50 GeV (10%)

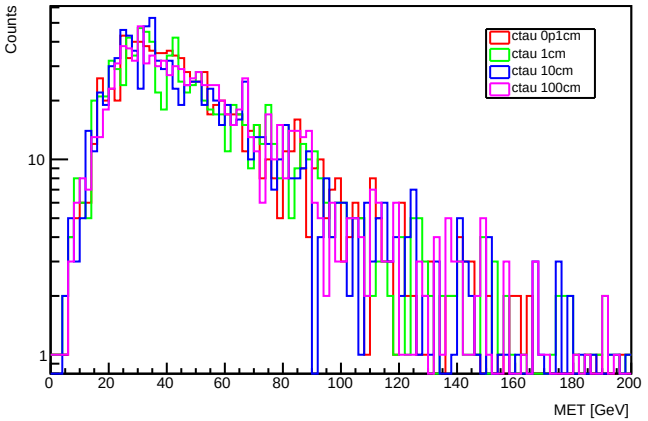
nevents ctau 0p1cm: 1000(c1:708(634),c2:59(49),c3:43(34),c4:6(34))

nevents ctau 1cm: 1000(c1:709(619),c2:74(63),c3:51(42),c4:11(42))

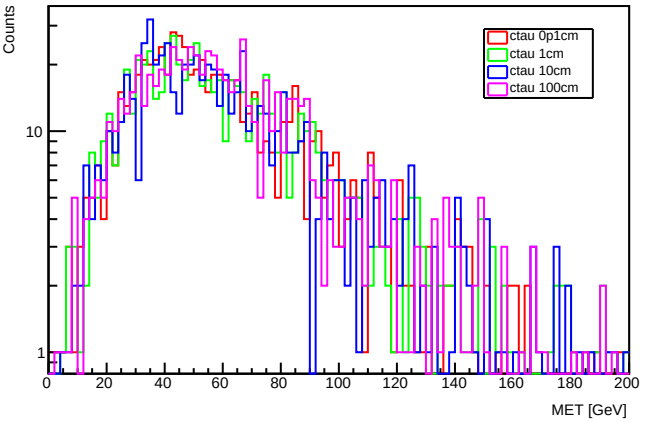
nevents ctau 10cm: 1000(c1:691(612),c2:67(58),c3:38(38),c4:11(38))

nevents ctau 100cm: 1000(c1:723(663),c2:60(58),c3:41(36),c4:11(36))

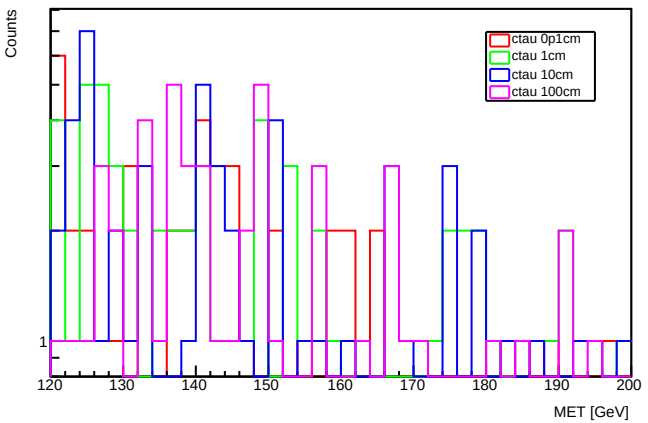
gen leading MET: no cuts



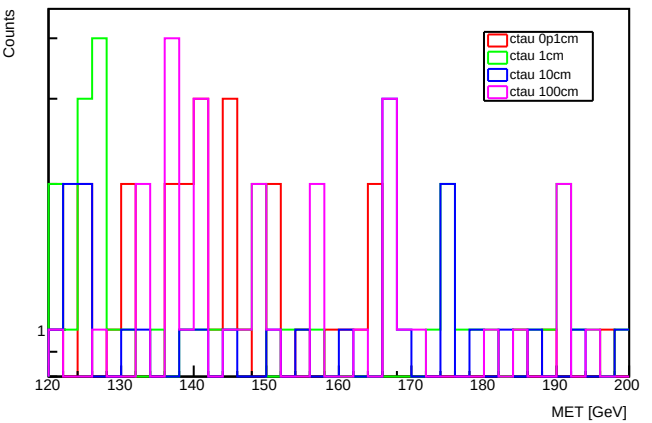
gen leading MET: n_jet >=1, j1pt > 30 GeV



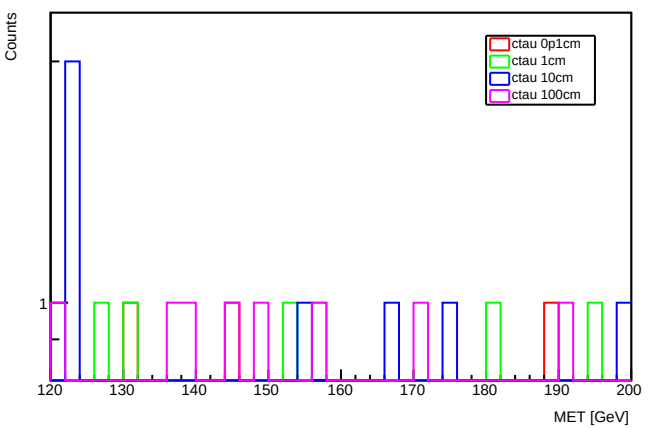
gen leading MET: MET > 120 GeV



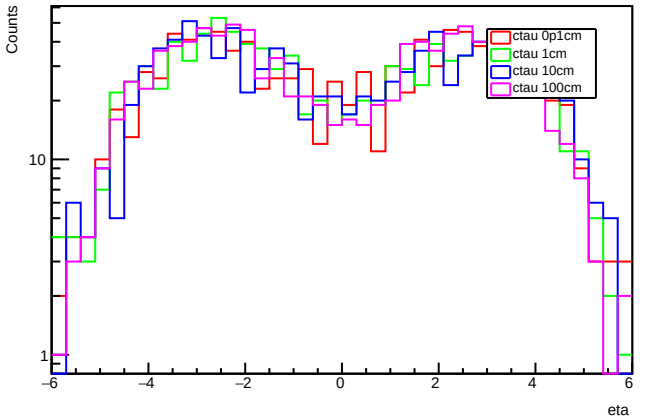
gen leading MET: j1pt >120, at most 2 jets w/ pt >30 GeV



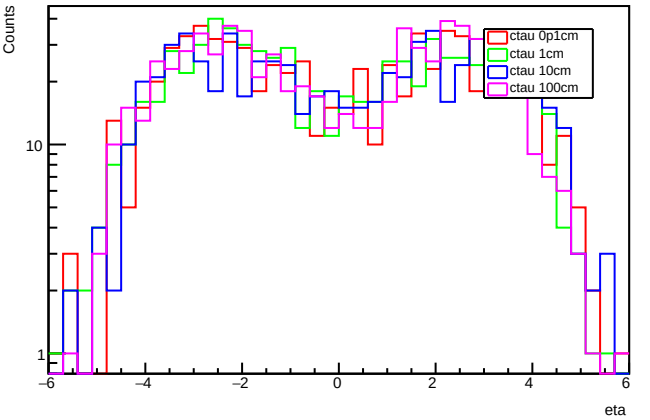
gen leading MET: at least 2 mu w/ pt > 2 GeV and eta<2.5



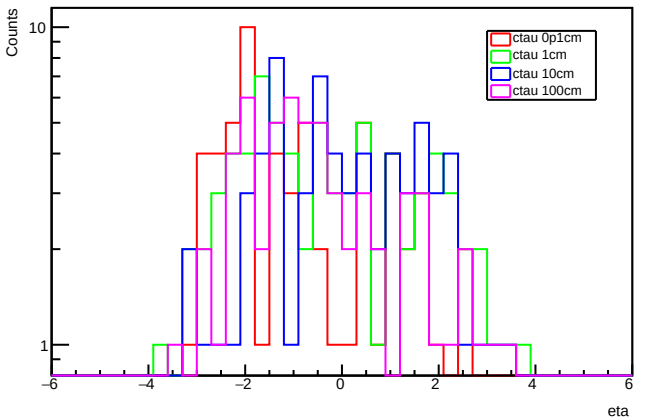
gen leading Met eta: no cuts



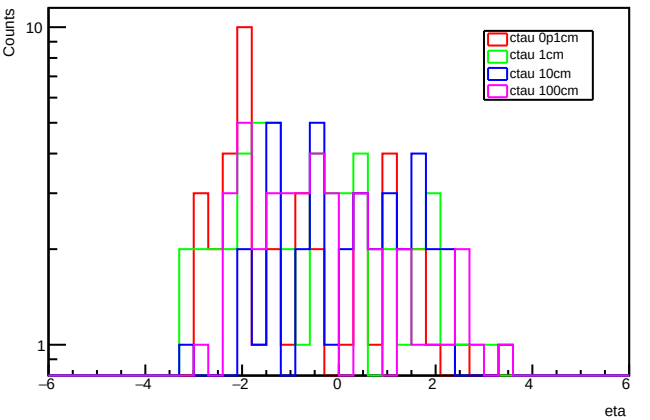
gen leading Met eta: n_jet >=1, j1pt > 30 GeV



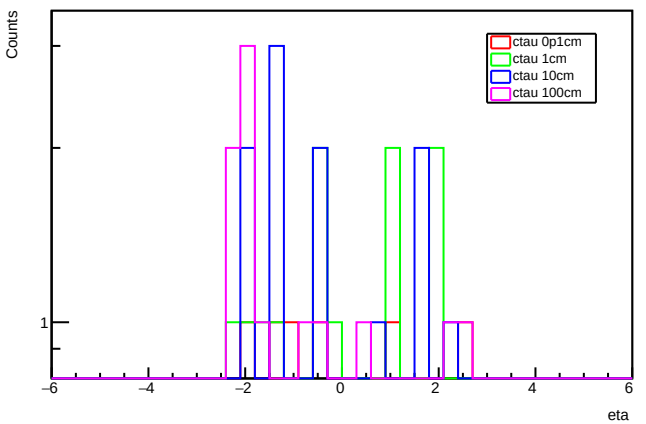
gen leading Met eta: MET > 120 GeV



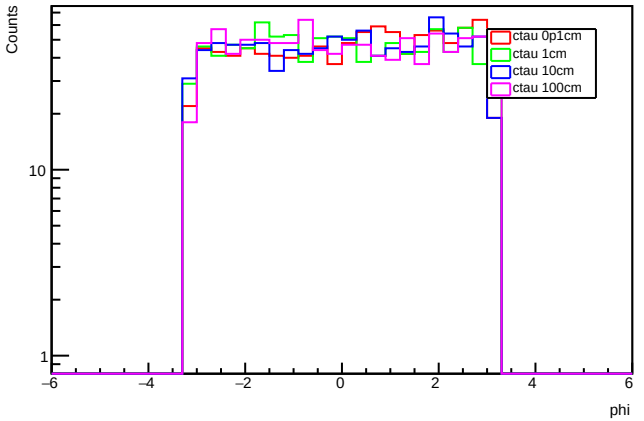
gen leading Met eta: j1pt >120, at most 2 jets w/ pt >30 GeV



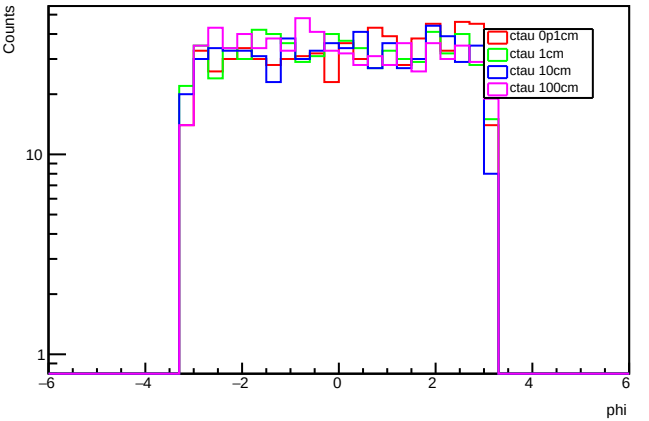
gen leading Met eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



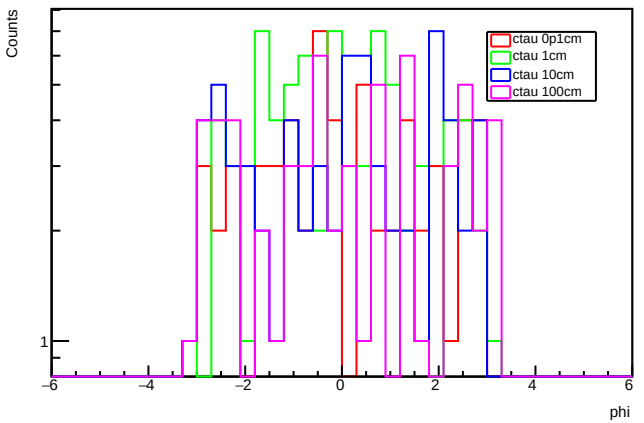
gen leading Met phi: no cuts



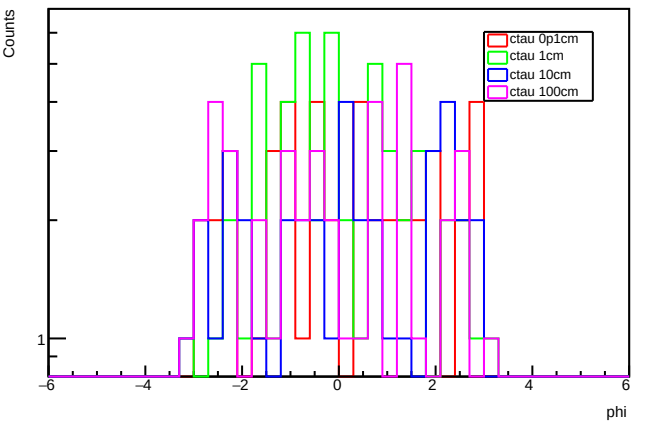
gen leading Met phi: n_jet >=1, j1pt > 30 GeV



