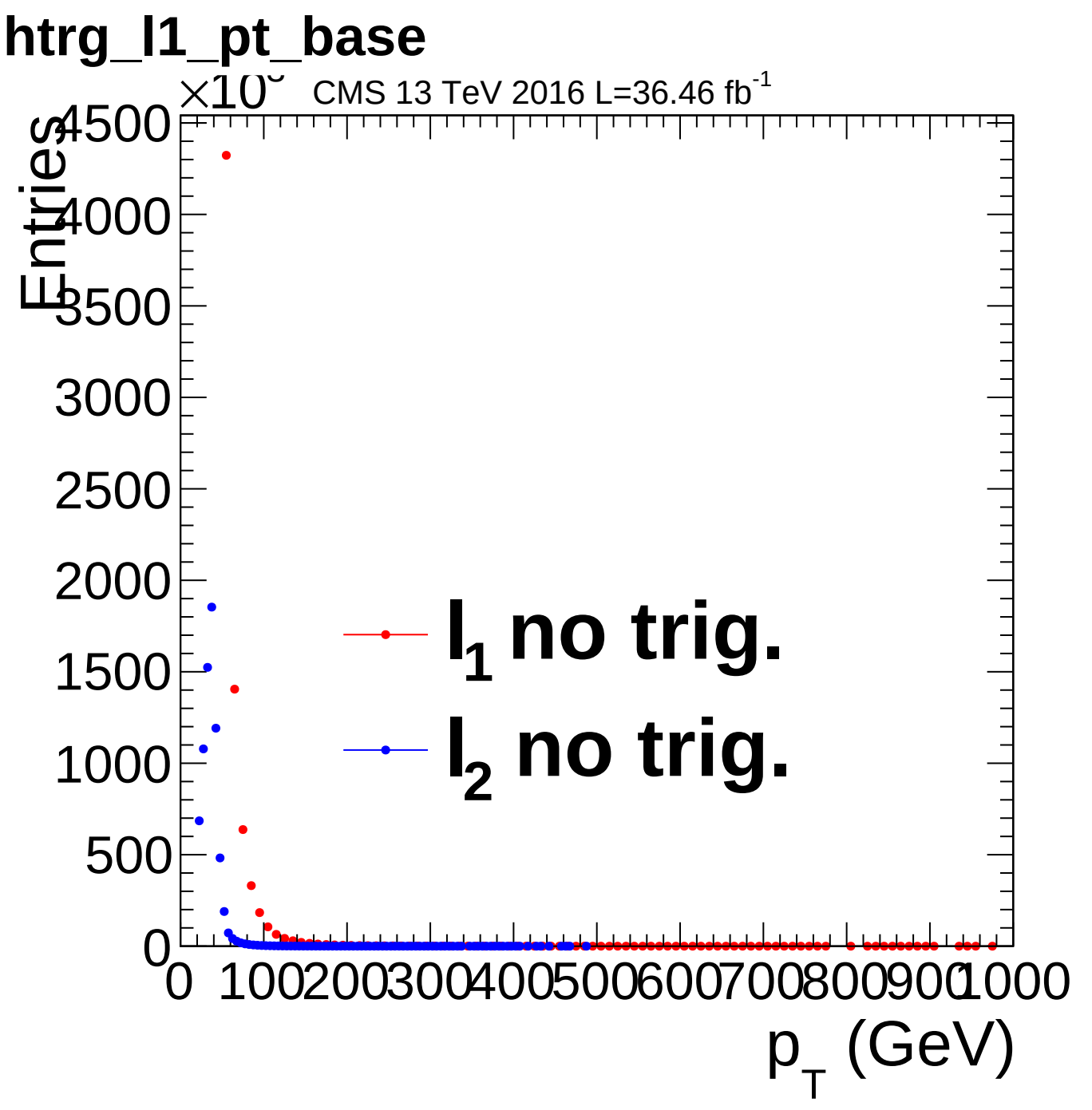
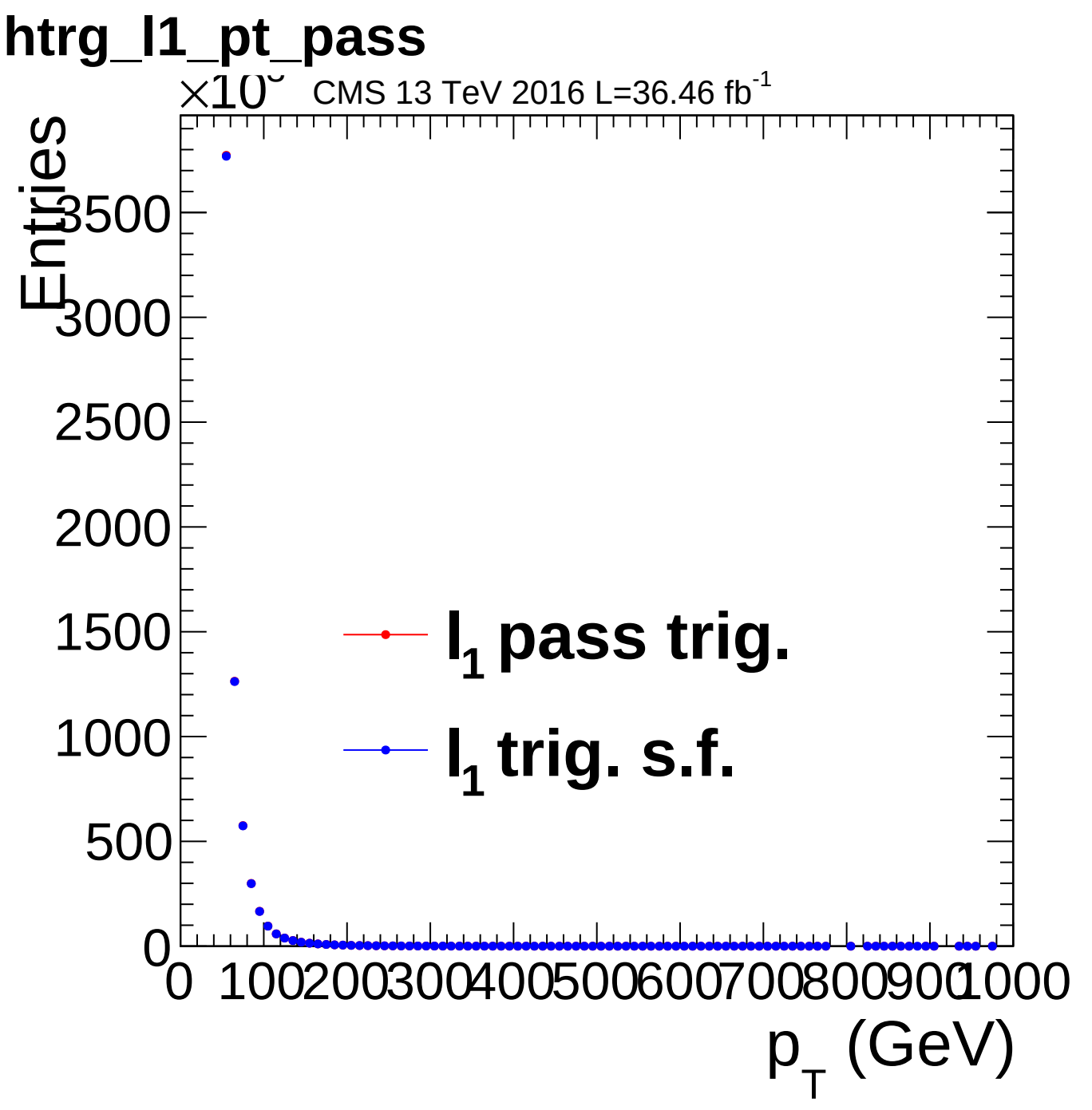
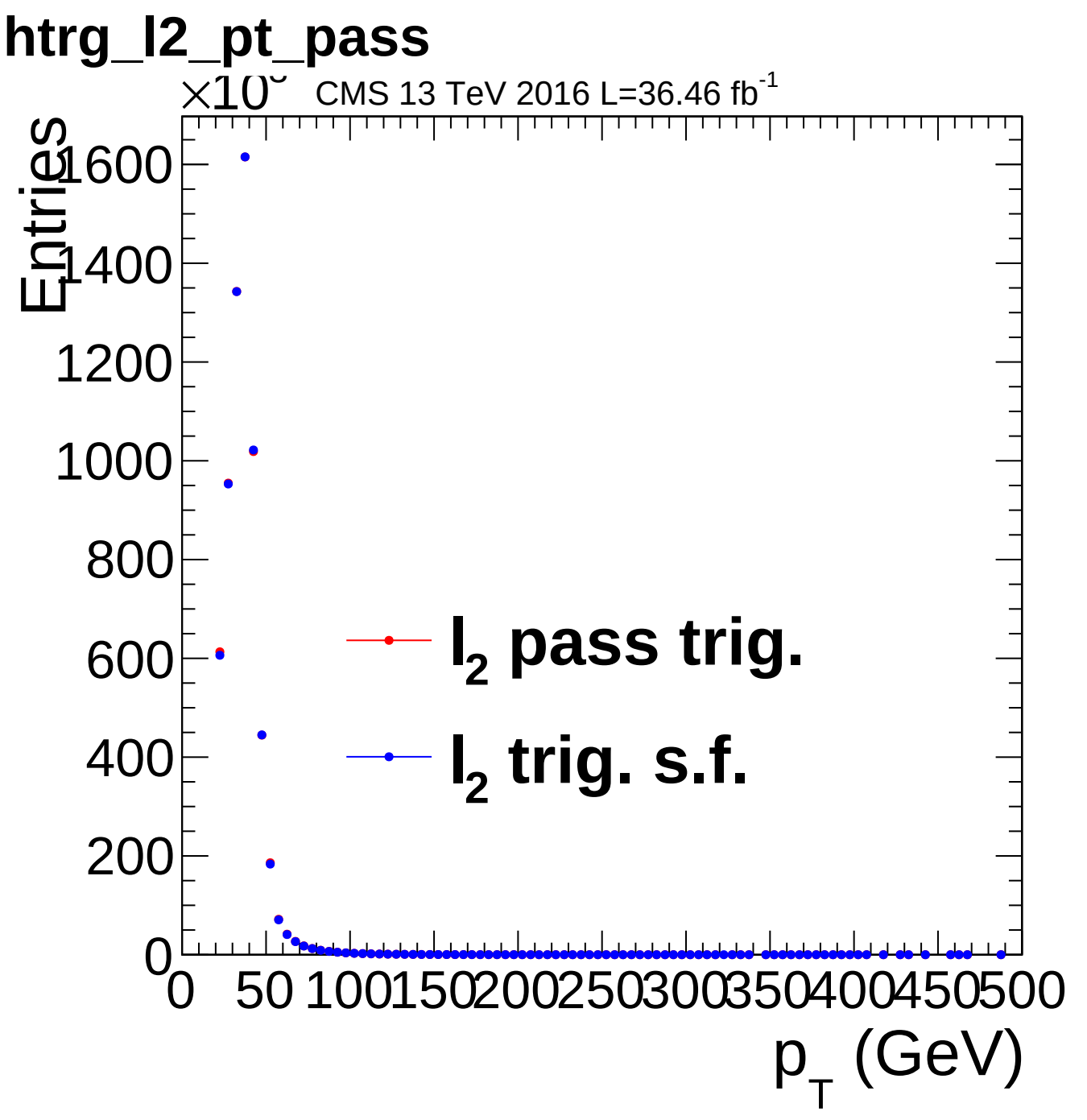
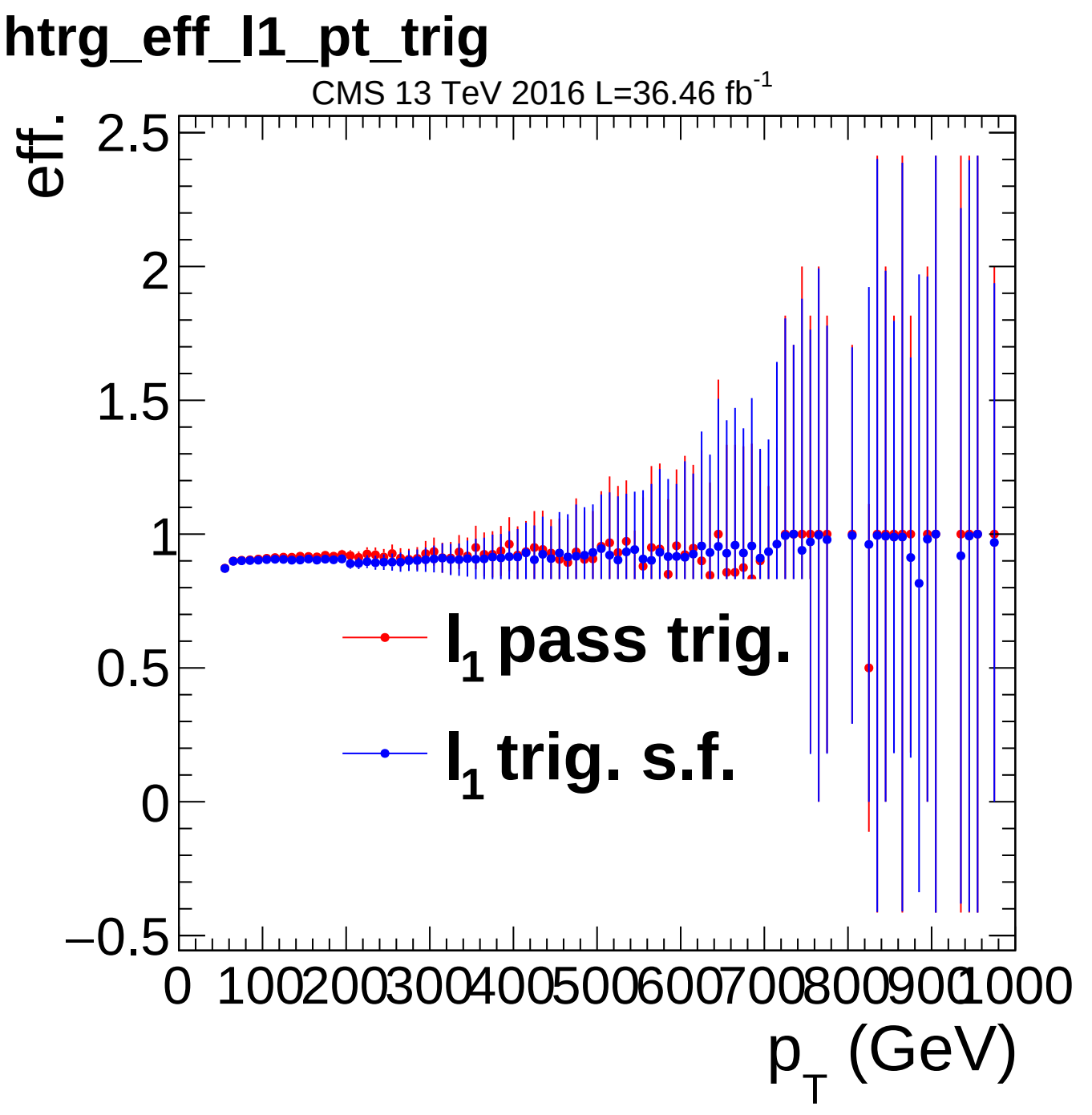
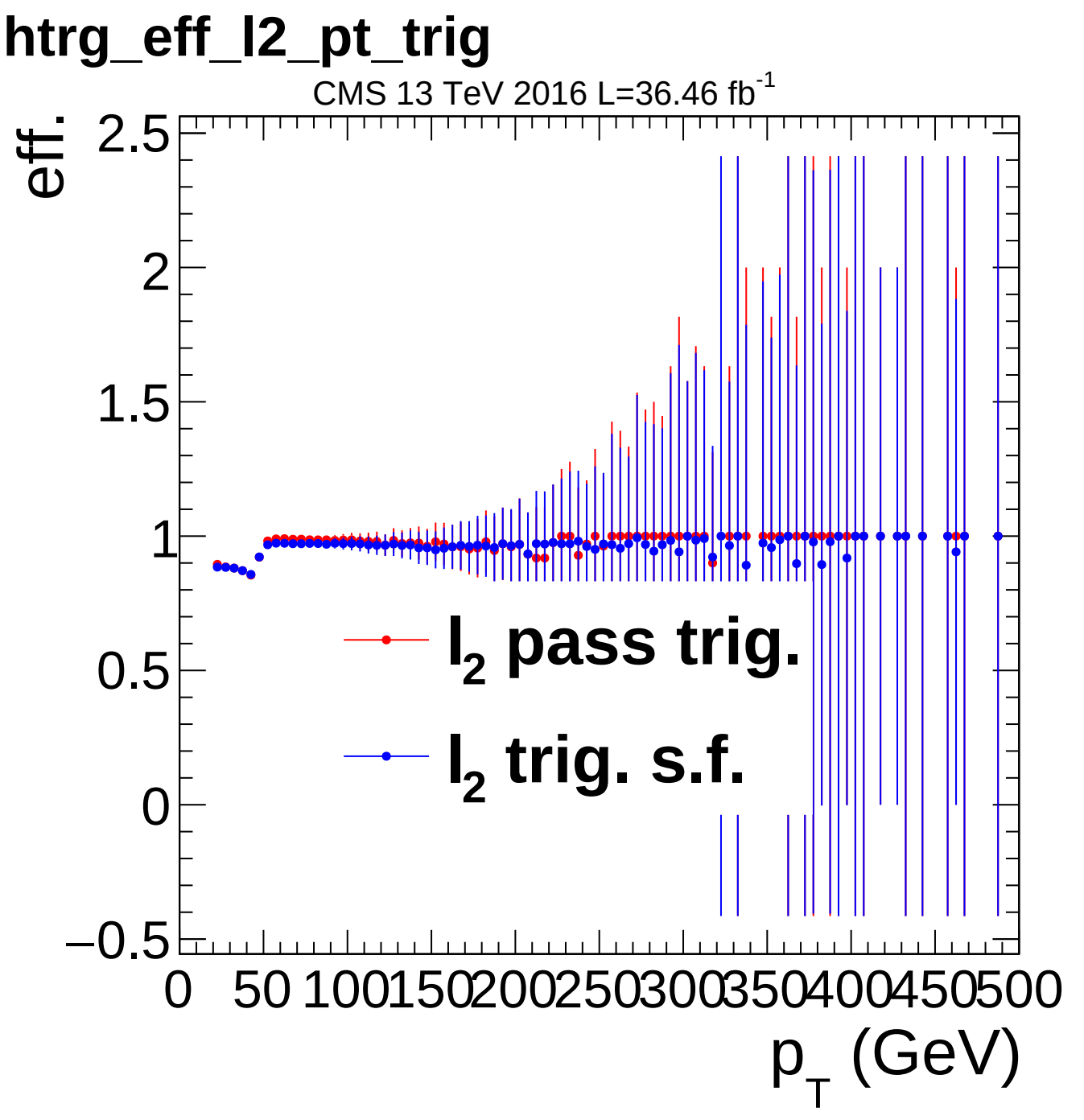
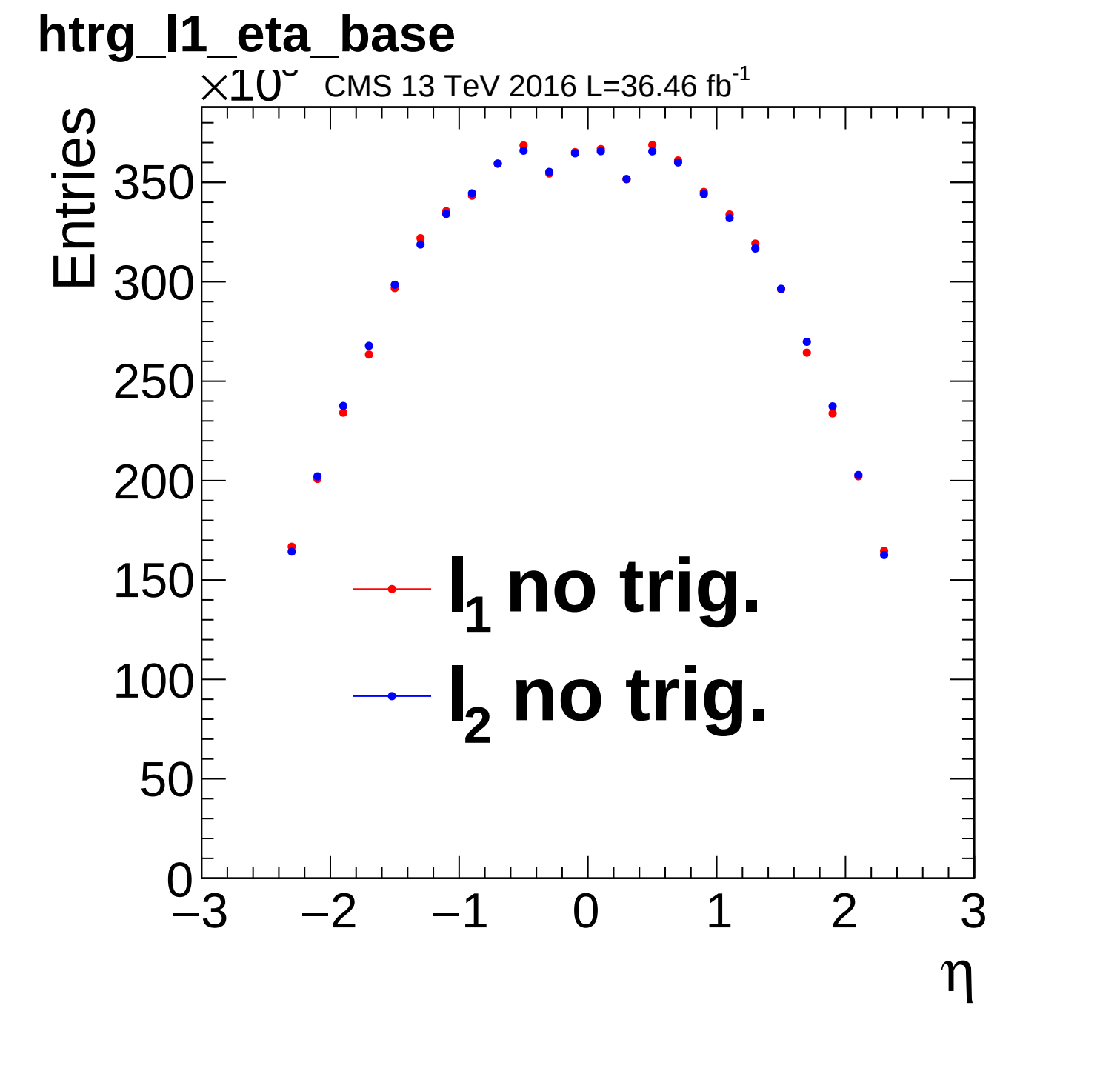

htrg_l1_pt_base
CMS 13 TeV 2016 L=36.46 fb-1
Entries
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
900
1000
pT (GeV)
l1 no trig.
l2 no trig.

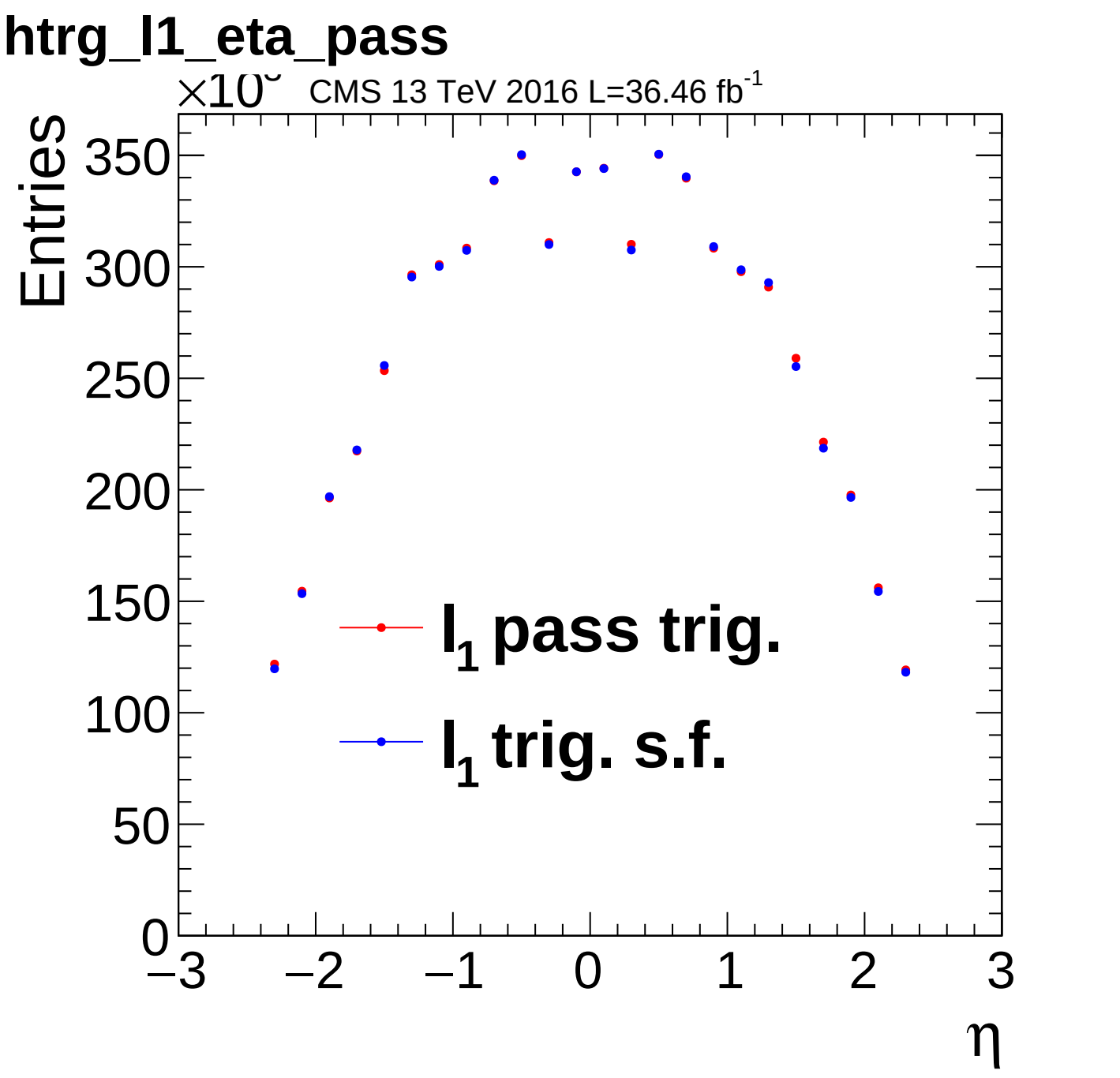

htrg_l1_pt_pass
CMS 13 TeV 2016 L=36.46 fb-1
Entries
3500
3000
2500
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
900
1000
pT (GeV)
l1 pass trig.
l1 trig. s.f.

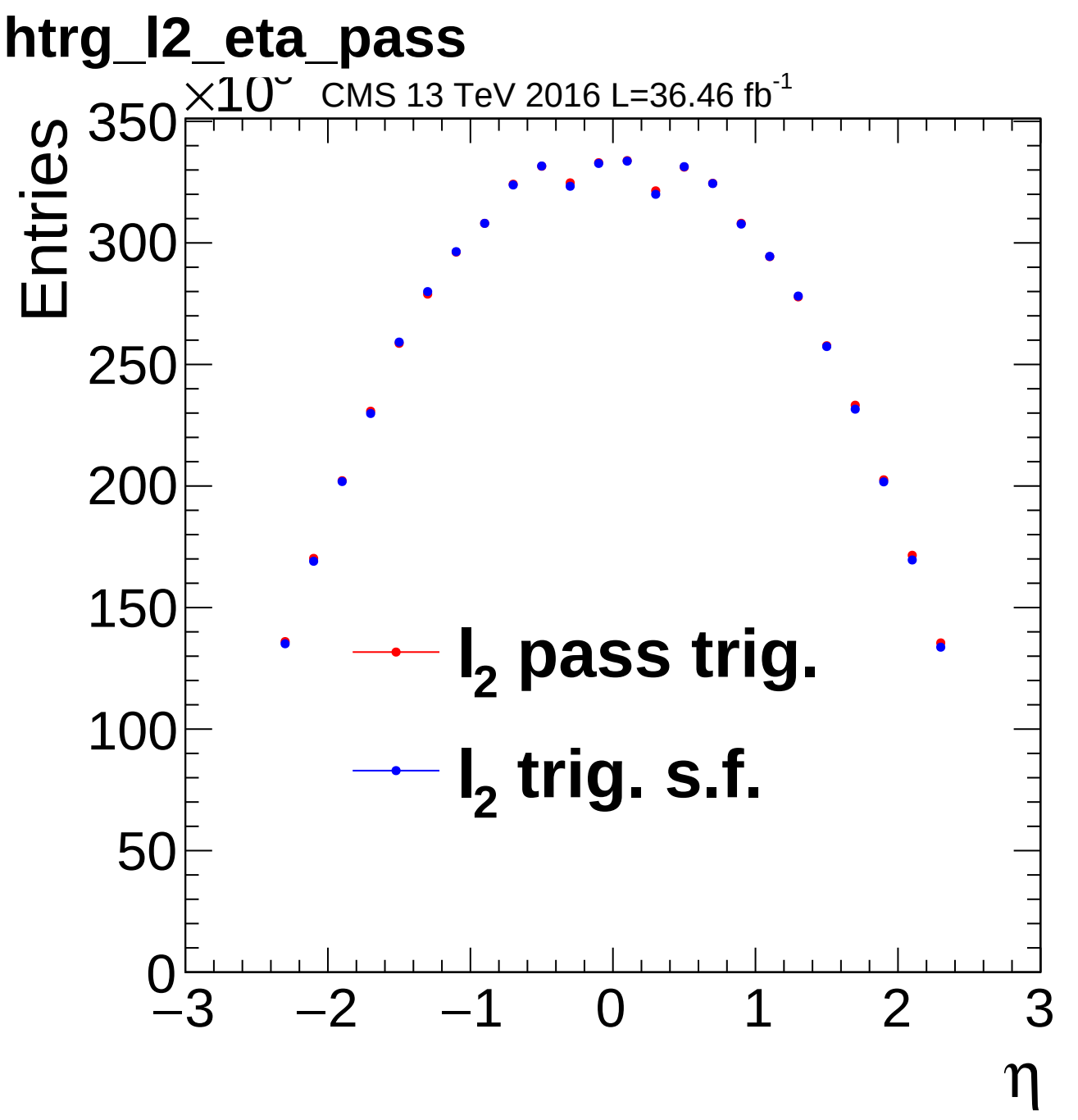

htrg_l2_pt_pass
CMS 13 TeV 2016 L=36.46 fb-1
Entries
1600
1400
1200
1000
800
600
400
200
0
0
50
100
150
200
250
300
350
400
450
500
pT (GeV)
l2 pass trig.
l2 trig. s.f.

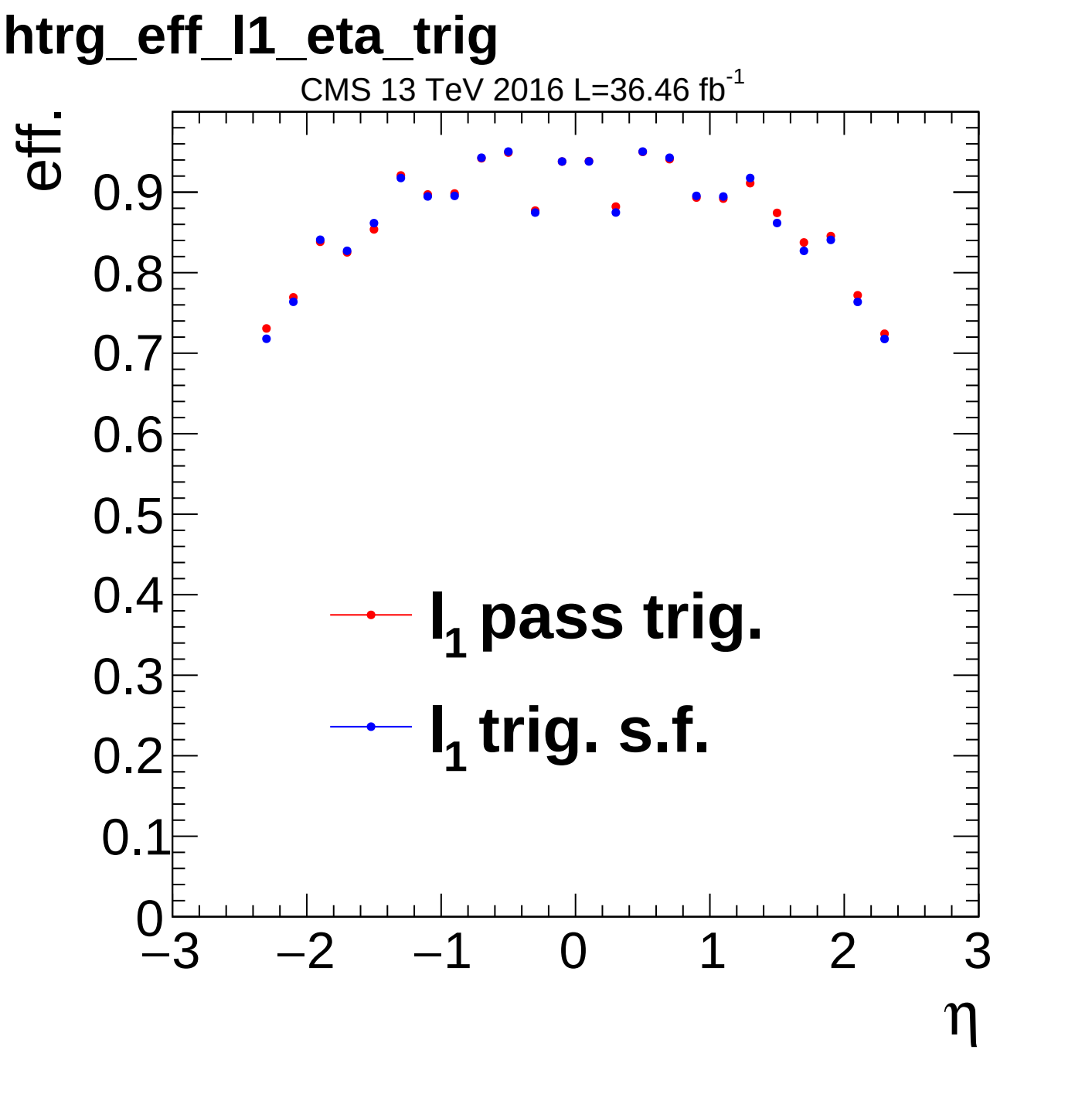

htrg_eff_l1_pt_trig
CMS 13 TeV 2016 L=36.46 fb-1
eff.
2.5
2
1.5
1
0.5
0
−0.5
0
100
200
300
400
500
600
700
800
900
1000
pT (GeV)
l1 pass trig.
l1 trig. s.f.

