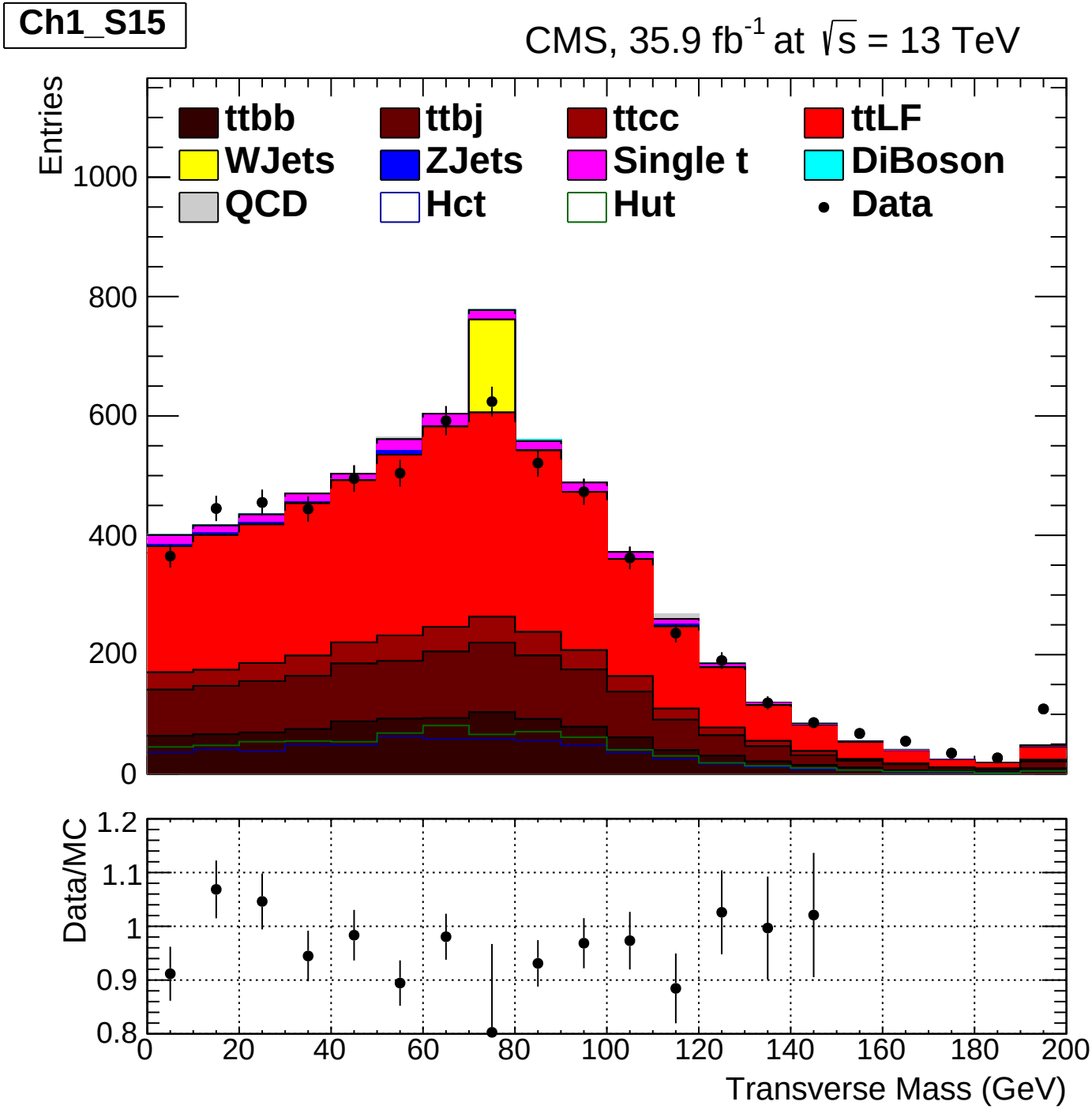

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
5000
4000
3000
2000
1000
0
Data/MC
1.2
1.1
1
0.9
0.8
0
2
4
6
8
10
12
Jet Multiplicity

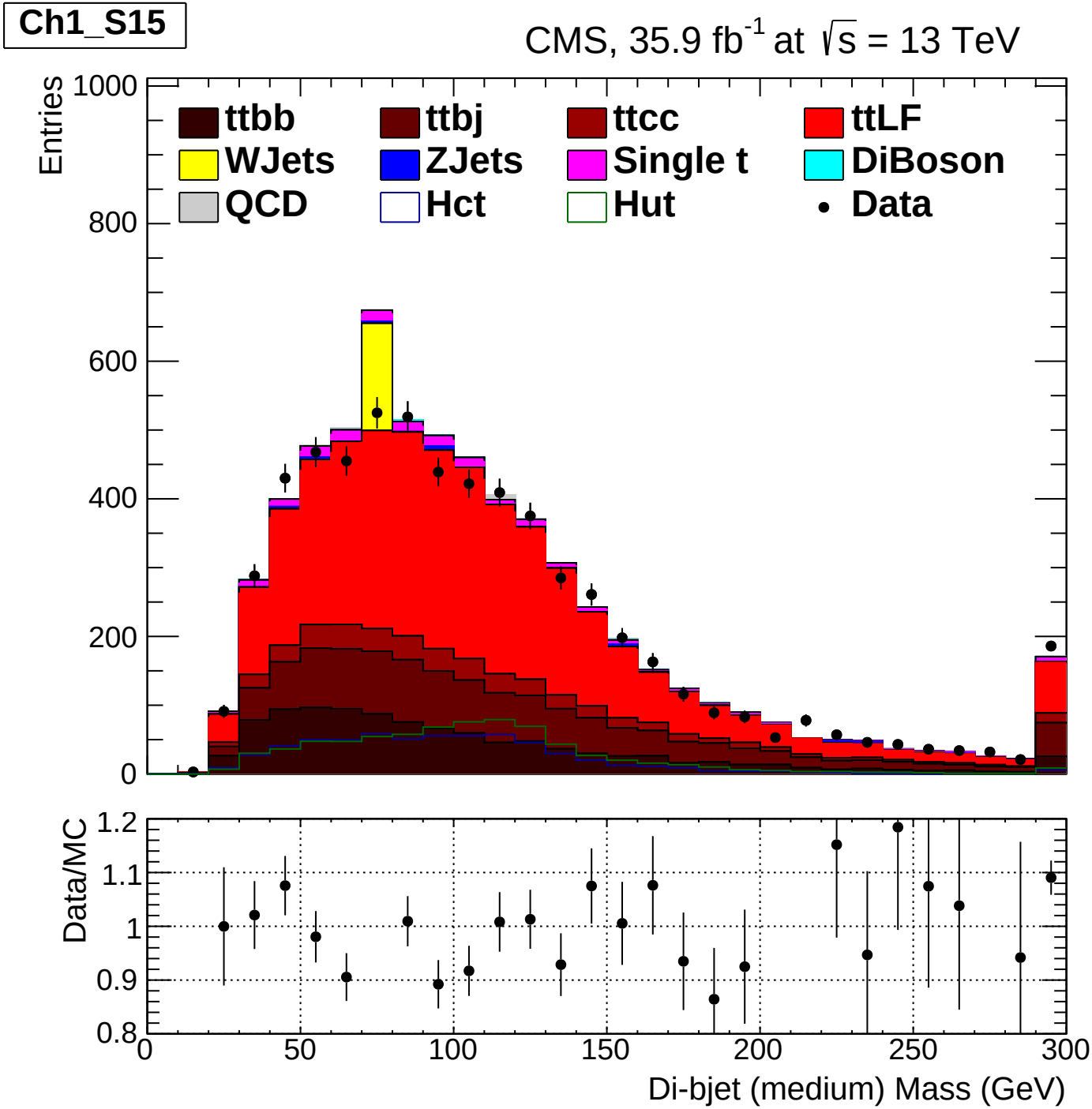

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2M)