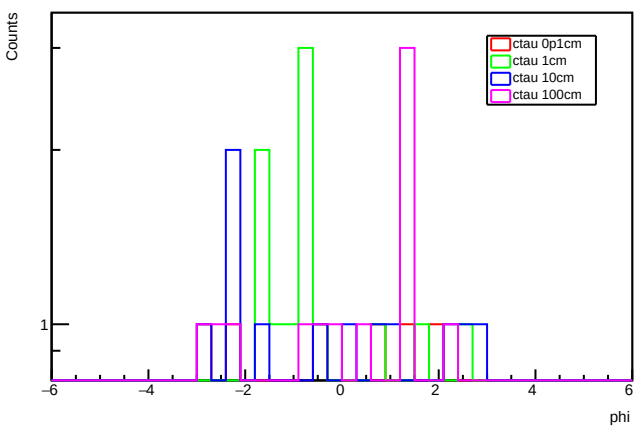
gen leading Met phi: MET > 120 GeV



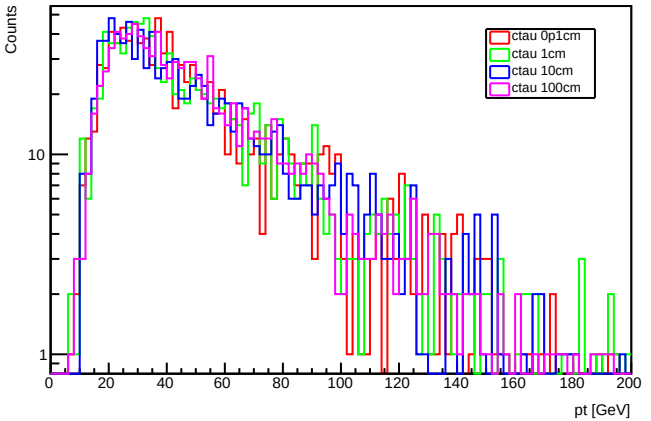
gen leading Met phi: j1pt >120, at most 2 jets w/ pt >30 GeV



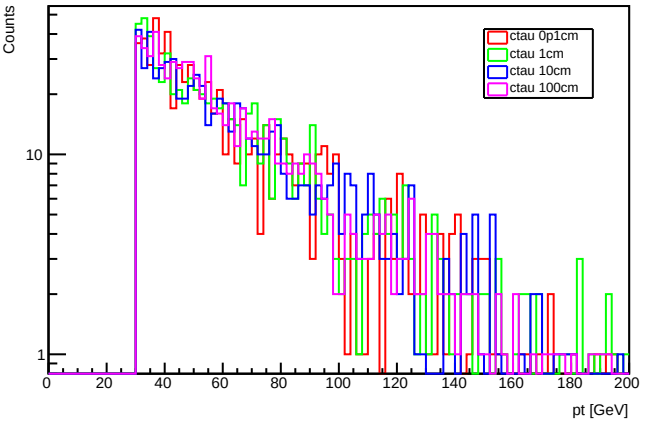
gen leading Met phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



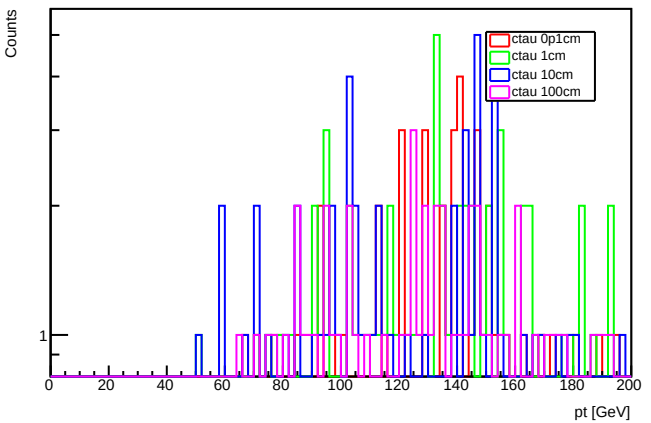
gen leading Jet pt: no cuts



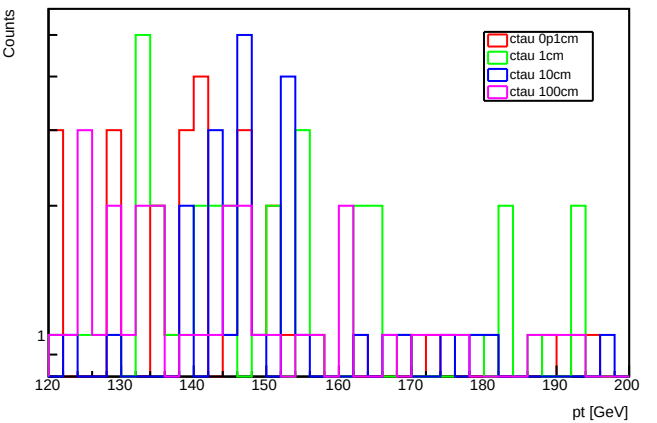
gen leading Jet pt: n_jet >=1, j1pt > 30 GeV



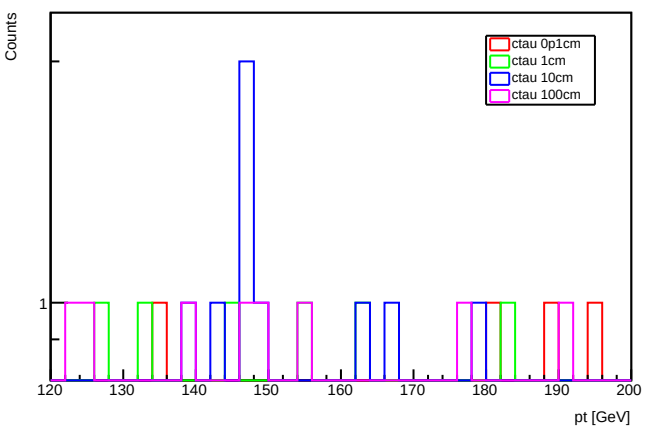
gen leading Jet pt: MET > 120 GeV



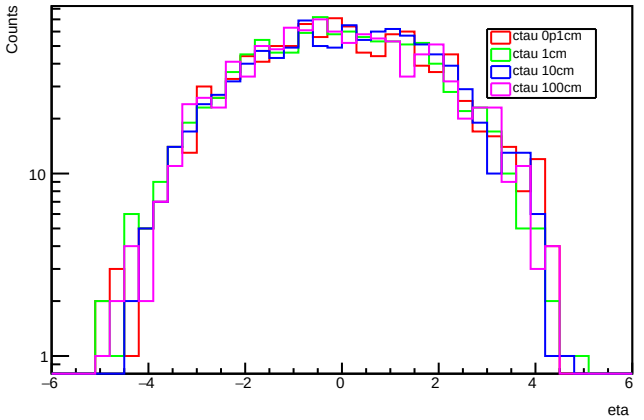
gen leading Jet pt: j1pt >120, at most 2 jets w/ pt >30 GeV



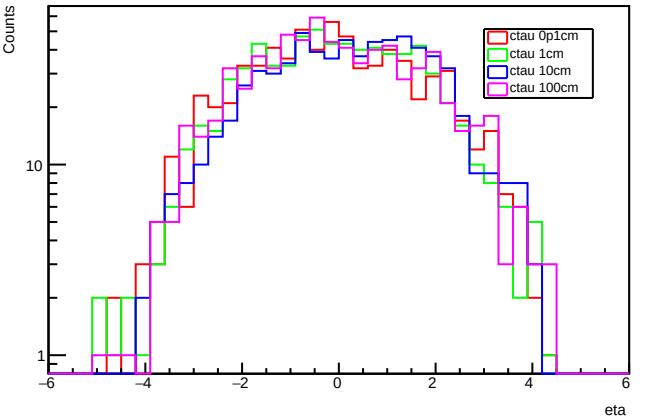
gen leading Jet pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



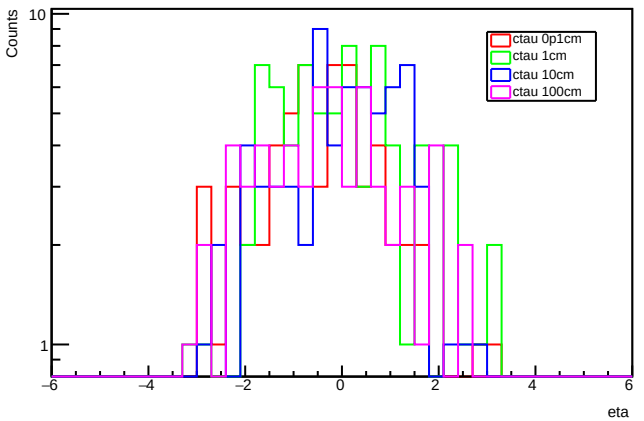
gen leading Jet eta: no cuts



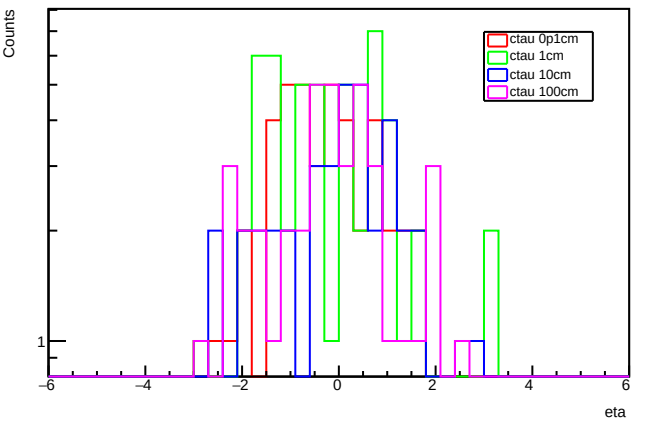
gen leading Jet eta: n_jet >=1, j1pt > 30 GeV



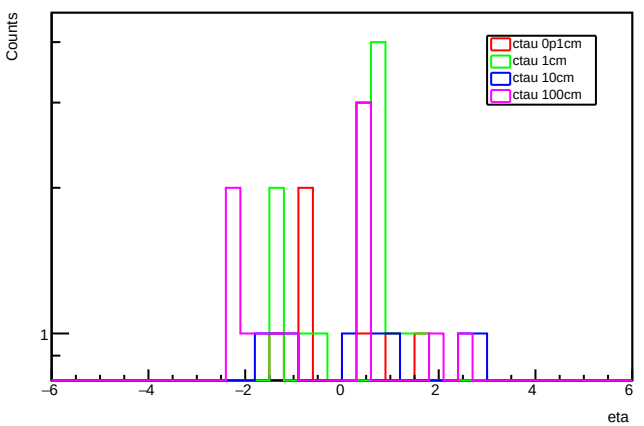
gen leading Jet eta: MET > 120 GeV



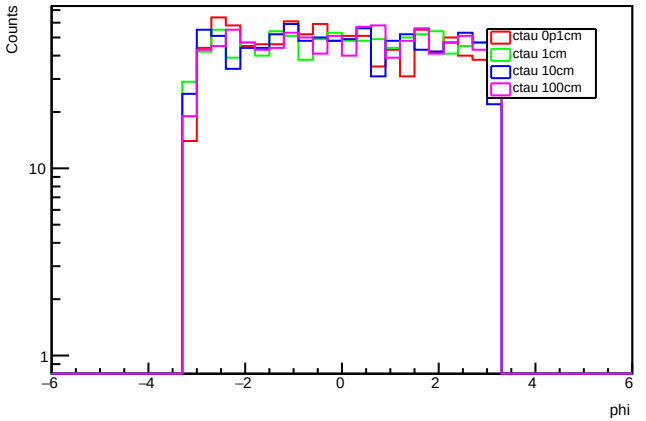
gen leading Jet eta: j1pt >120, at most 2 jets w/ pt >30 GeV



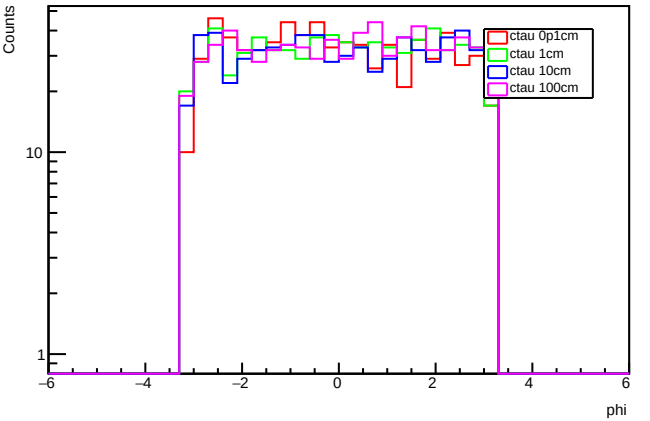
gen leading Jet eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



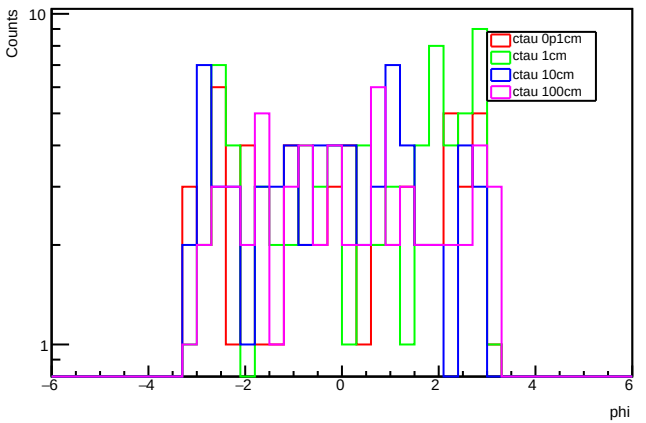
gen leading Jet phi: no cuts



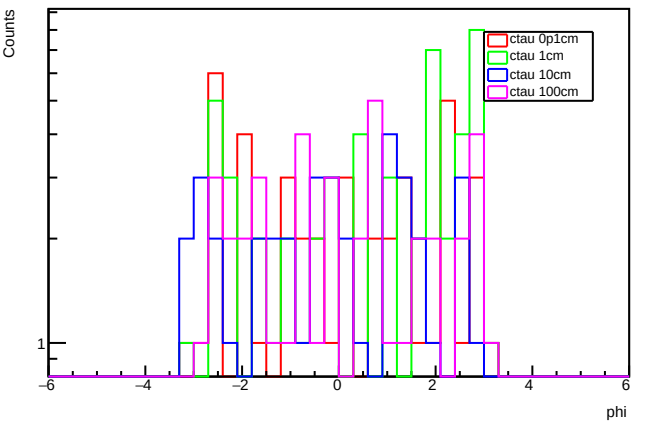
gen leading Jet phi: n_jet >=1, j1pt > 30 GeV