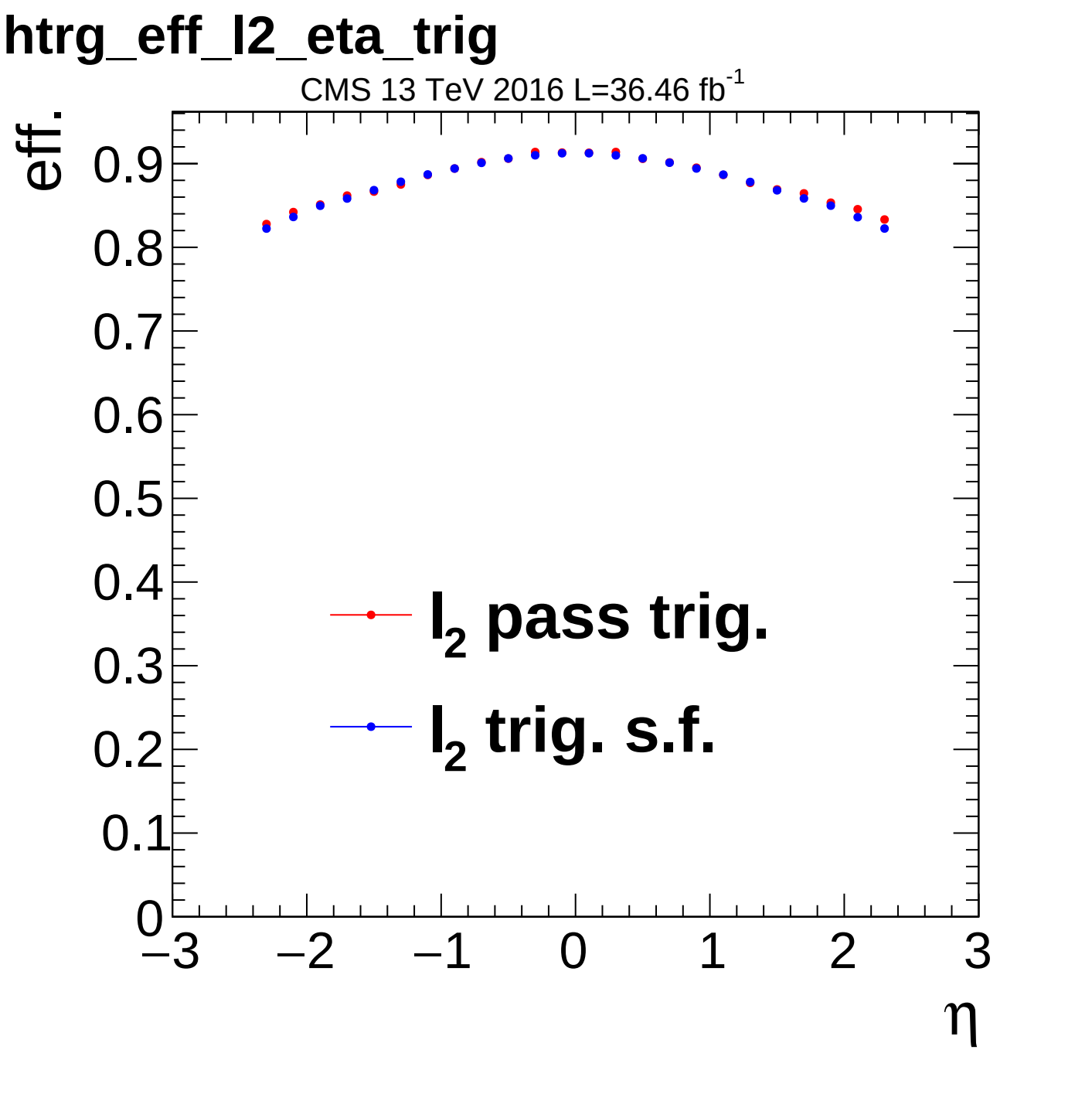

htrg_eff_l2_pt_trig
CMS 13 TeV 2016 L=36.46 fb-1
eff.
2.5
2
1.5
1
0.5
0
−0.5
0
50
100
150
200
250
300
350
400
450
500
pT (GeV)
l2 pass trig.
l2 trig. s.f.


htrg_l1_eta_base
×10³
CMS 13 TeV 2016 L=36.46 fb-1
Entries
350
300
250
200
150
100
50
0
−3
−2
−1
0
1
2
3
η
l1 no trig.
l2 no trig.

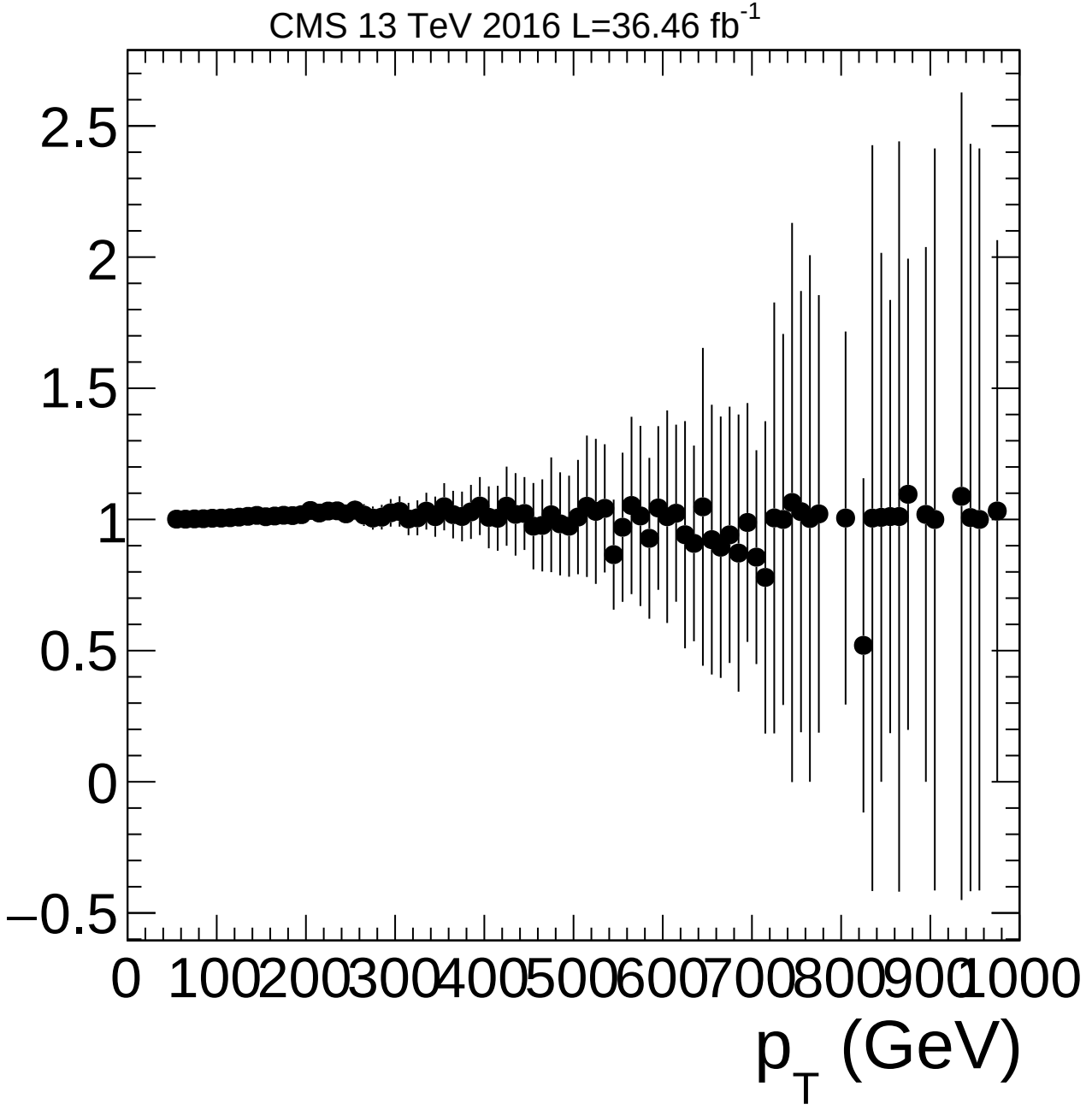

htrg_l1_eta_pass
×10
CMS 13 TeV 2016 L=36.46 fb-1
Entries
350
300
250
200
150
100
50
0
−3
−2
−1
0
1
2
3
η
l1 pass trig.
l1 trig. s.f.


htrg_l2_eta_pass
CMS 13 TeV 2016 L=36.46 fb-1
Entries
350
300
250
200
150
100
50
0
−3
−2
−1
0
1
2
3
η
l2 pass trig.
l2 trig. s.f.

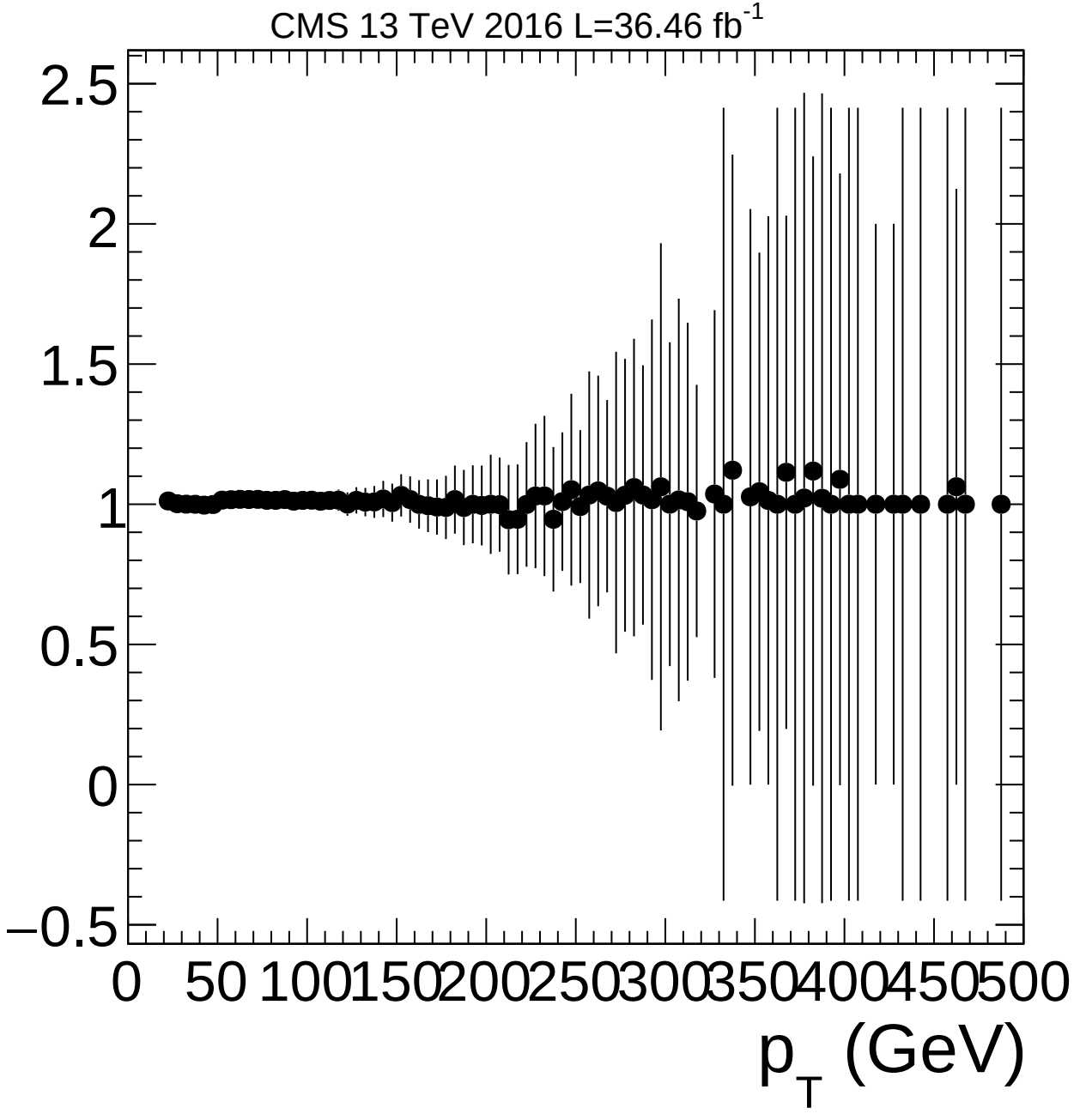

htrg_eff_l1_eta_trig
CMS 13 TeV 2016 L=36.46 fb-1
eff.
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−3
−2
−1
0
1
2
3
η
l1 pass trig.
l1 trig. s.f.


htrg_eff_l2_eta_trig
CMS 13 TeV 2016 L=36.46 fb-1
eff.
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−3
−2
−1
0
1
2
3
η
l2 pass trig.
l2 trig. s.f.