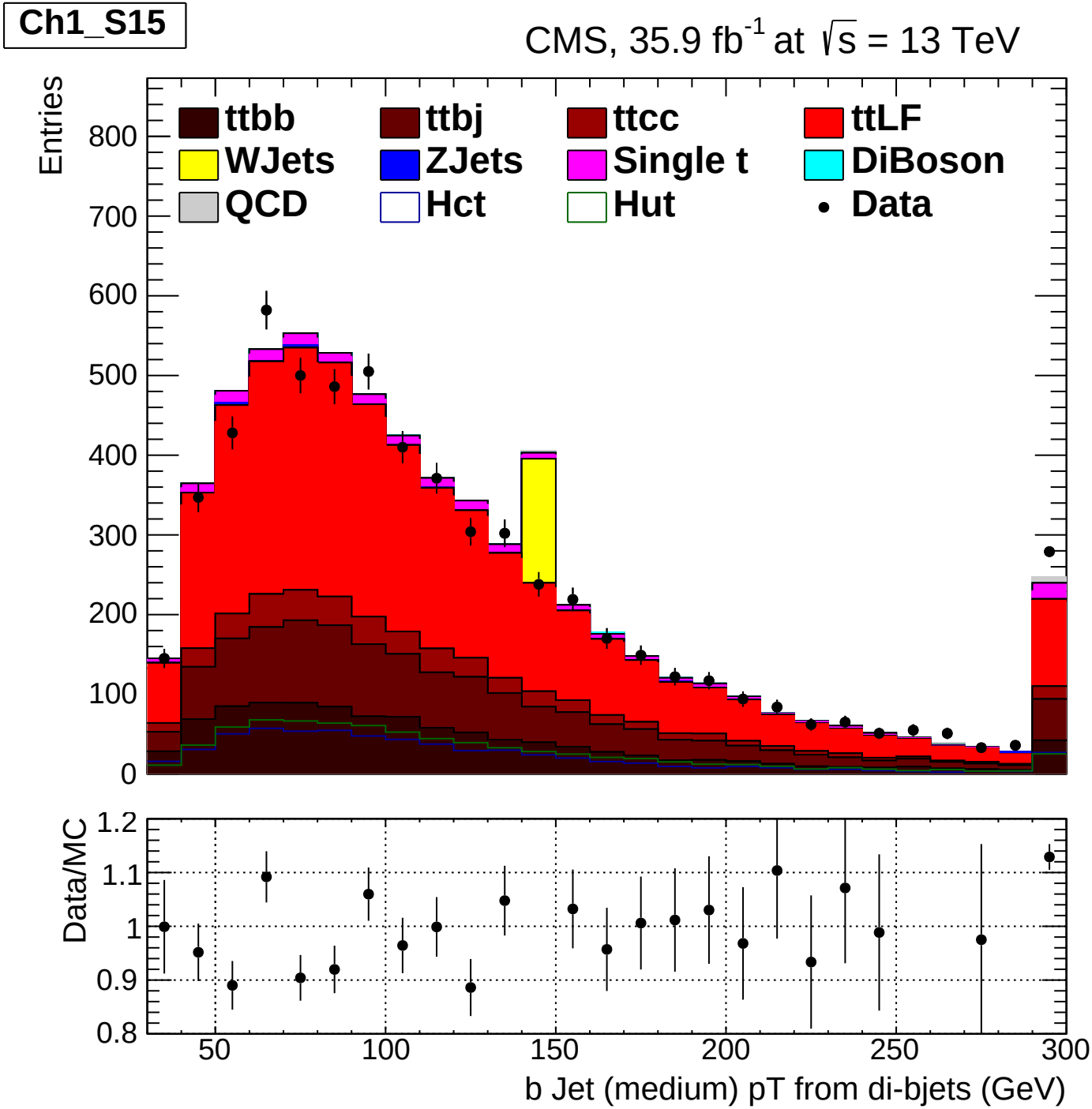

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b-tagged Jet Multiplicity (CSVv2T)

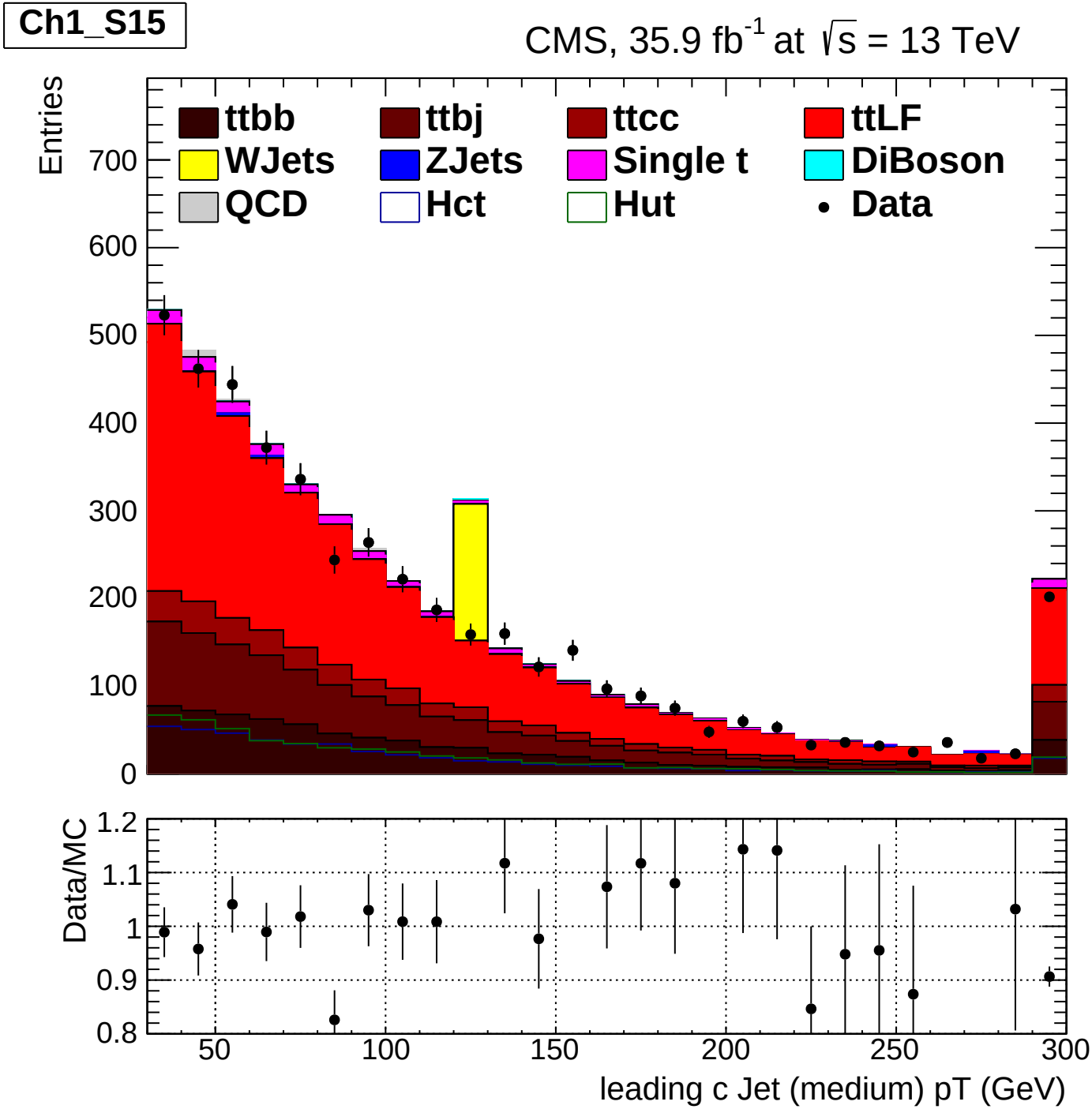

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
c-tagged Jet Multiplicity (M)