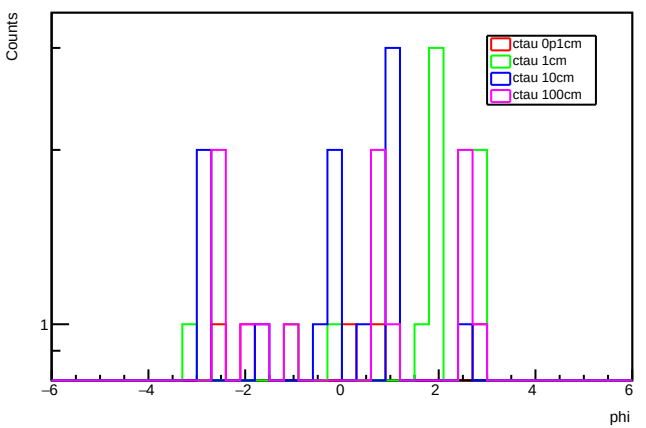
gen leading Jet phi: MET > 120 GeV



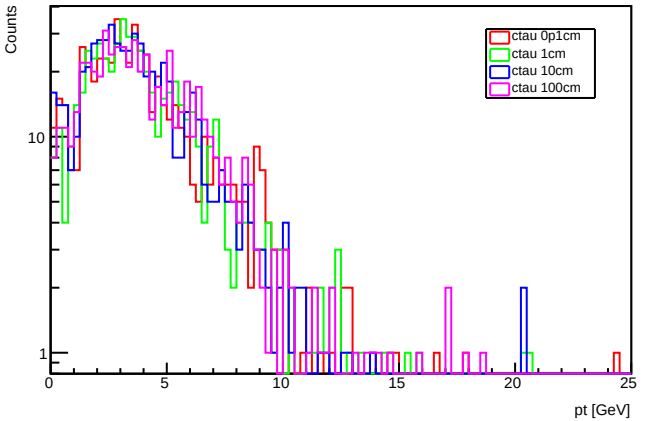
gen leading Jet phi: j1pt >120, at most 2 jets w/ pt >30 GeV



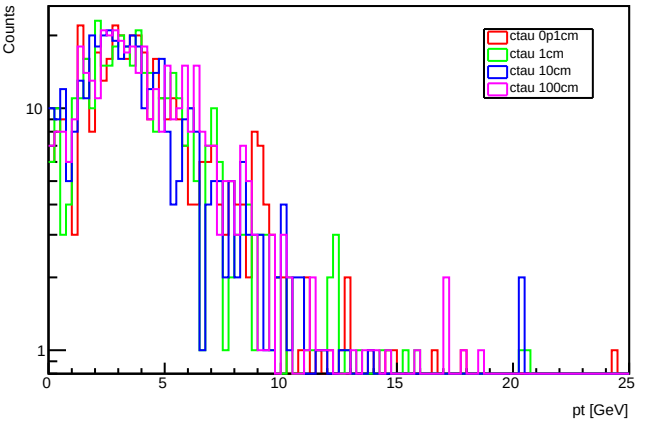
gen leading Jet phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



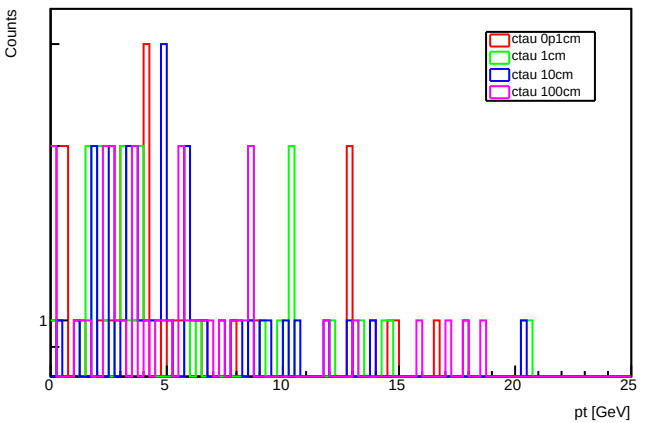
gen leading Mu pt: no cuts



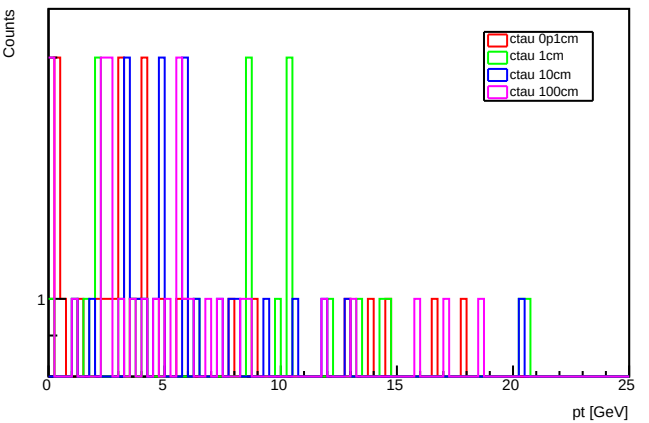
gen leading Mu pt: n_jet >=1, j1pt > 30 GeV



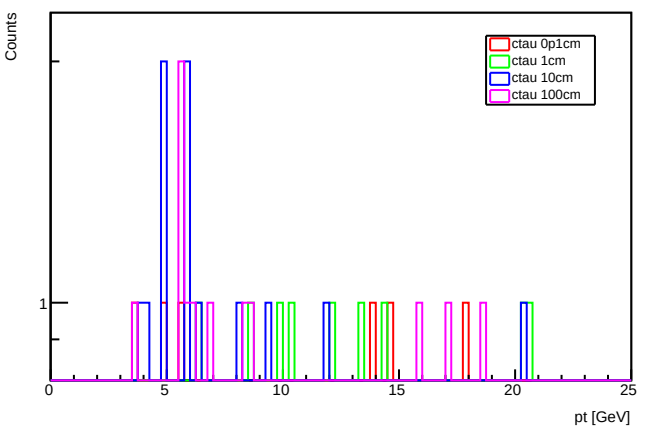
gen leading Mu pt: MET > 120 GeV



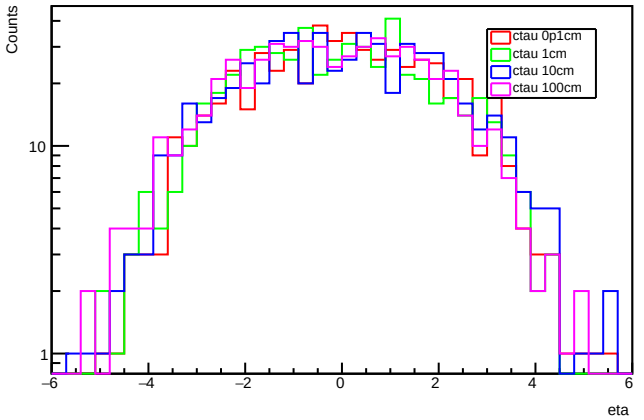
gen leading Mu pt: j1pt >120, at most 2 jets w/ pt >30 GeV



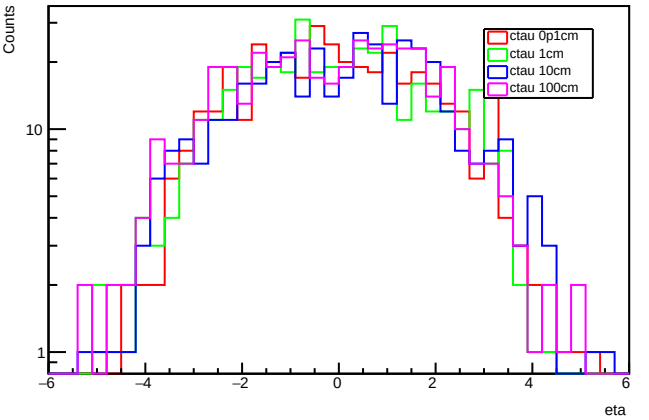
gen leading Mu pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



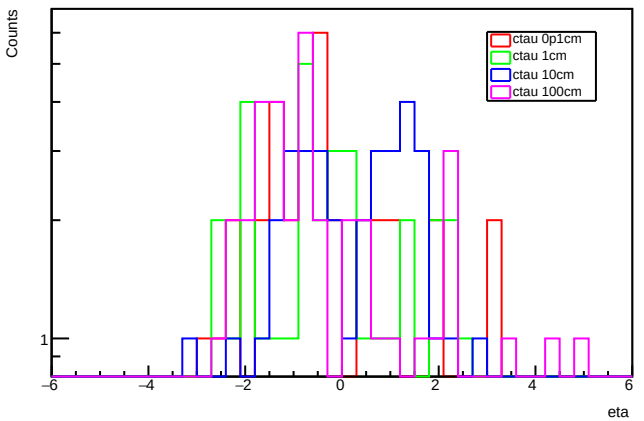
gen leading Mu eta: no cuts



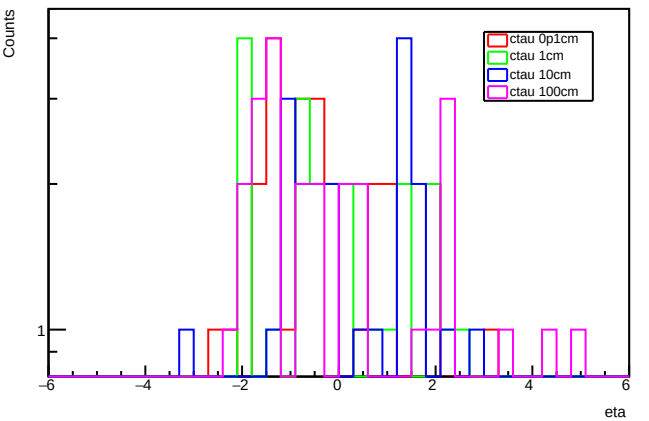
gen leading Mu eta: n_jet >=1, j1pt > 30 GeV



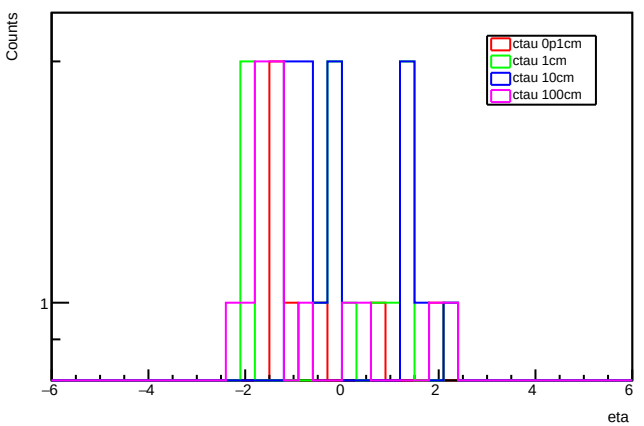
gen leading Mu eta: MET > 120 GeV



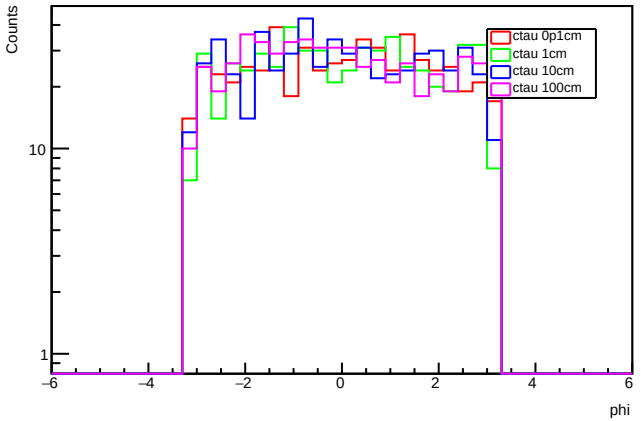
gen leading Mu eta: j1pt >120, at most 2 jets w/ pt >30 GeV



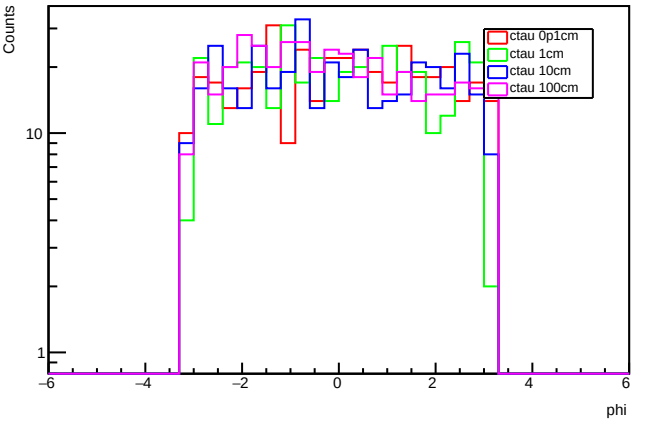
gen leading Mu eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



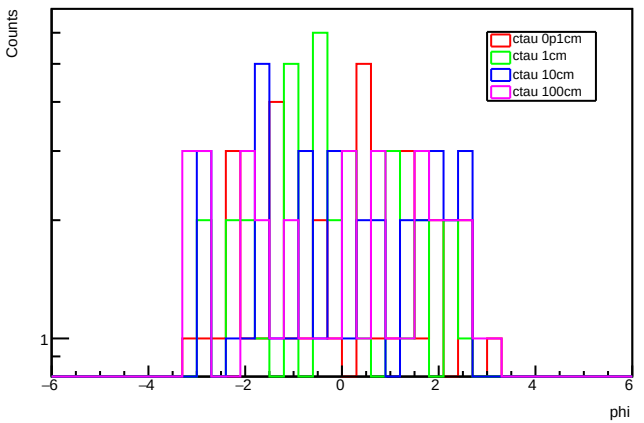
gen leading Mu phi: no cuts



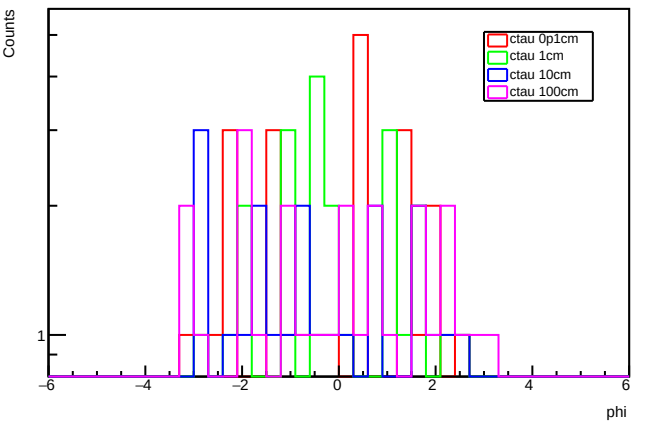
gen leading Mu phi: n_jet >=1, j1pt > 30 GeV