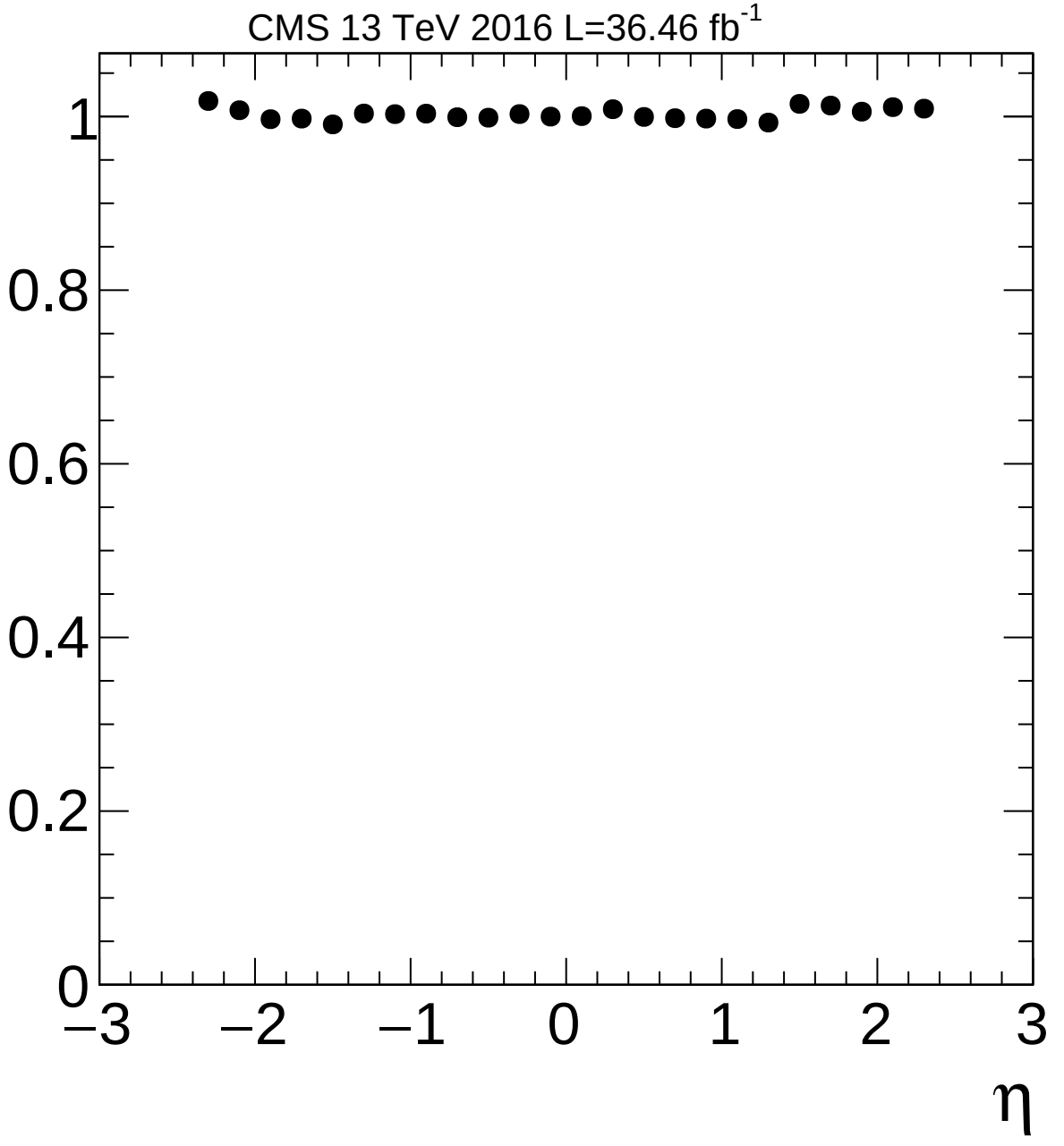
htrg_l1_pt_pass_vs_tgsf



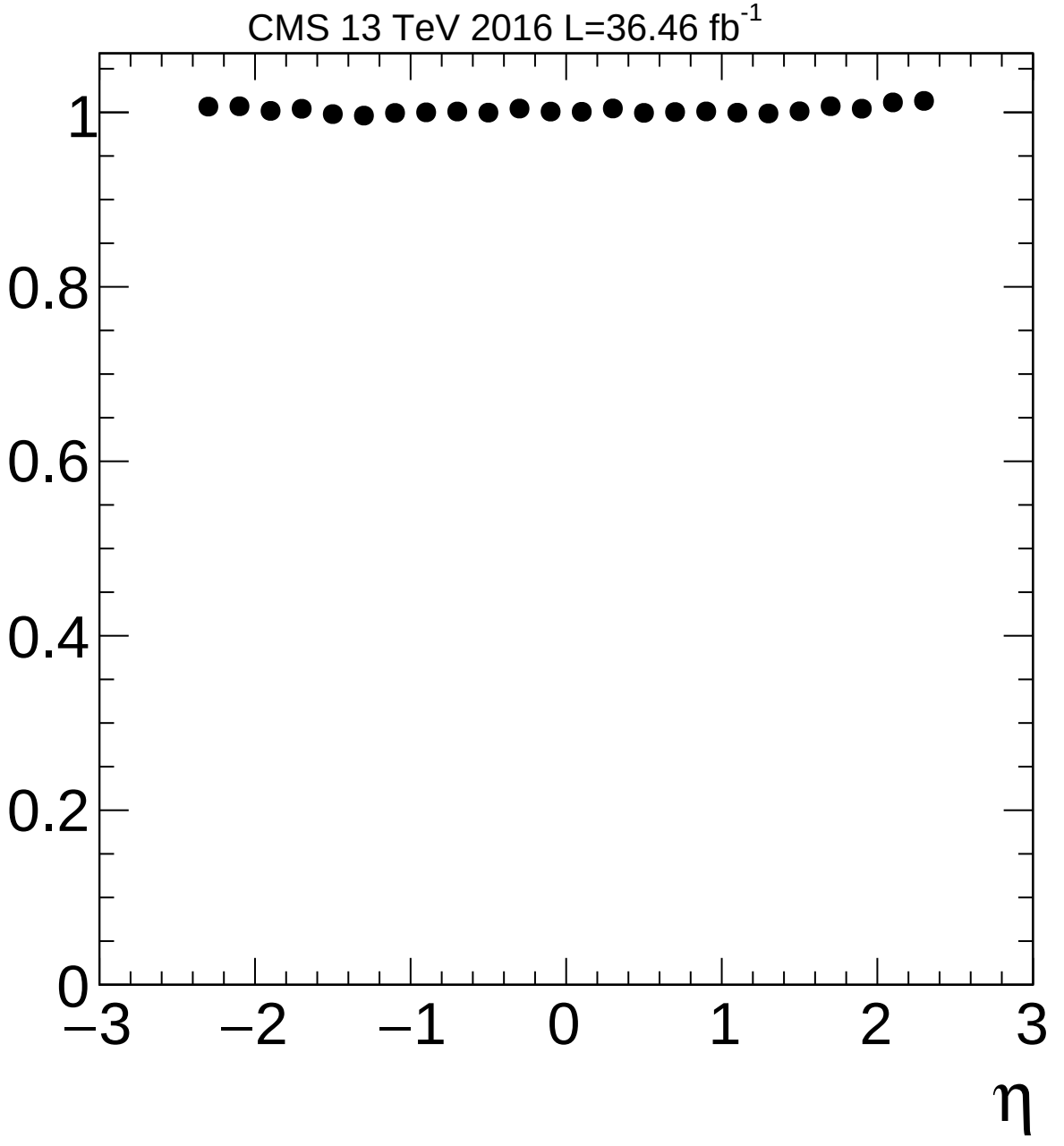
htrg_l2_pt_pass_vs_tgsf



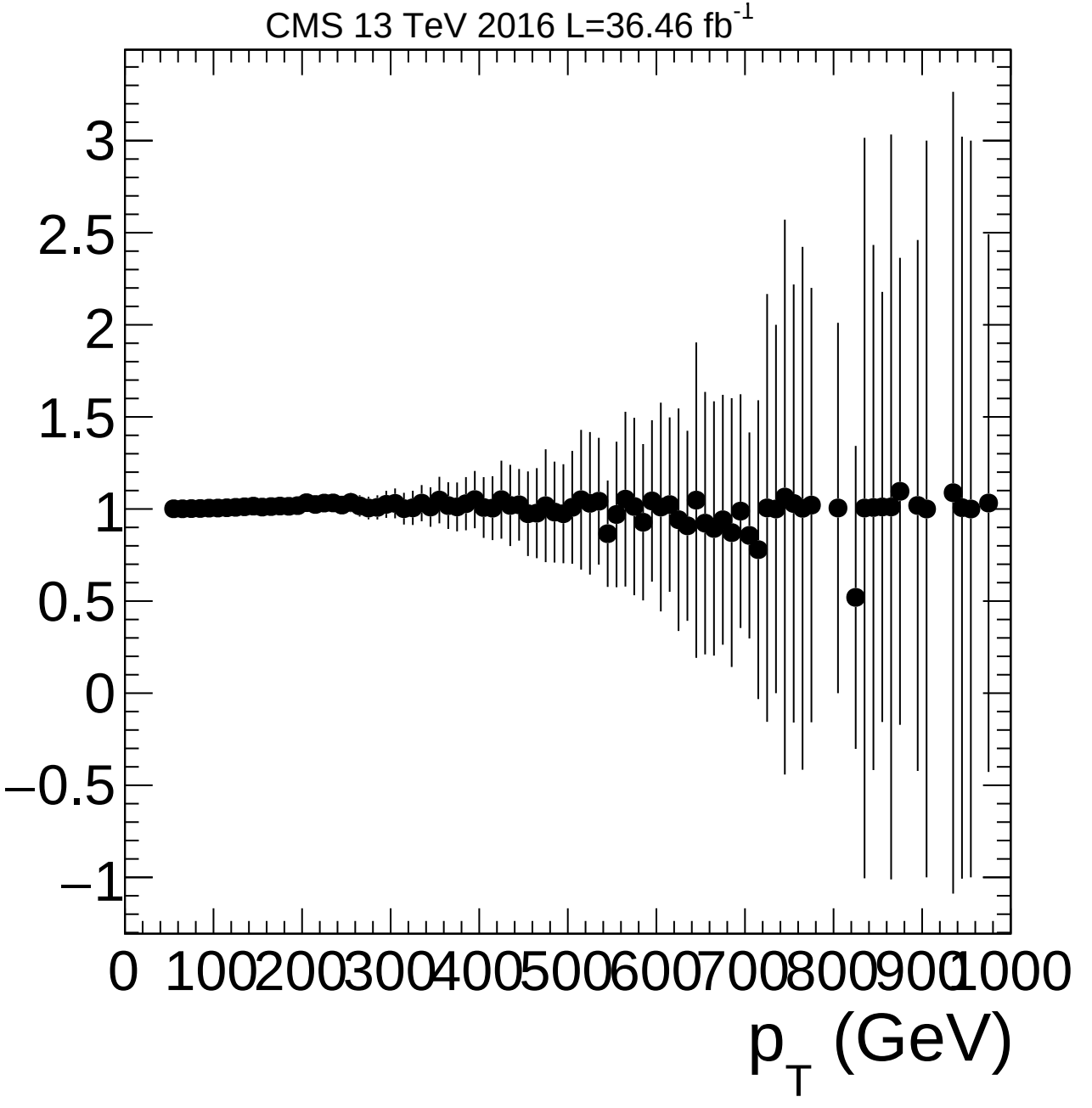
htrg_l1_eta_pass_vs_tgsf



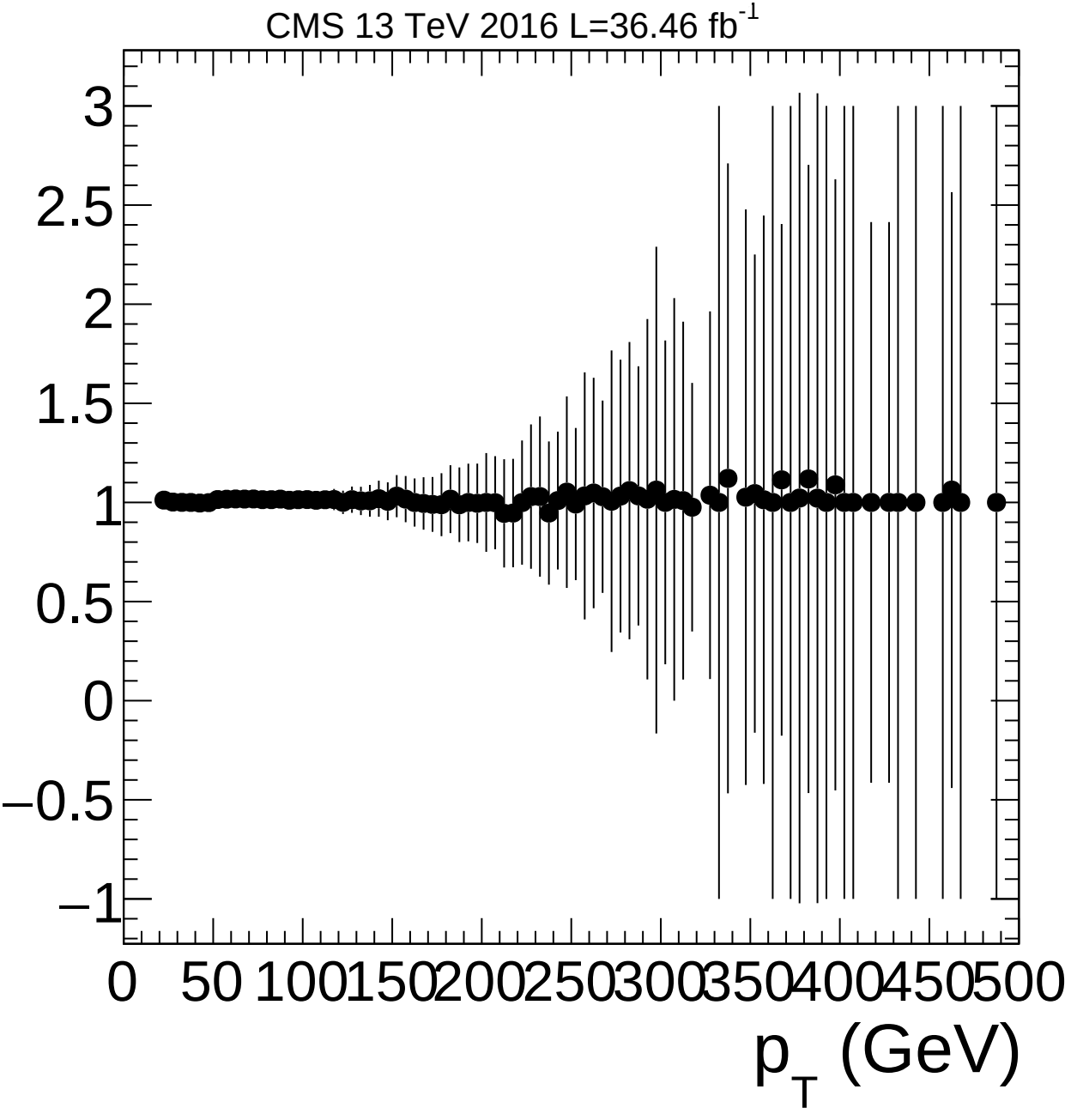
htrg_l2_eta_pass_vs_tgsf



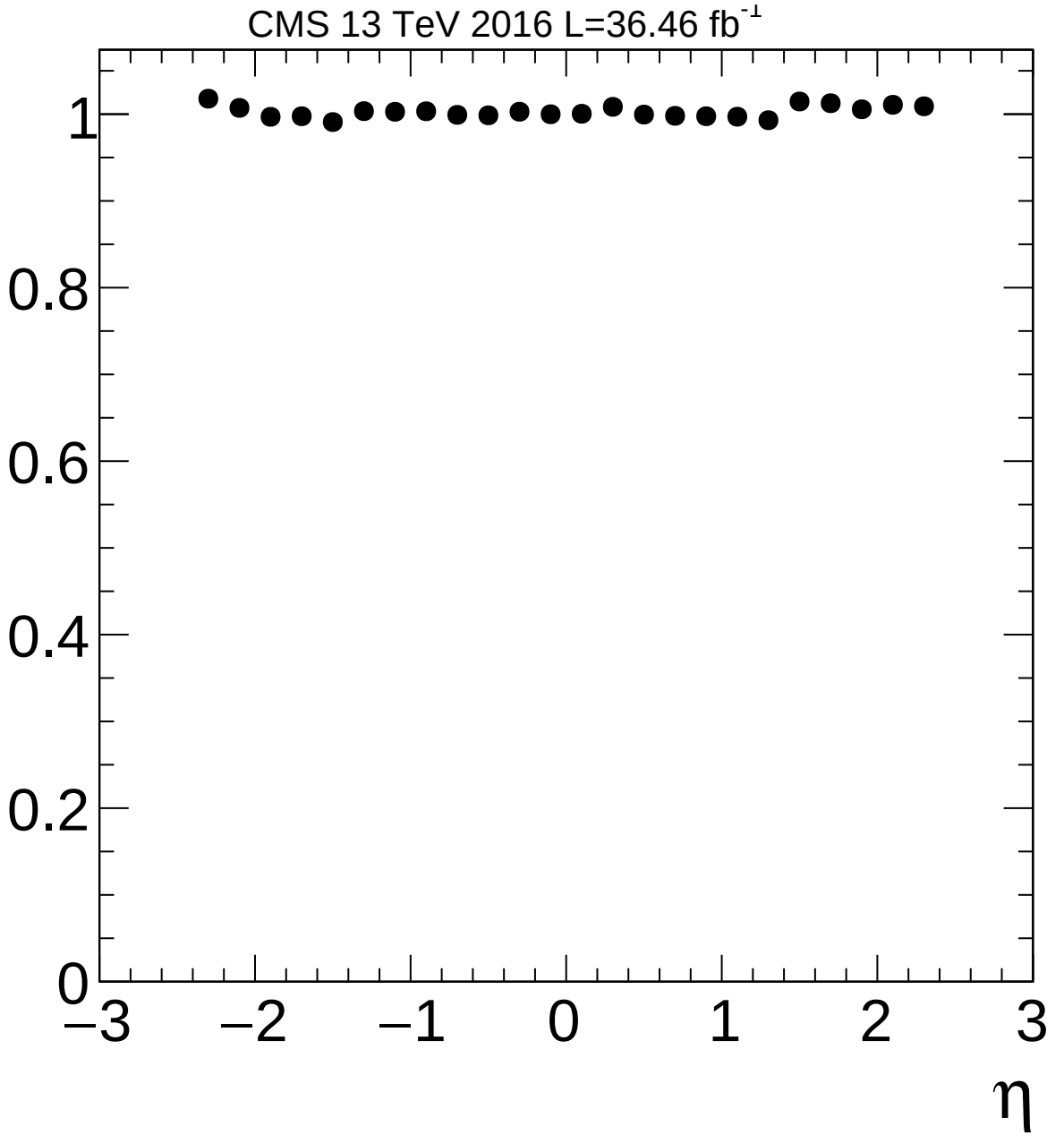
htrg_eff_l1_pt_trig_vs_tgsf



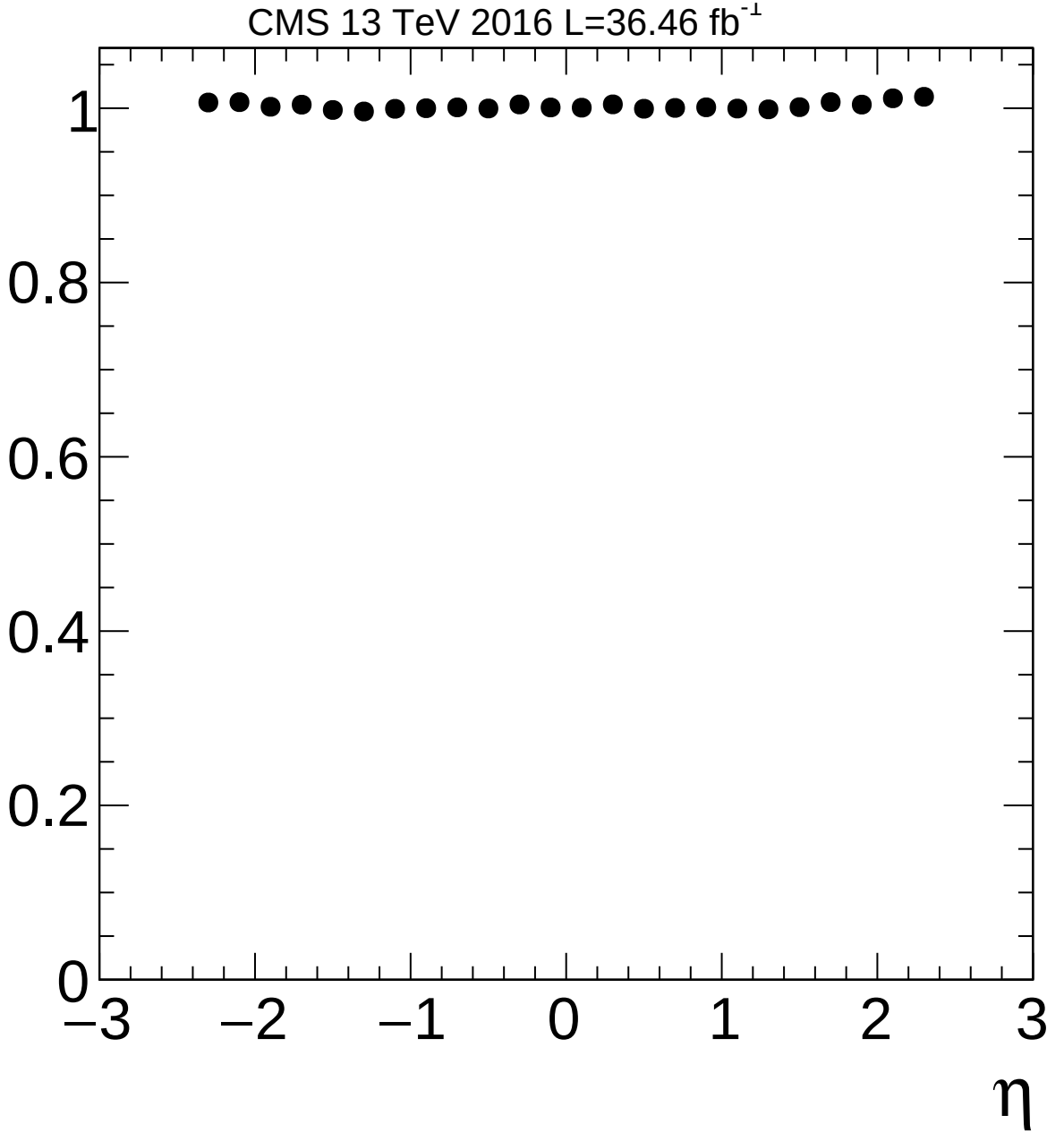
htrg_eff_l2_pt_trig_vs_tgsf

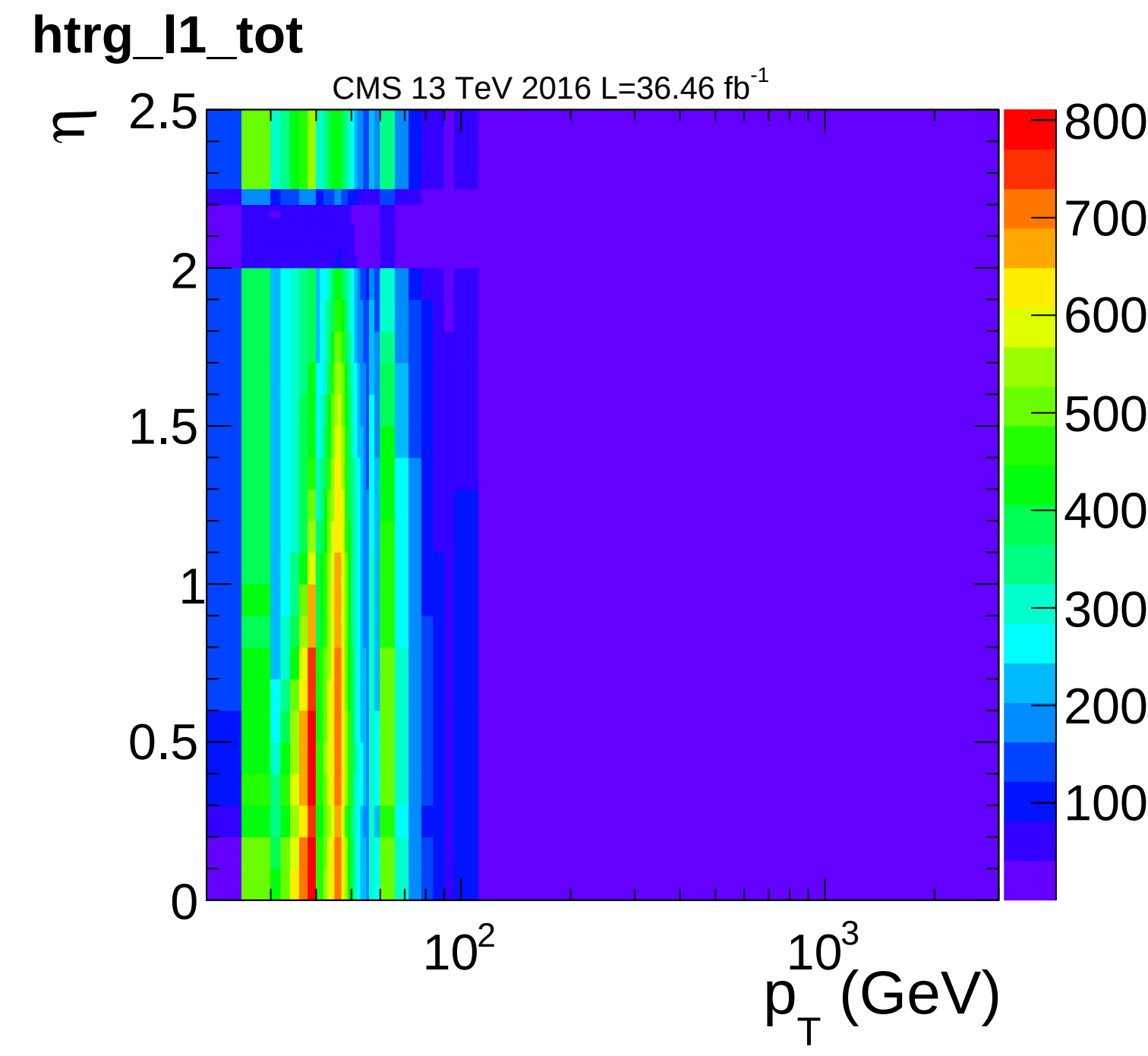


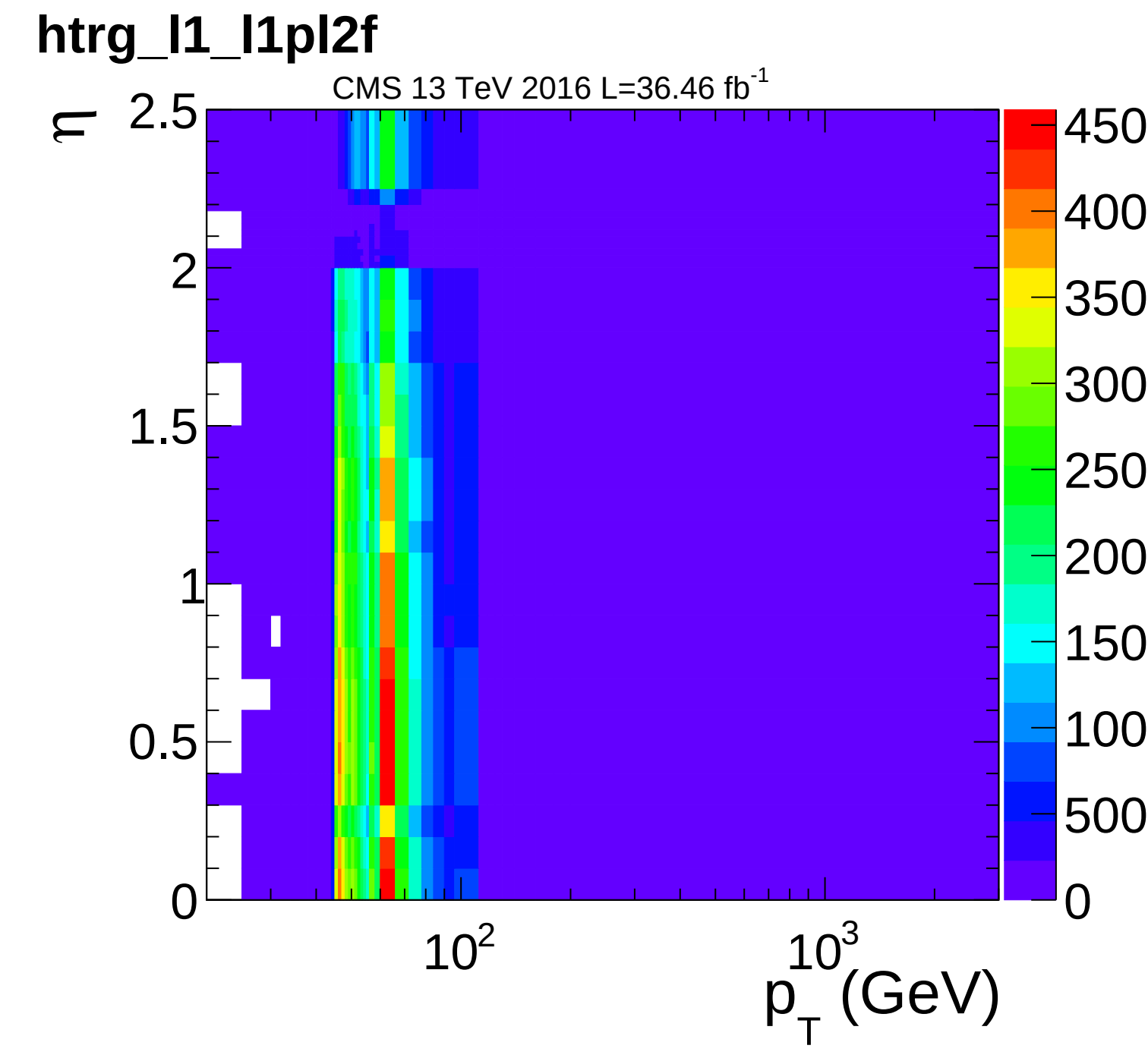
htrg_eff_l1_eta_trig_vs_tgsf

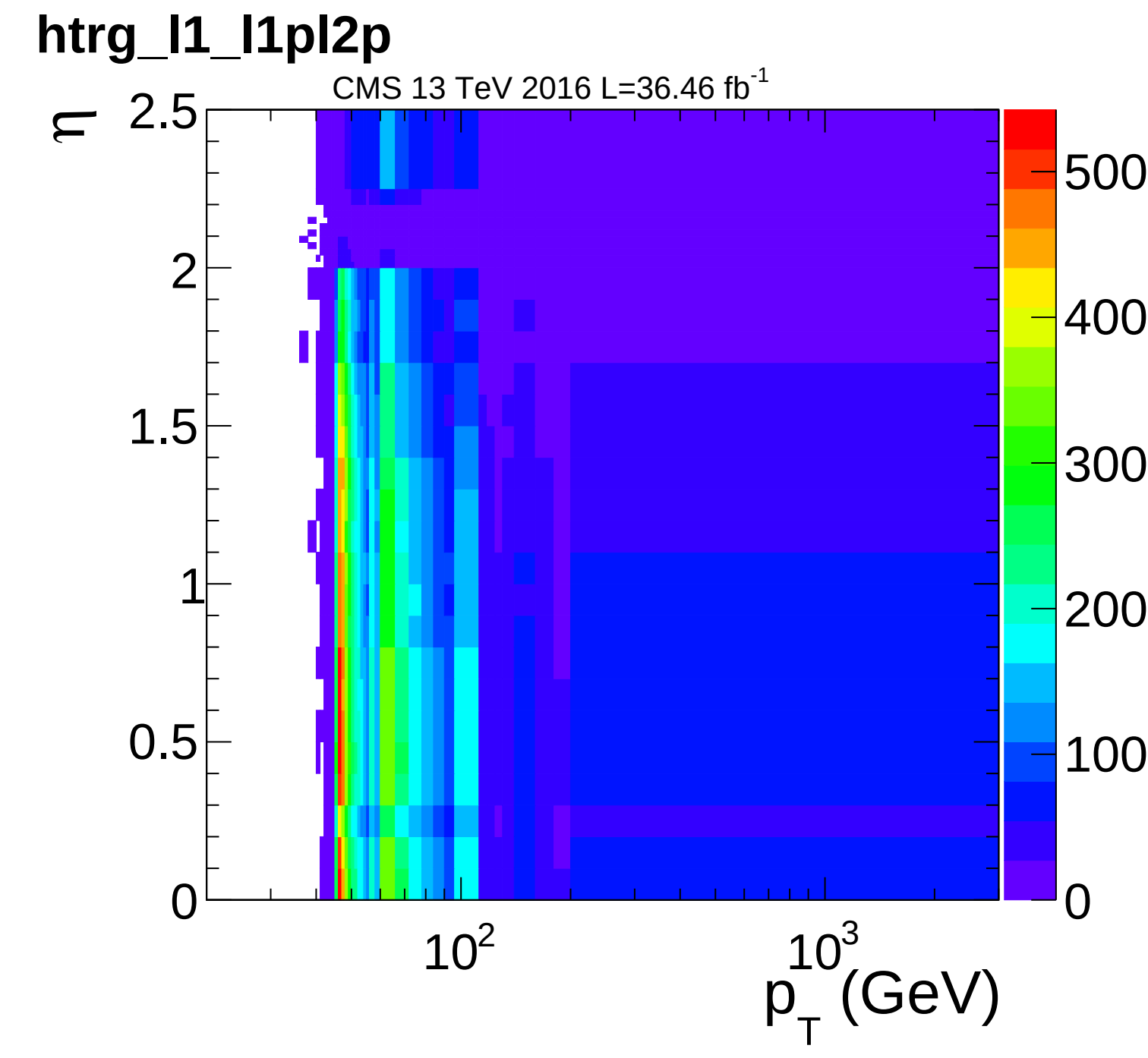


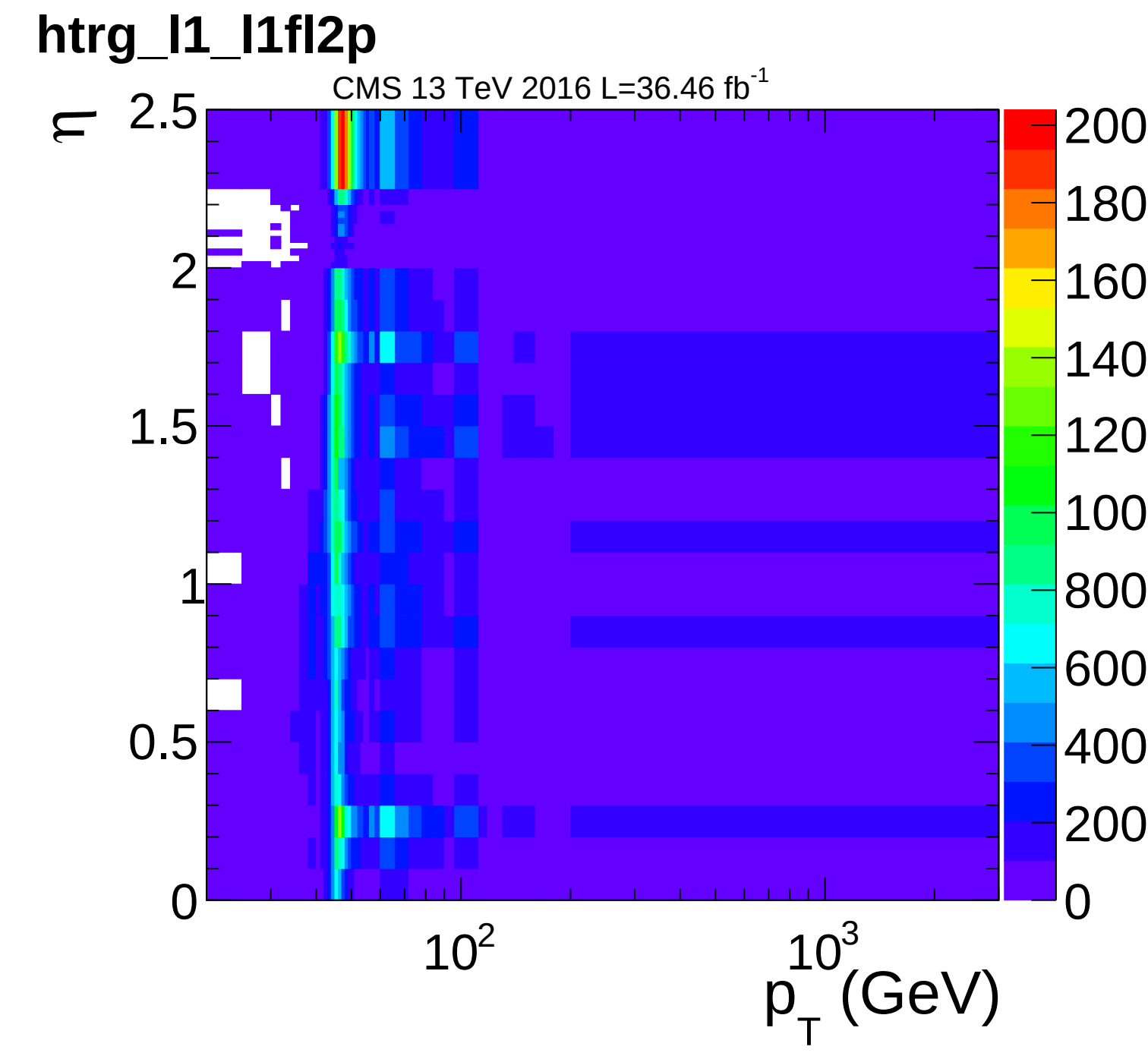
htrg_eff_l2_eta_trig_vs_tgsf

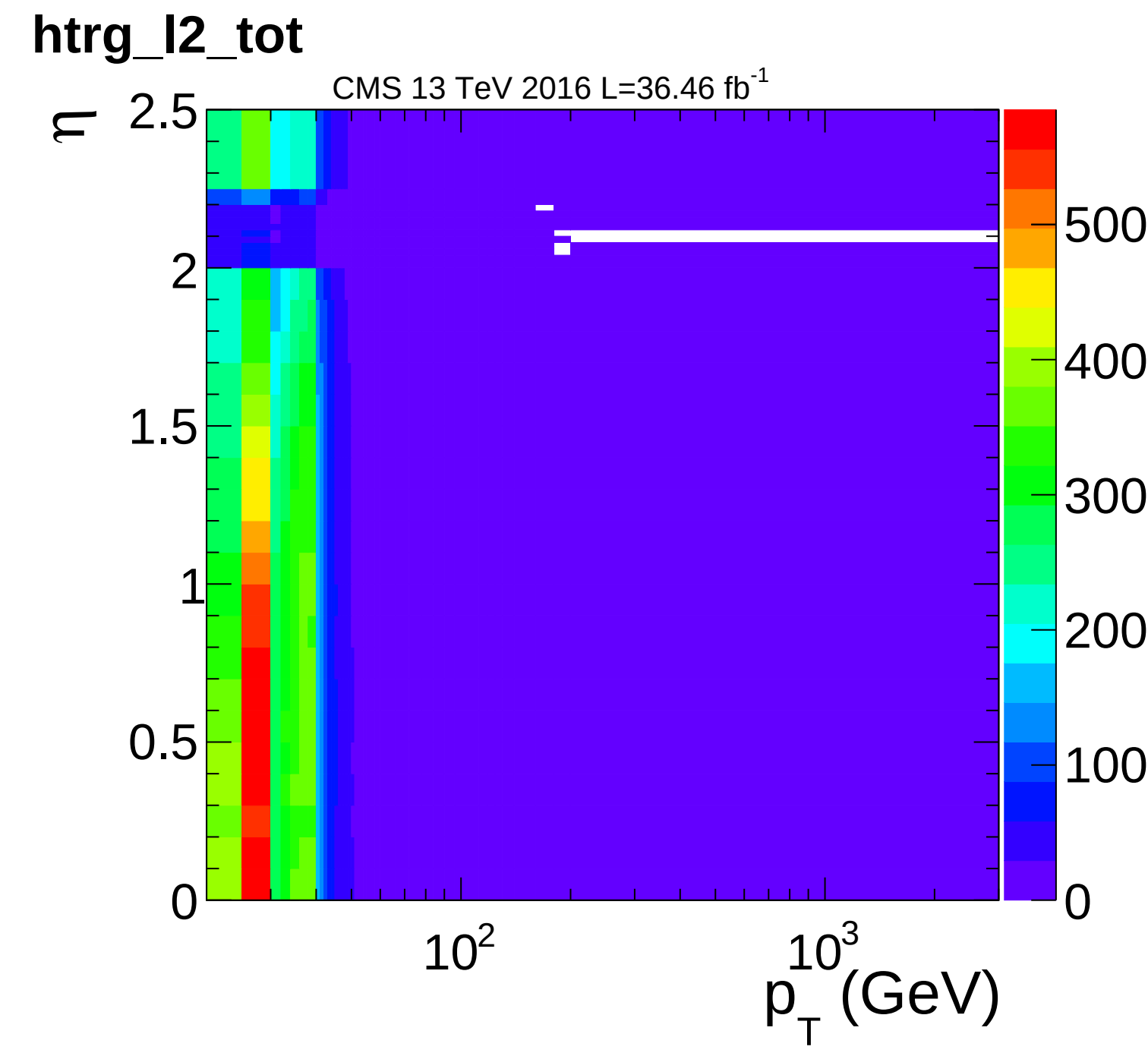


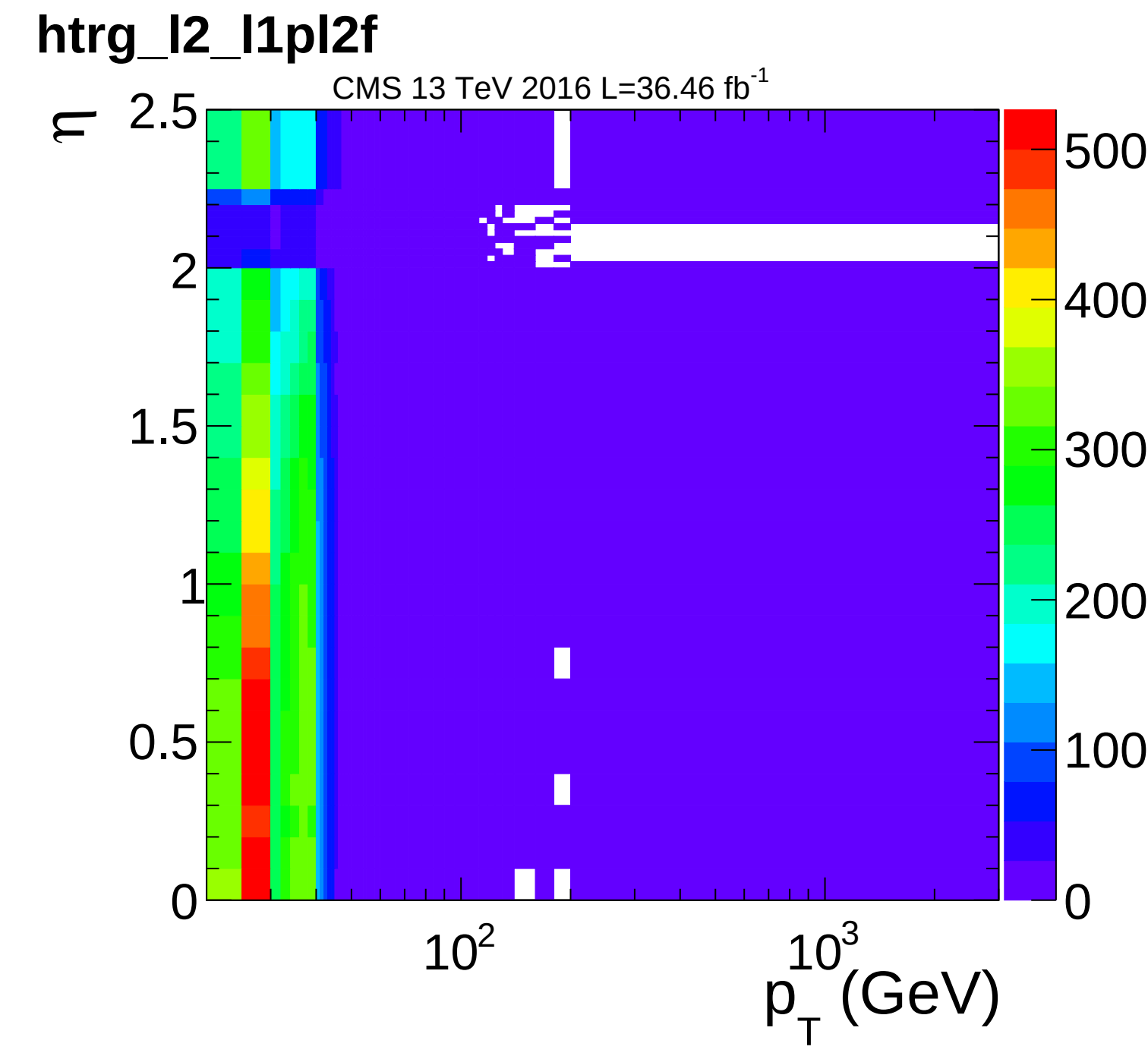

htrg_l1_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
800
700
600
500
400
300
200
100
10^2
10^3
p_T (GeV)

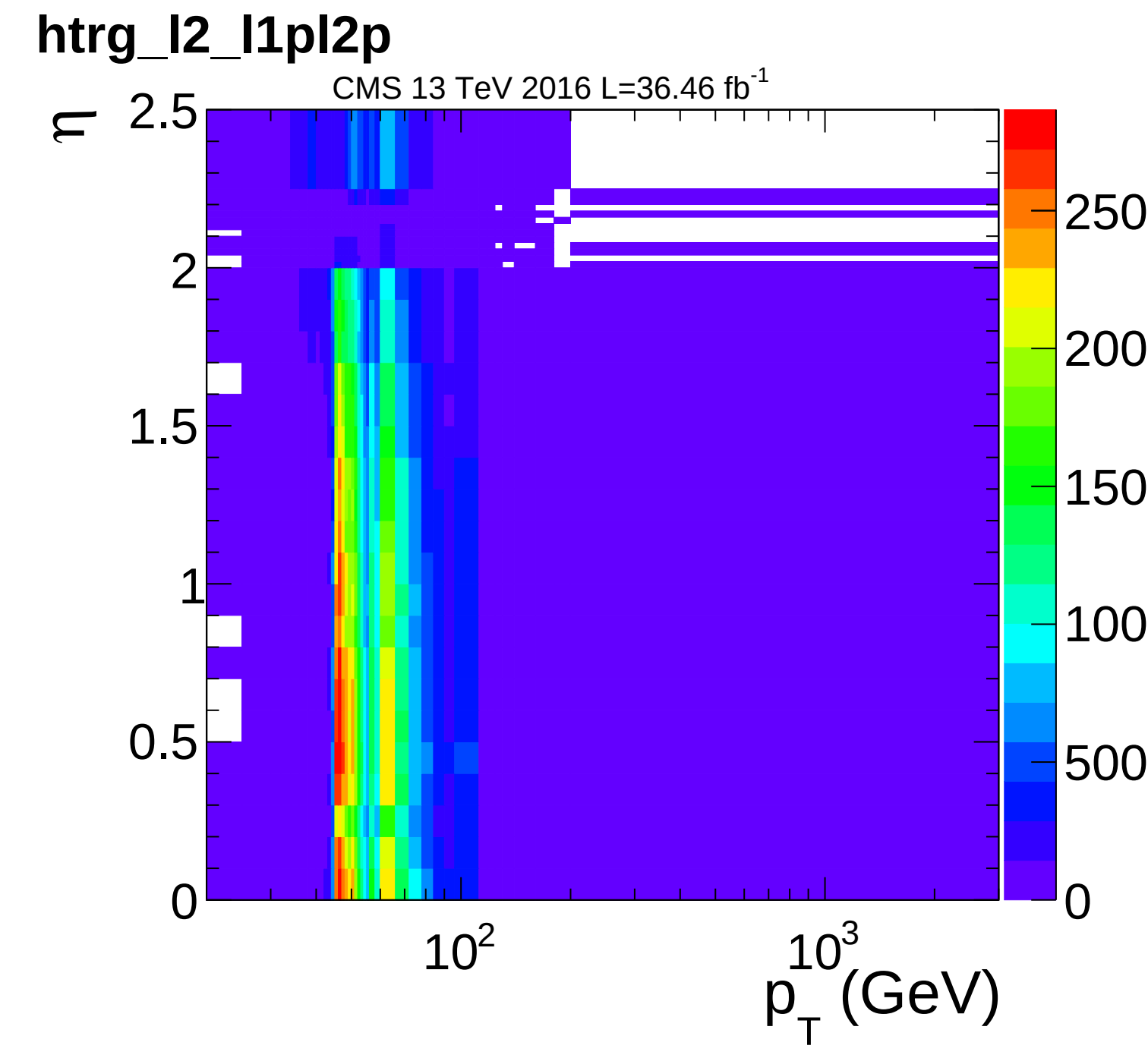

htrg_l1_l1pl2f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
450
400
350
300
250
200
150
100
500
0

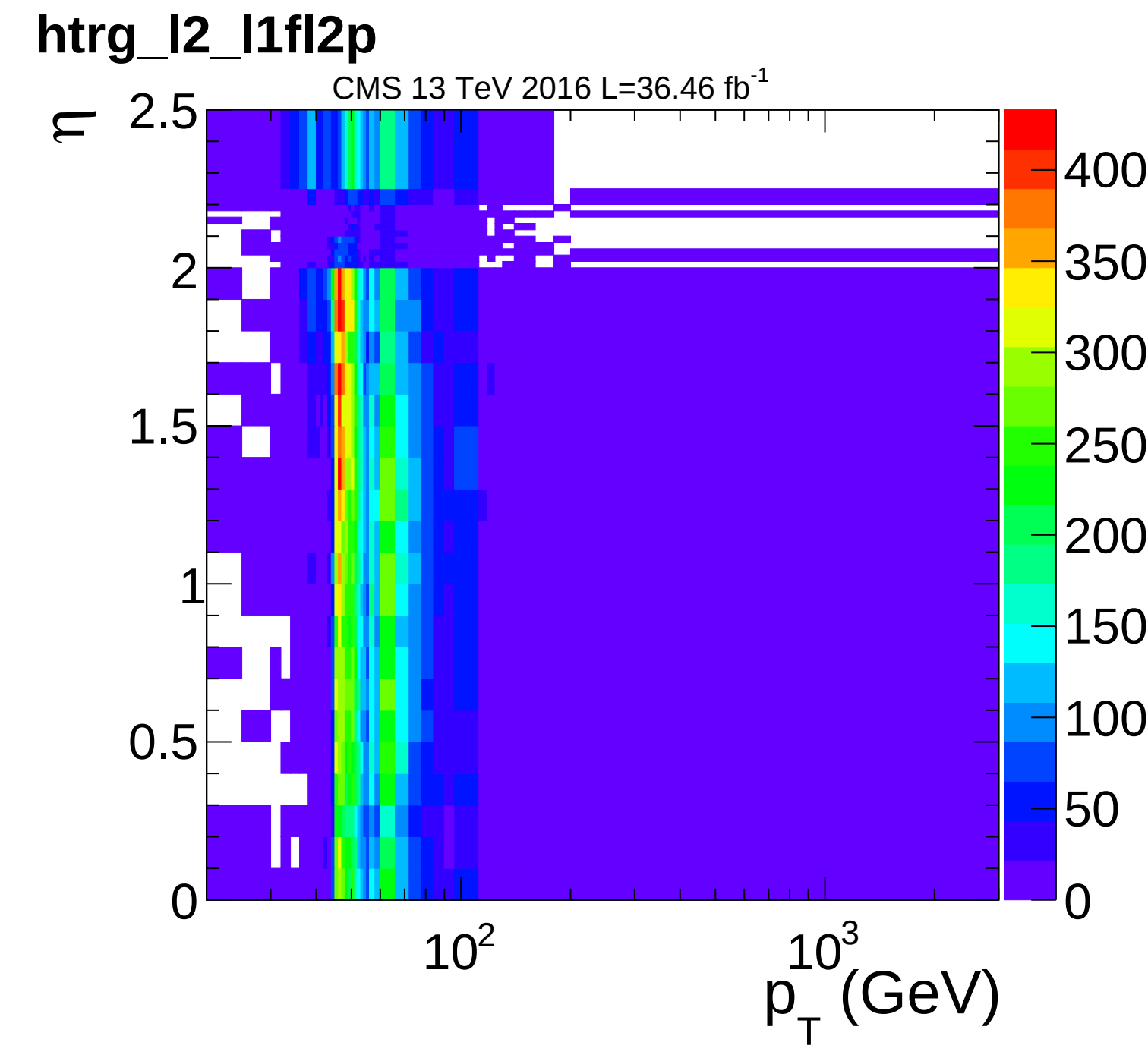

htrg_l1_l1pl2p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

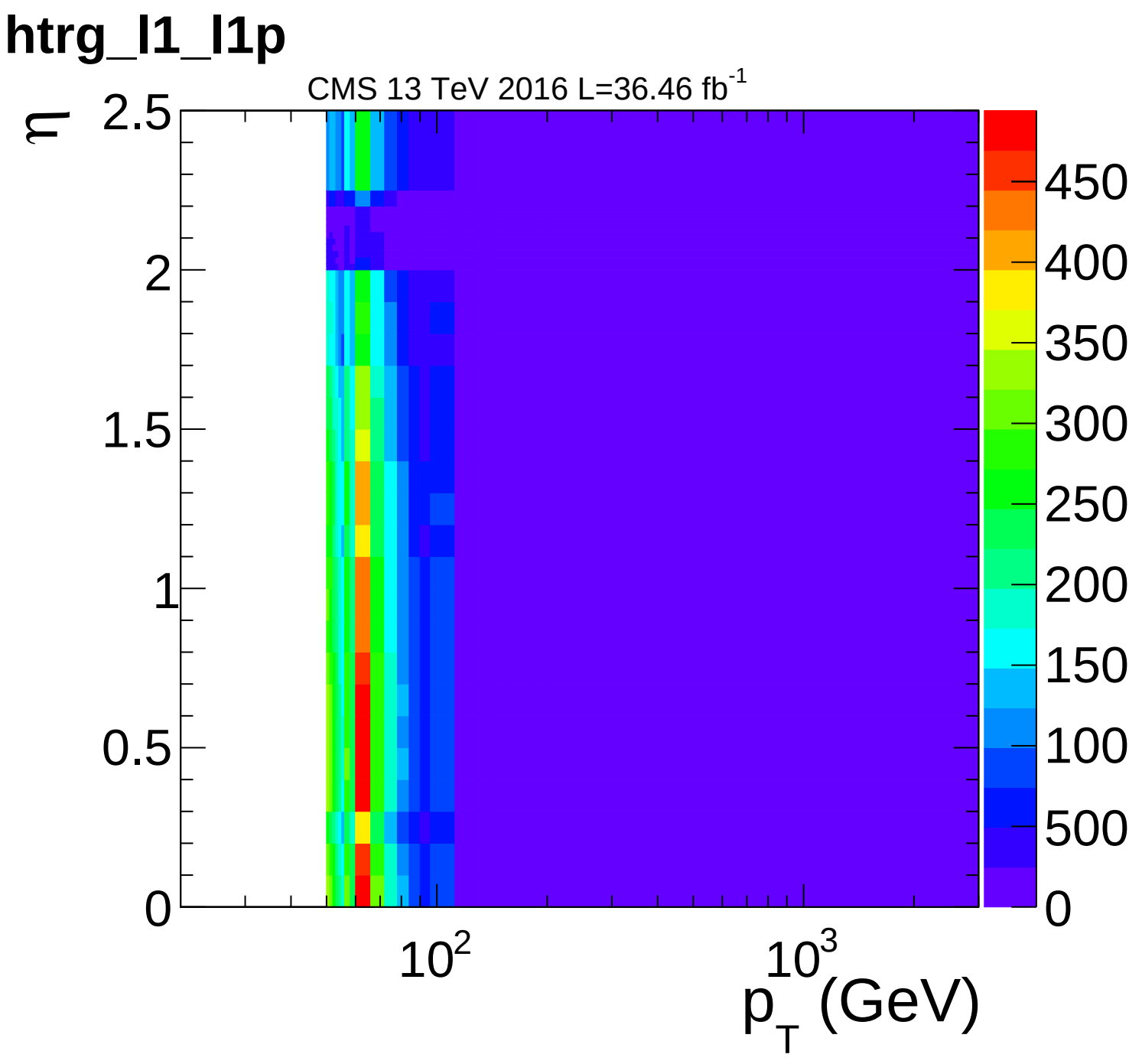

htrg_l1_l1fl2p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
200
180
160
140
120
100
800
600
400
200
0