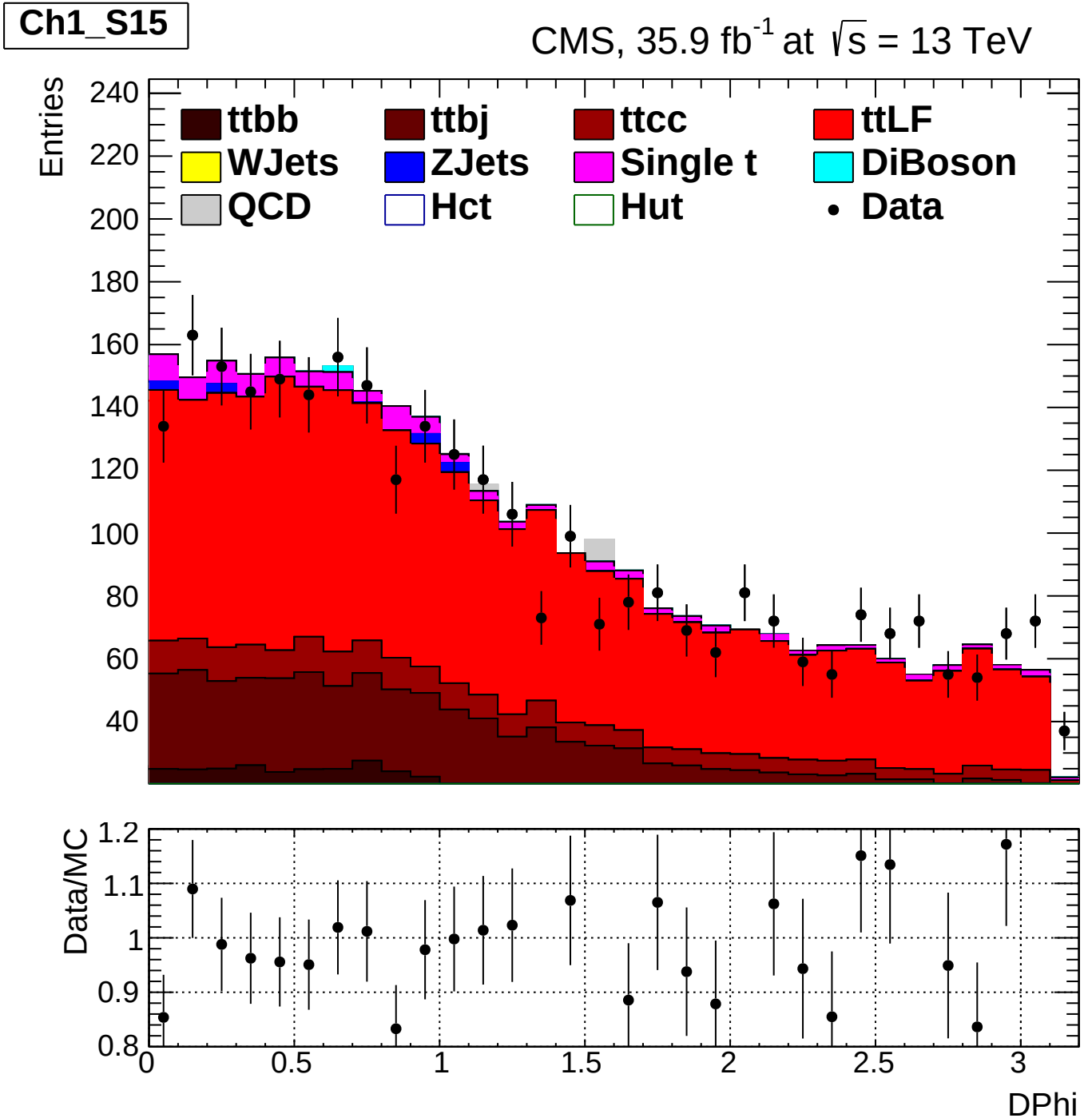

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
MET (GeV)

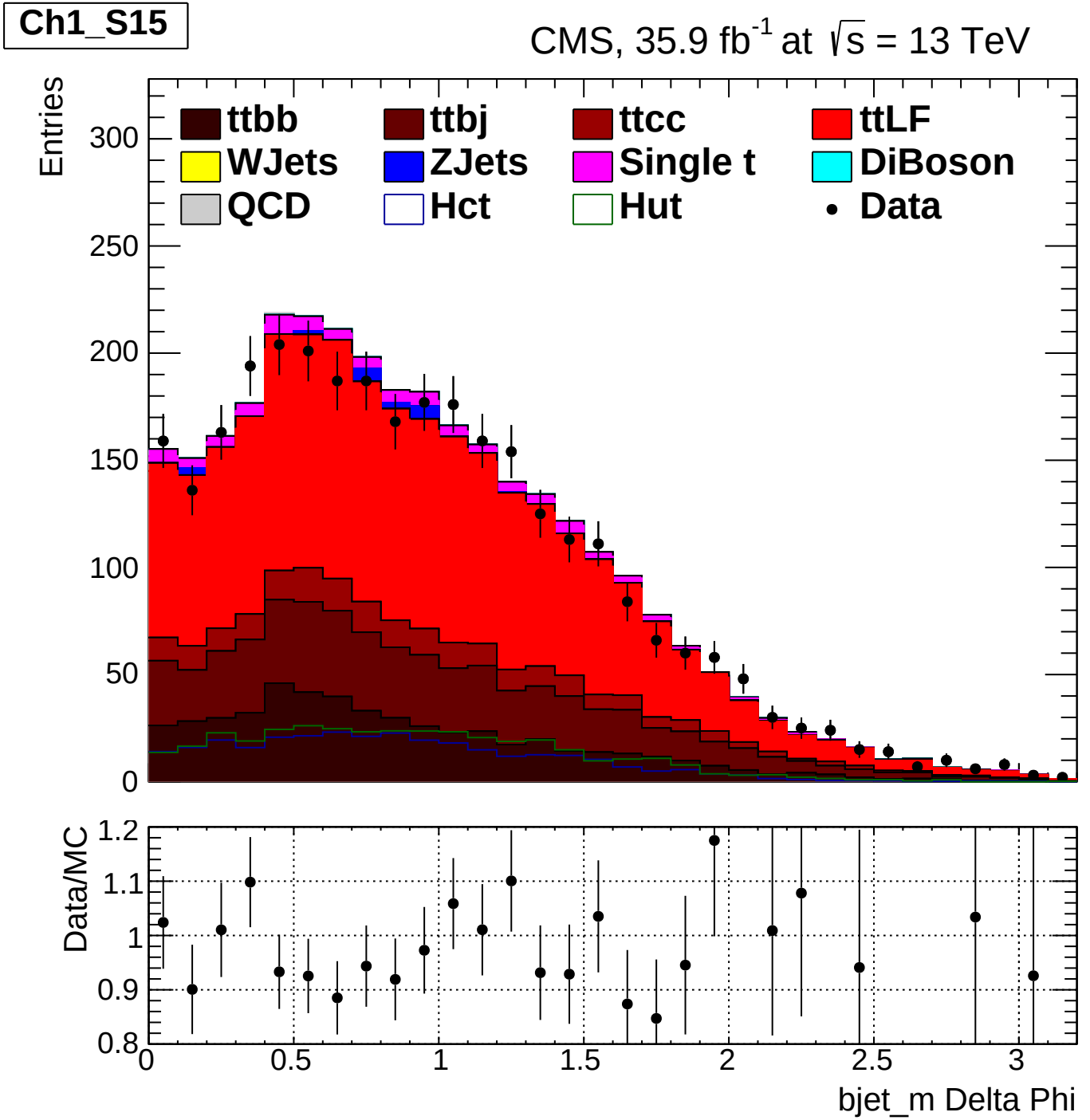

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
200
400
600
800
1000
Data/MC
0.8
0.9
1
1.1
1.2
0
20
40
60
80
100
120
140
160
180
200
Transverse Mass (GeV)