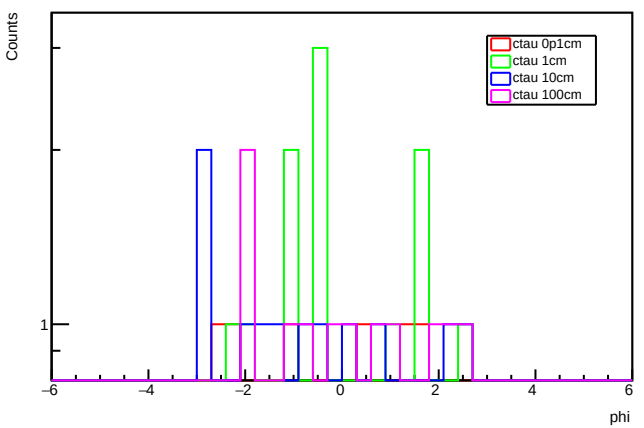
gen leading Mu phi: MET > 120 GeV



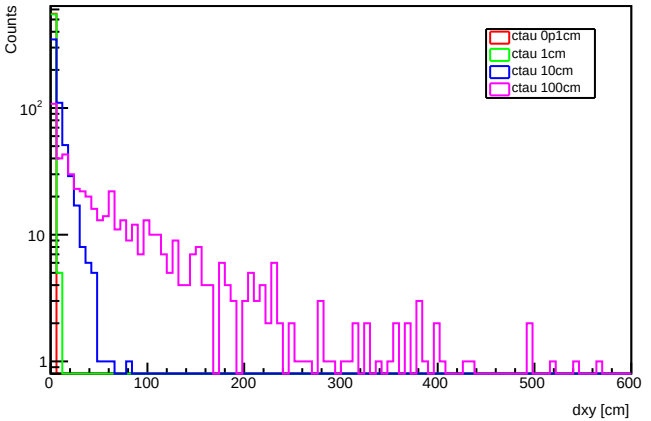
gen leading Mu phi: j1pt >120, at most 2 jets w/ pt >30 GeV



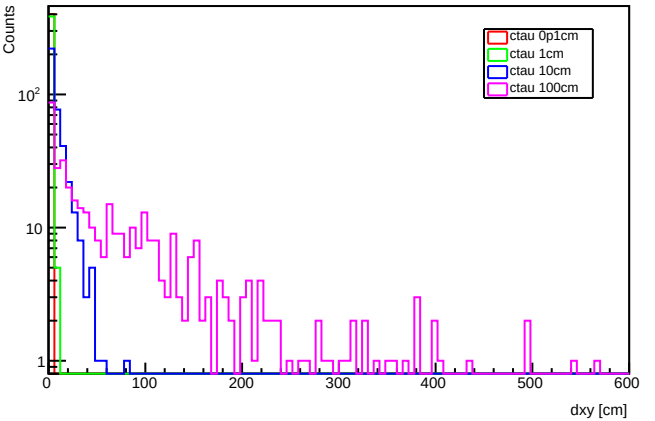
gen leading Mu phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



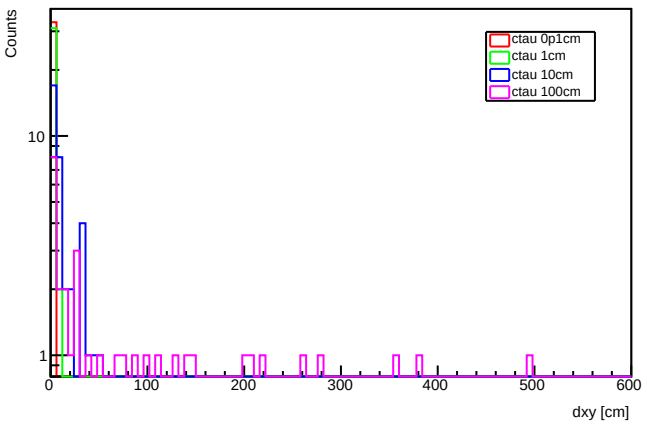
gen leading Mu vxy: no cuts



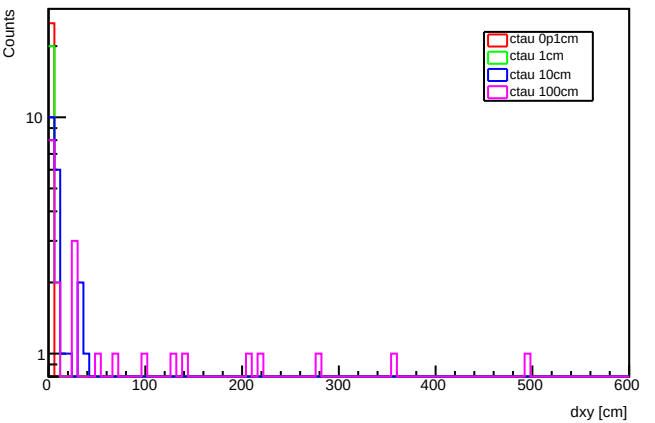
gen leading Mu vxy: n_jet >=1, j1pt > 30 GeV



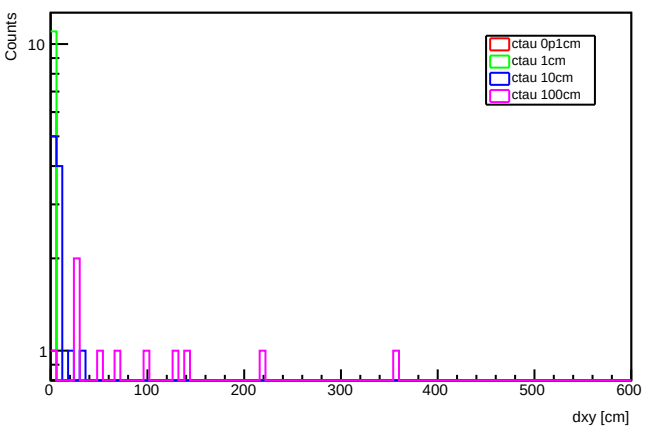
gen leading Mu vxy: MET > 120 GeV



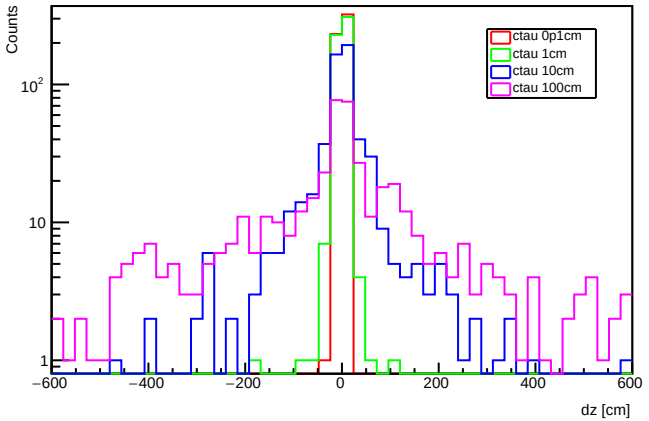
gen leading Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



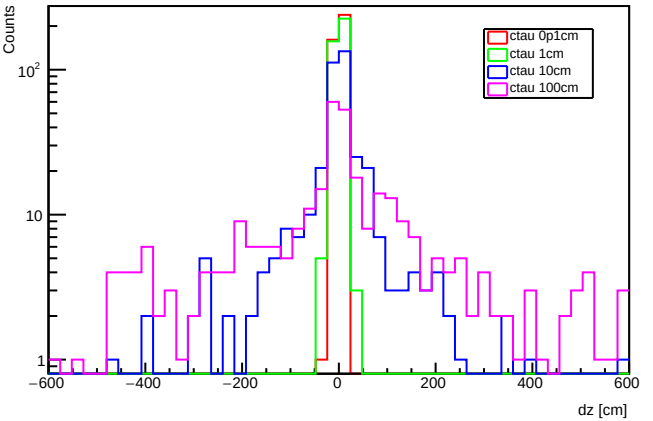
gen leading Mu vxy: at least 2 mu w/ pt > 2 GeV and eta<2.5



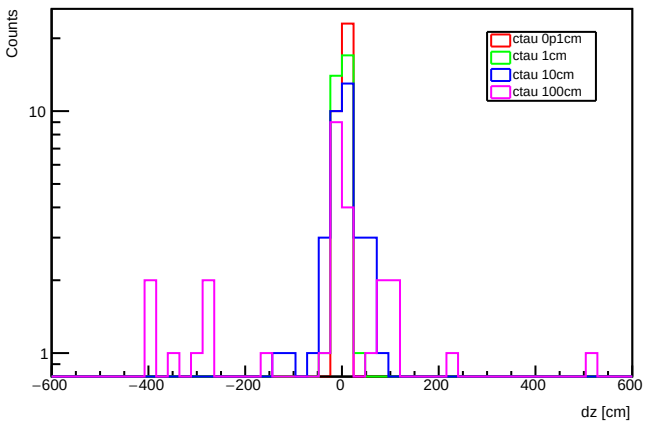
gen leading Mu vz: no cuts



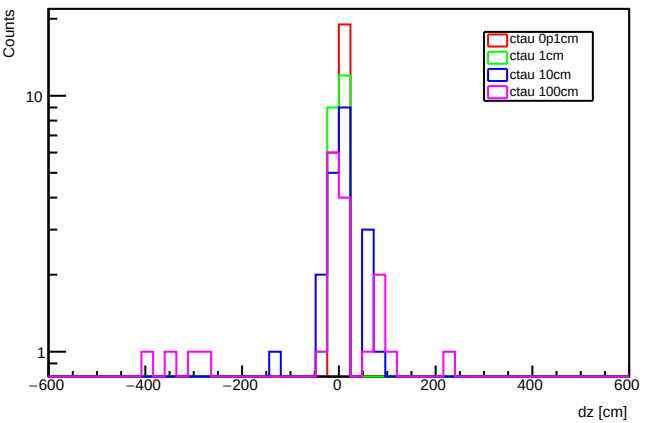
gen leading Mu vz: n_jet >=1, j1pt > 30 GeV



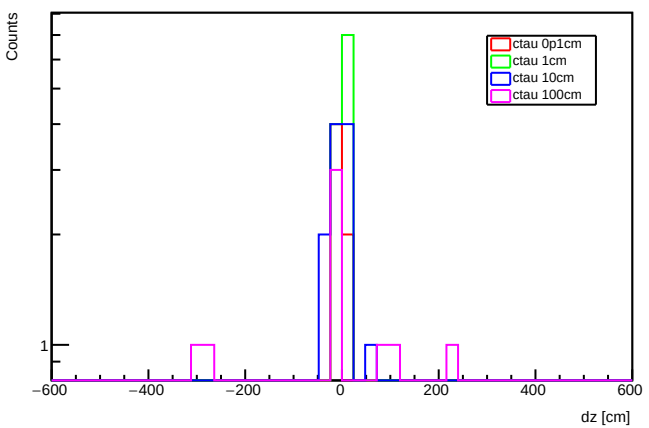
gen leading Mu vz: MET > 120 GeV



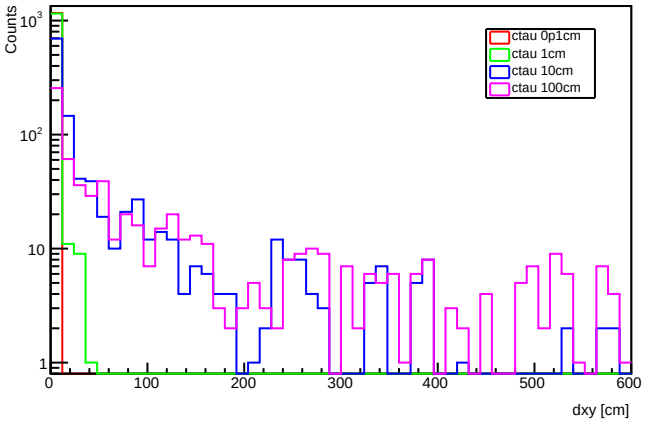
gen leading Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



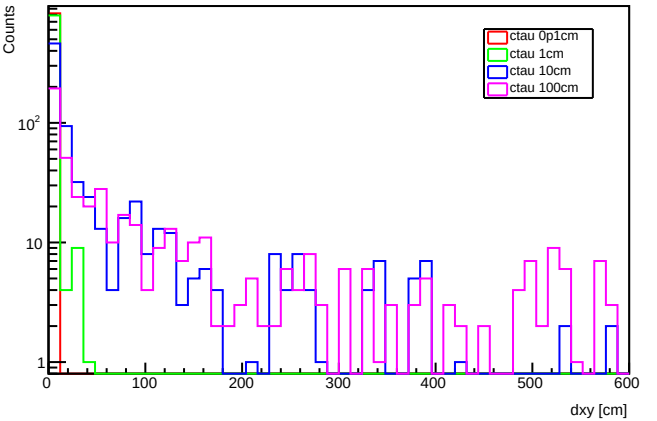
gen leading Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