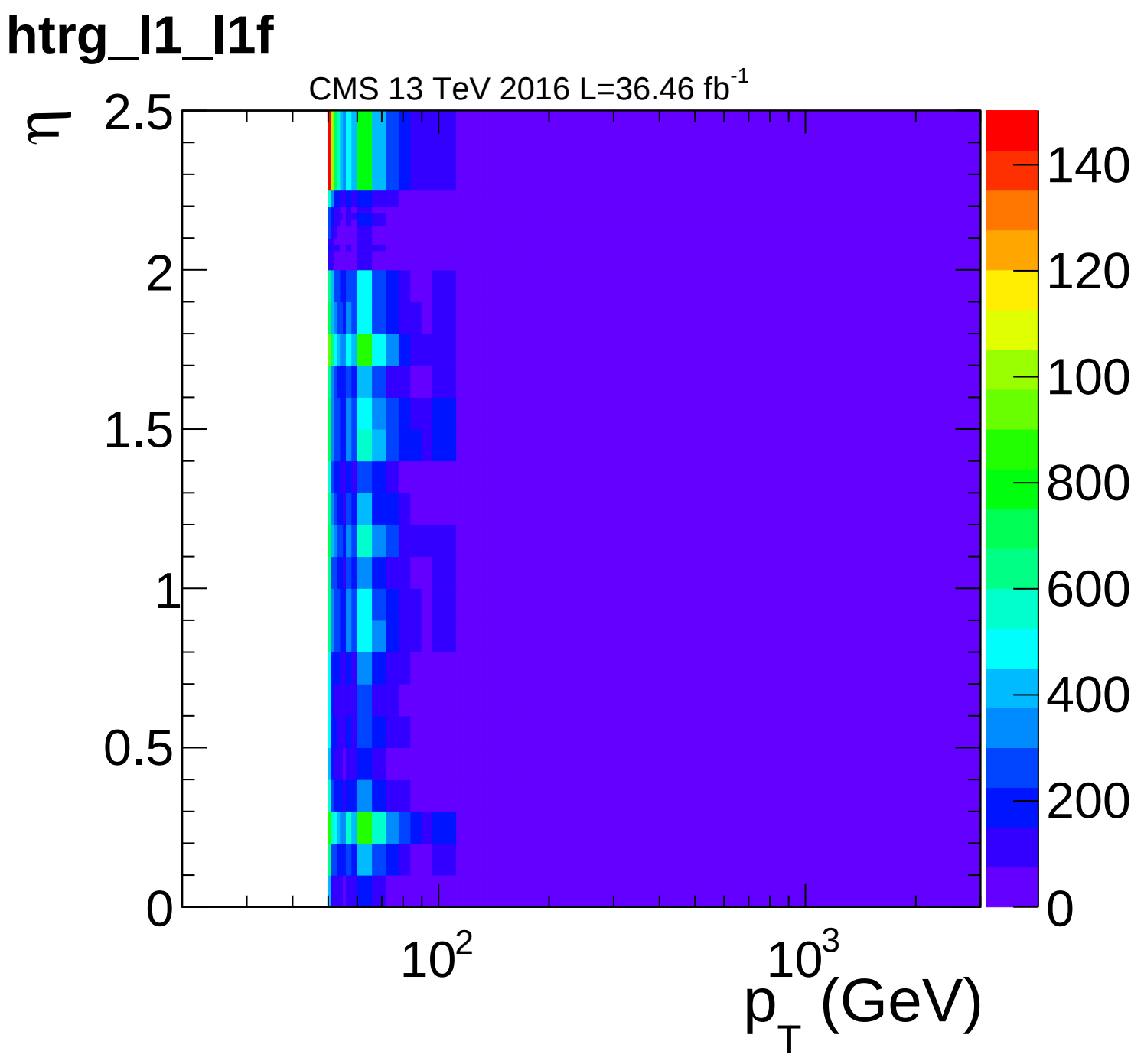

htrg_l2_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

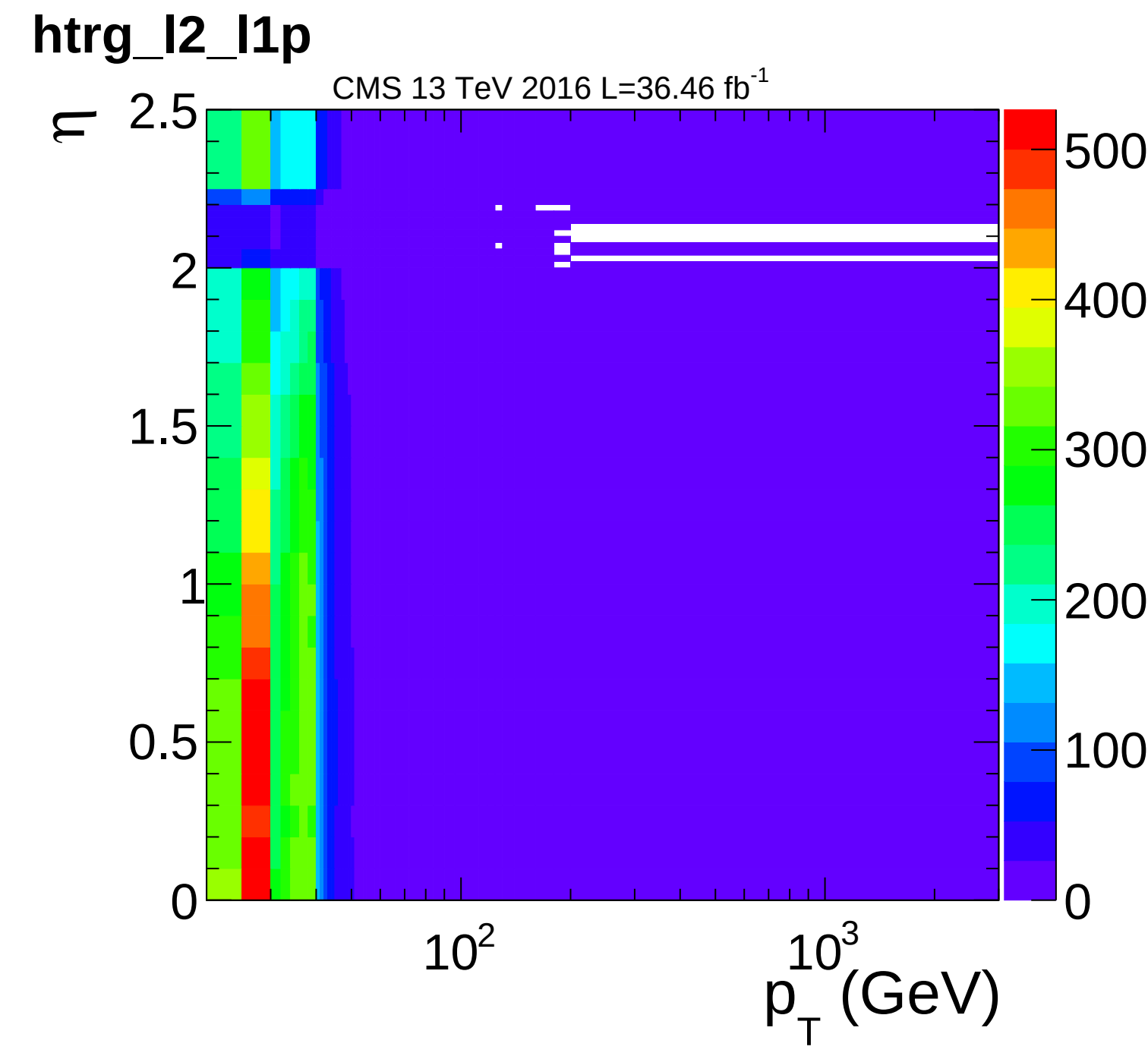

htrg_l2_l1pl2f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
500
400
300
200
100
0

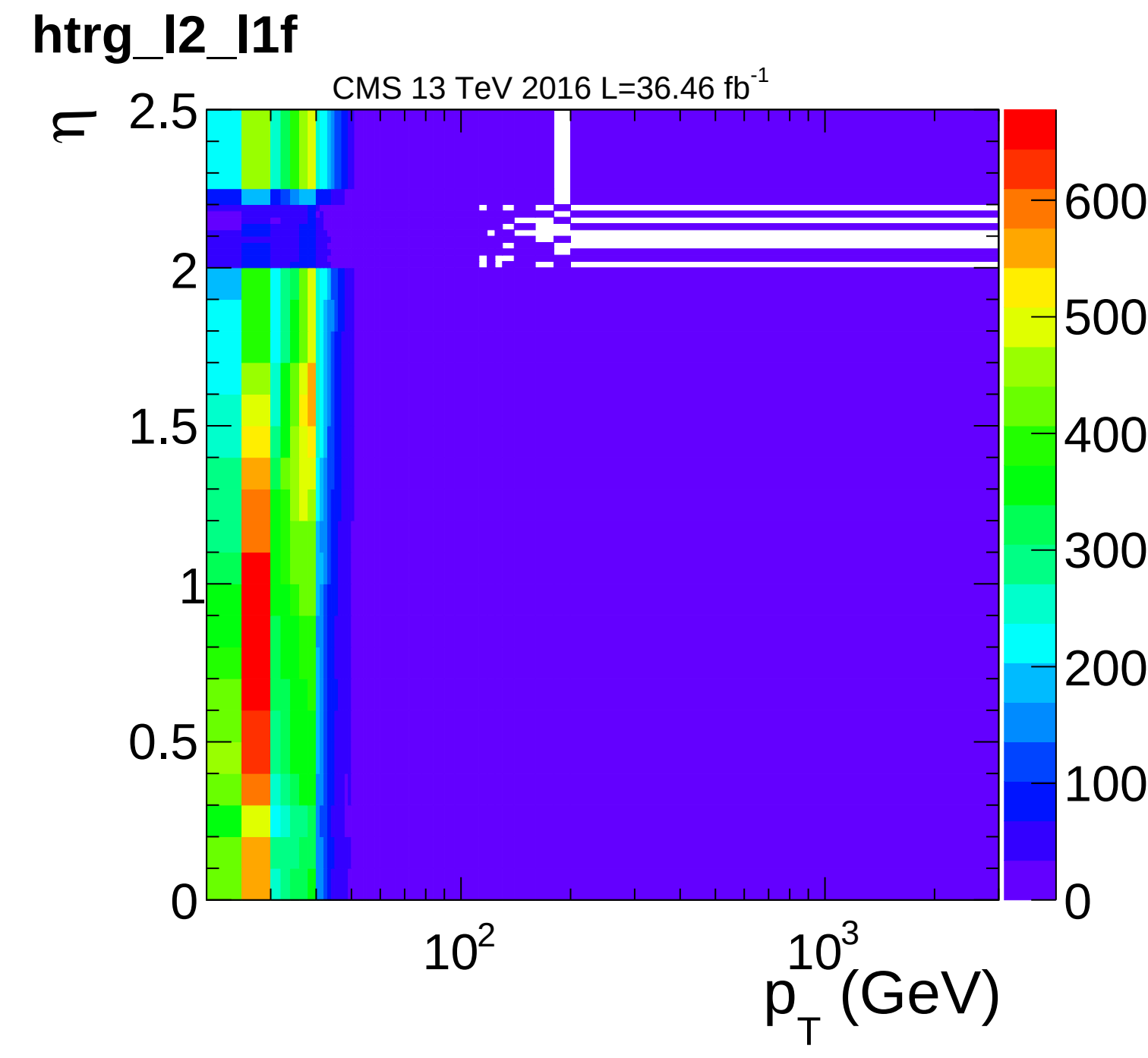

htrg_l2_l1pl2p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
250
200
150
100
500
0
10^2
10^3
p_T (GeV)

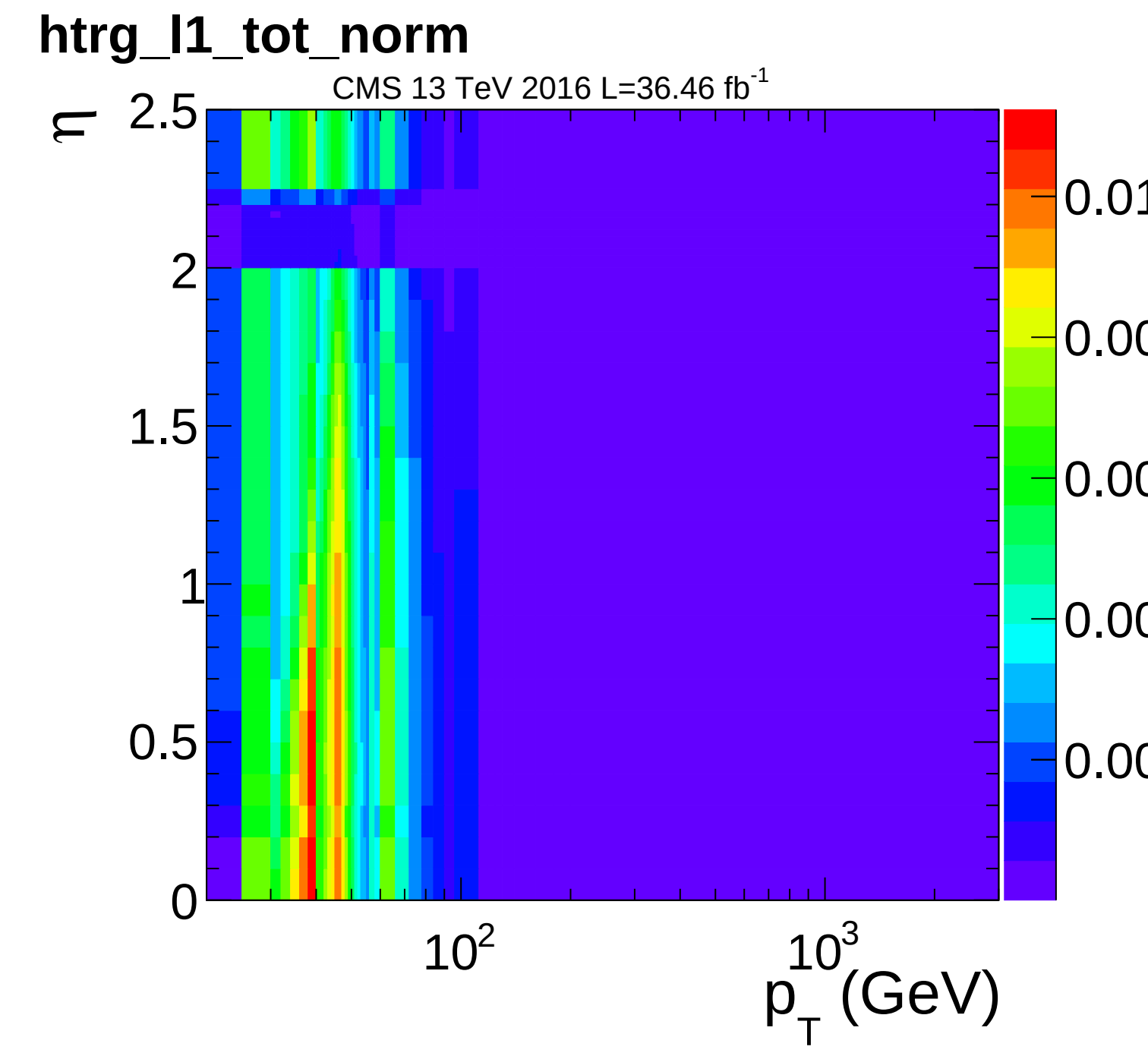

htrg_l2_l1fl2p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
400
350
300
250
200
150
100
50
0
10^2
10^3
p_T (GeV)

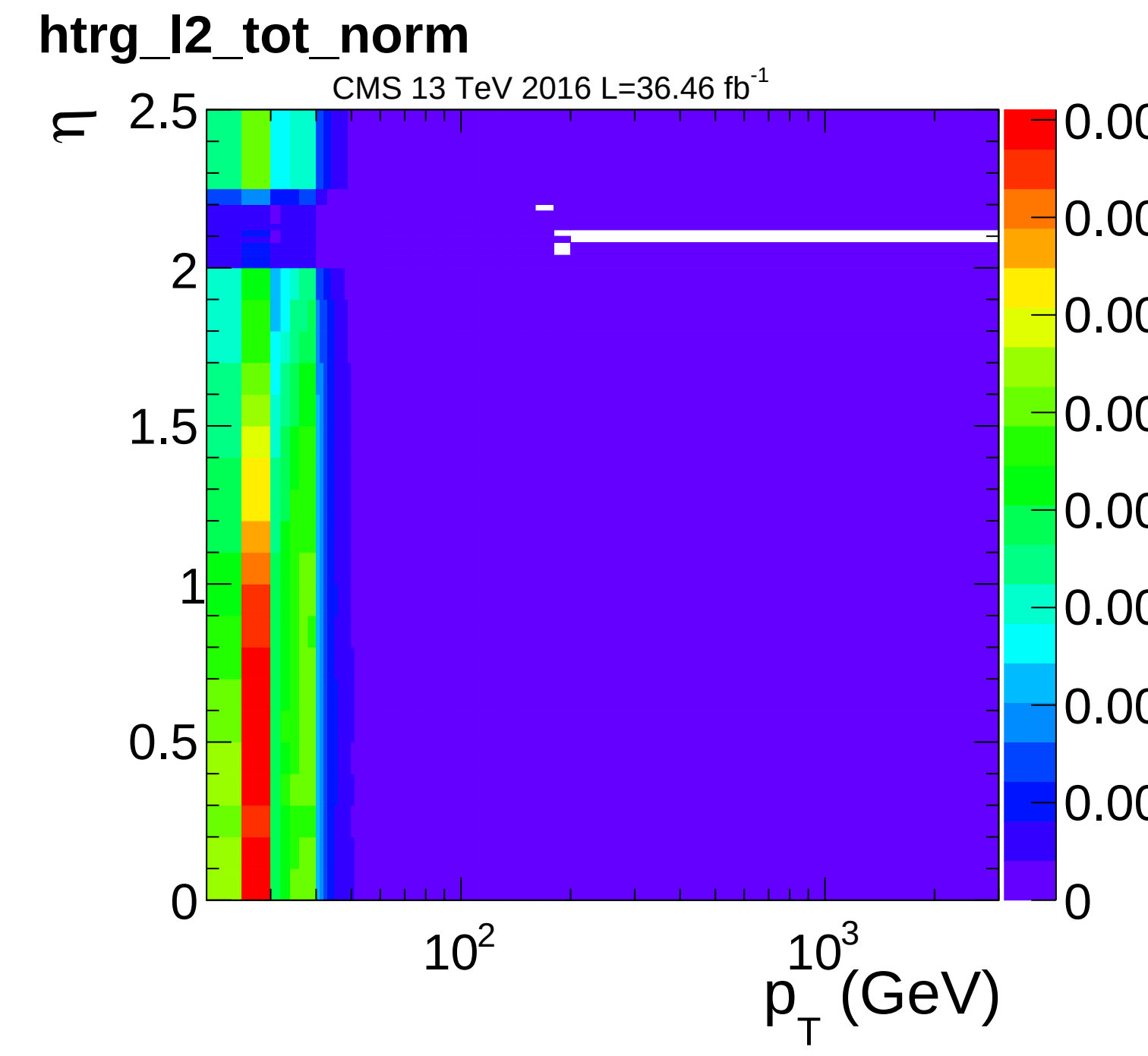

htrg_l1_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
450
400
350
300
250
200
150
100
500
0

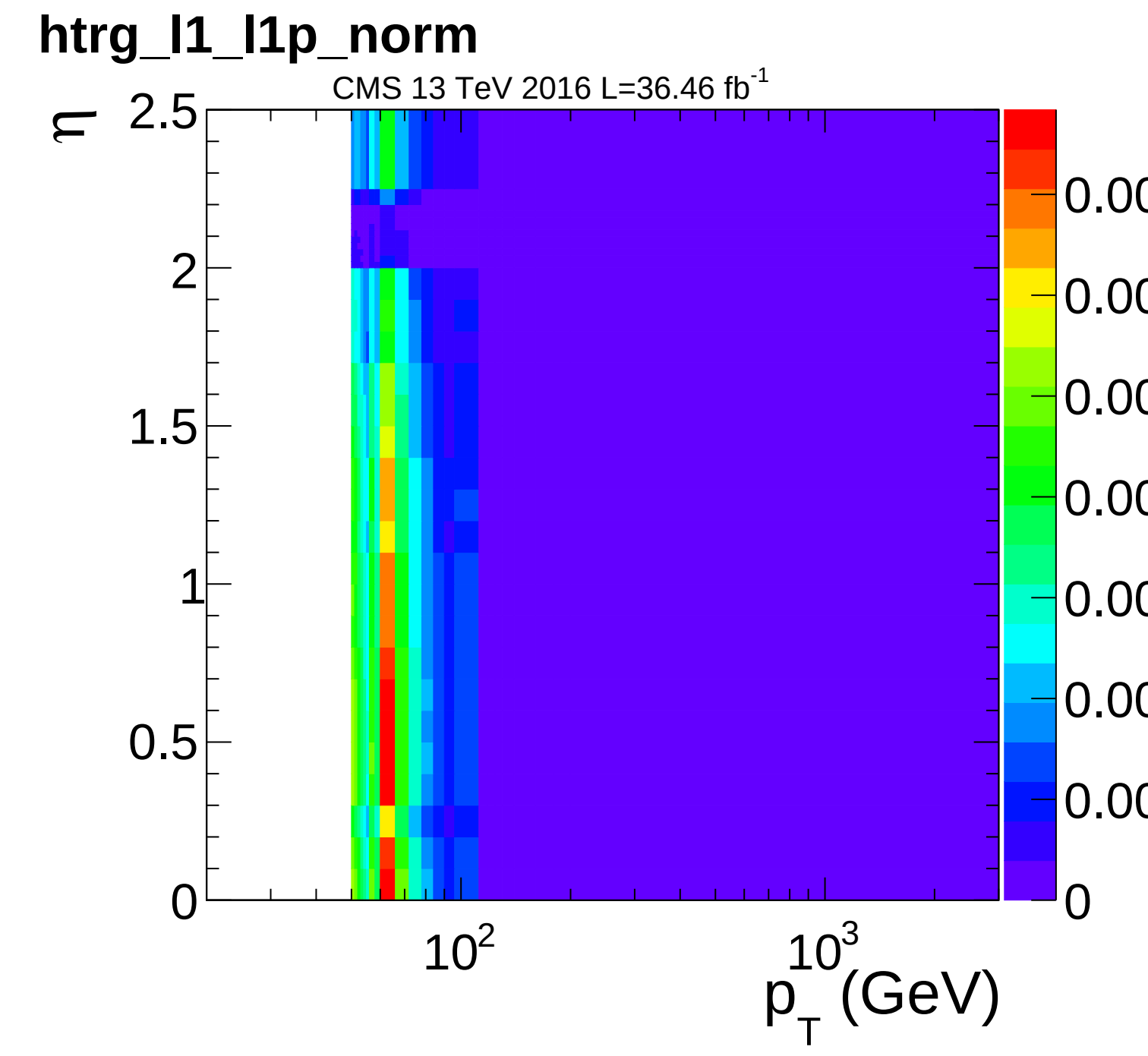

htrg_l1_l1f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
140
120
100
800
600
400
200
0

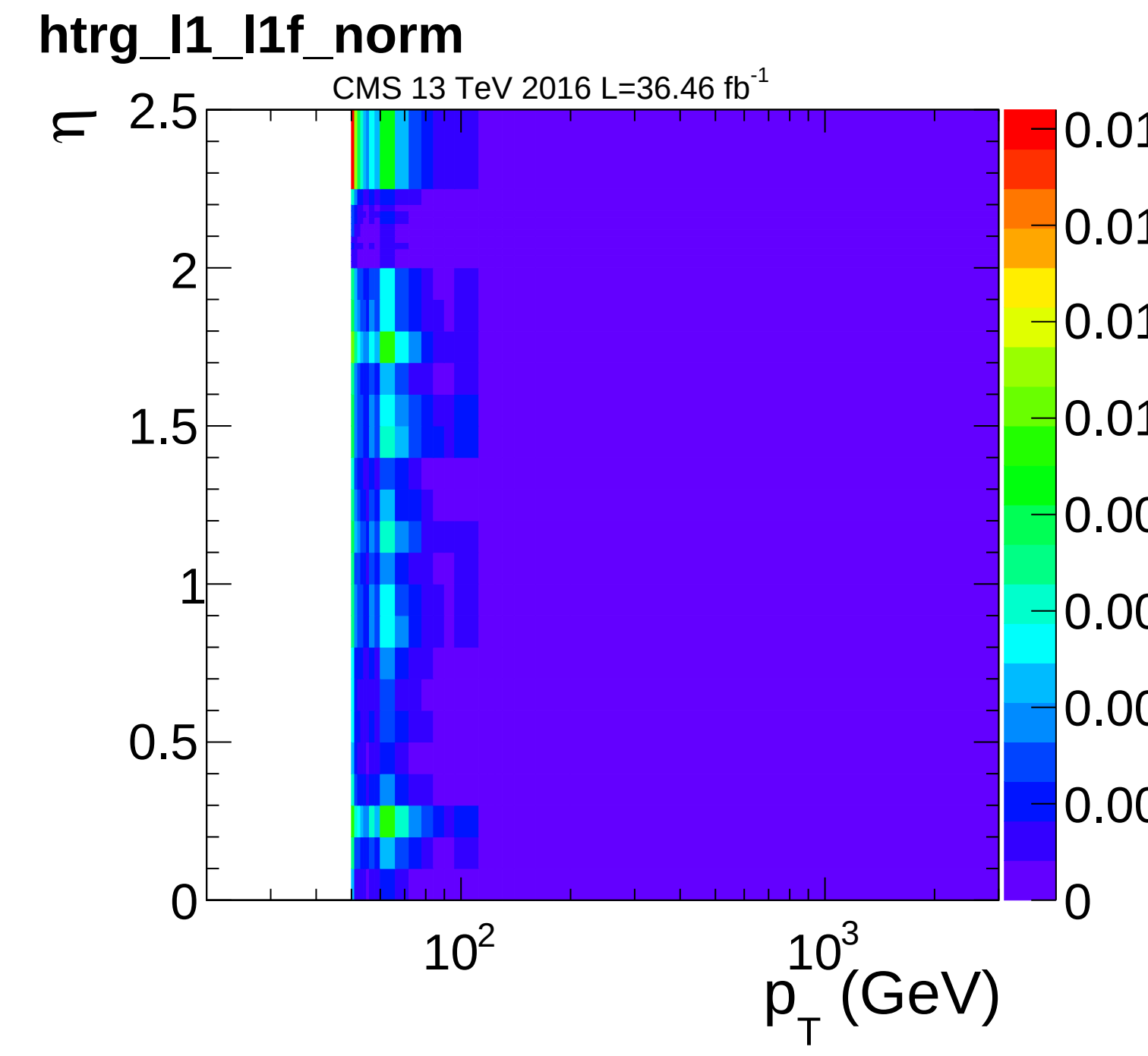

htrg_l2_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

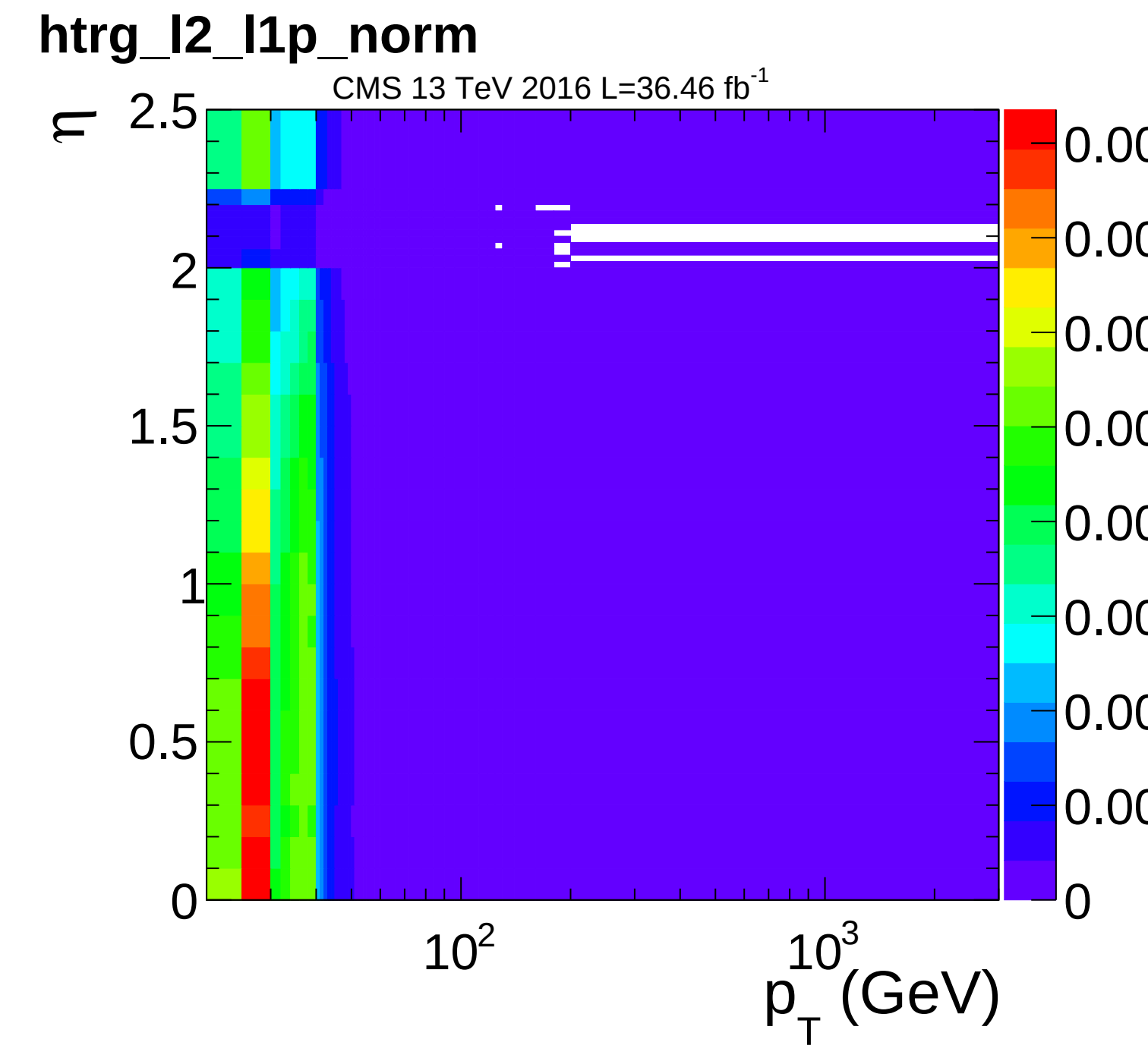

htrg_l2_l1f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
600
500
400
300
200
100
0