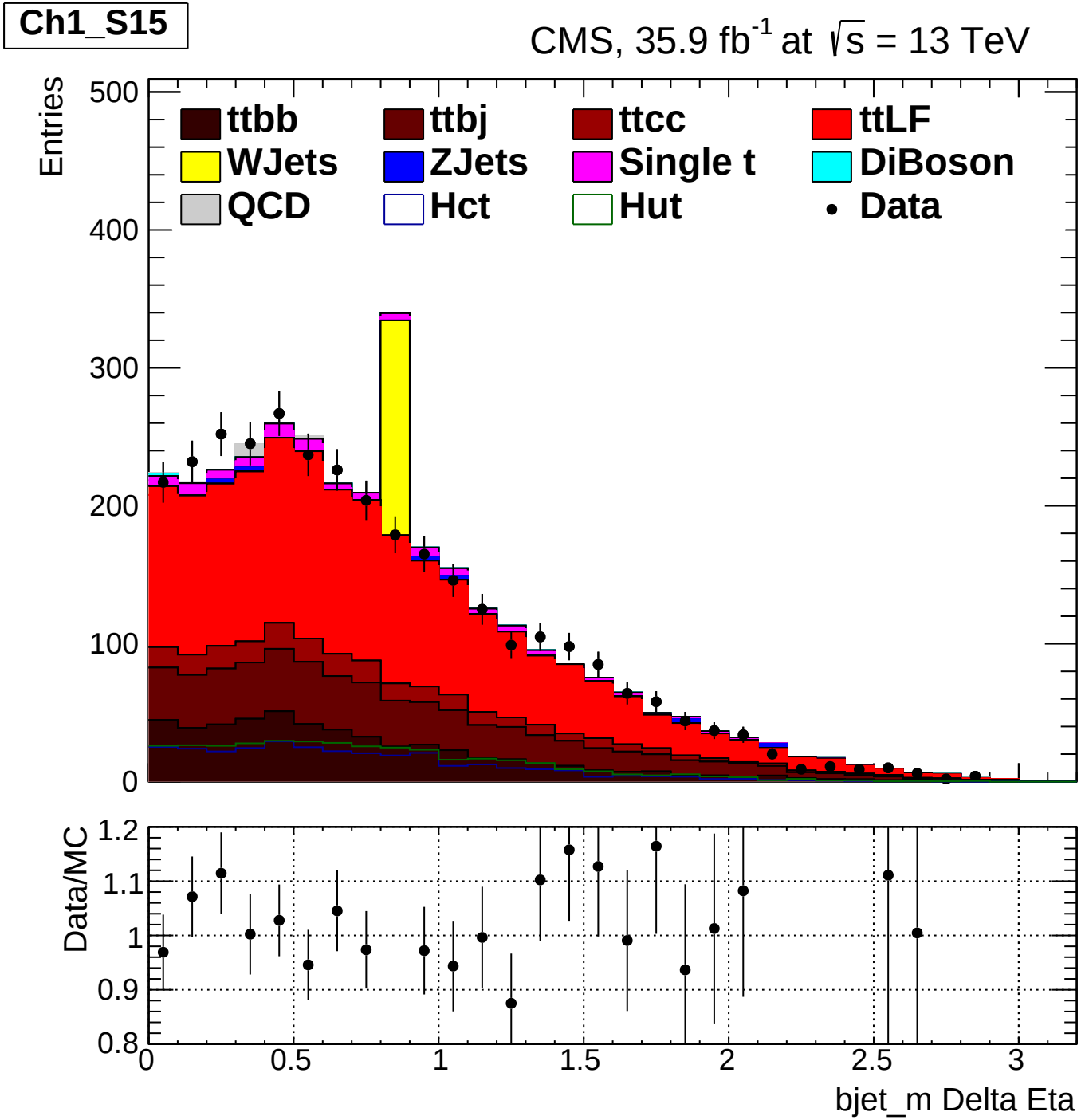

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Di-bjet (medium) Mass (GeV)

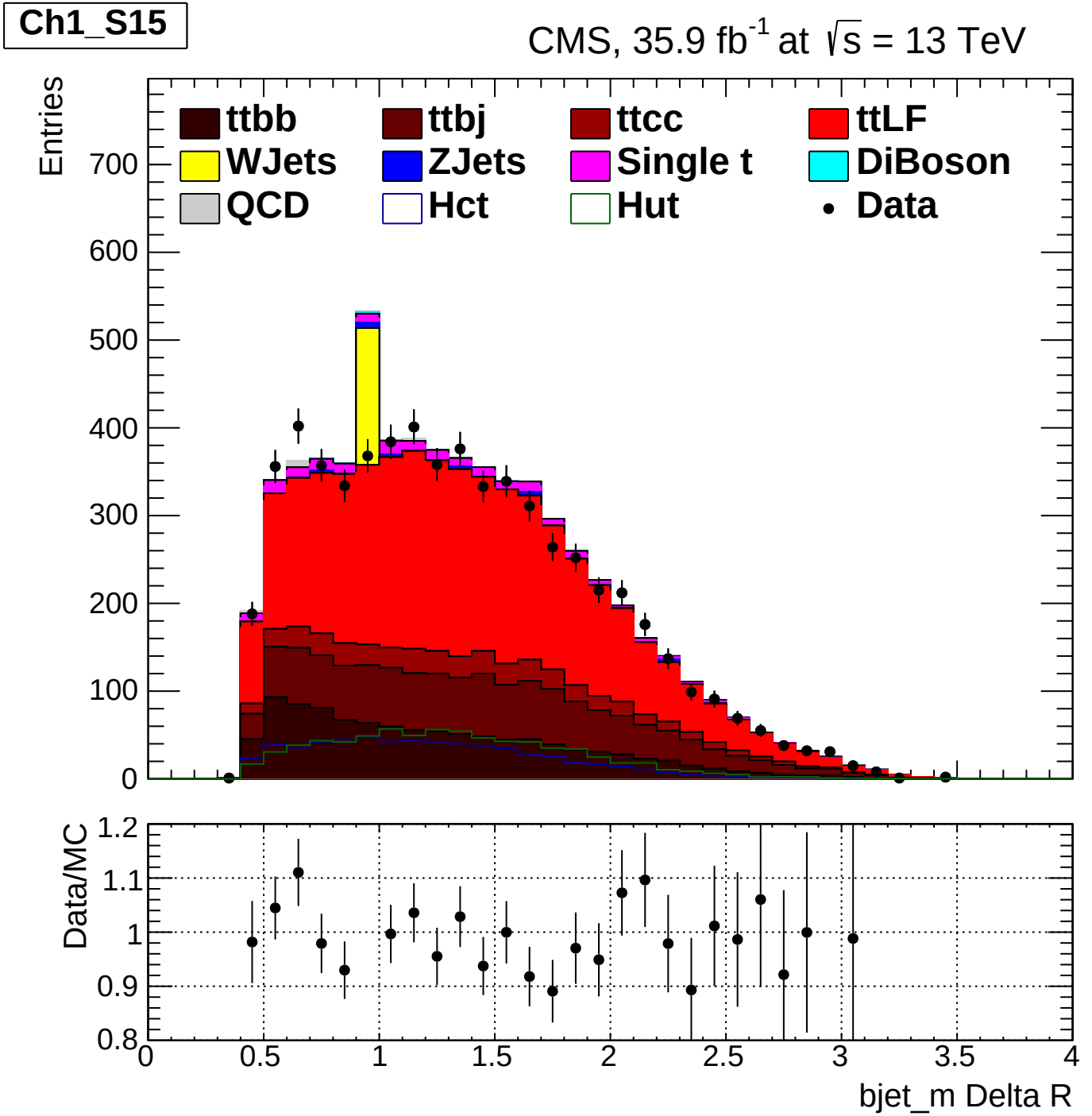

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
b Jet (medium) pT from di-bjets (GeV)