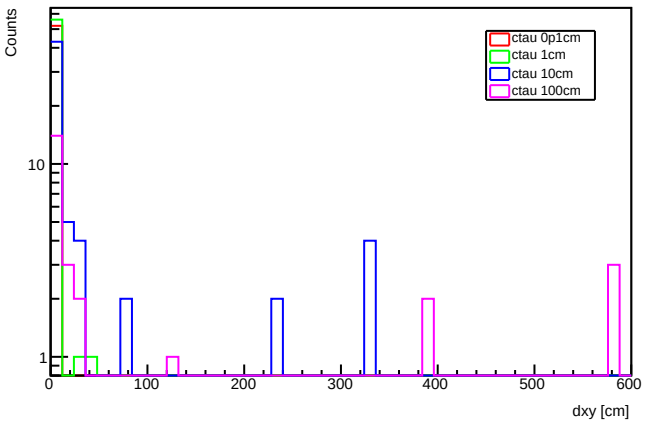
gen all Mu vxy: no cuts



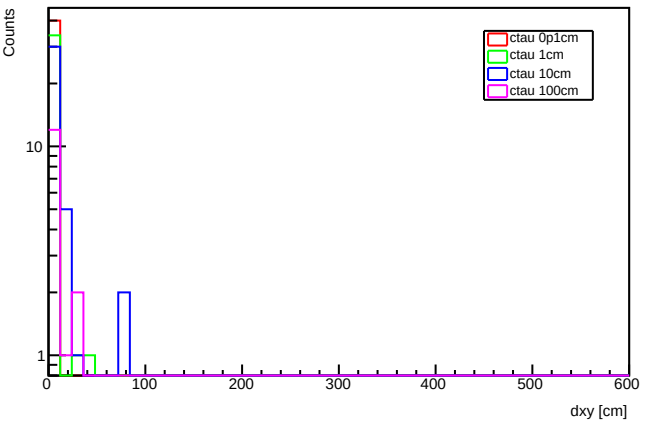
gen all Mu vxy: n_jet >=1, j1pt > 30 GeV



gen all Mu vxy: MET > 120 GeV



gen all Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



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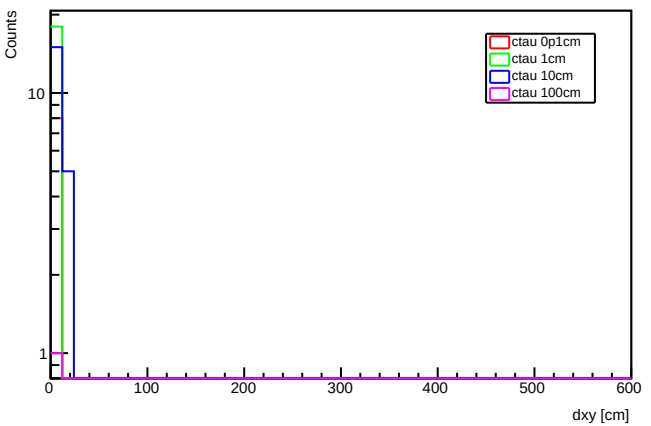
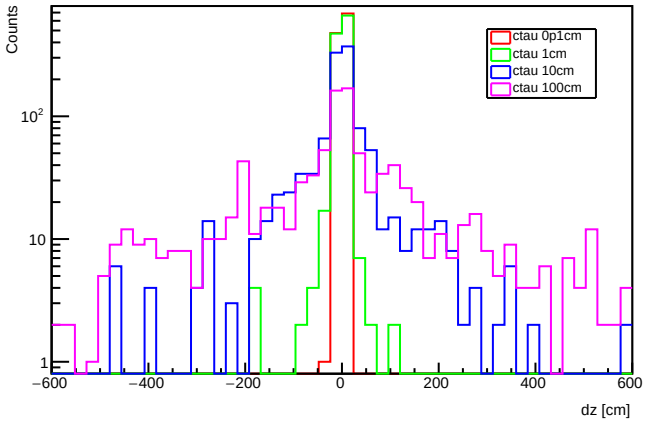
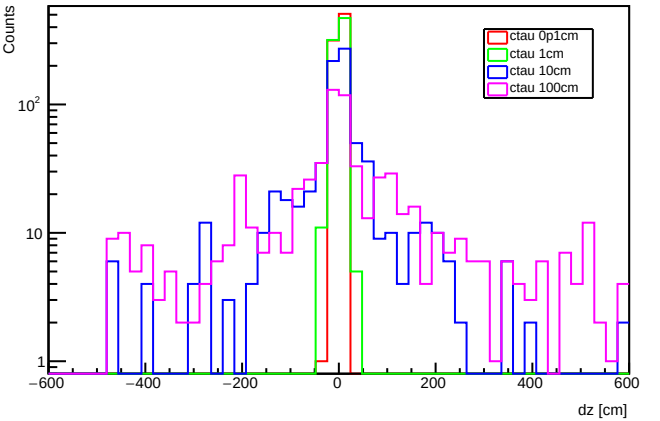


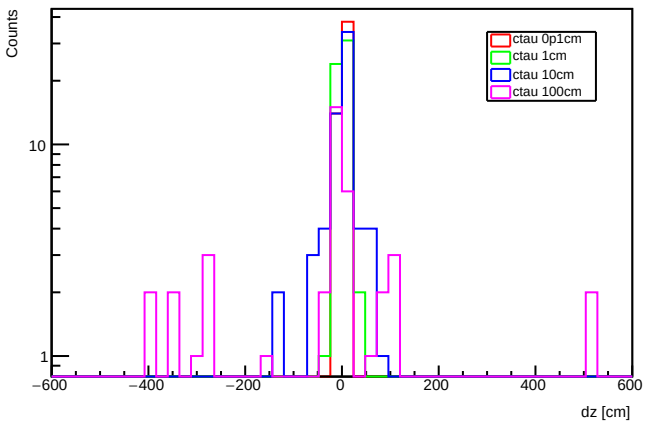
gen all Mu vz: no cuts



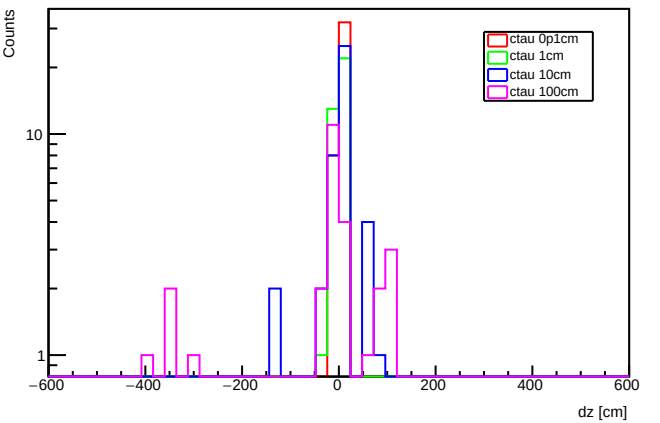
gen all Mu vz: n_jet >=1, j1pt > 30 GeV



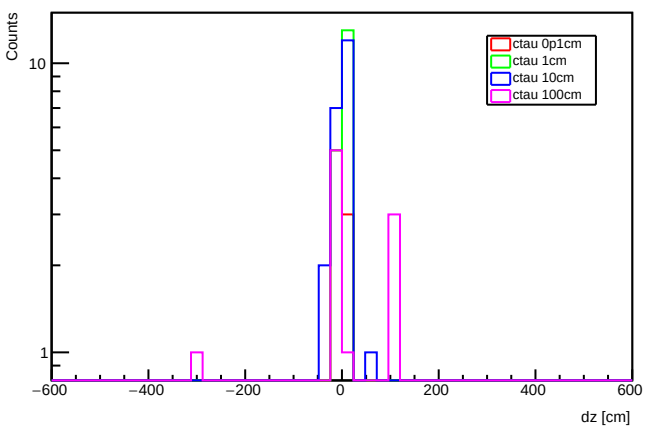
gen all Mu vz: MET > 120 GeV



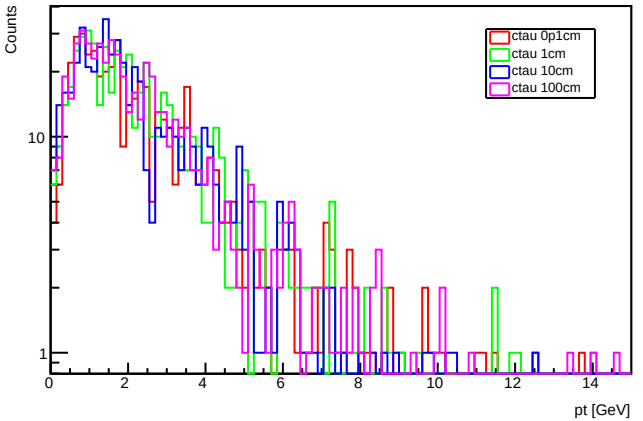
gen all Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



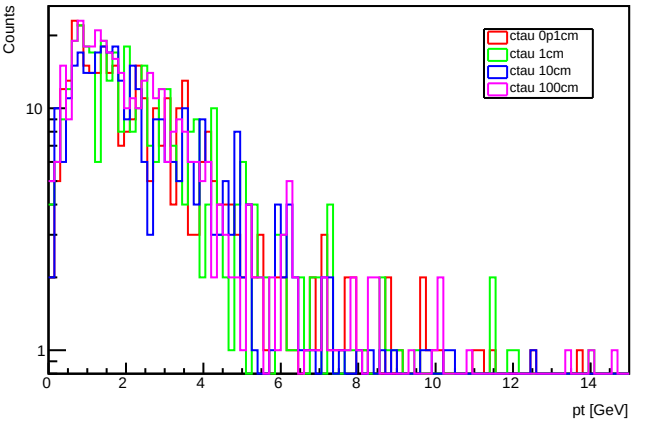
gen all Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



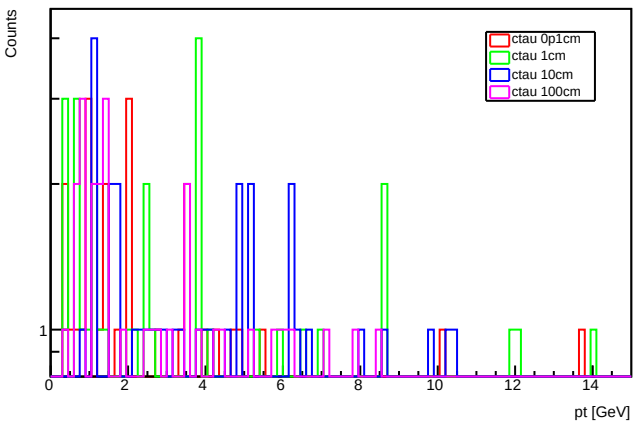
gen subleading Mu pt: no cuts



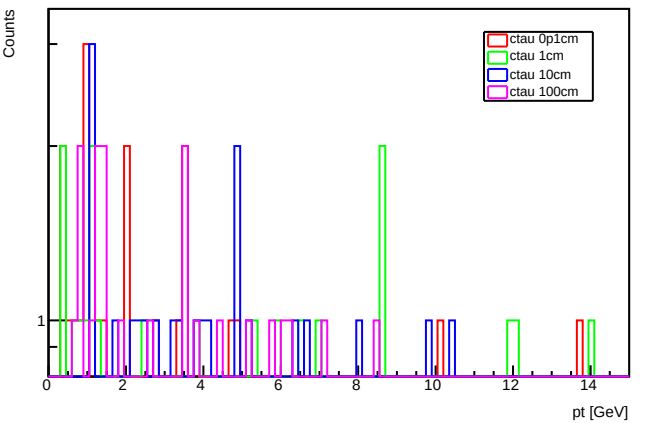
gen subleading Mu pt: n_jet >=1, j1pt > 30 GeV



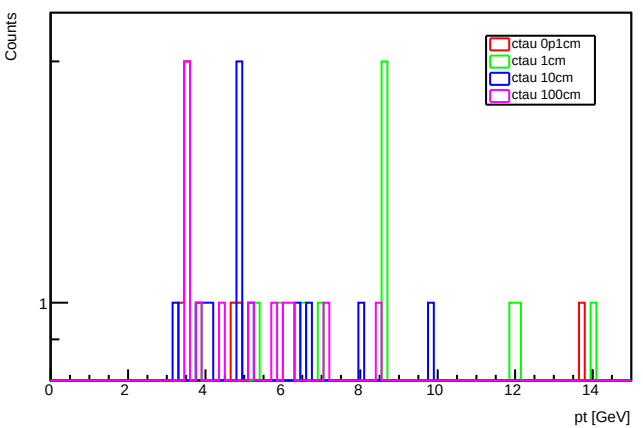
gen subleading Mu pt: MET > 120 GeV



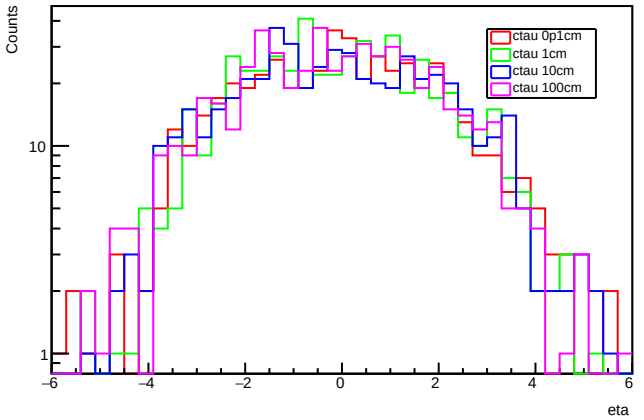
gen subleading Mu pt: j1pt >120, at most 2 jets w/ pt >30 GeV



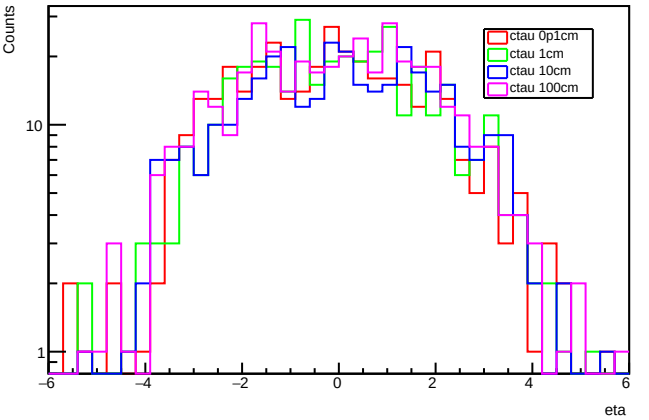
gen subleading Mu pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