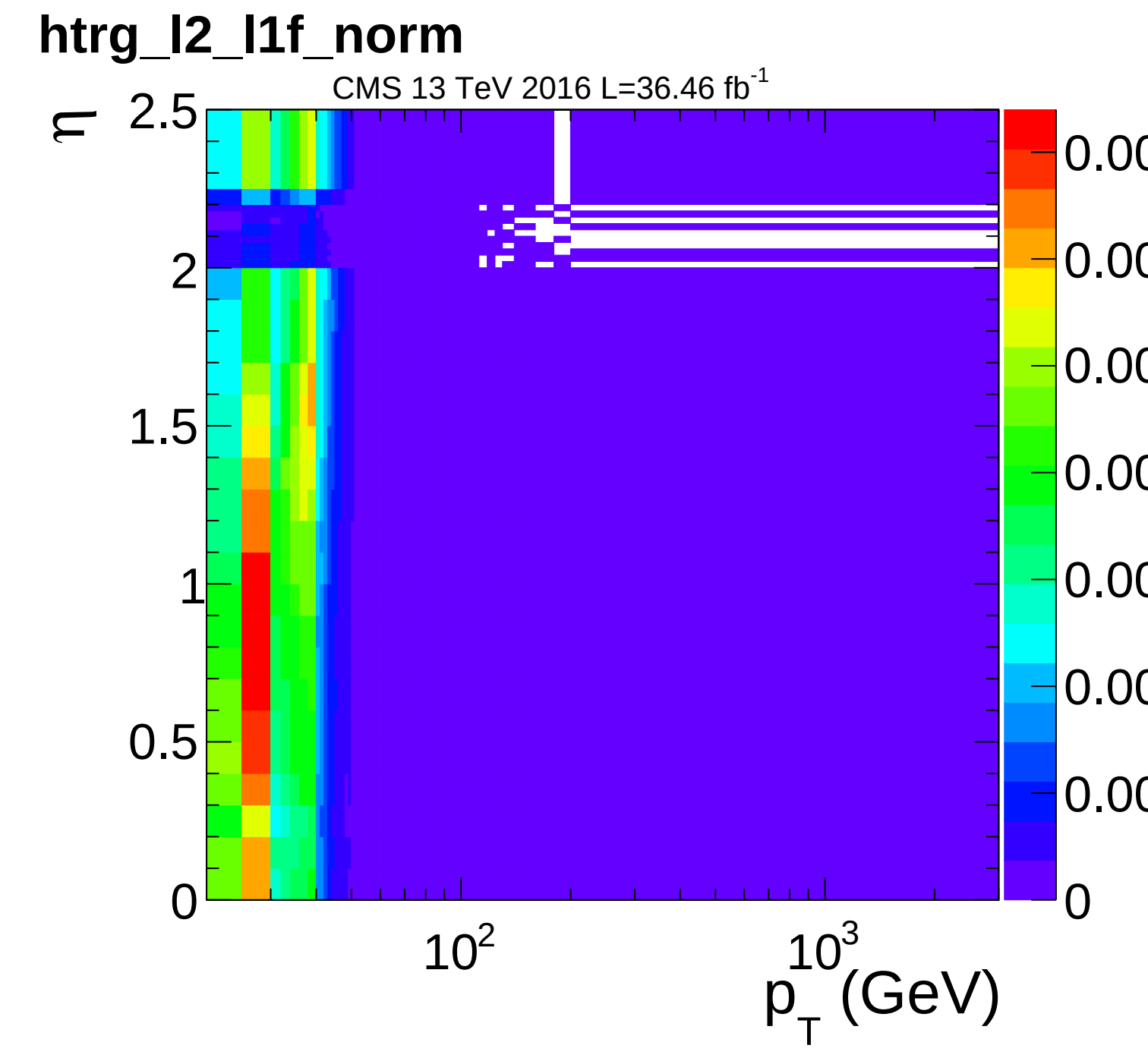

htrg_l1_tot_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.01
0.00
0.00
0.00
0.00

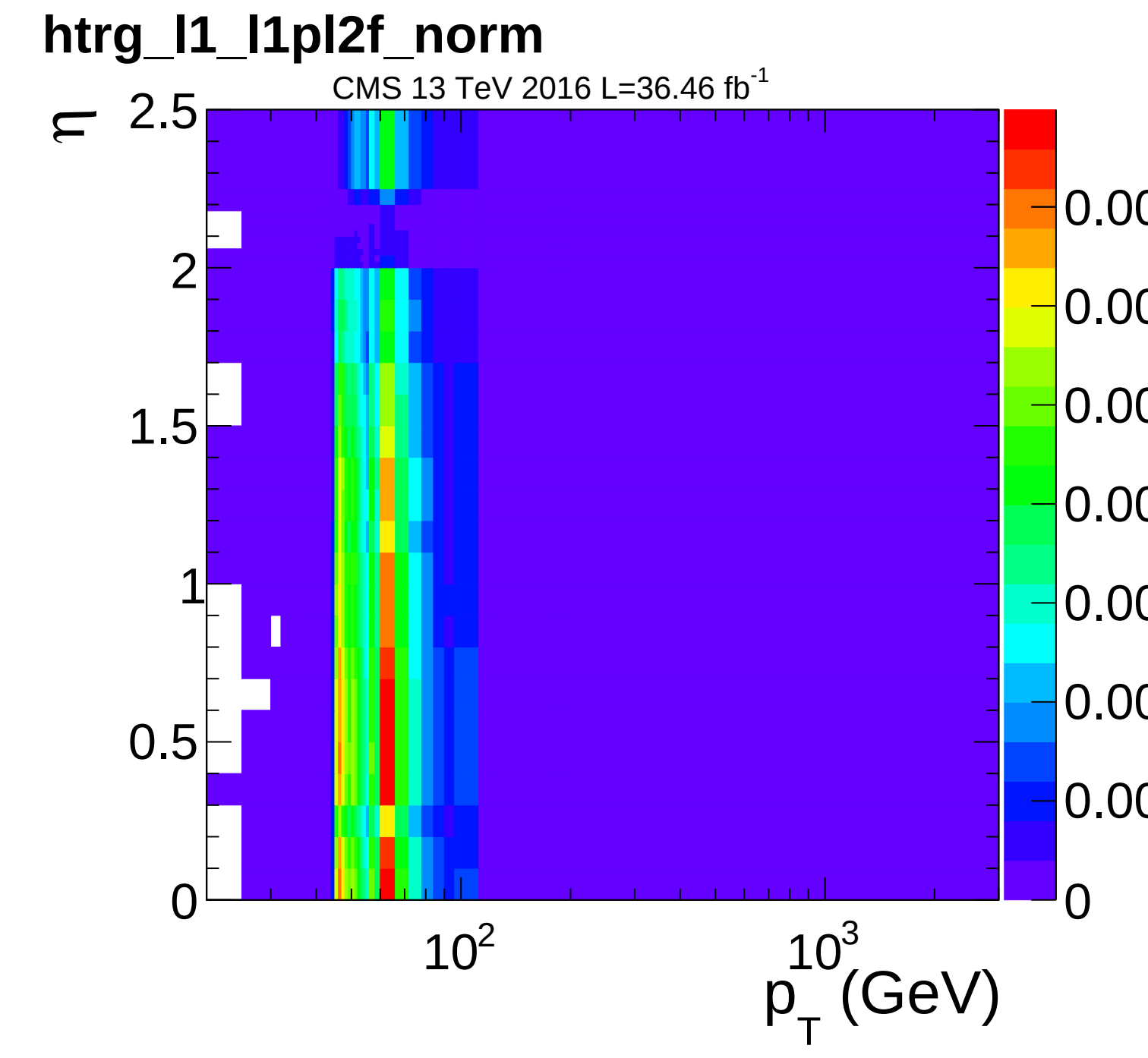

htrg_l2_tot_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0

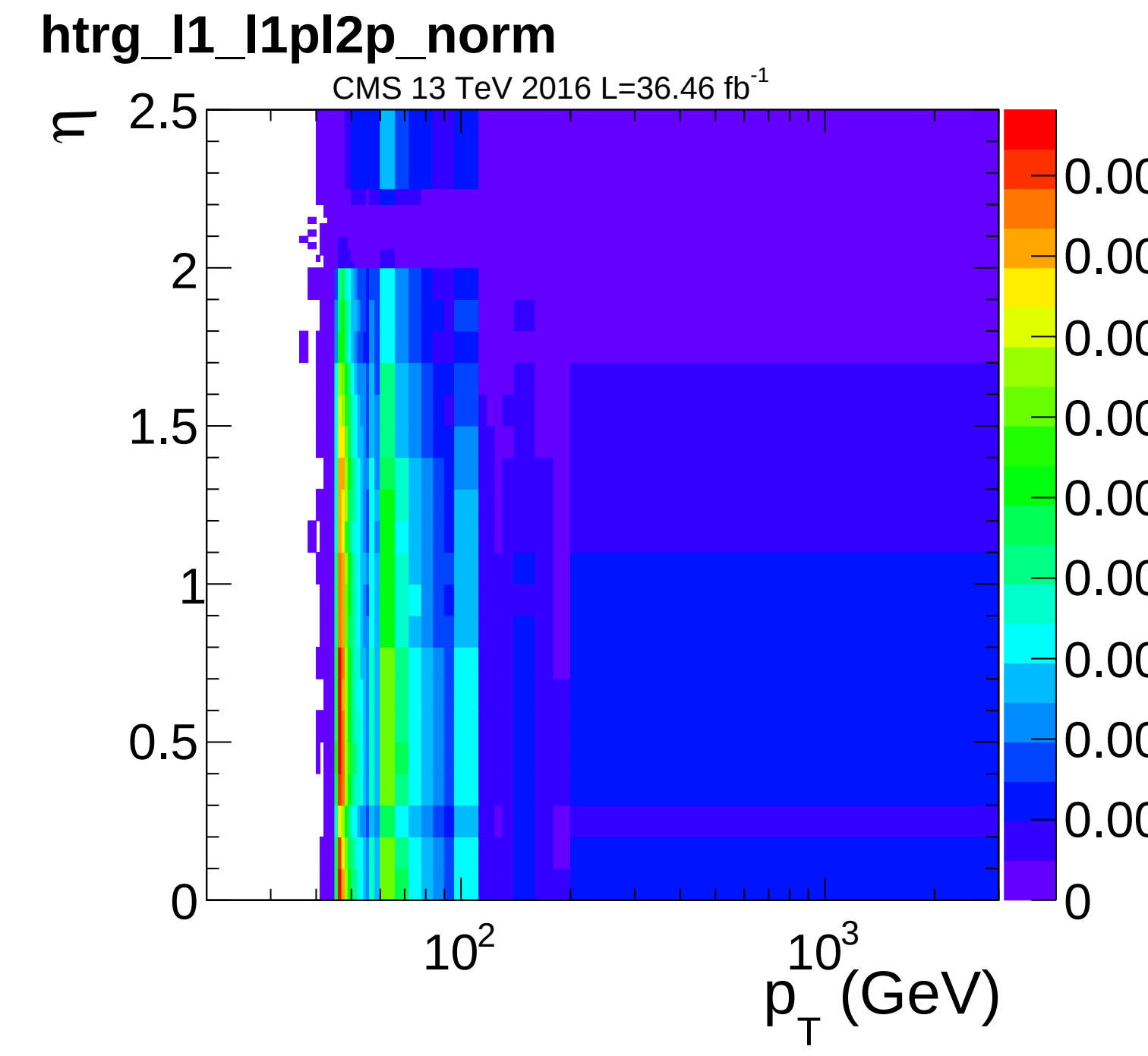

htrg_l1_l1p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0

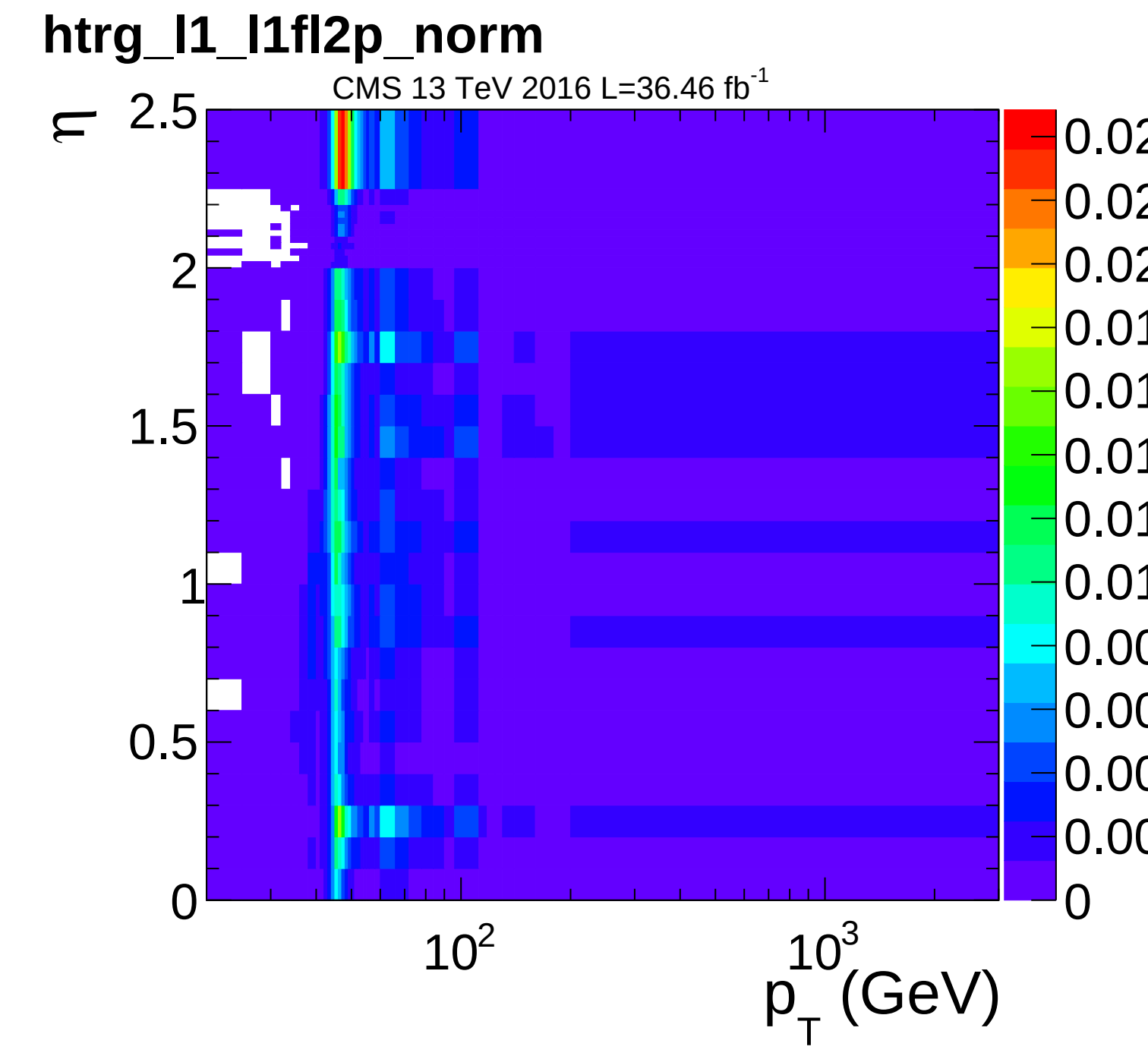

htrg_l1_l1f_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.01
0.01
0.01
0.01
0.00
0.00
0.00
0.00
0

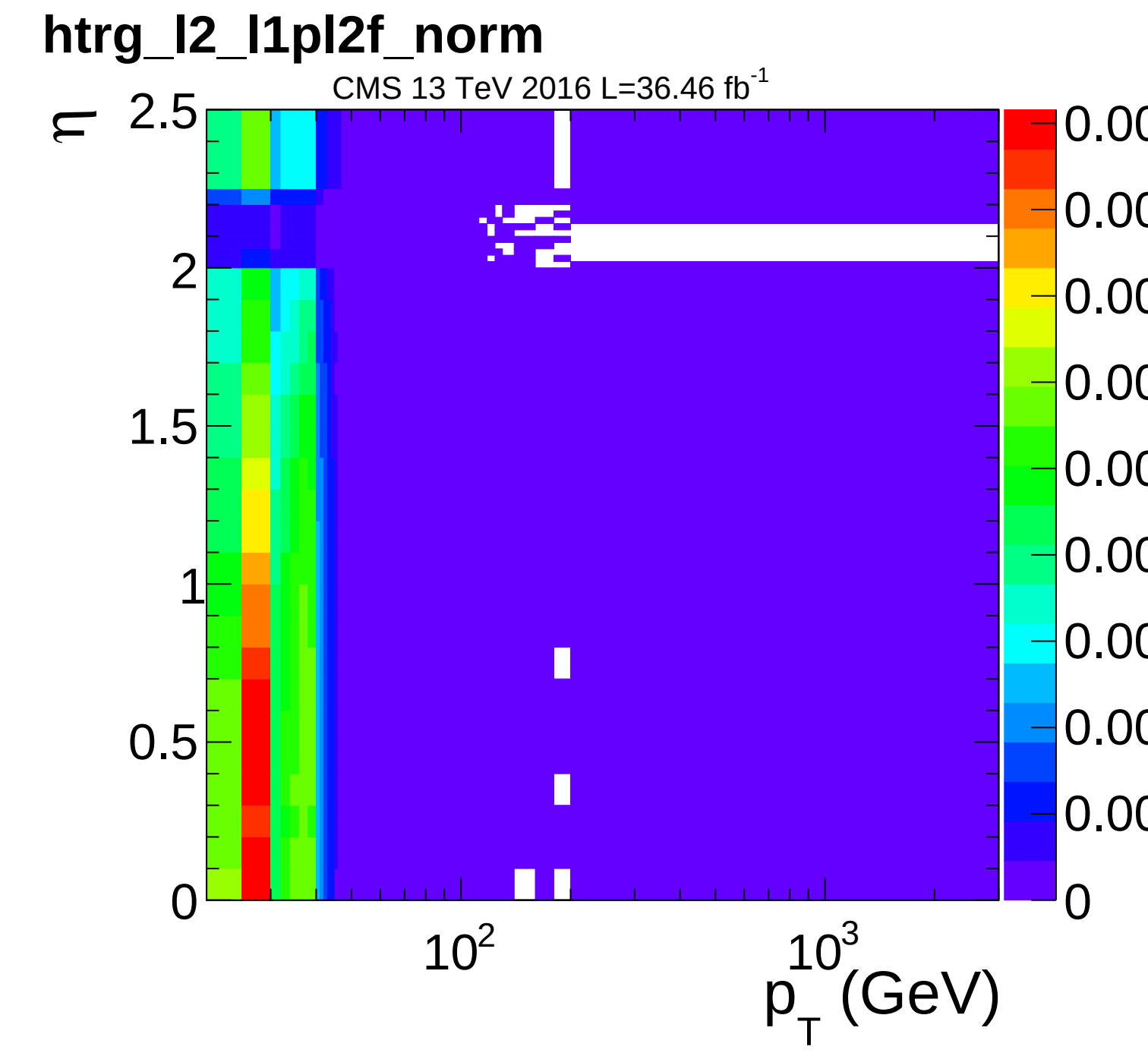

htrg_l2_l1p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0

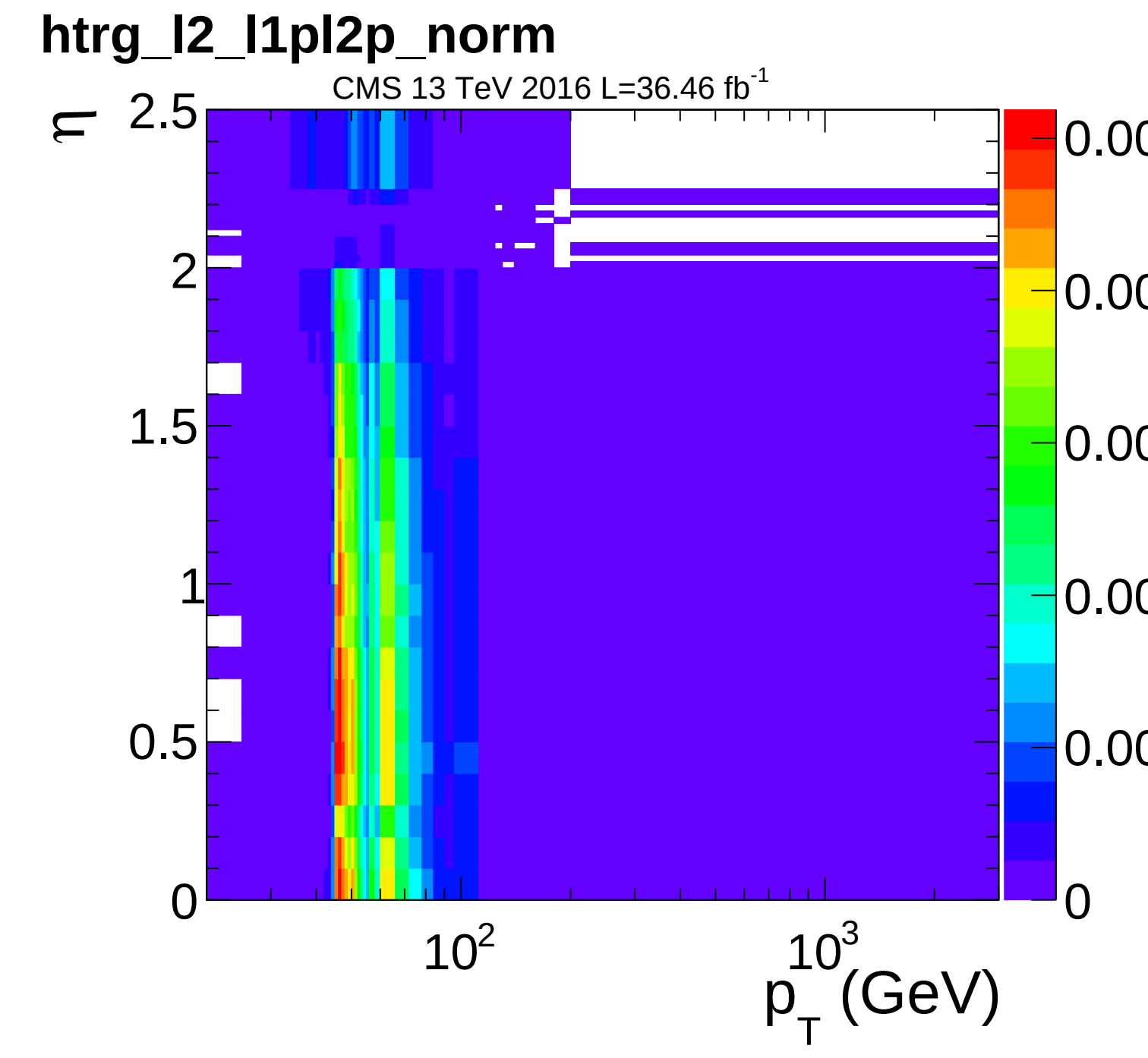

htrg_l2_l1f_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0

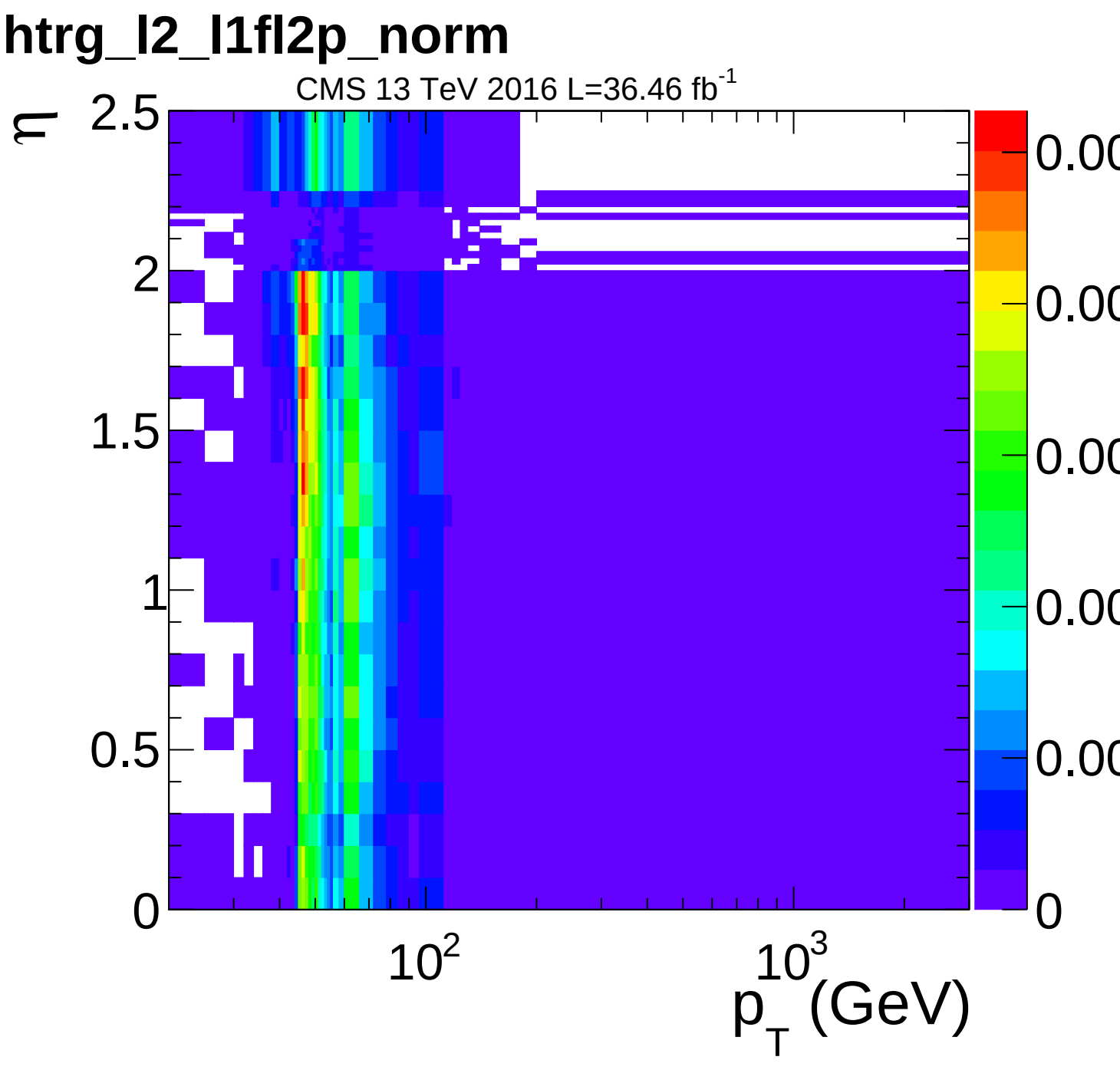

htrg_l1_l1pl2f_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0

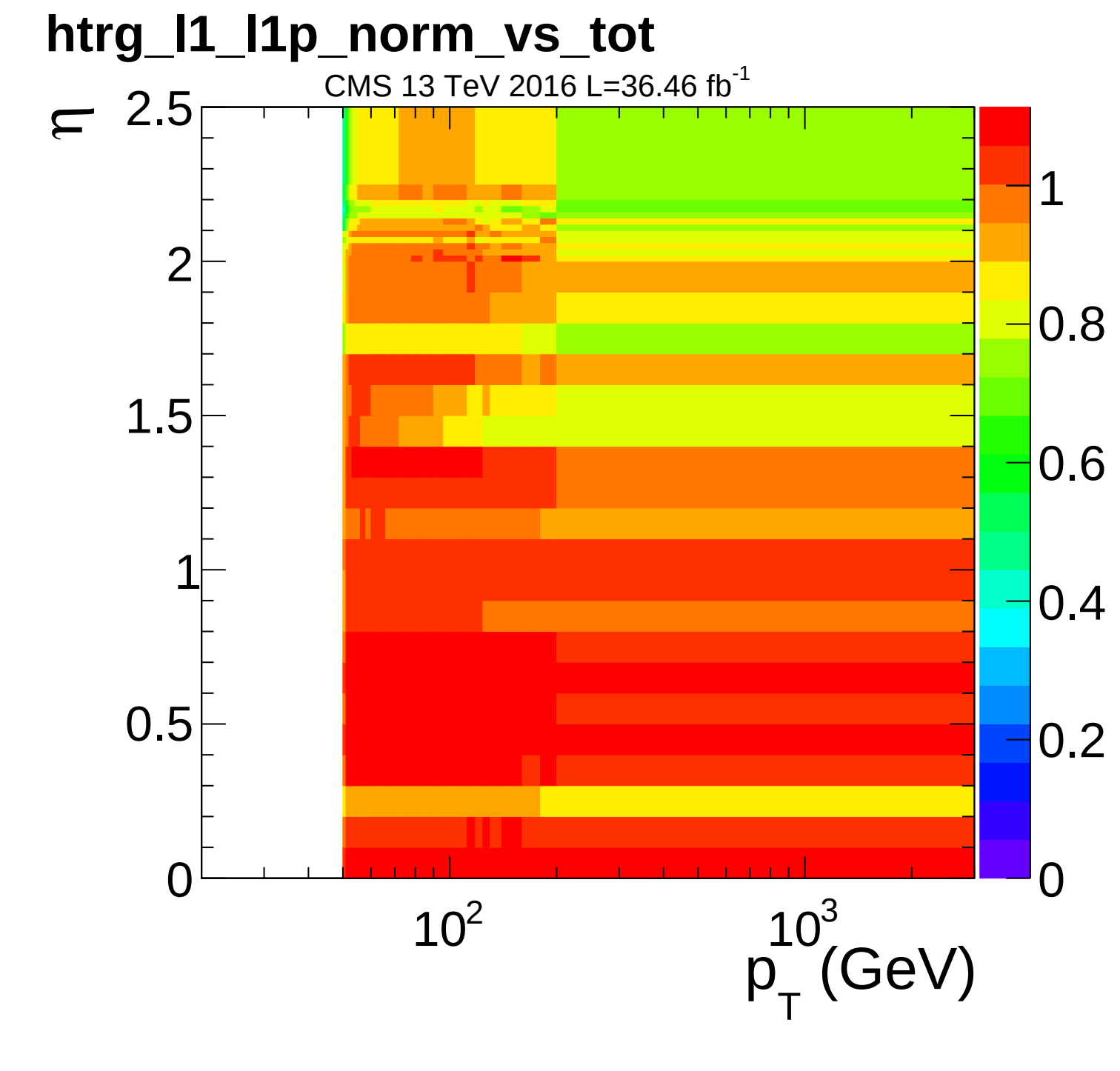

htrg_l1_l1pl2p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0

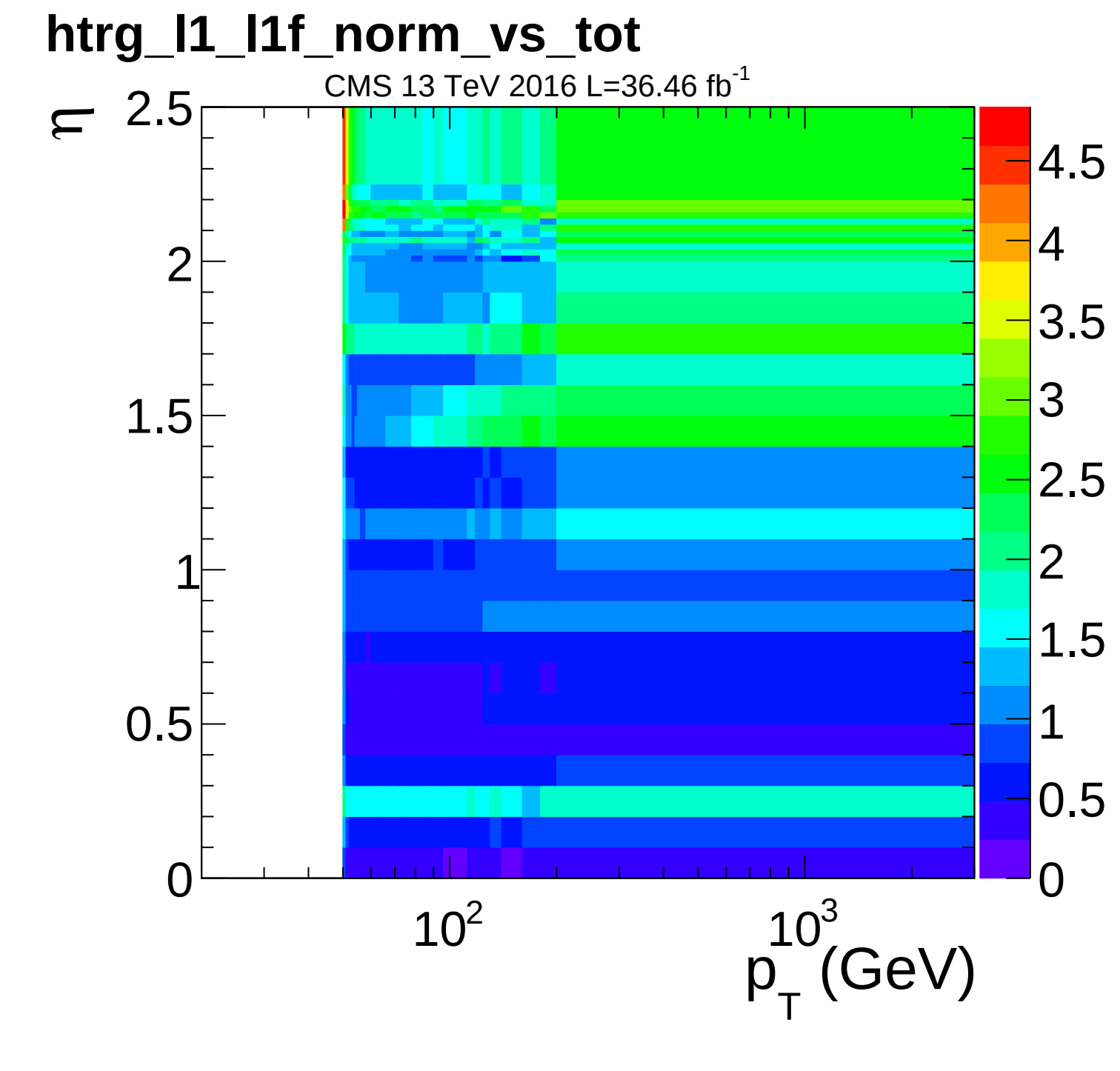

htrg_l1_l1fl2p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.02
0.02
0.02
0.01
0.01
0.01
0.01
0.01
0.00
0.00
0.00
0.00
0