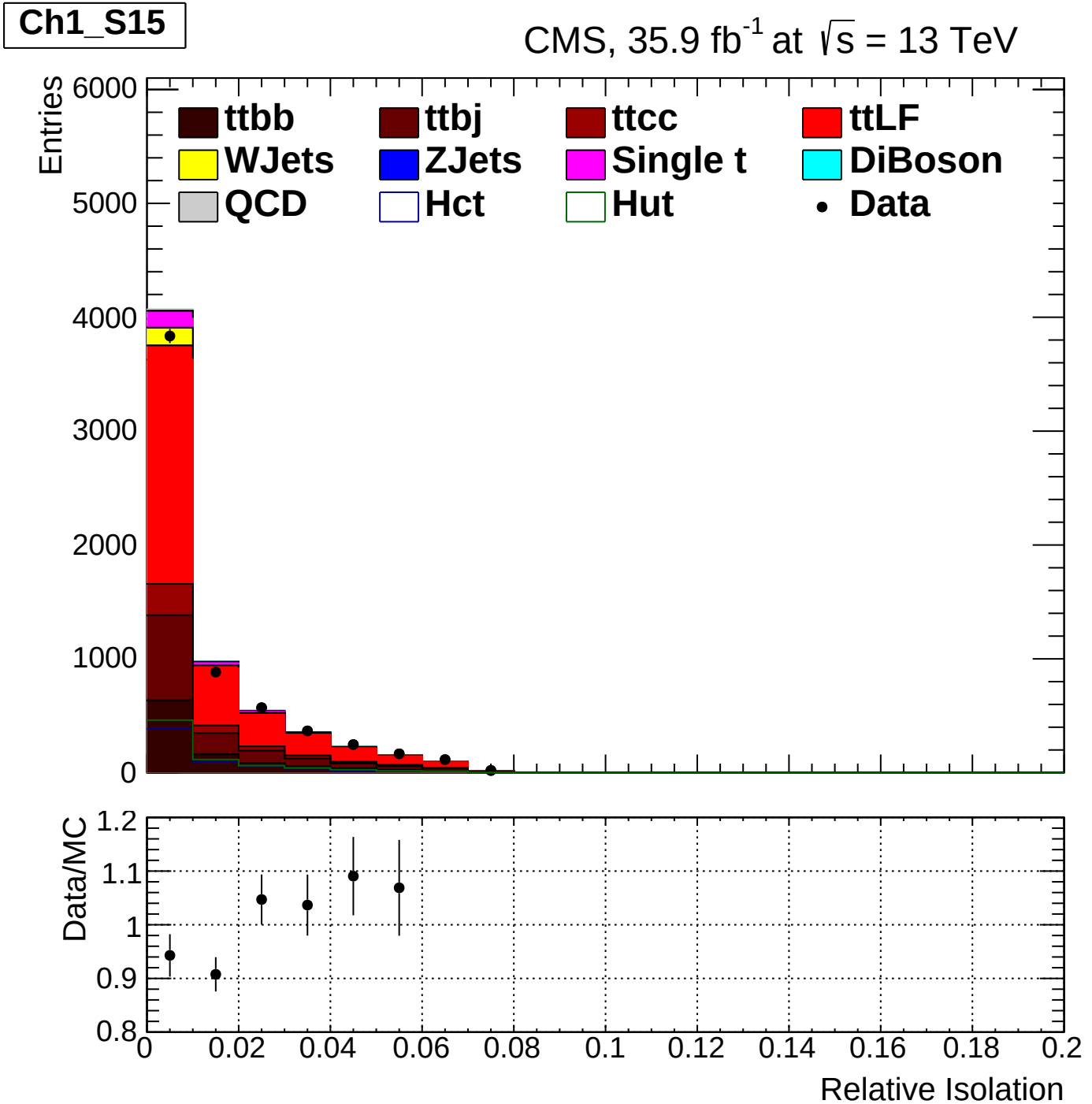

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
0
100
200
300
400
500
600
700
Data/MC
0.8
0.9
1
1.1
1.2
50
100
150
200
250
300
leading c Jet (medium) pT (GeV)