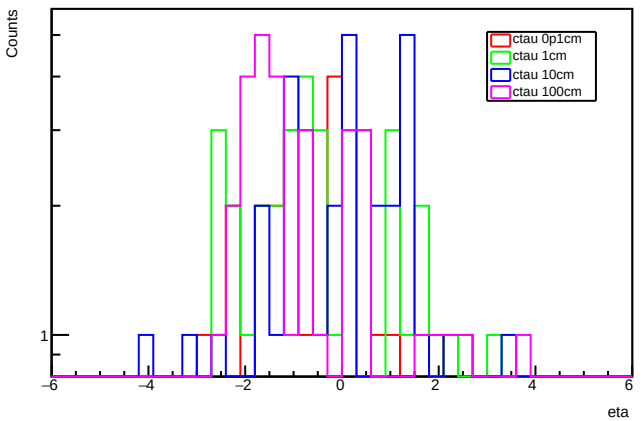
gen subleading Mu eta: no cuts



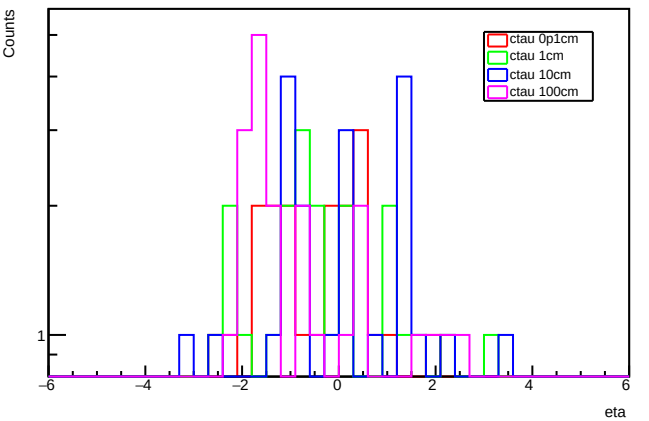
gen subleading Mu eta: n_jet >=1, j1pt > 30 GeV



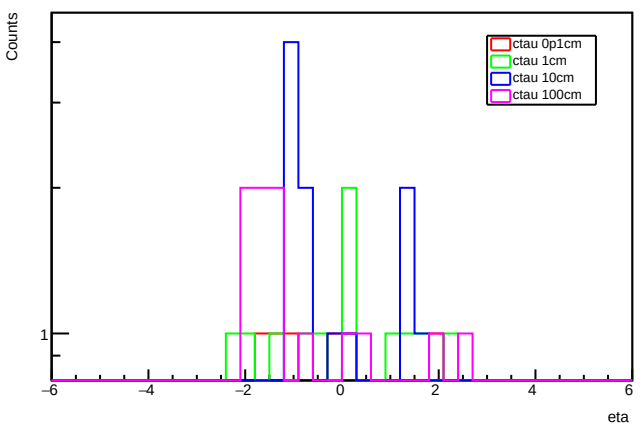
gen subleading Mu eta: MET > 120 GeV



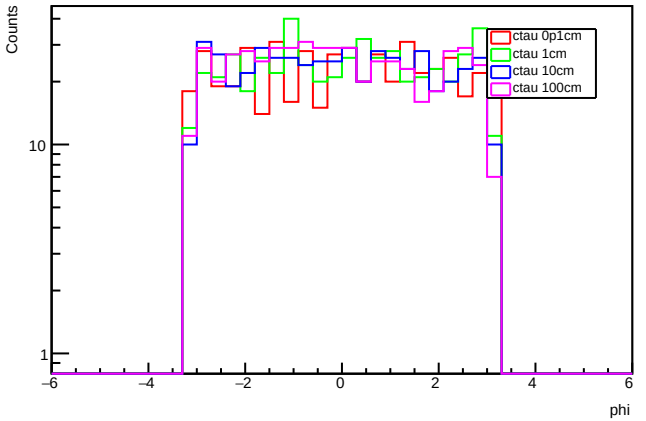
gen subleading Mu eta: j1pt >120, at most 2 jets w/ pt >30 GeV



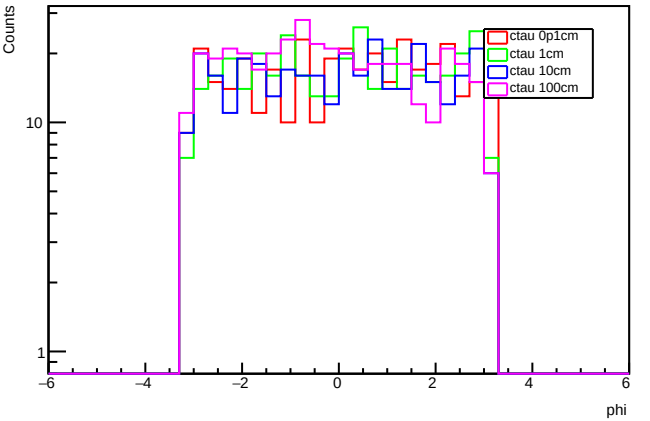
gen subleading Mu eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



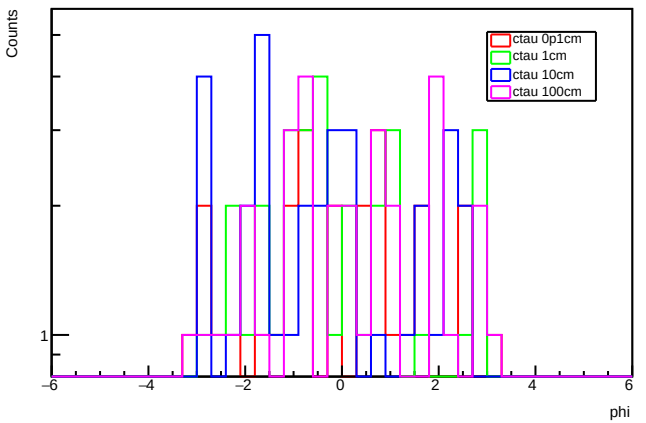
gen subleading Mu phi: no cuts



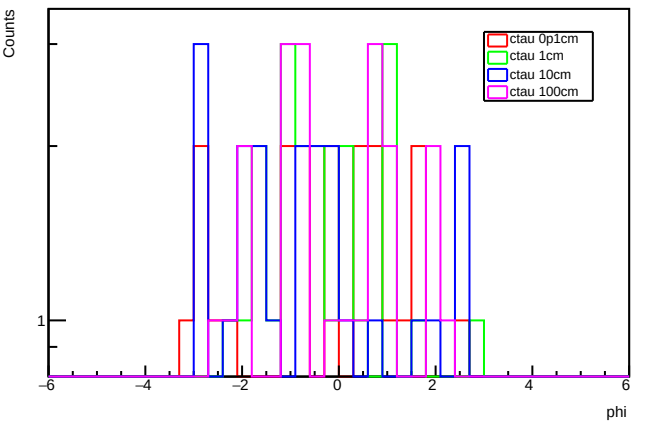
gen subleading Mu phi: n_jet >=1, j1pt > 30 GeV



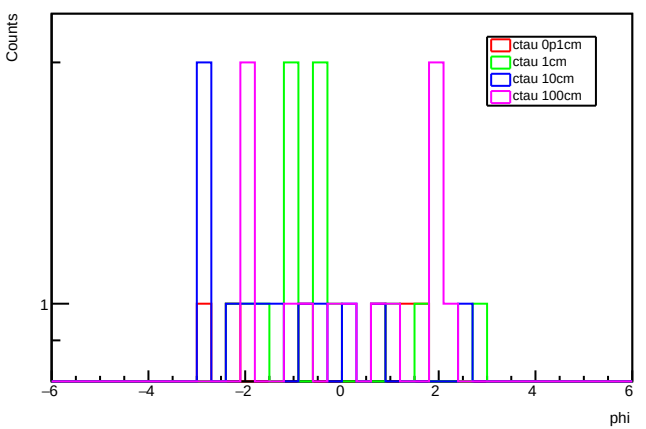
gen subleading Mu phi: MET > 120 GeV



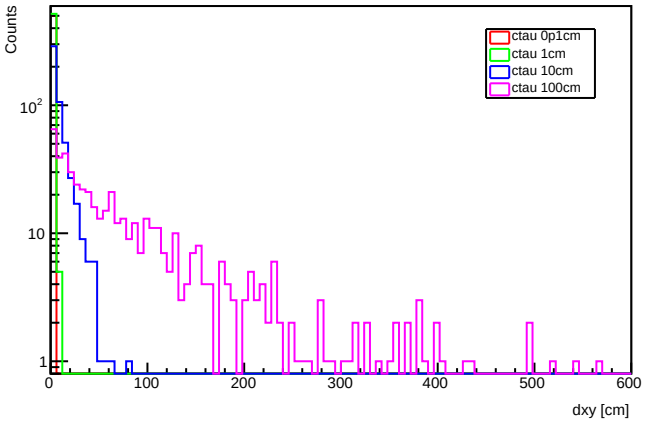
gen subleading Mu phi: j1pt >120, at most 2 jets w/ pt >30 GeV



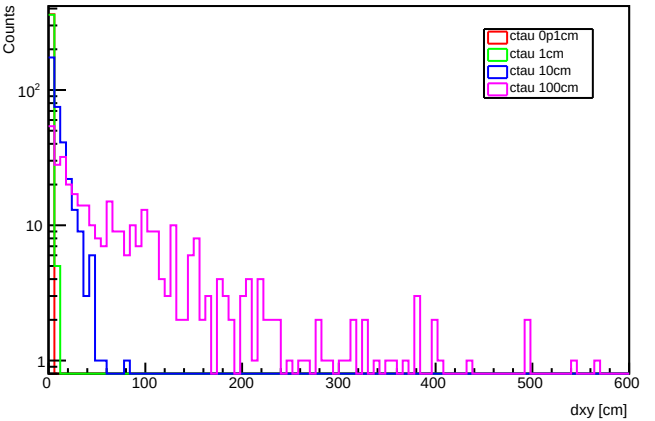
gen subleading Mu phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



gen subleading Mu vxy: no cuts



gen subleading Mu vxy: n_jet >=1, j1pt > 30 GeV



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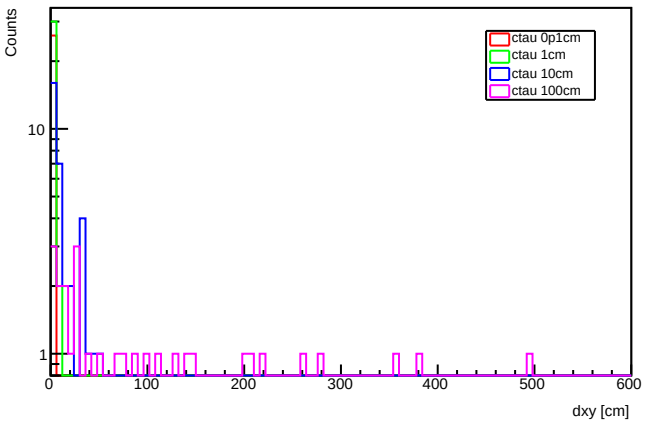
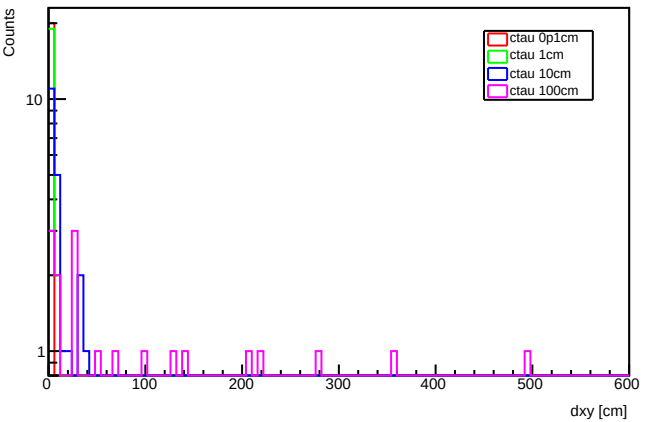
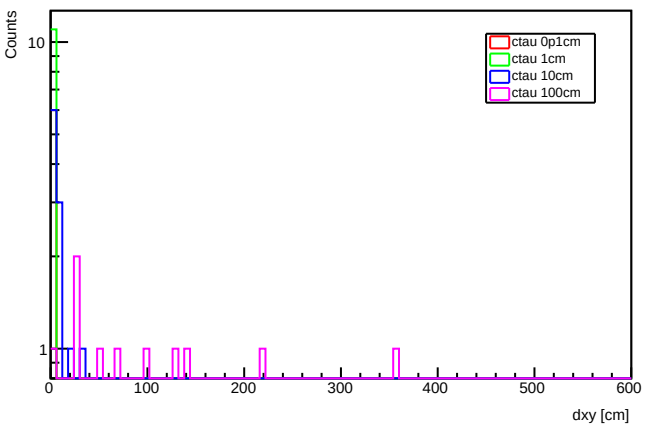


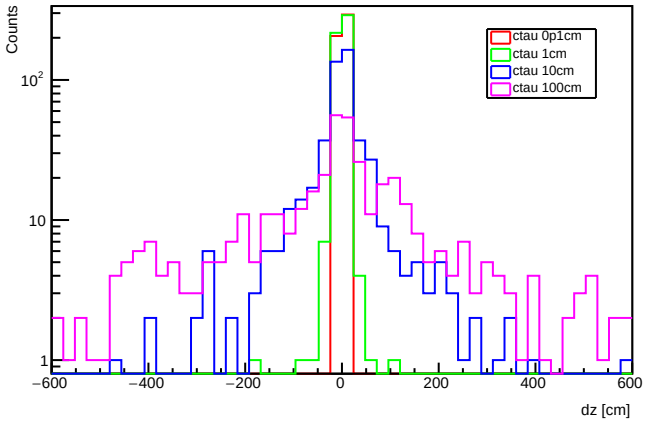
gen subleading Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