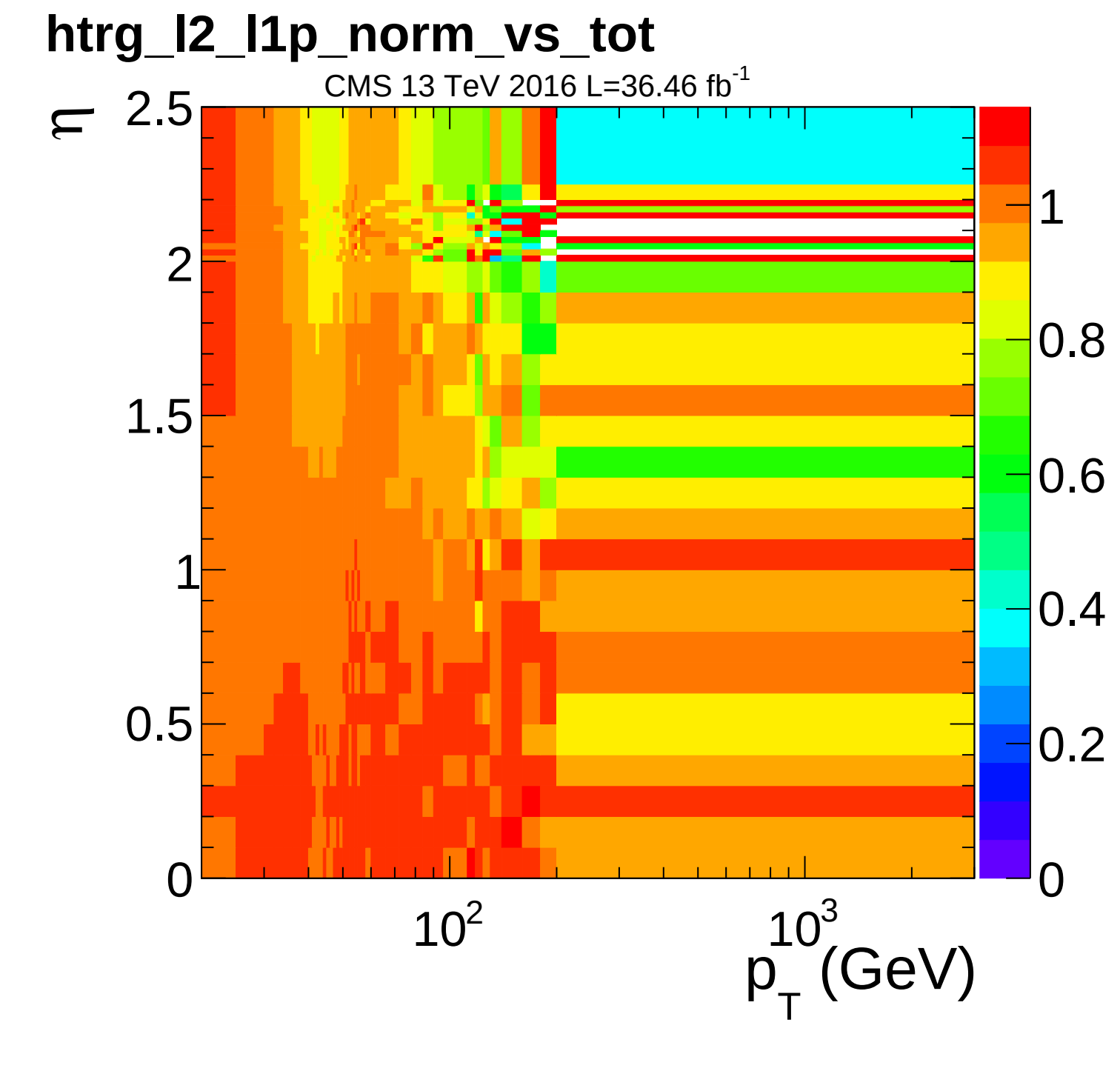

htrg_l2_l1pl2f_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0.00
0

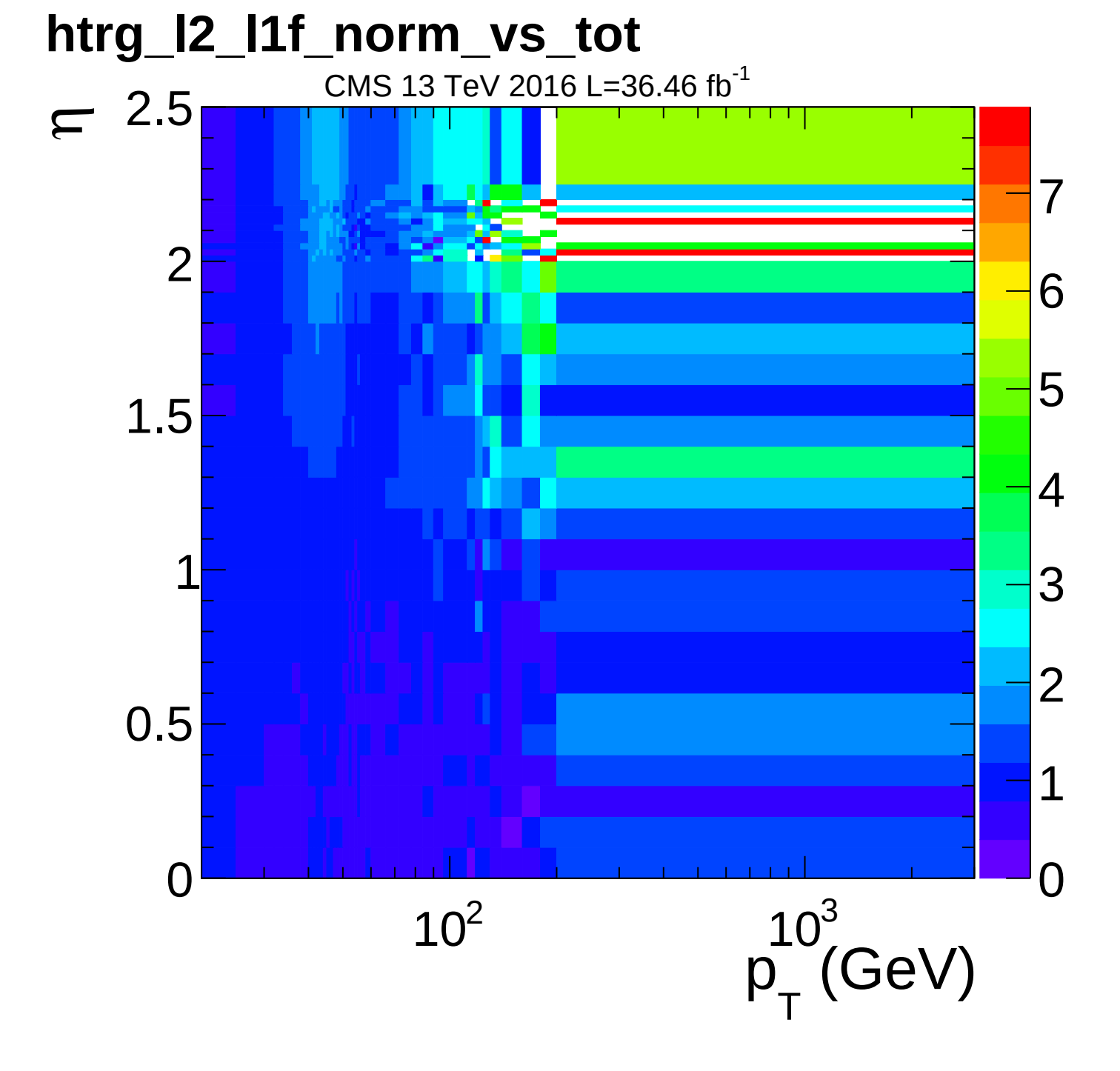

htrg_l2_l1pl2p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0

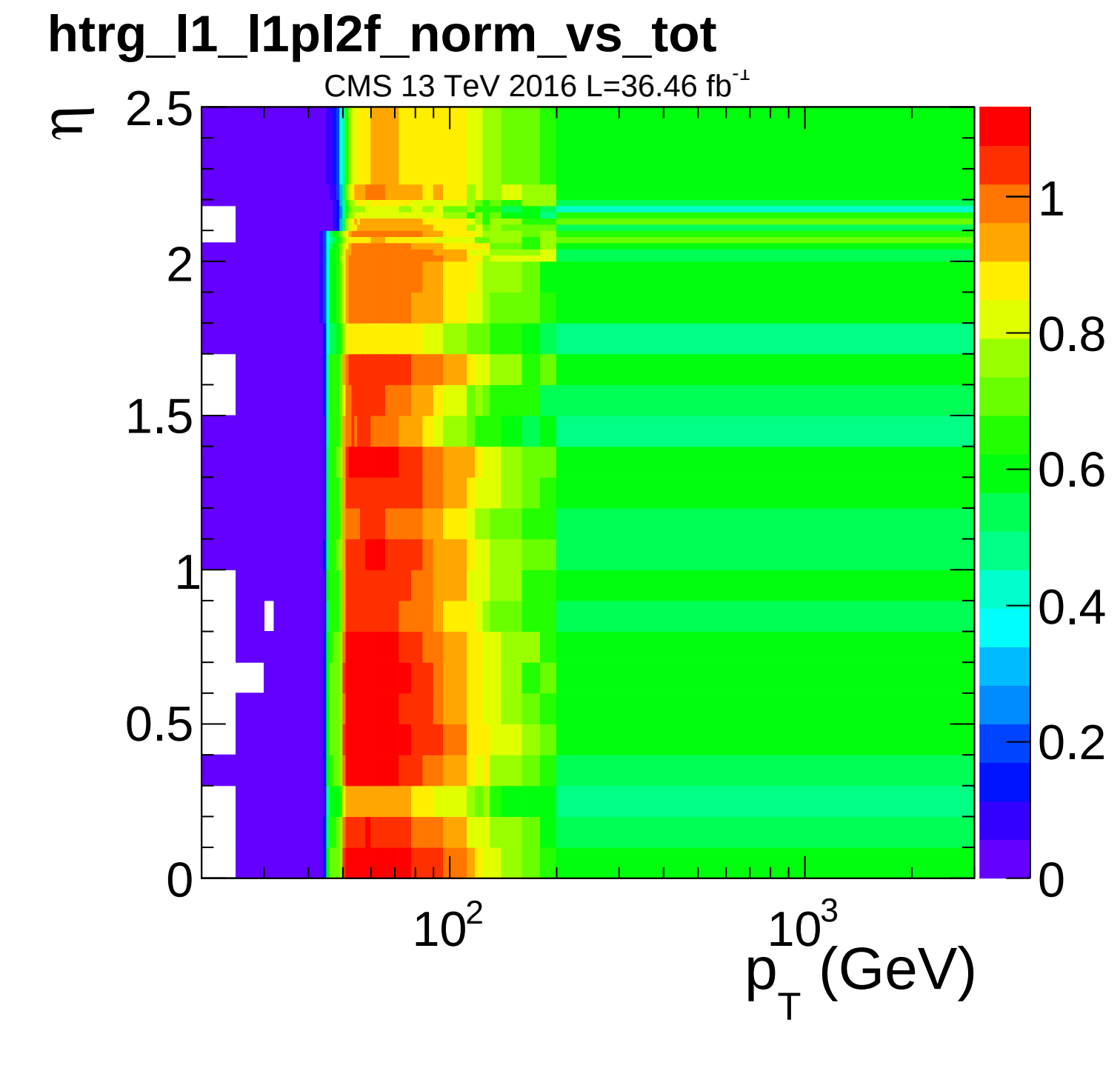

htrg_l2_l1fl2p_norm
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.00
0.00
0.00
0.00
0.00
0

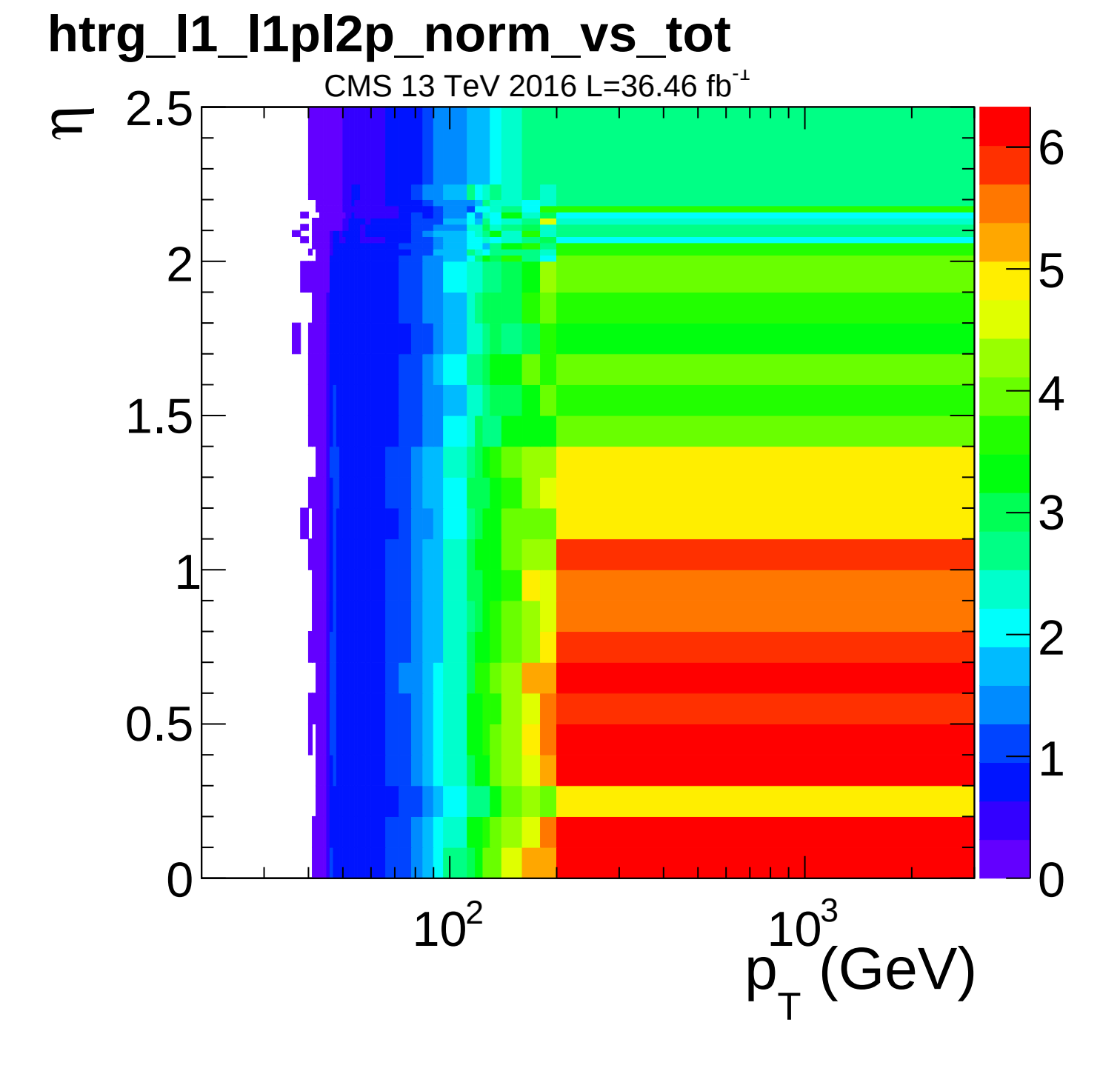

htrg_l1_l1p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.8
0.6
0.4
0.2
0

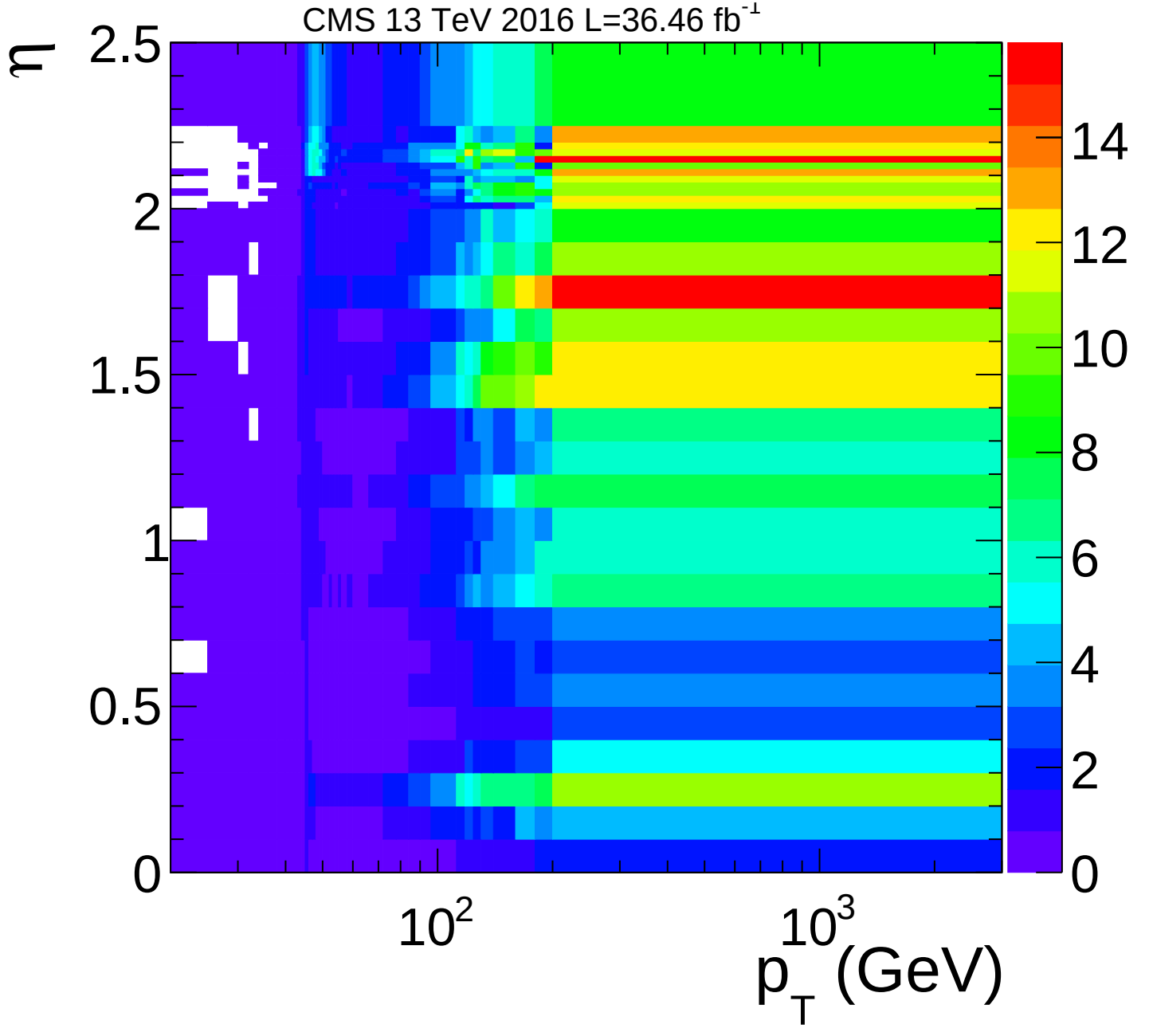

htrg_l1_l1f_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0

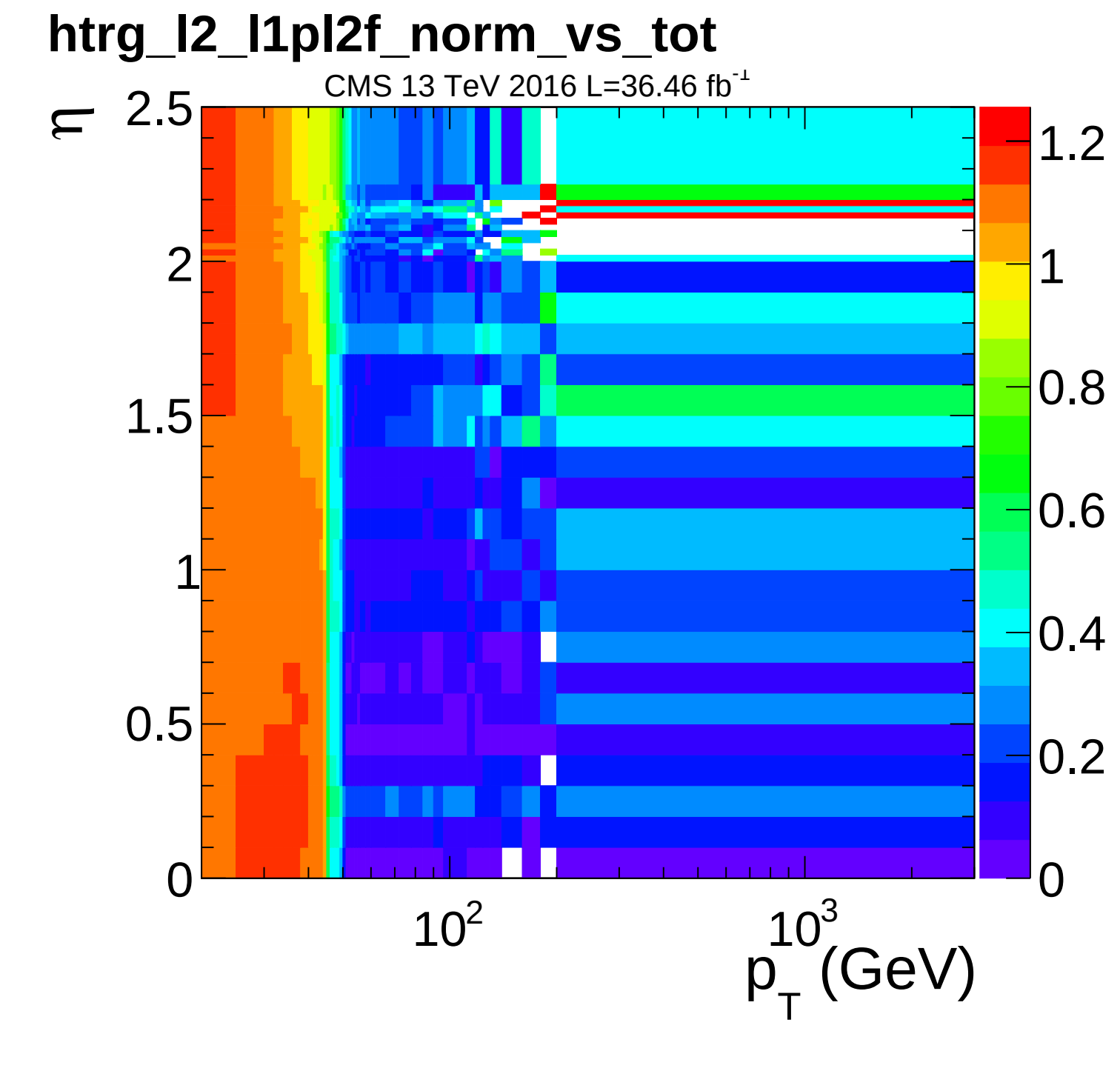

htrg_l2_l1p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.8
0.6
0.4
0.2
0

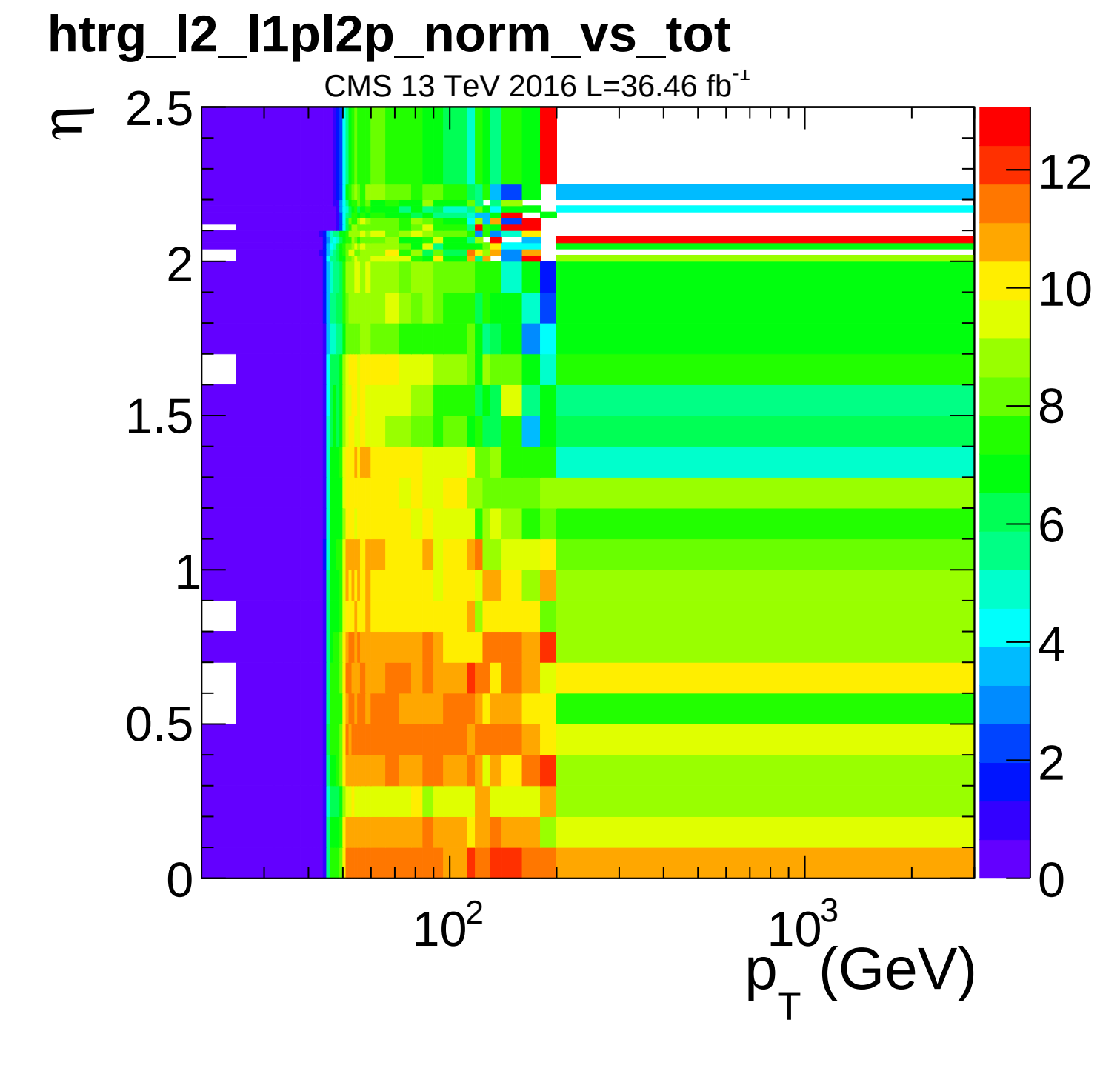

htrg_l2_l1f_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
7
6
5
4
3
2
1
0

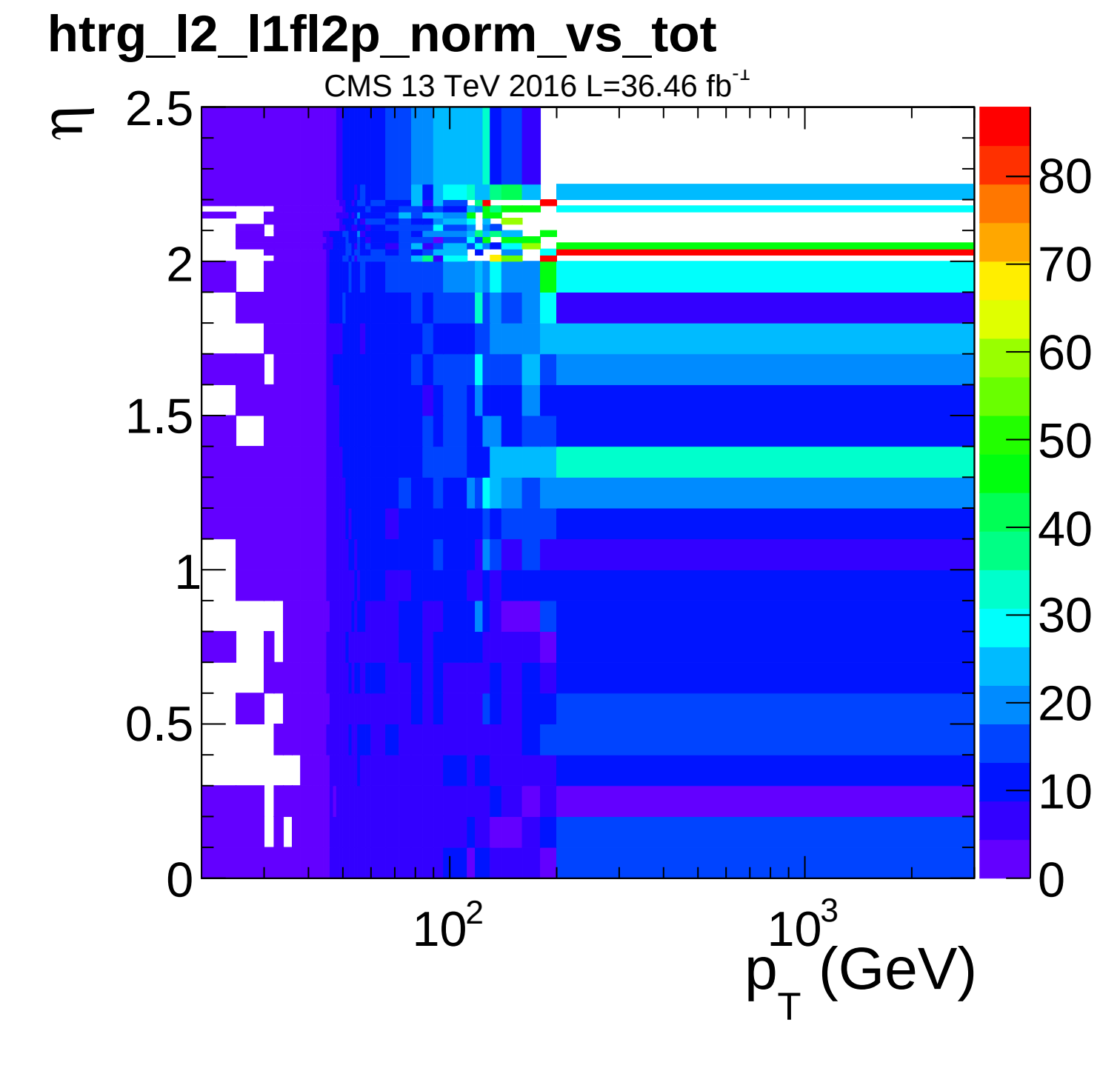

htrg_l1_l1pl2f_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
pT (GeV)
1
0.8
0.6
0.4
0.2
0

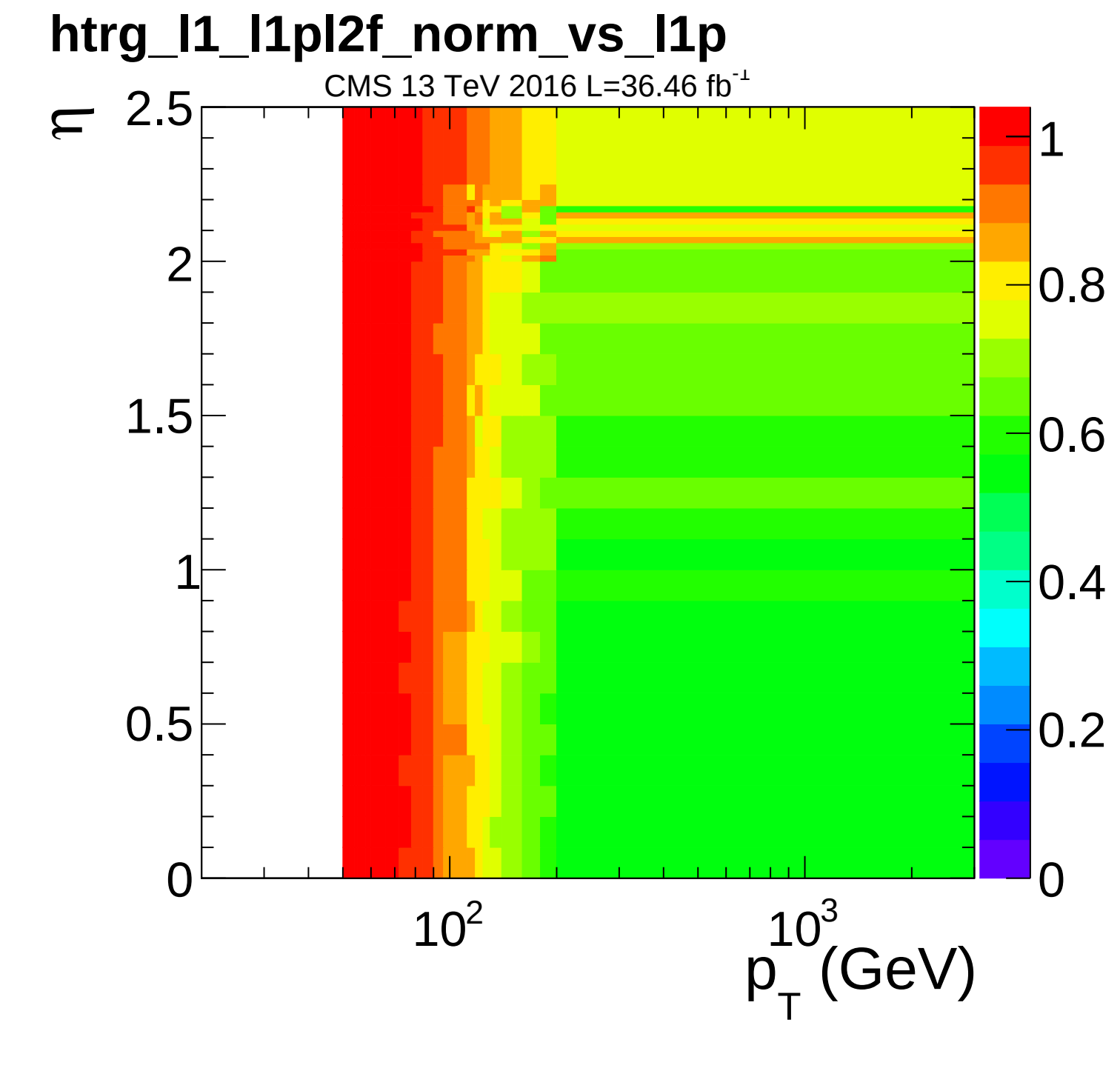

htrg_l1_l1pl2p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
pT (GeV)
6
5
4
3
2
1
0