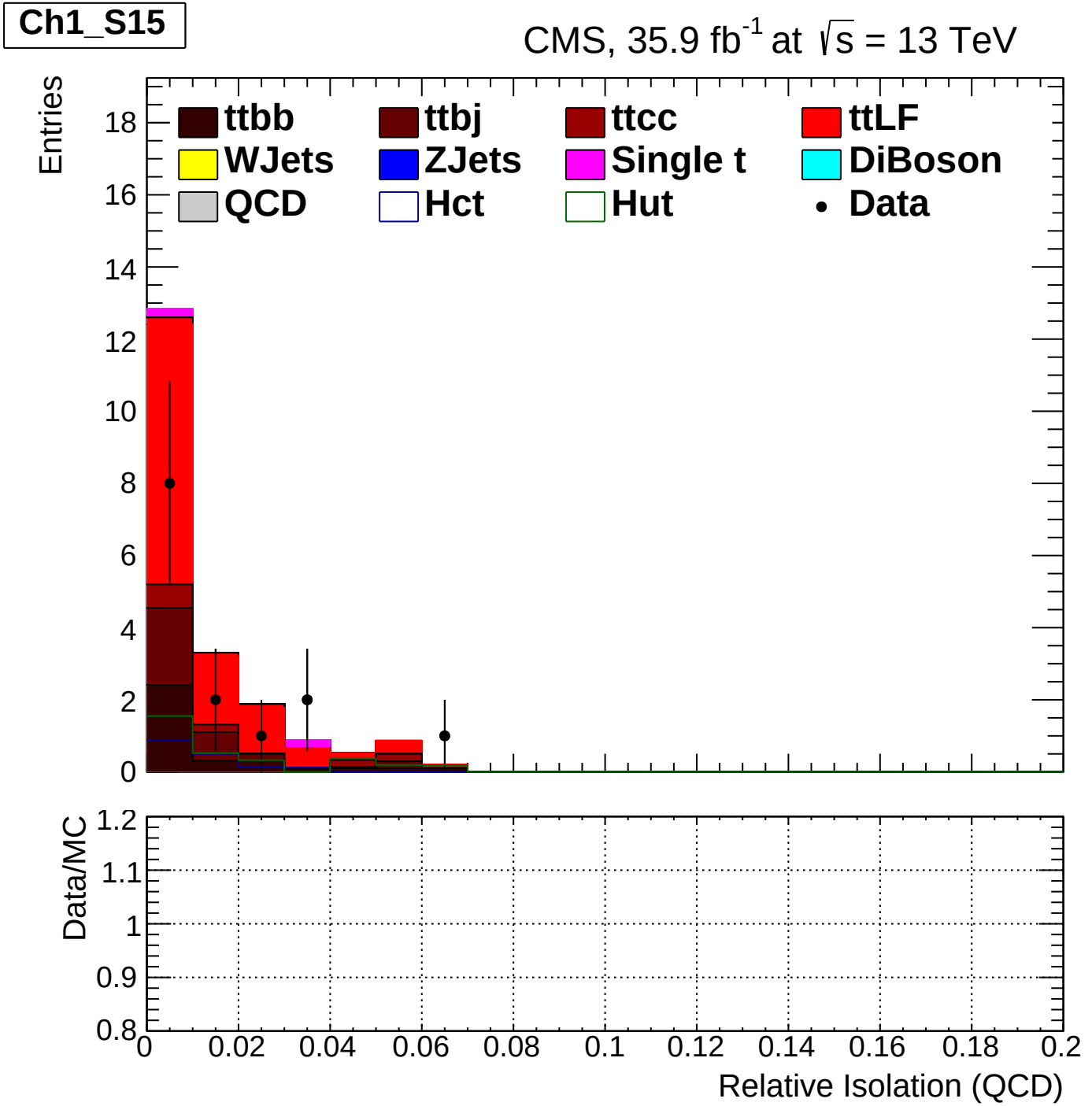

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
DPhi

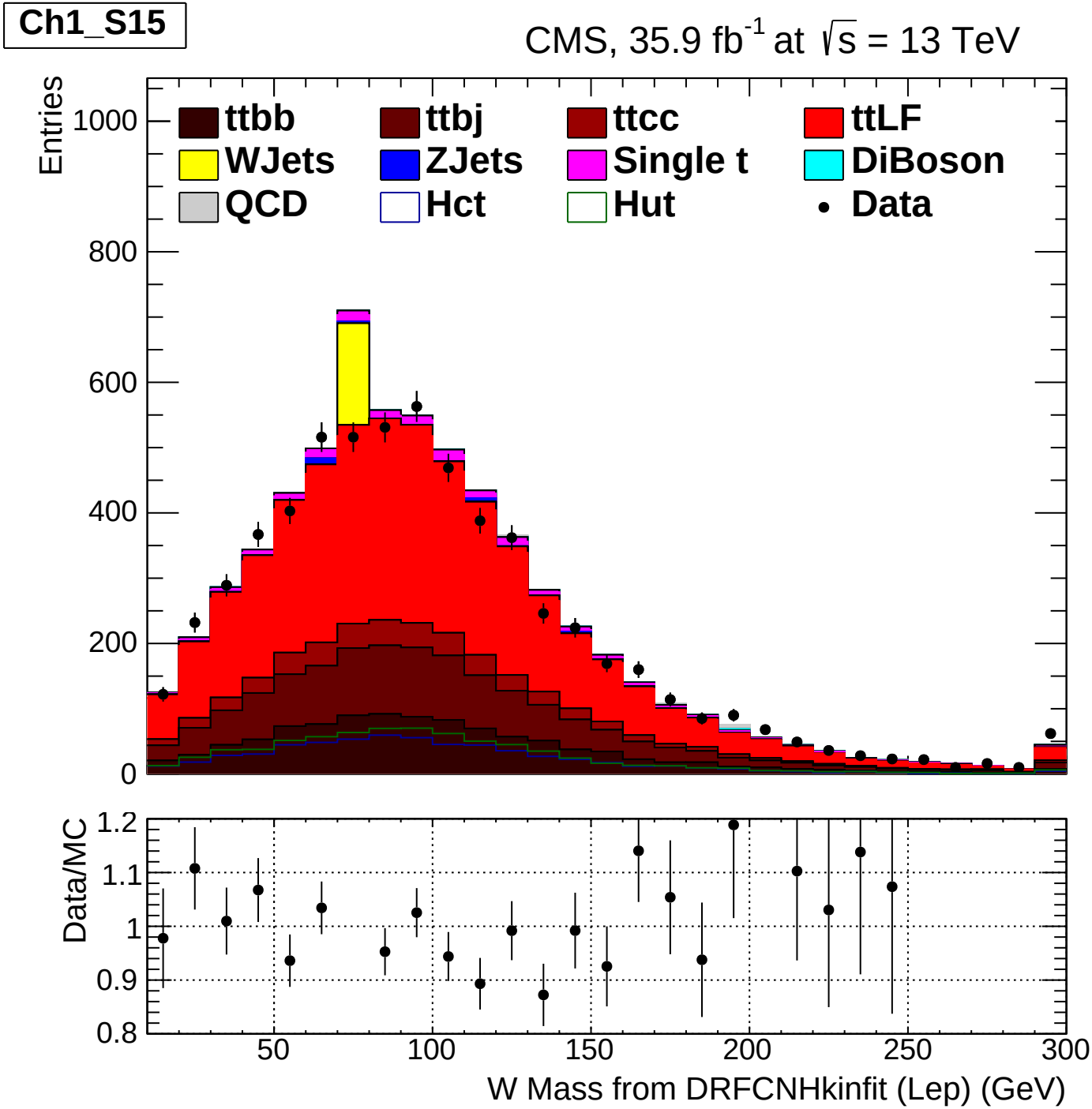

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Phi

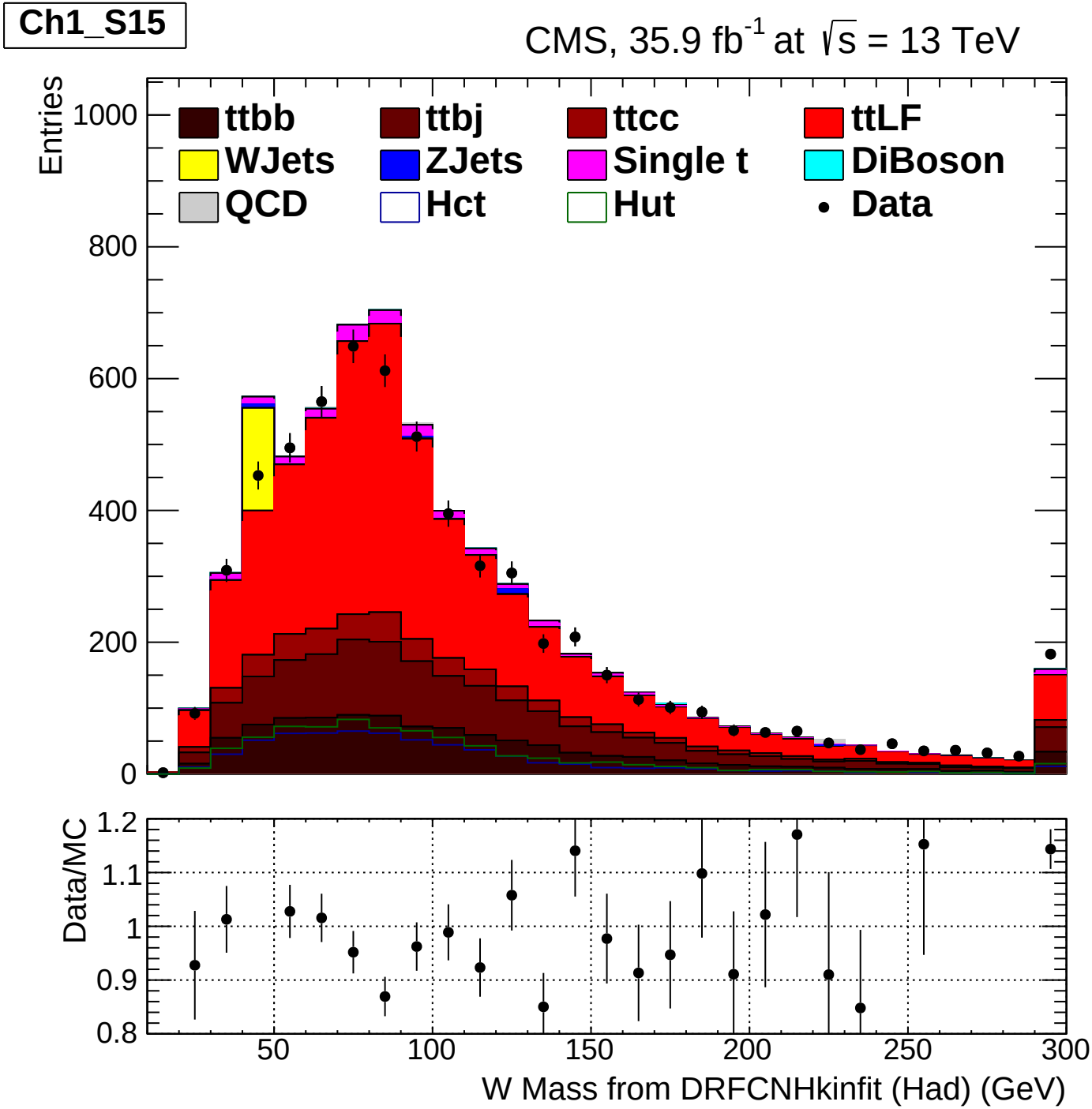

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta Eta

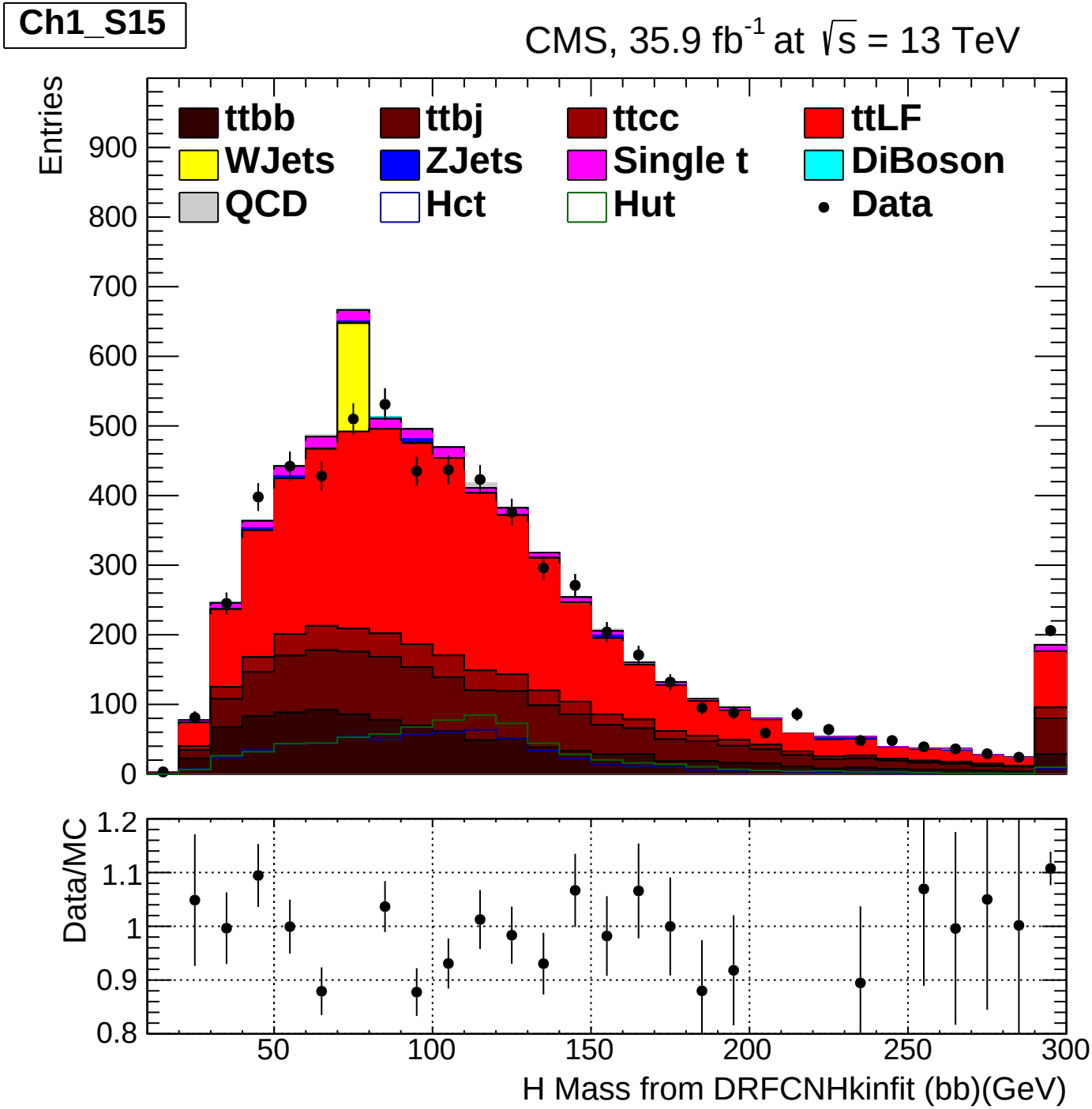

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
bjet_m Delta R