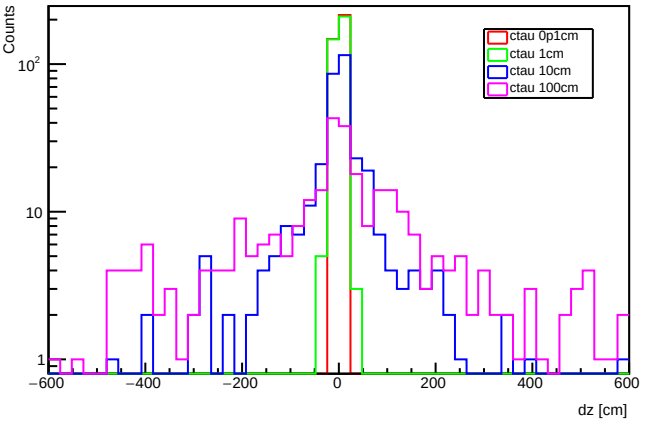
gen subleading Mu vxy: at least 2 mu w/ pt > 2 GeV and eta<2.5



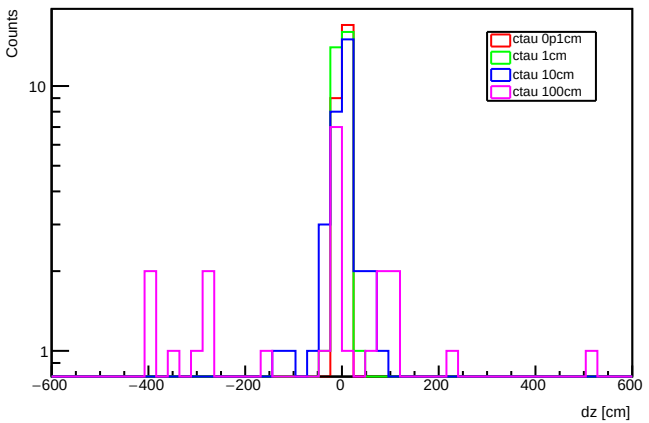
gen subleading Mu vz: no cuts



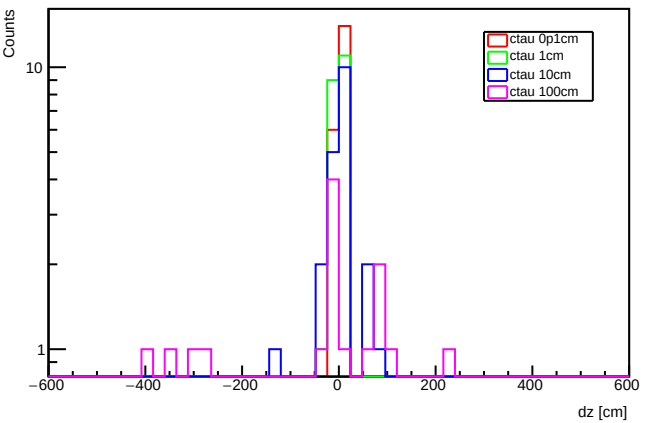
gen subleading Mu vz: n_jet >=1, j1pt > 30 GeV



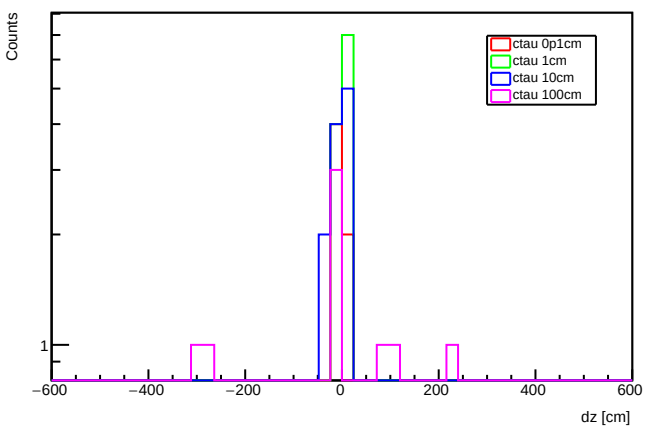
gen subleading Mu vz: MET > 120 GeV



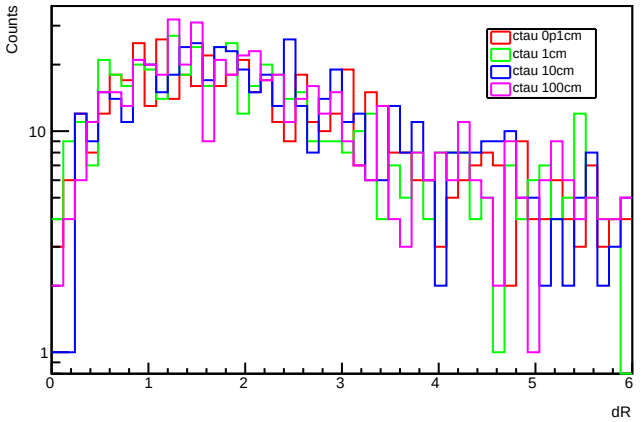
gen subleading Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



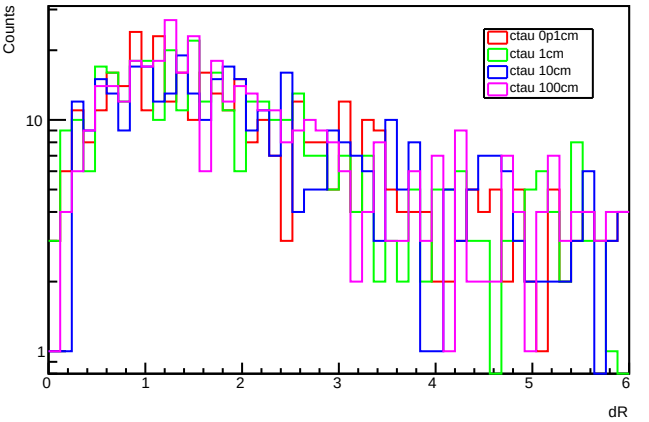
gen subleading Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



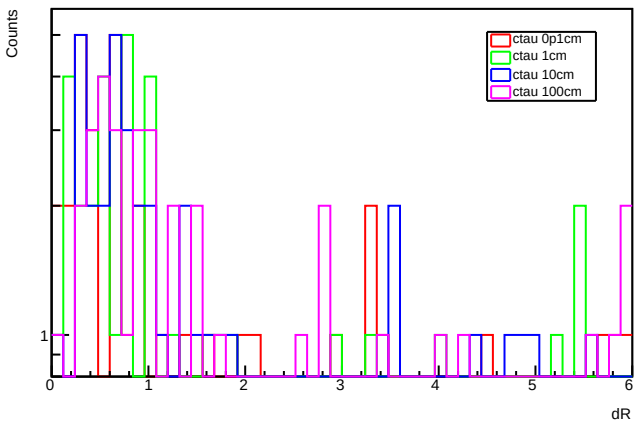
dR: gen leading mu and subleading mu: no cuts



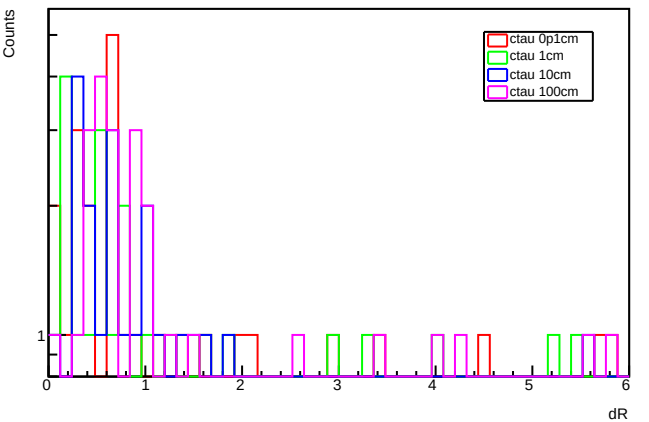
dR: gen leading mu and subleading mu: n_jet >=1, j1pt > 30 GeV



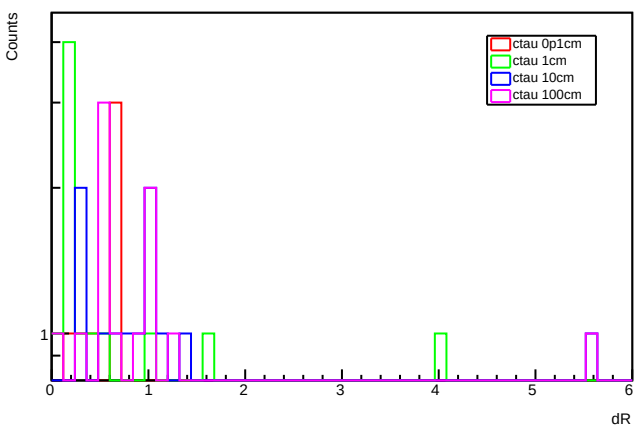
dR: gen leading mu and subleading mu: MET > 120 GeV



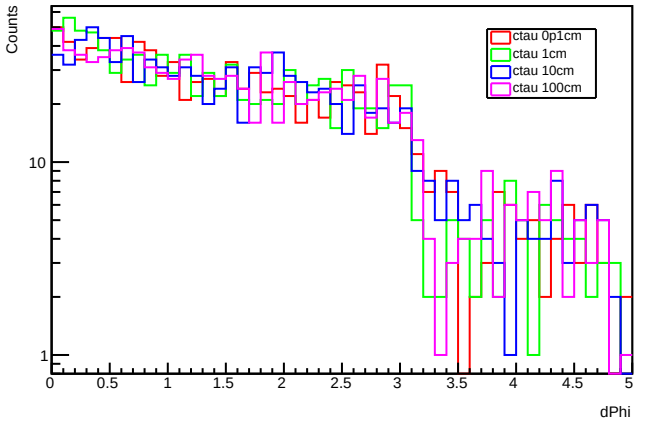
dR: gen leading mu and subleading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



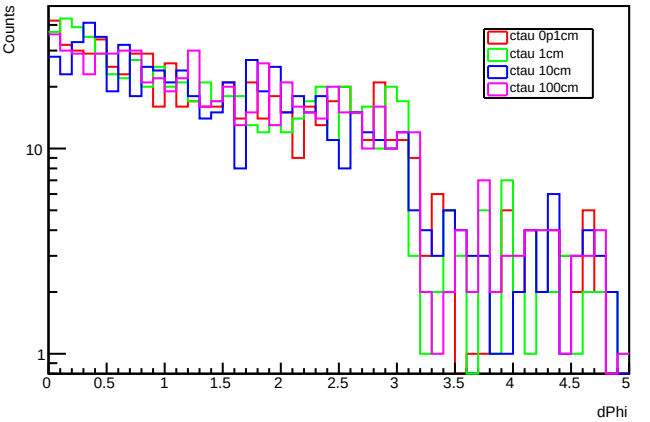
dR: gen leading mu and subleading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



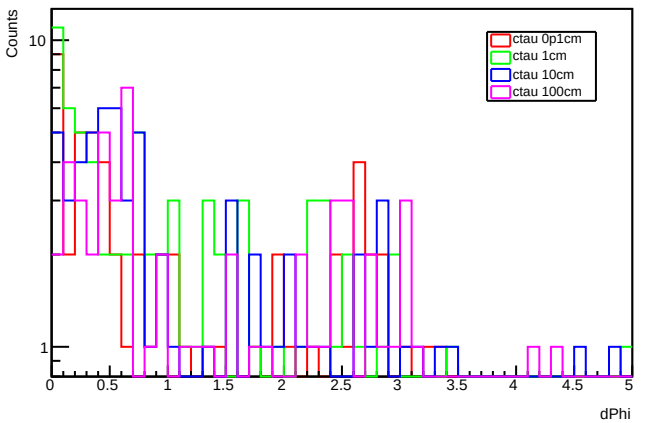
dPhi: gen MET and leading mu: no cuts



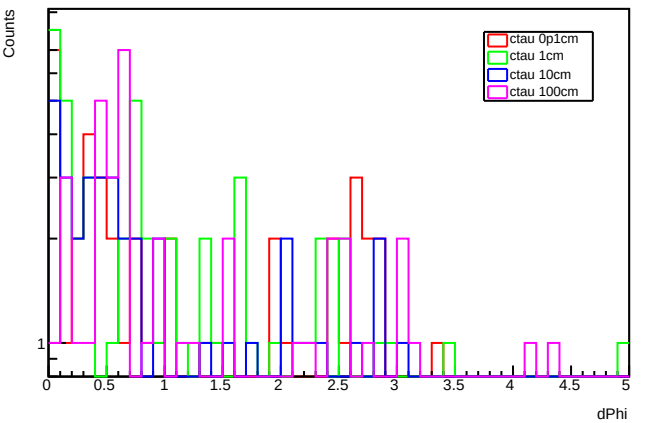
dPhi: gen MET and leading mu: n_jet >=1, j1pt > 30 GeV



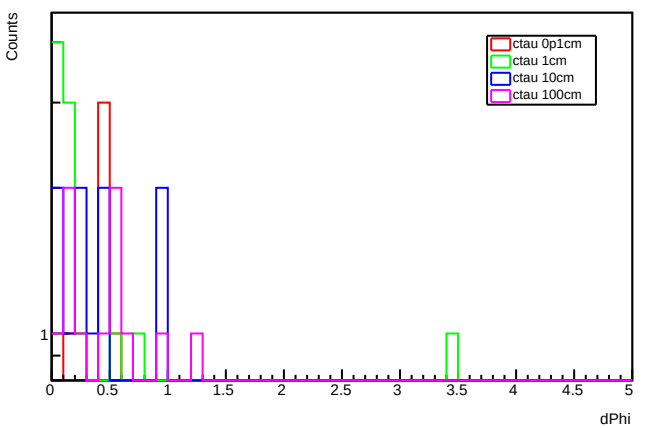
dPhi: gen MET and leading mu: MET > 120 GeV



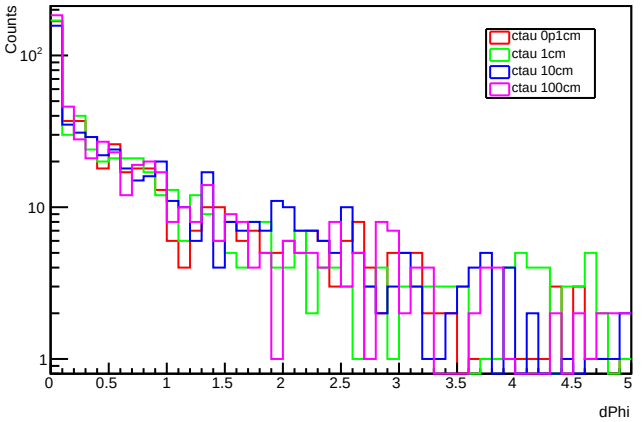
dPhi: gen MET and leading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