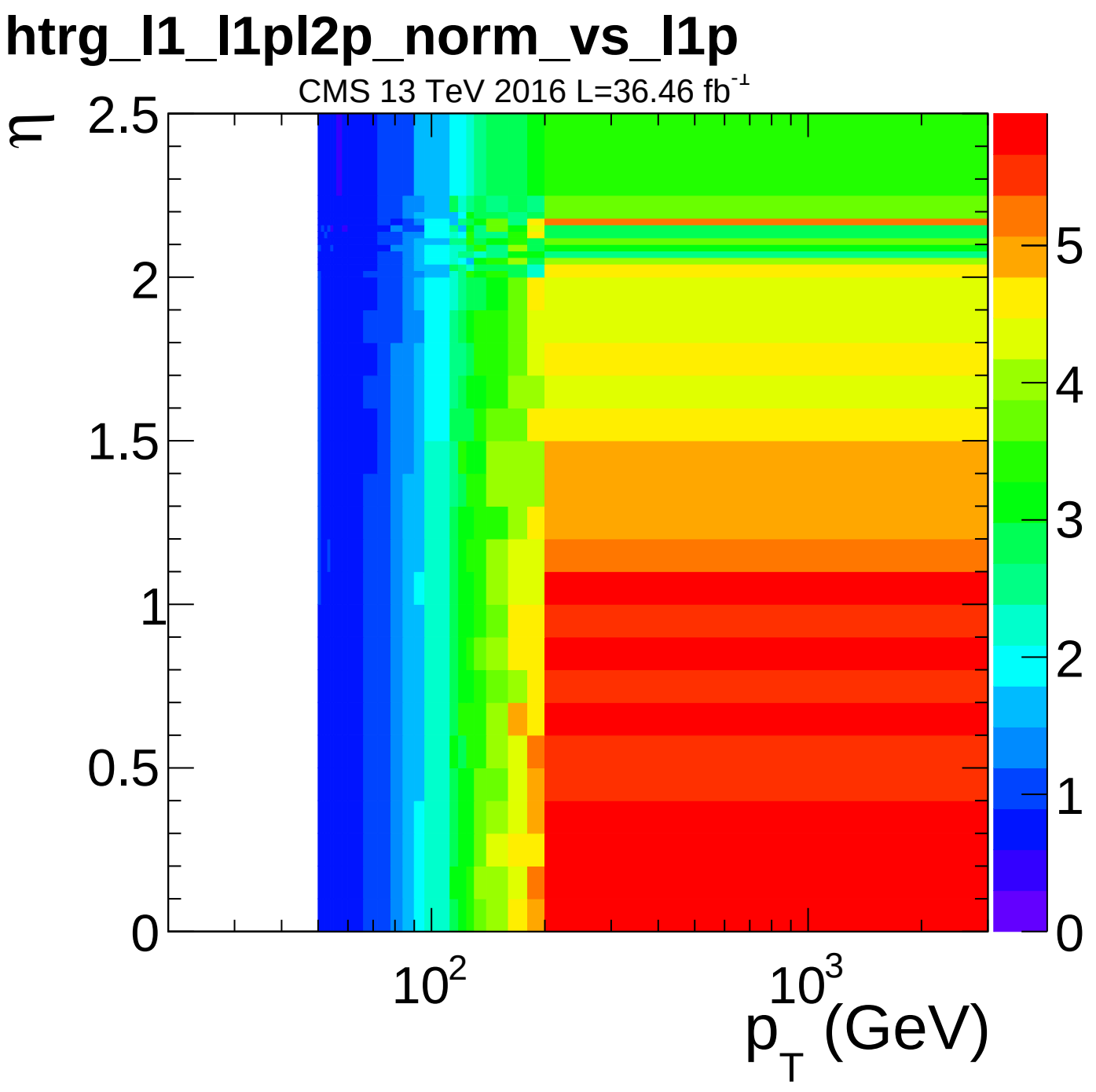

htrg_l1_l1fl2p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
14
12
10
8
6
4
2
0

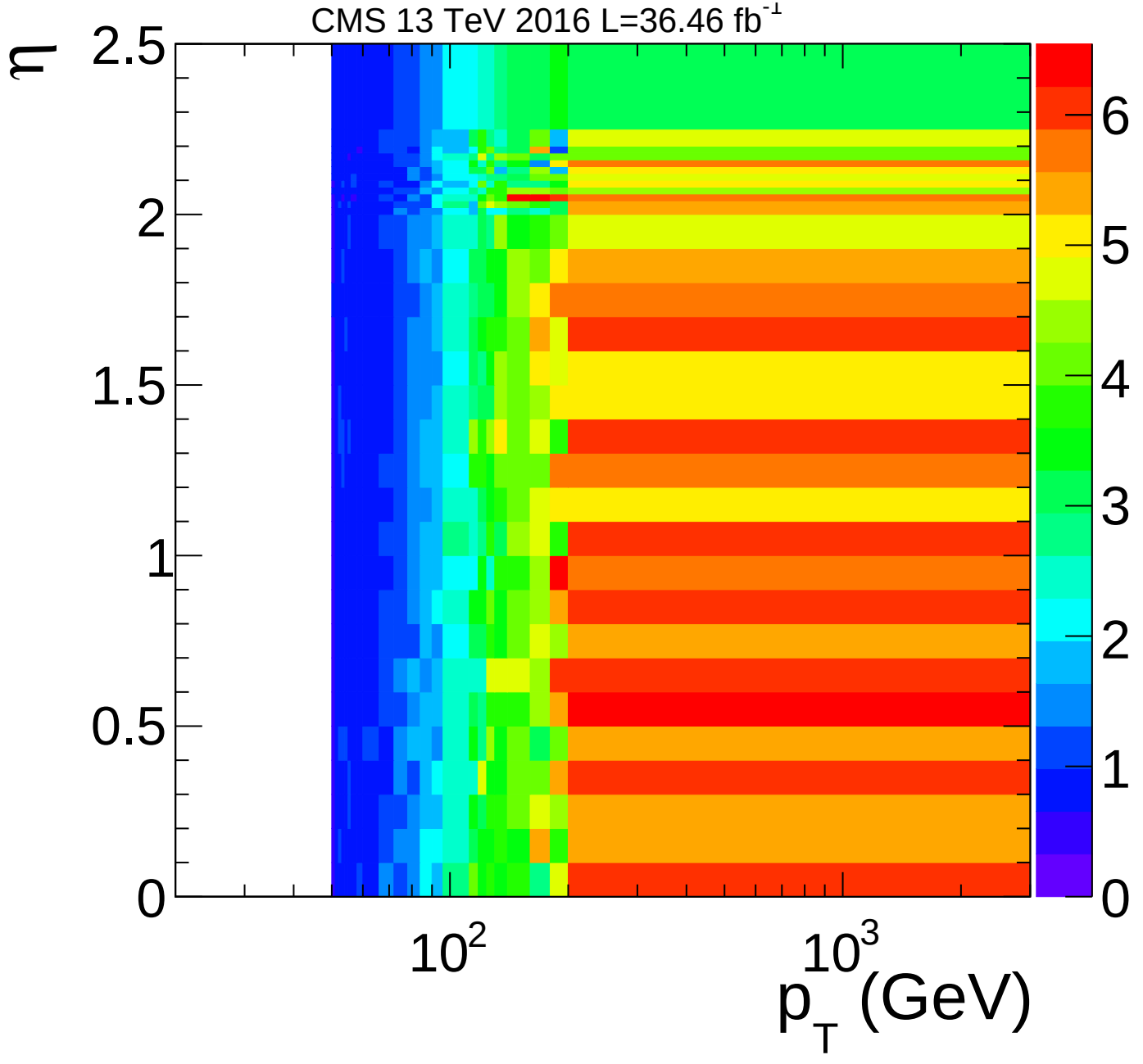

htrg_l2_l1pl2f_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1.2
1
0.8
0.6
0.4
0.2
0

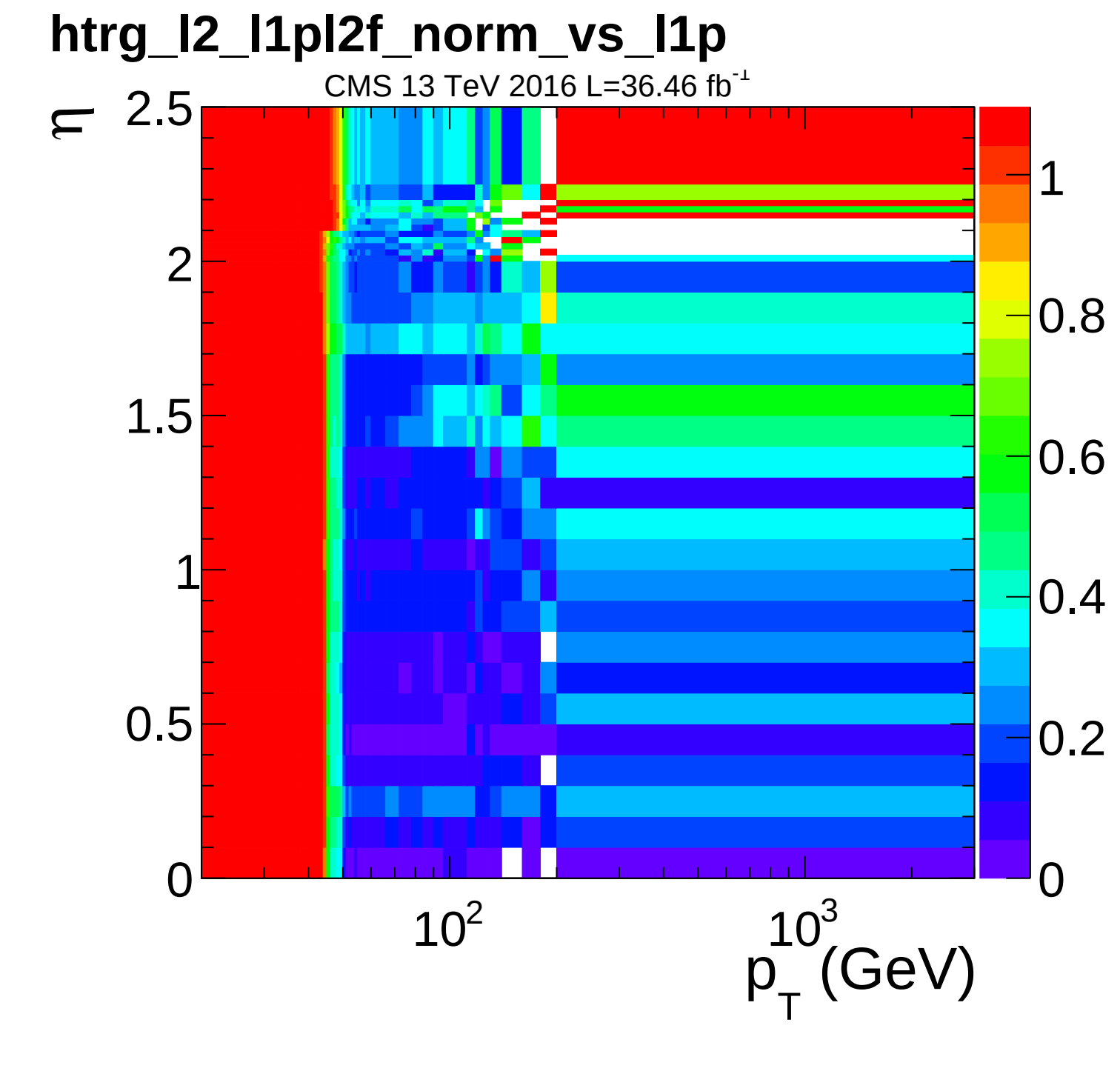

htrg_l2_l1pl2p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
12
10
8
6
4
2
0

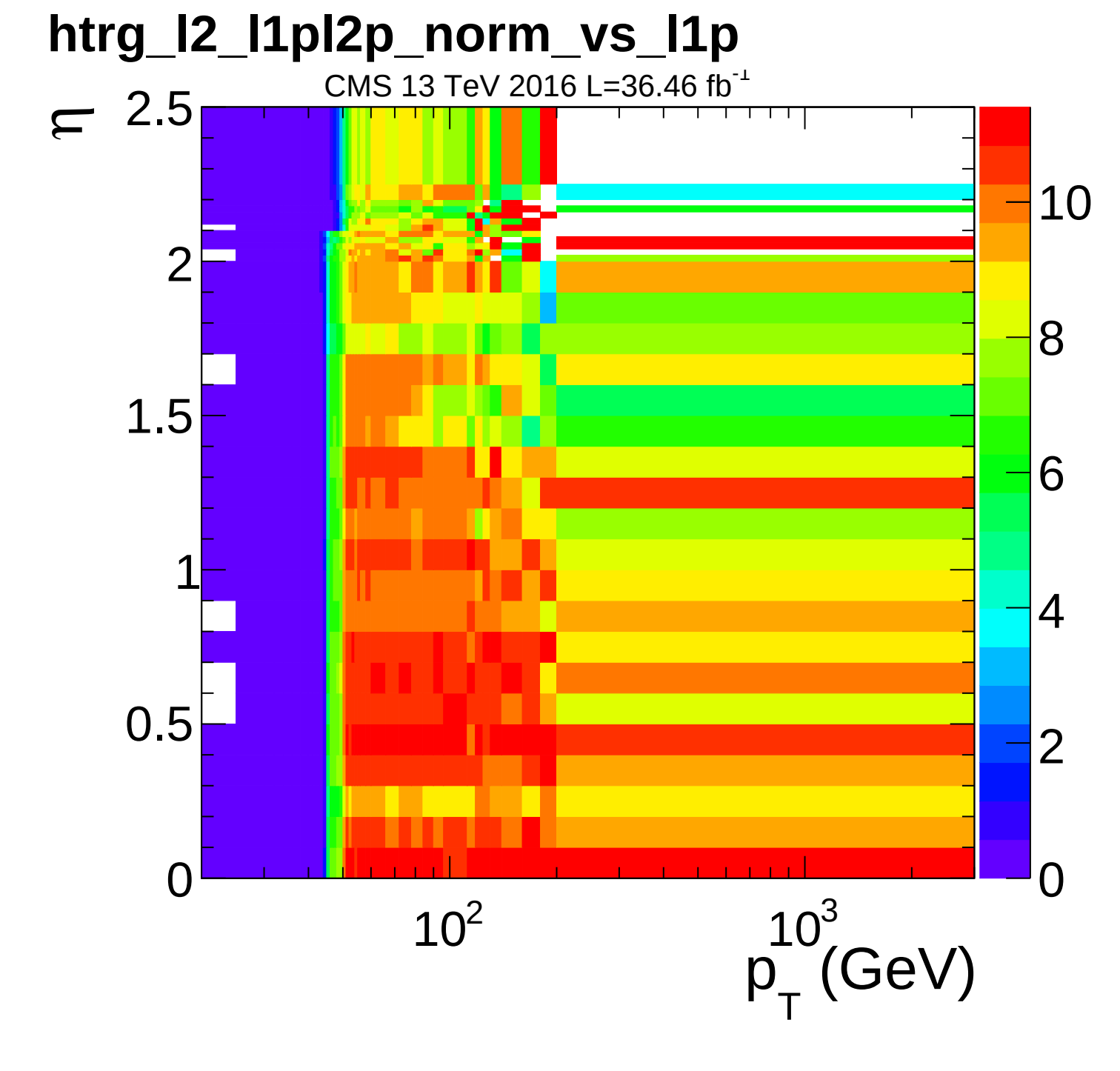

htrg_l2_l1fl2p_norm_vs_tot
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
80
70
60
50
40
30
20
10
0

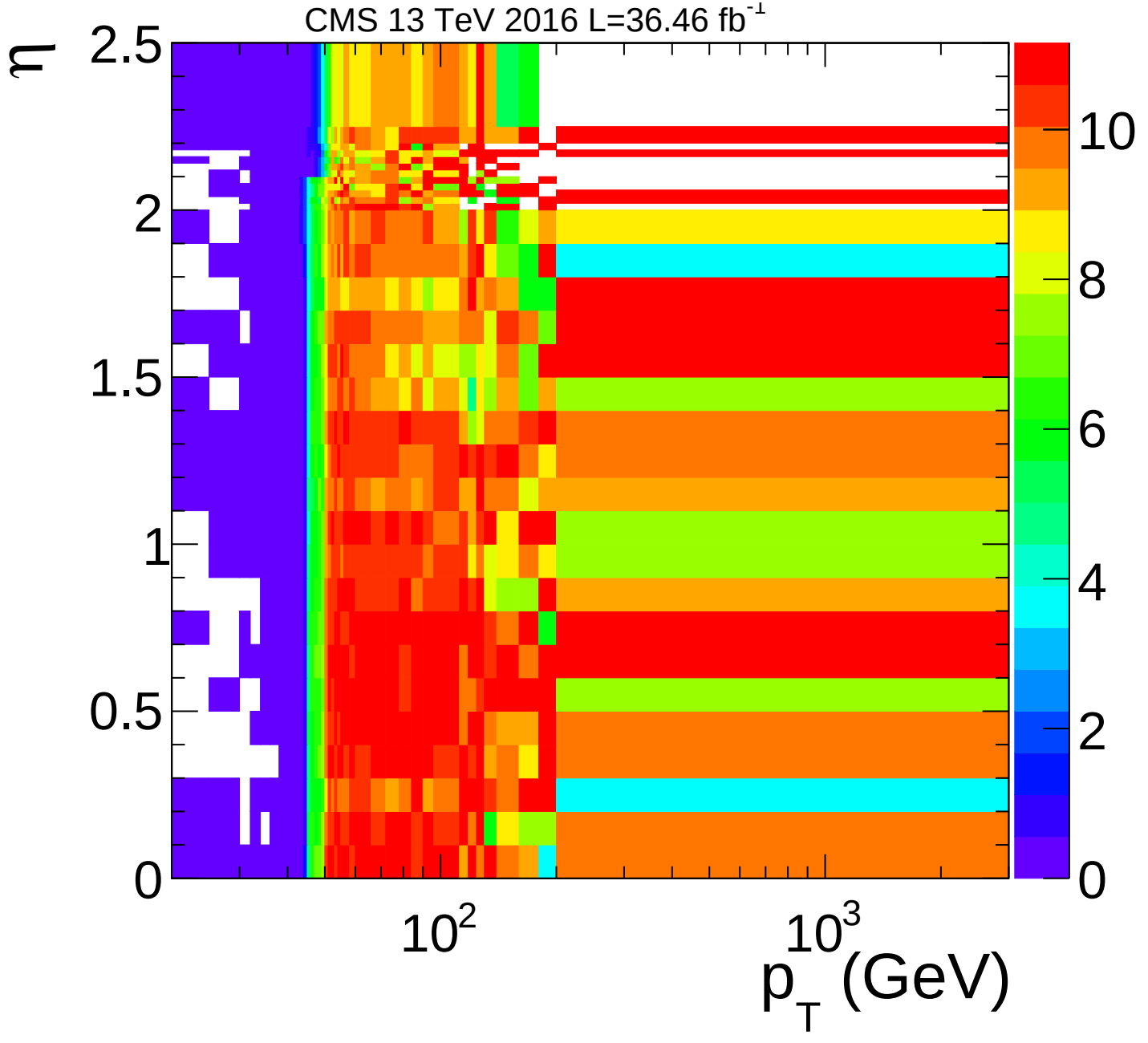

htrg_l1_l1pl2f_norm_vs_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.8
0.6
0.4
0.2
0

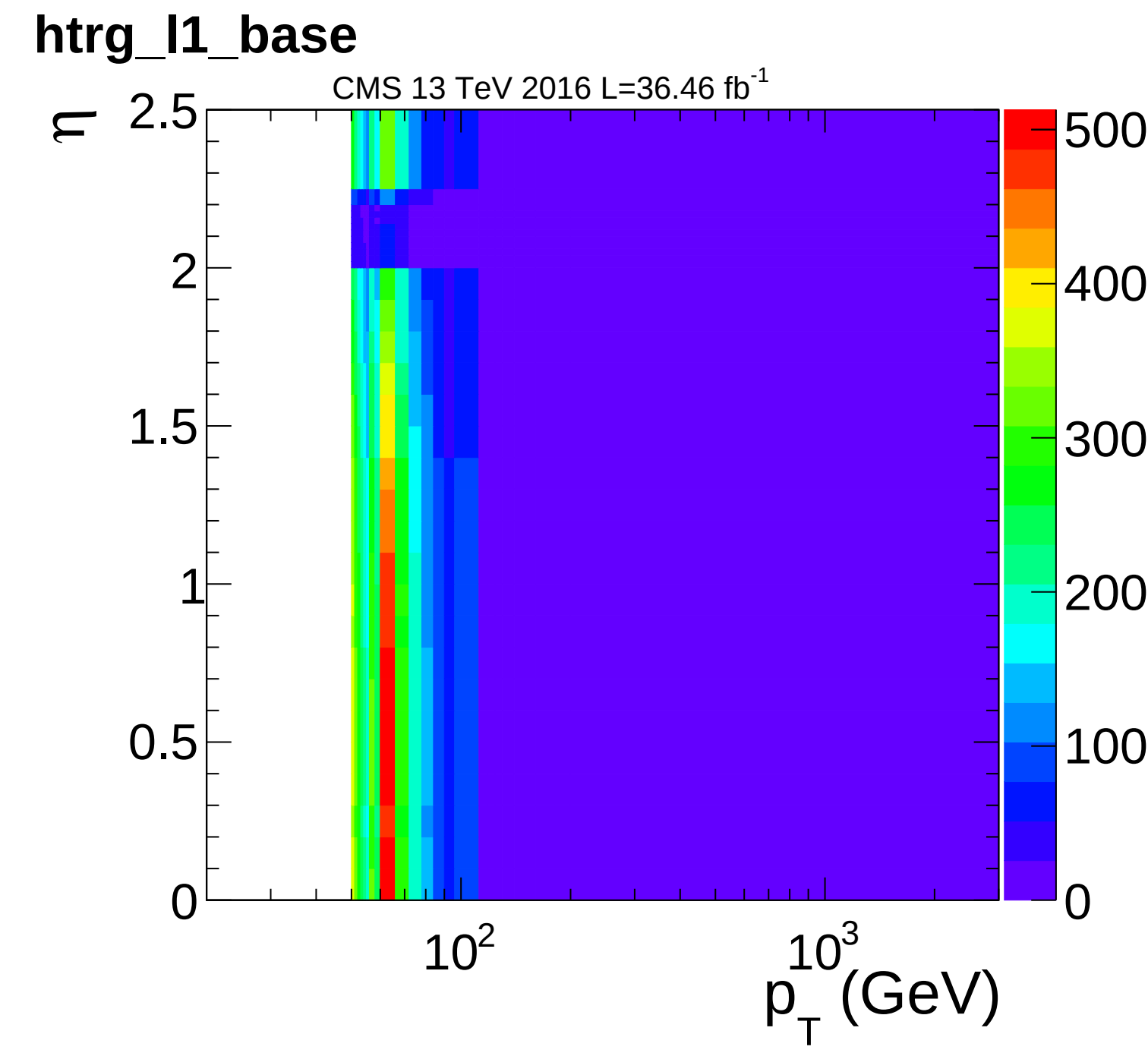

htrg_l1_l1pl2p_norm_vs_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
5
4
3
2
1
0

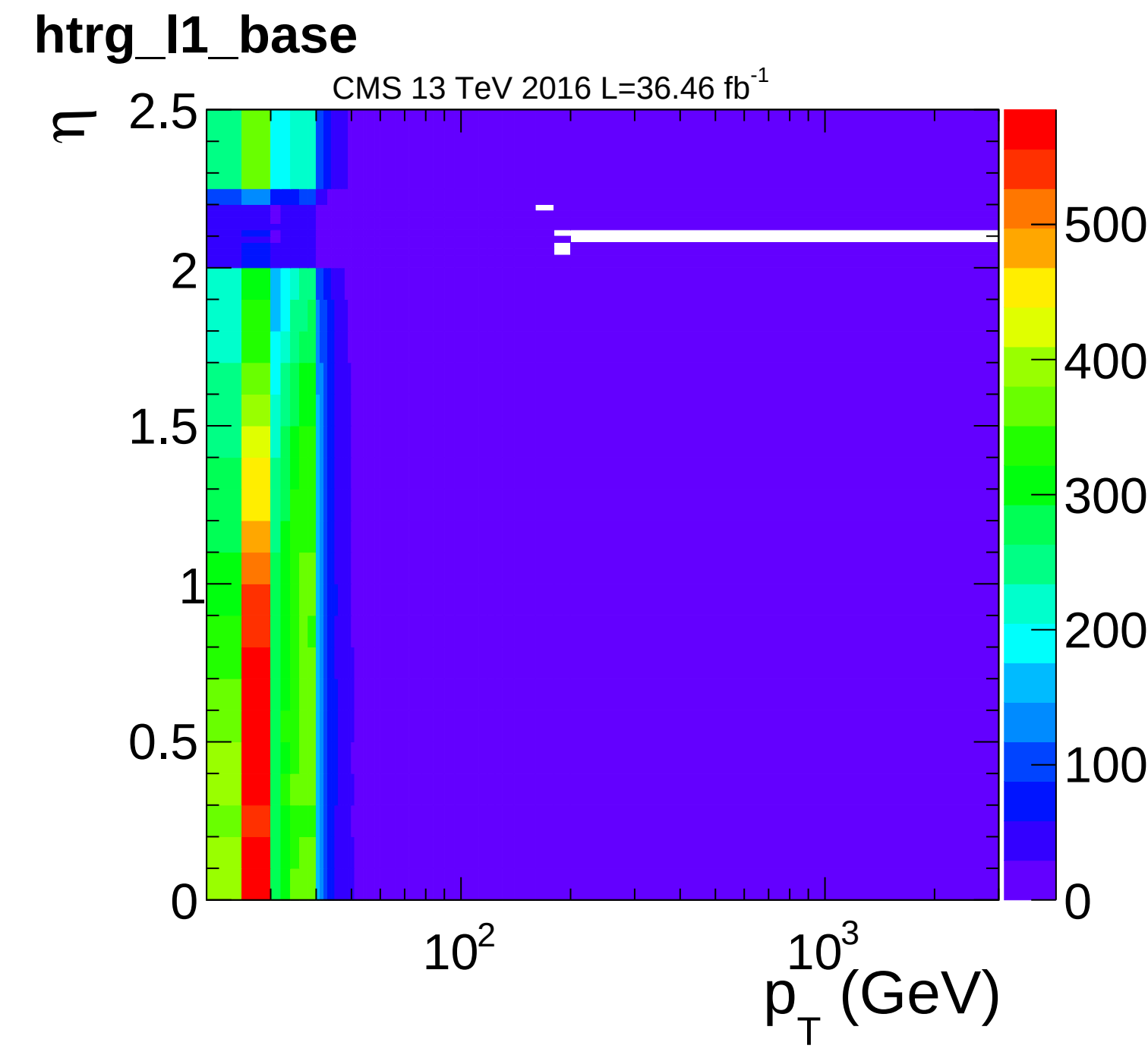

htrg_l1_l1fl2p_norm_vs_l1f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
6
5
4
3
2
1
0

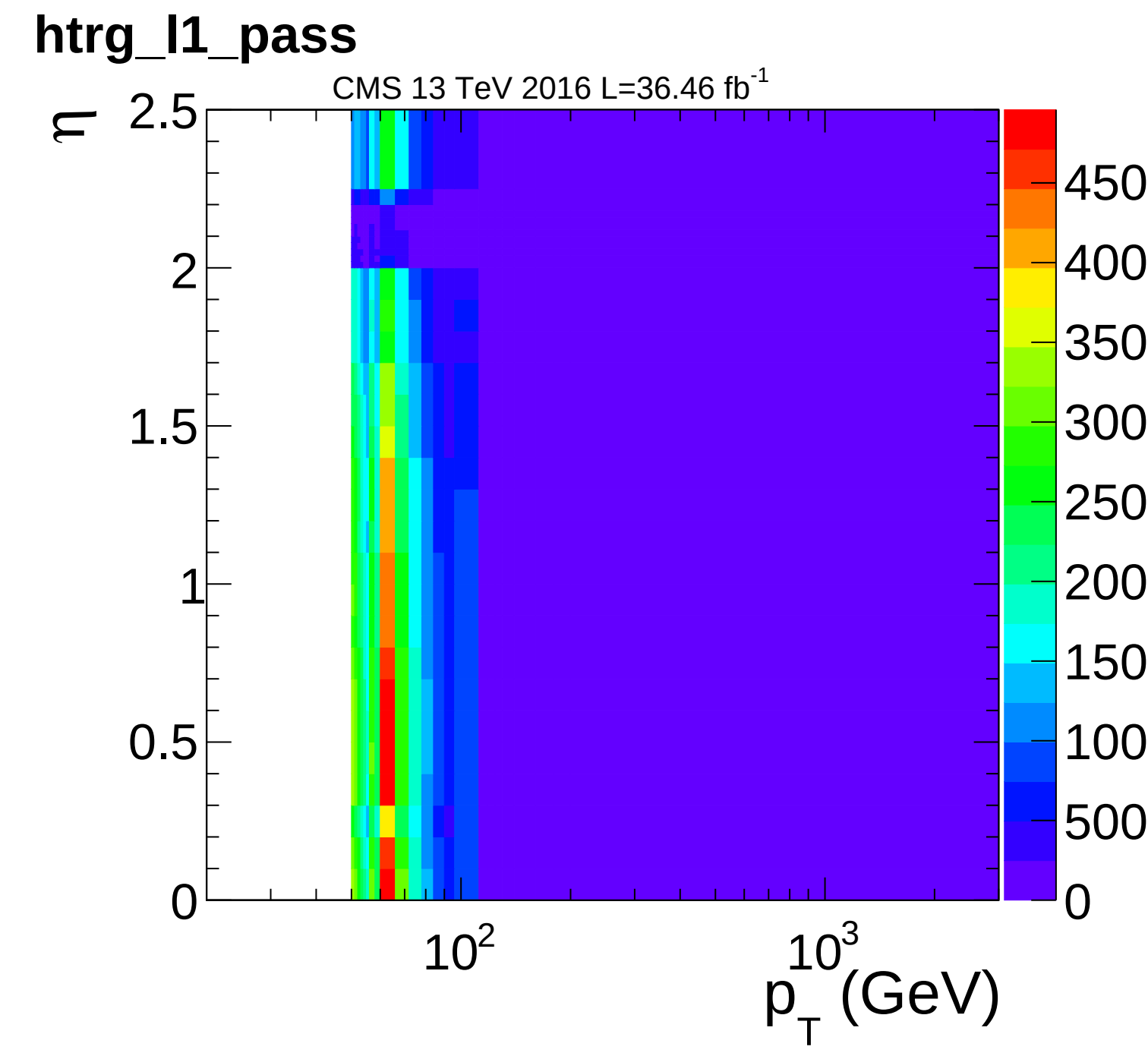

htrg_l2_l1pl2f_norm_vs_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.8
0.6
0.4
0.2
0