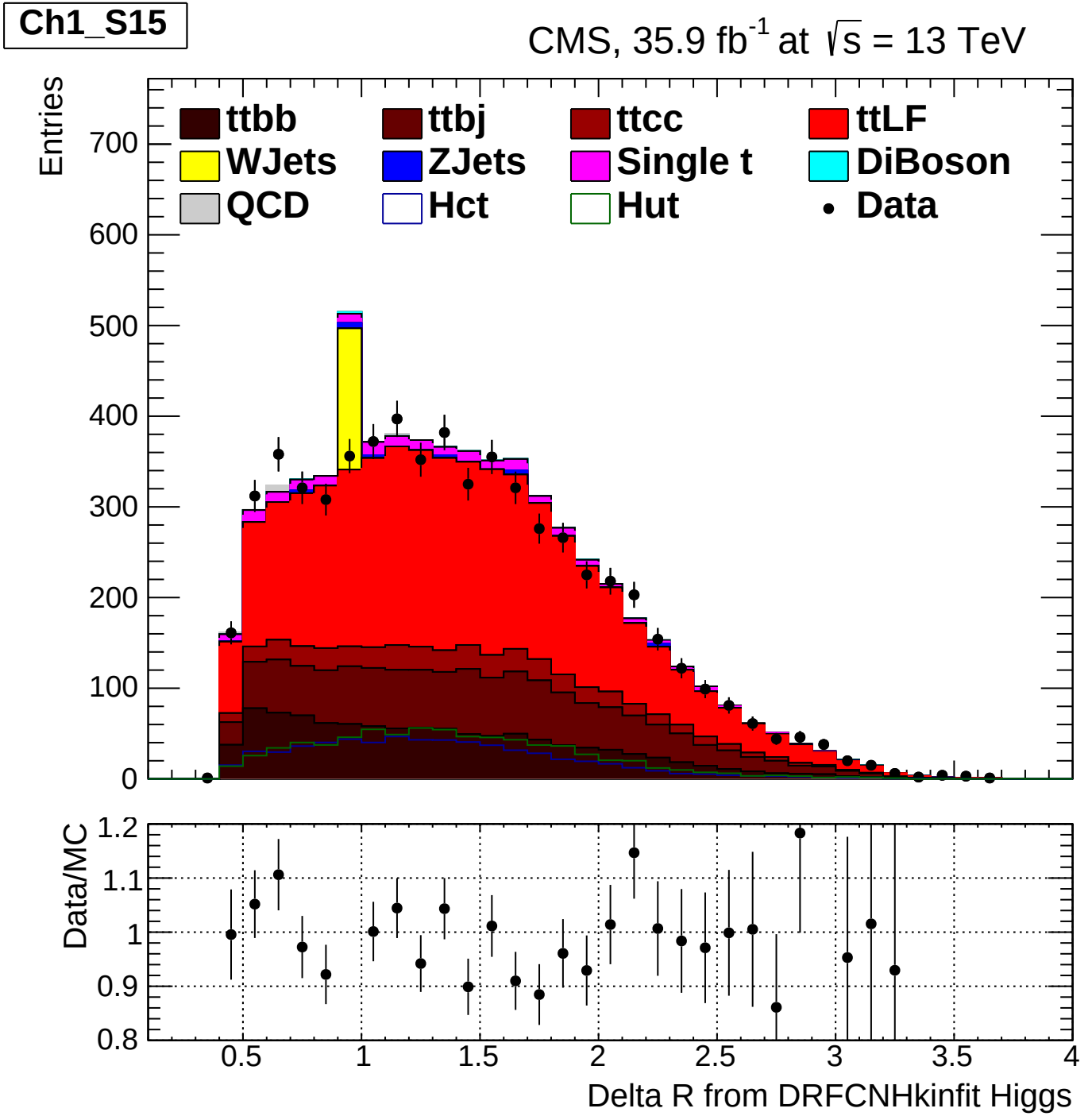

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation

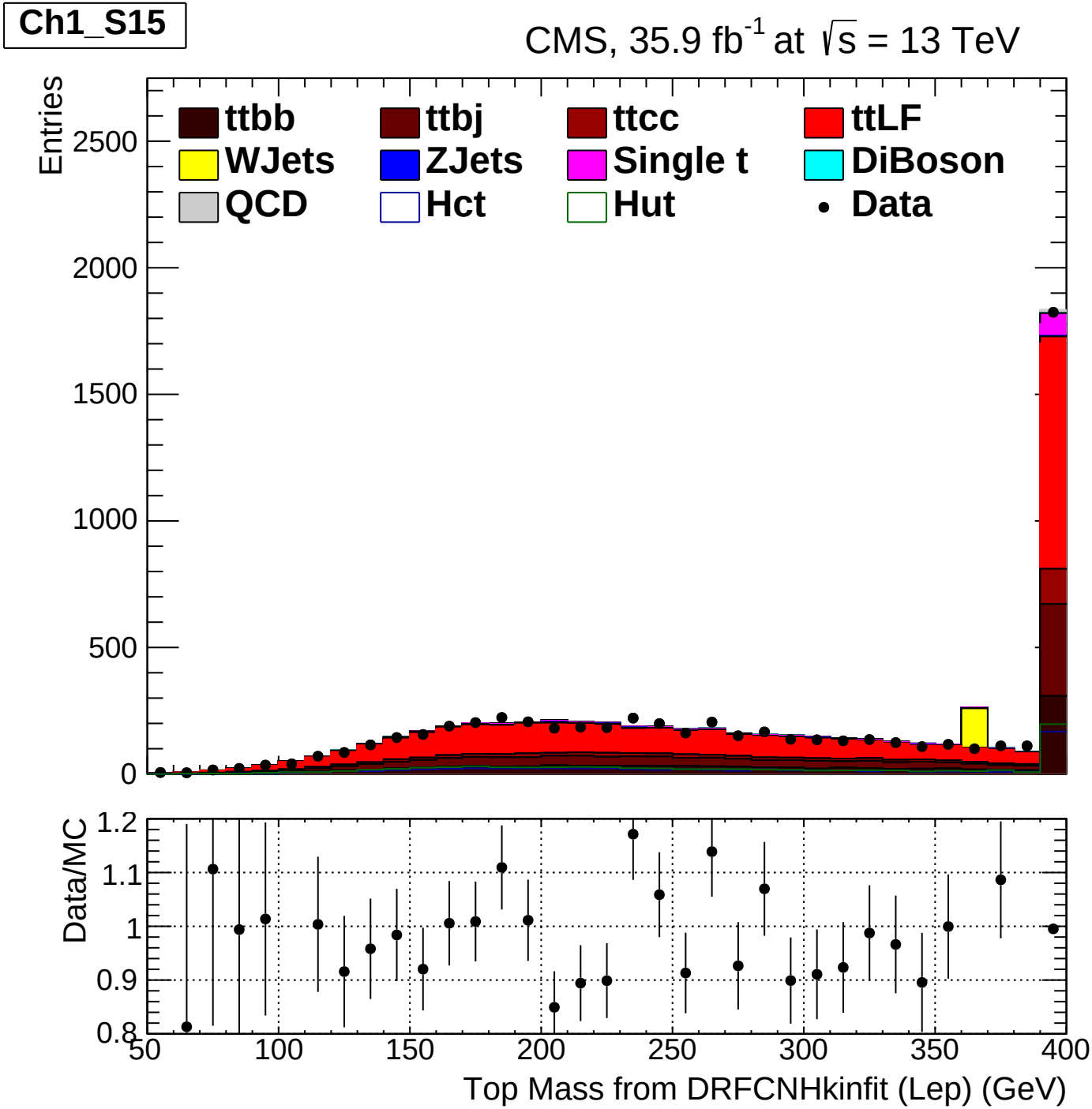

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Relative Isolation (QCD)

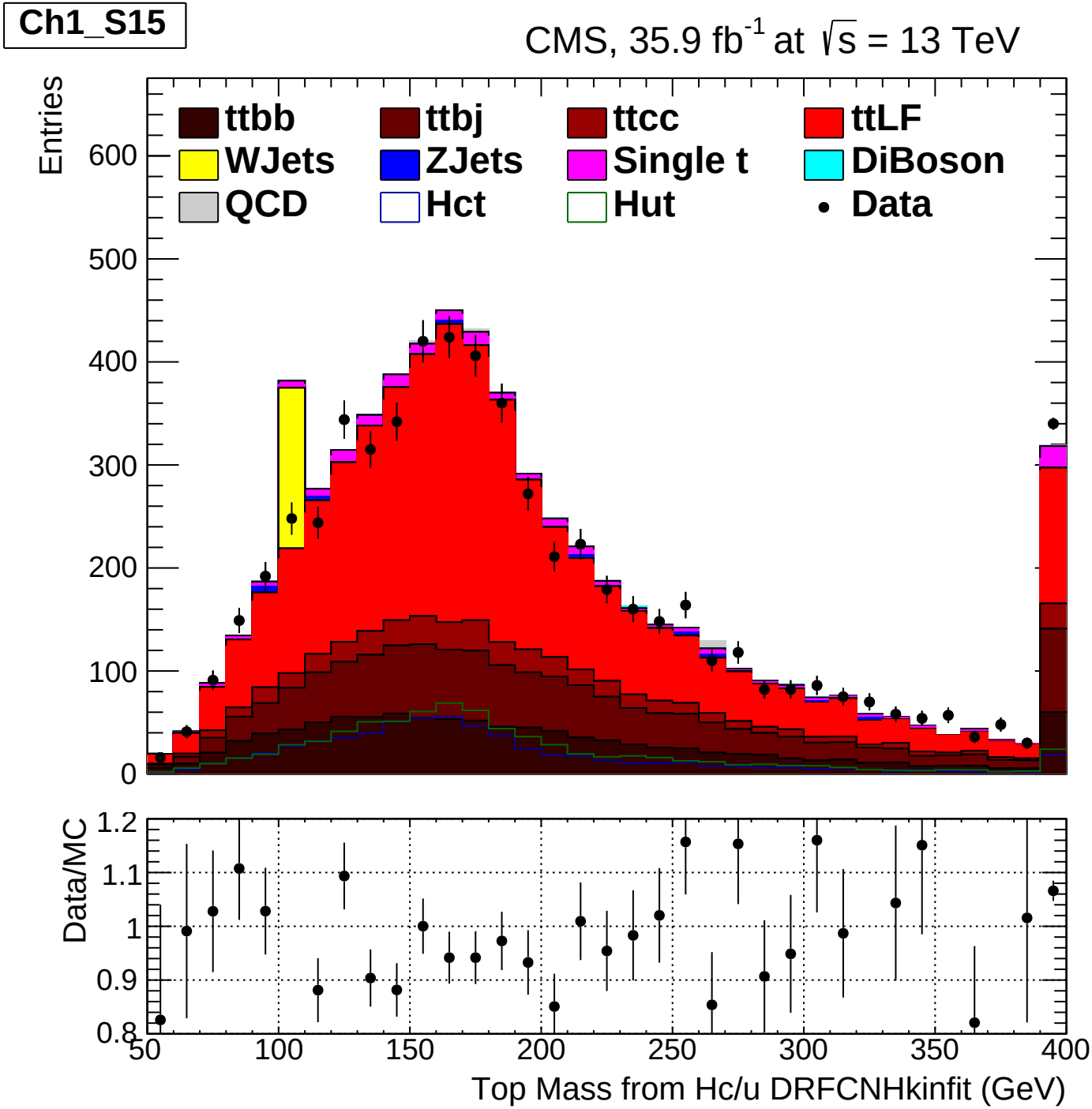

Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Lep) (GeV)


Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
W Mass from DRFCNHkinfit (Had) (GeV)


Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
H Mass from DRFCNHkinfit (bb)(GeV)


Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Delta R from DRFCNHkinfit Higgs


Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from DRFCNHkinfit (Lep) (GeV)


Ch1_S15
CMS, 35.9 fb^{-1} at $\sqrt{s}$ = 13 TeV
Entries
ttbb
ttbj
ttcc
ttLF
WJets
ZJets
Single t
DiBoson
QCD
Hct
Hut
Data
Data/MC
Top Mass from Hc/u DRFCNHkinfit (GeV)