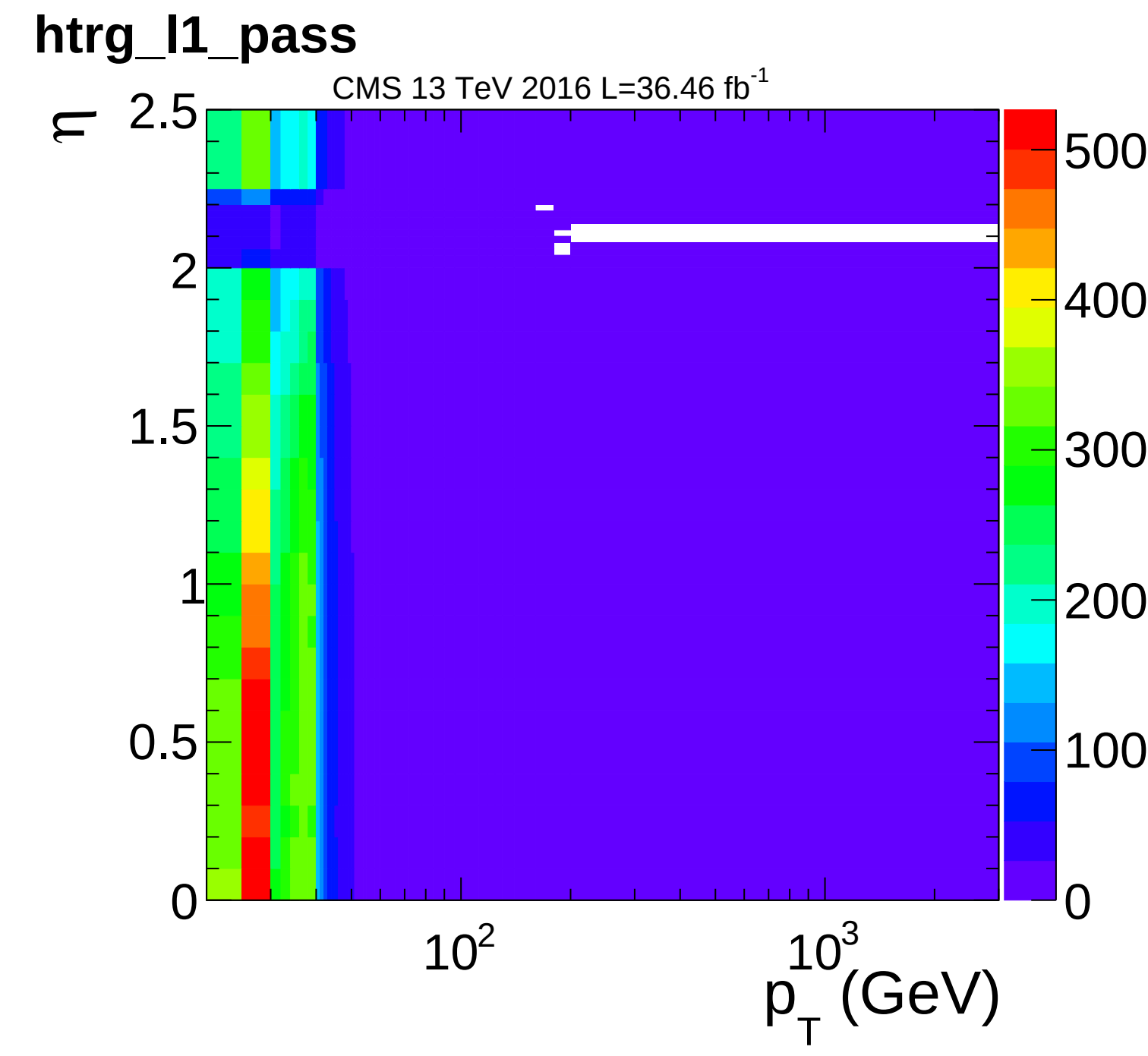

htrg_l2_l1pl2p_norm_vs_l1p
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10
8
6
4
2
0
10^2
10^3
p_T (GeV)

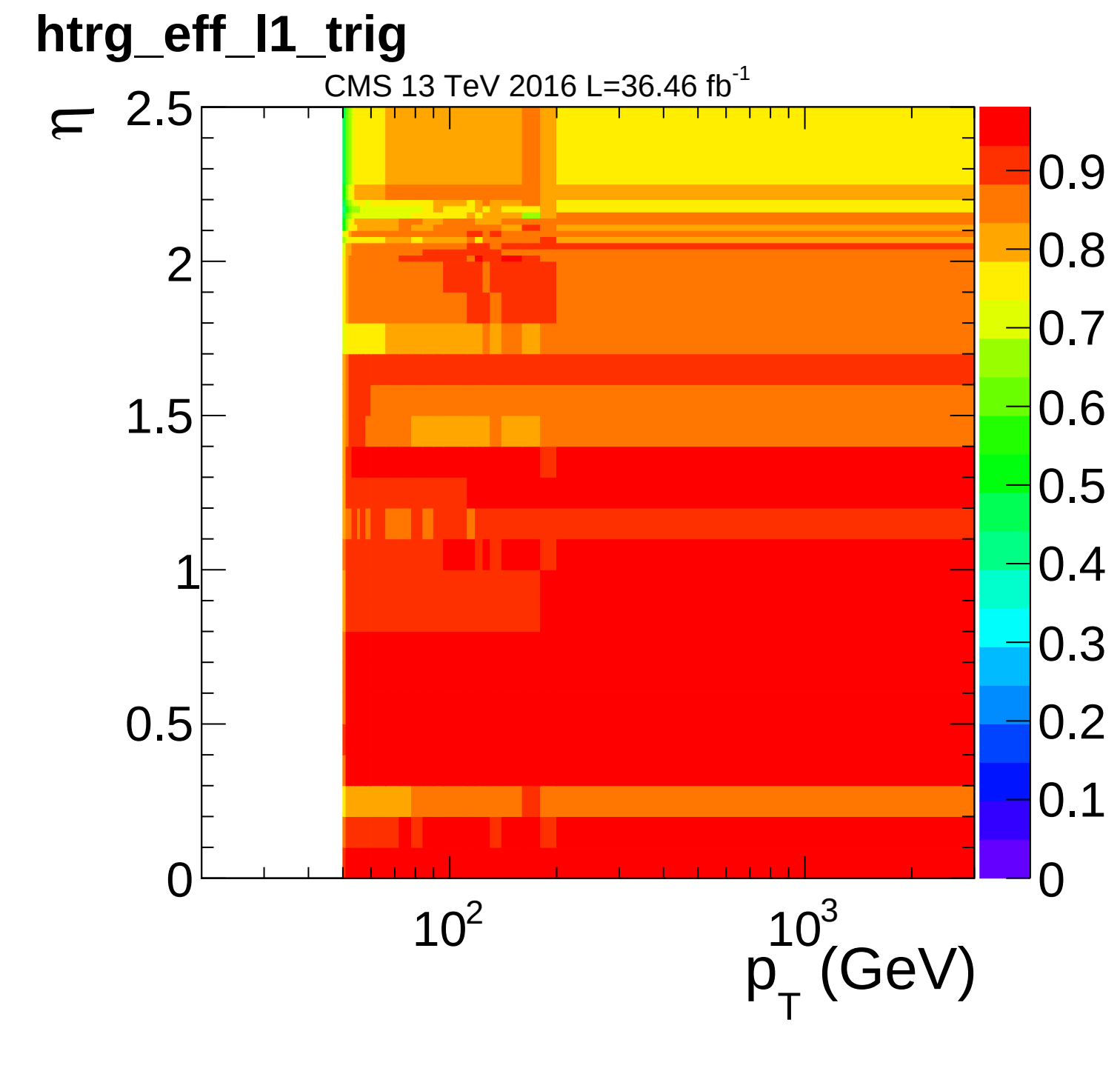

htrg_l2_l1fl2p_norm_vs_l1f
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10
8
6
4
2
0
10^2
10^3
p_T (GeV)

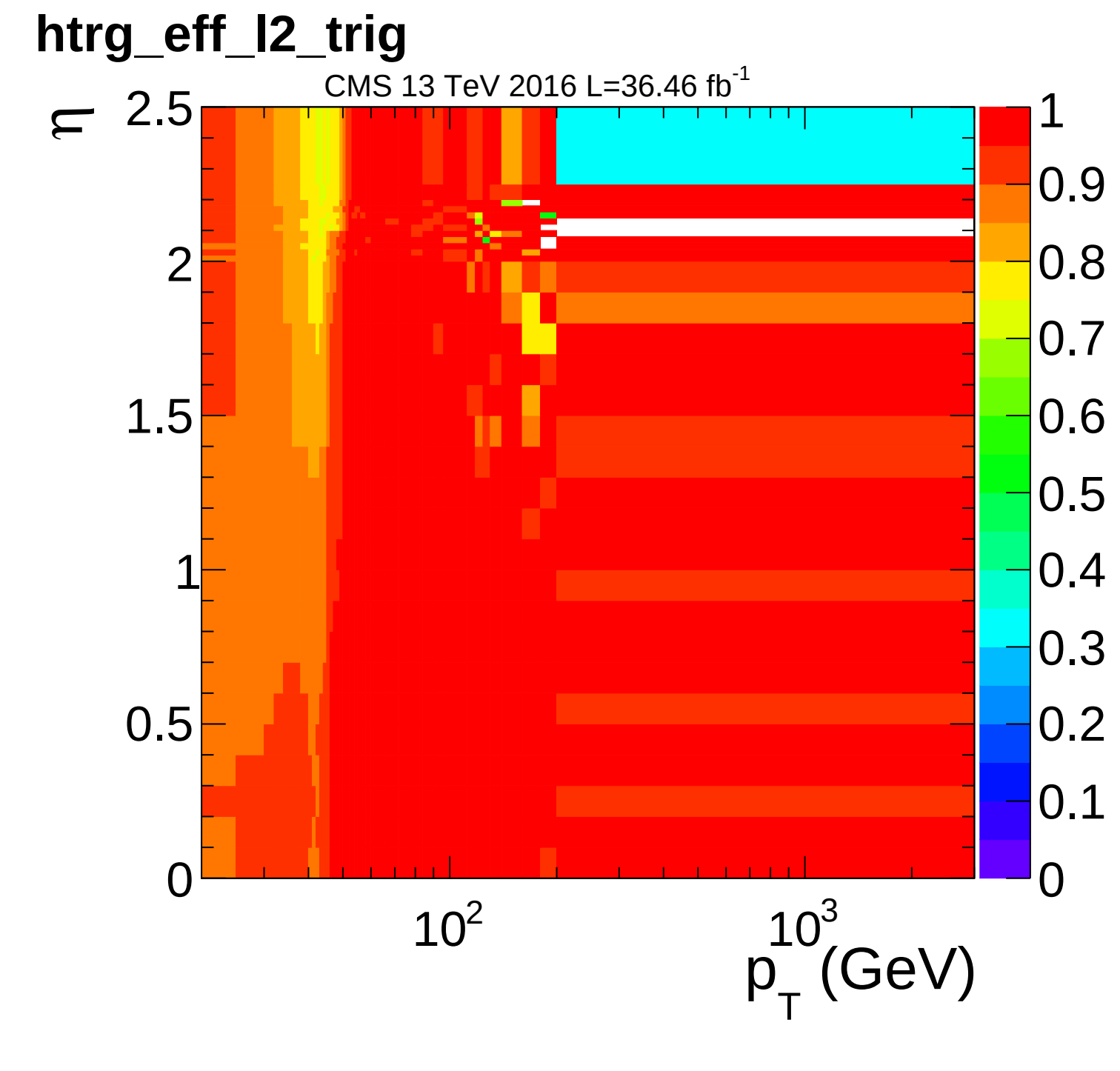

htrg_l1_base
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

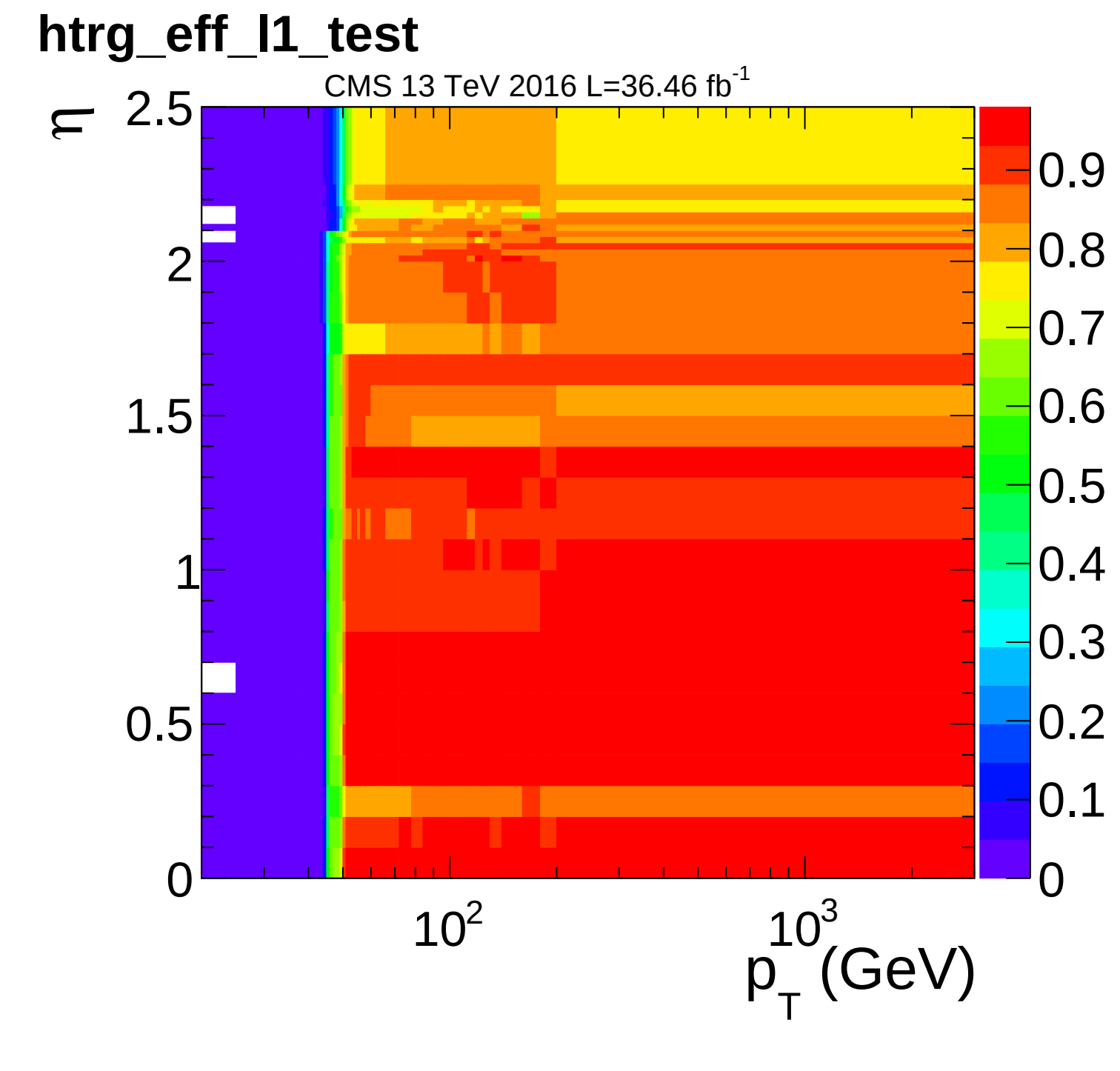

htrg_l1_base
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

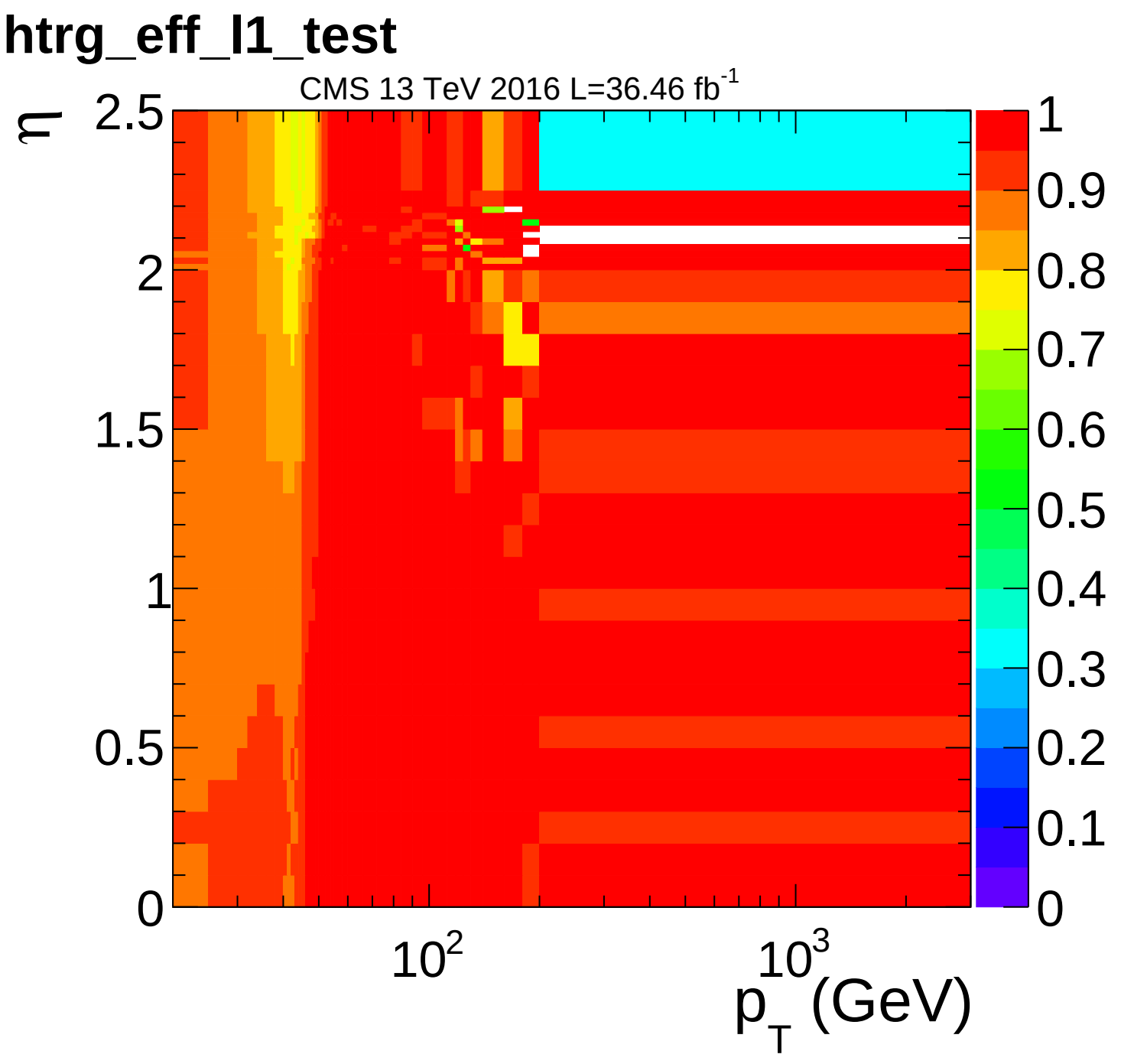

htrg_l1_pass
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
450
400
350
300
250
200
150
100
500
0

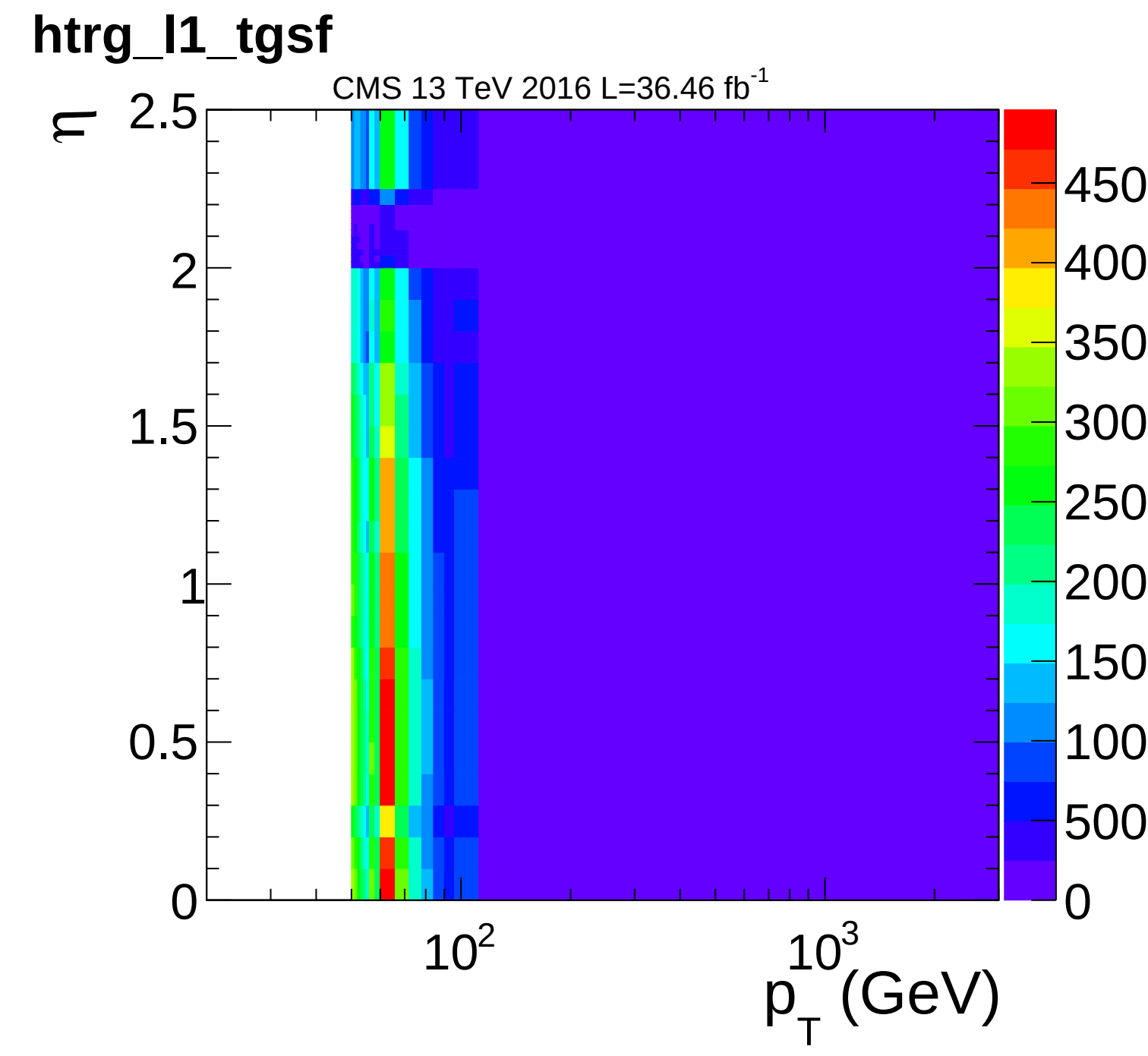

htrg_l1_pass
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)

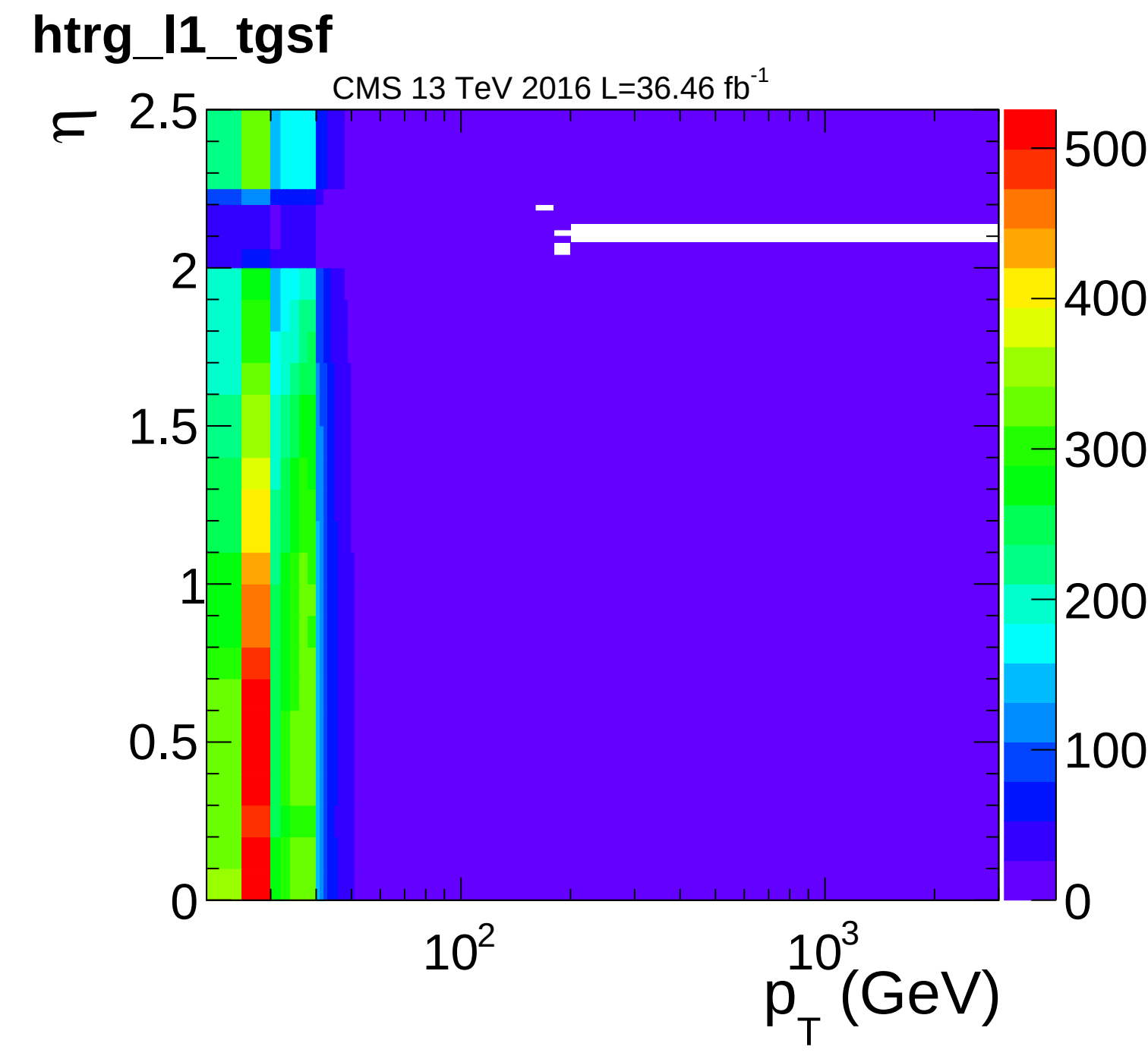

htrg_eff_l1_trig
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

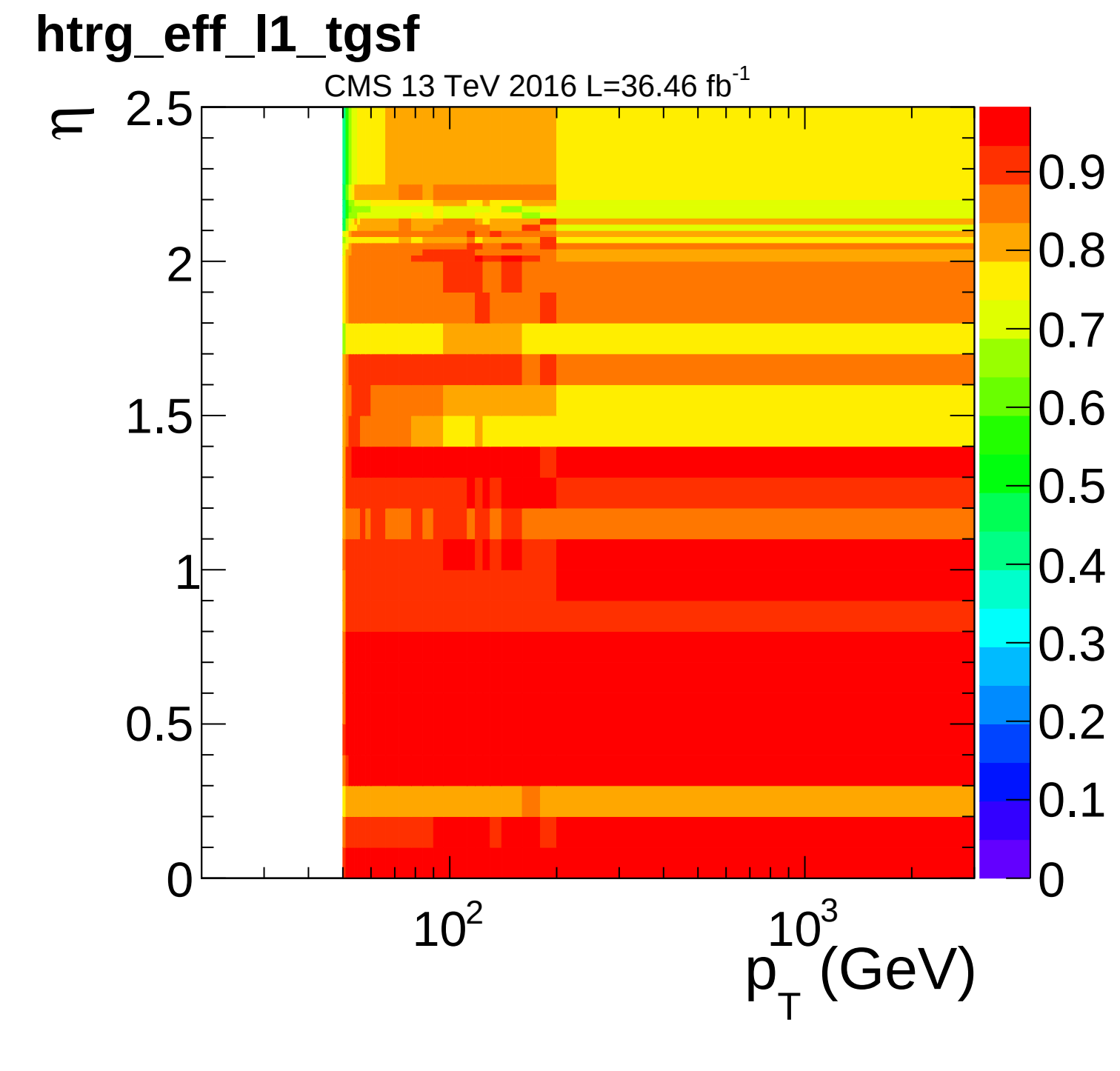

htrg_eff_l2_trig
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10^2
10^3
p_T (GeV)

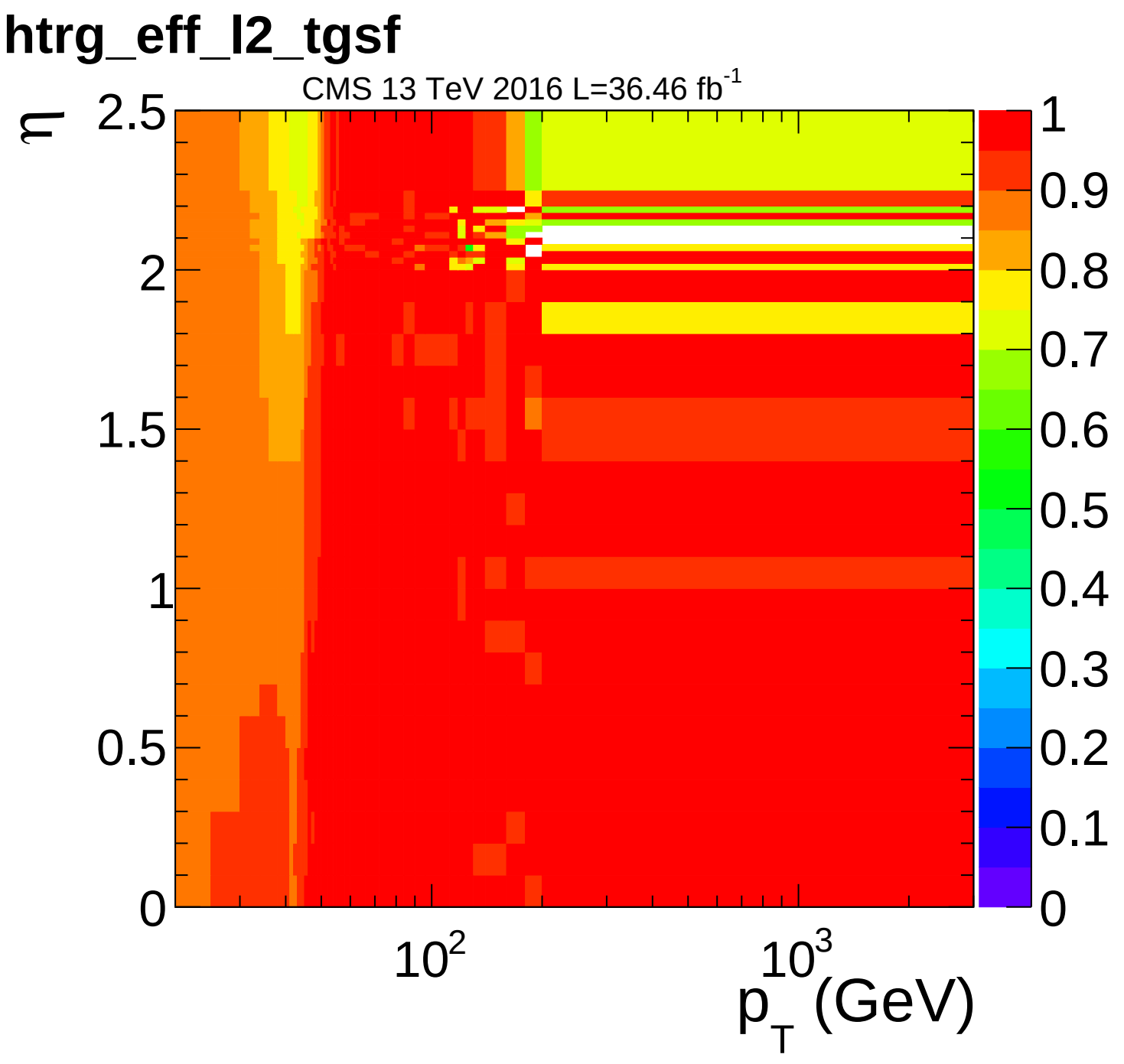

htrg_eff_l1_test
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10^2
10^3
p_T (GeV)


htrg_eff_l1_test
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0


htrg_l1_tgsf
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
450
400
350
300
250
200
150
100
500
0
10^2
10^3
p_T (GeV)


htrg_l1_tgsf
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
500
400
300
200
100
0
10^2
10^3
p_T (GeV)


htrg_eff_l1_tgsf
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0


htrg_eff_l2_tgsf
CMS 13 TeV 2016 L=36.46 fb-1
η
2.5
2
1.5
1
0.5
0
10^2
10^3
p_T (GeV)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0