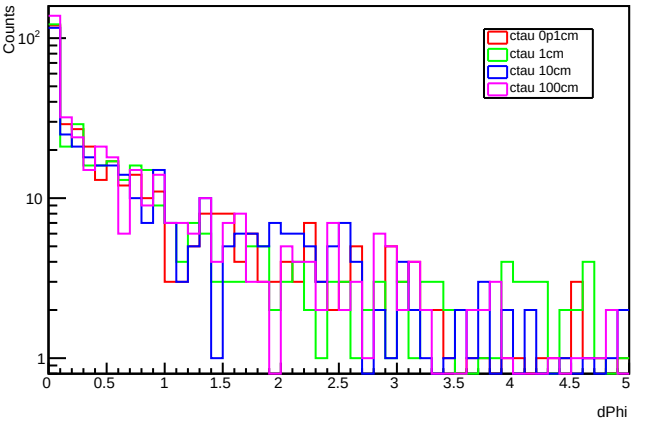
dPhi: gen MET and leading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



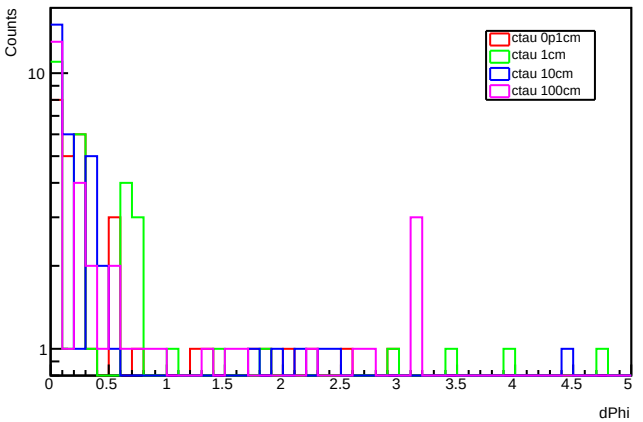
dPhi: gen leading mu and subleading mu: no cuts



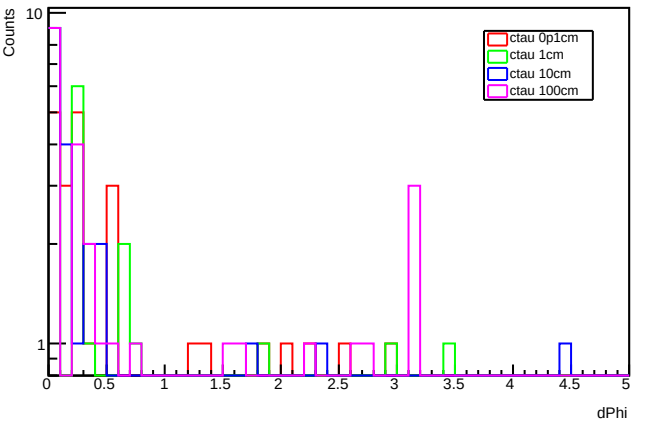
dPhi: gen leading mu and subleading mu: n_jet >=1, j1pt > 30 GeV



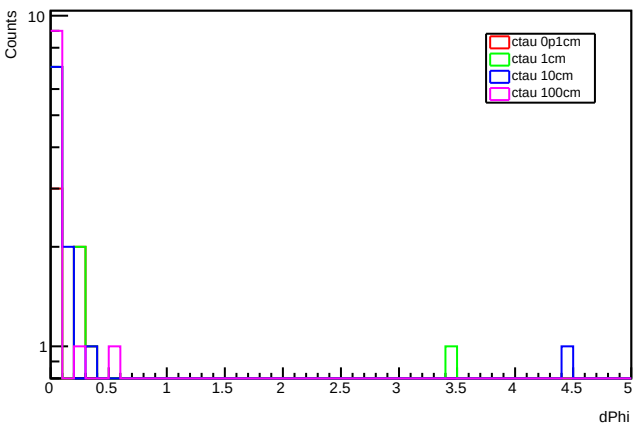
dPhi: gen leading mu and subleading mu: MET > 120 GeV



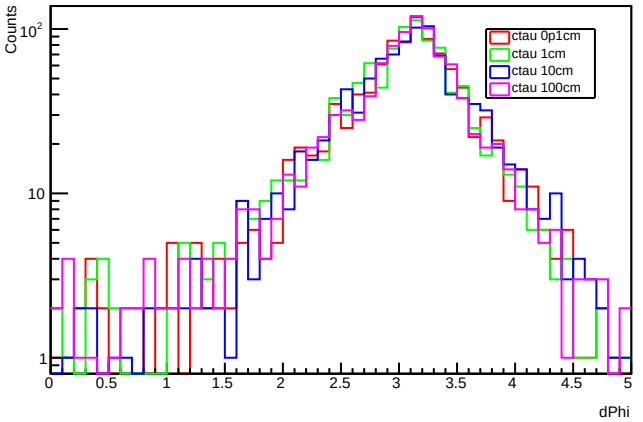
dPhi: gen leading mu and subleading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



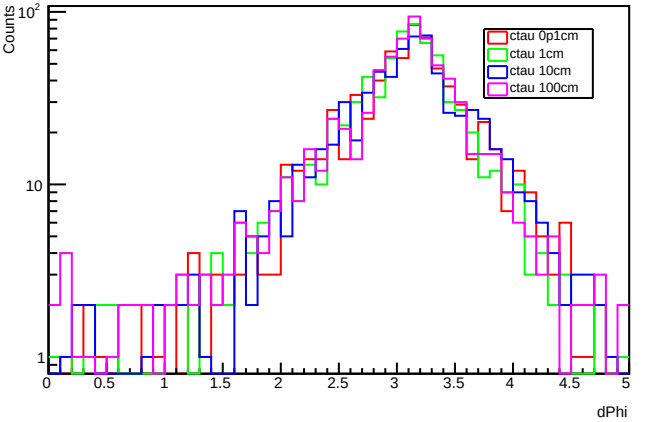
dPhi: gen leading mu and subleading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



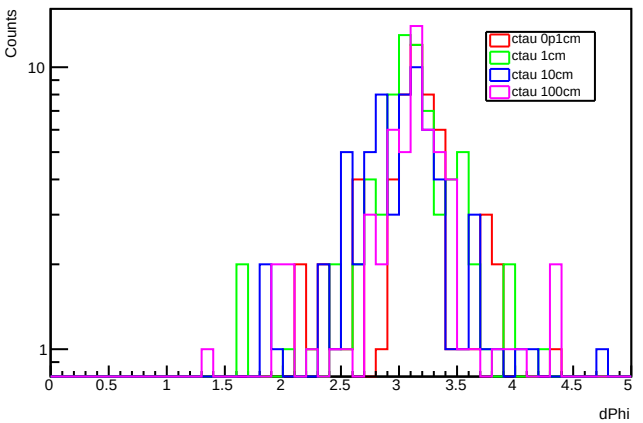
dPhi: gen MET and leading jet: no cuts



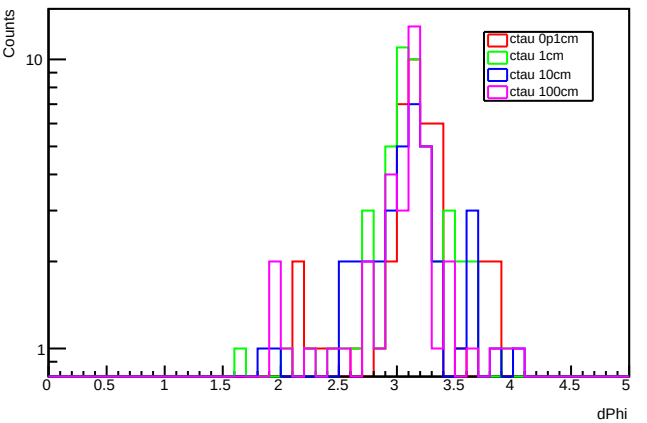
dPhi: gen MET and leading jet: n_jet >=1, j1pt > 30 GeV



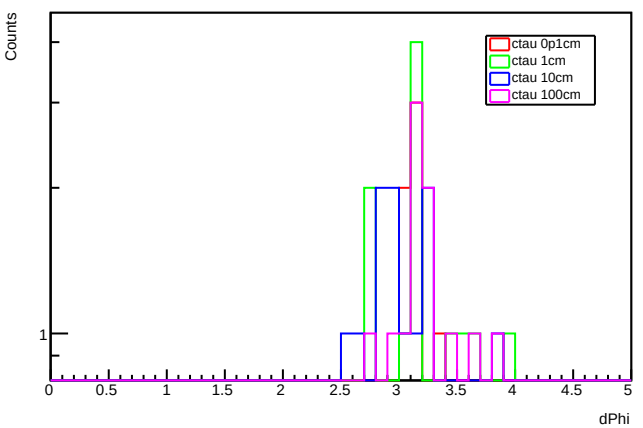
dPhi: gen MET and leading jet: MET > 120 GeV



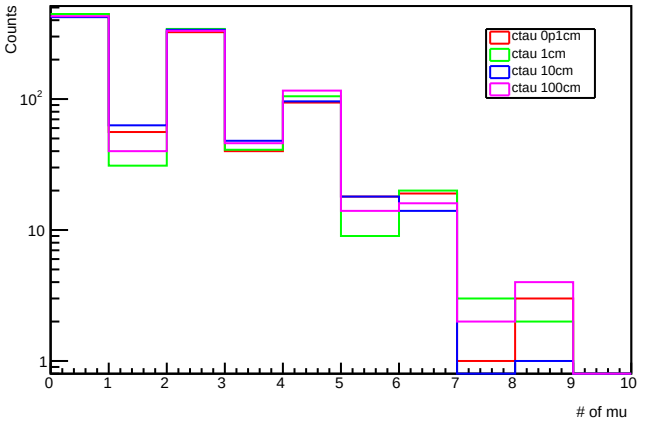
dPhi: gen MET and leading jet: j1pt >120, at most 2 jets w/ pt >30 GeV



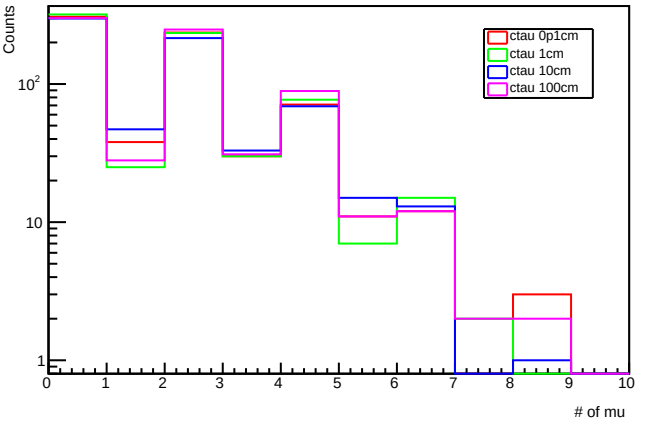
dPhi: gen MET and leading jet: at least 2 mu w/ pt > 2 GeV and eta<2.5



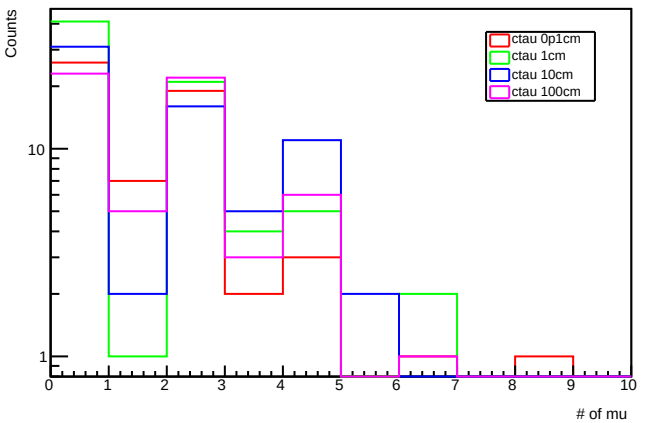
gen number of mu: no cuts



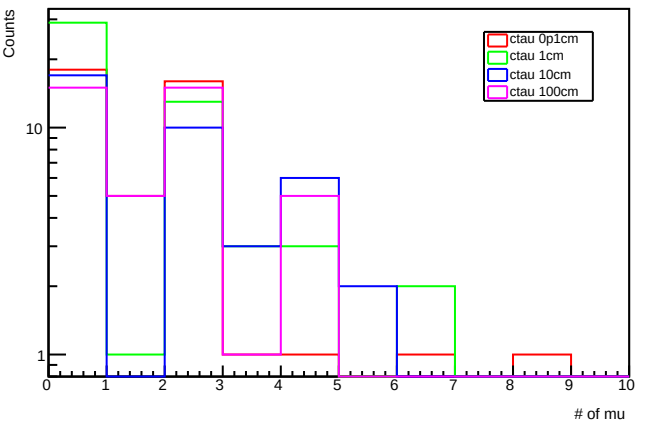
gen number of mu: n_jet >=1, j1pt > 30 GeV



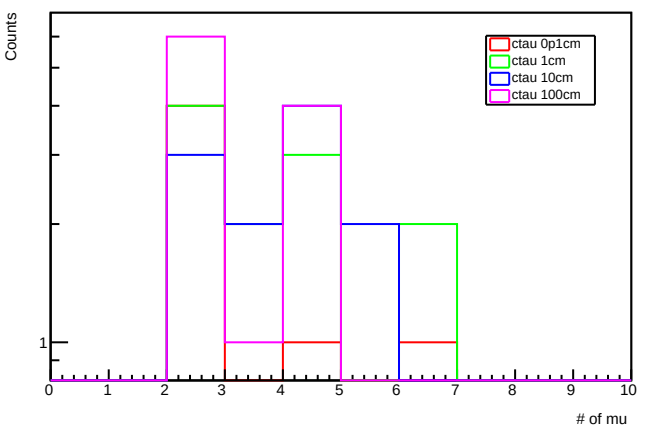
gen number of mu: MET > 120 GeV



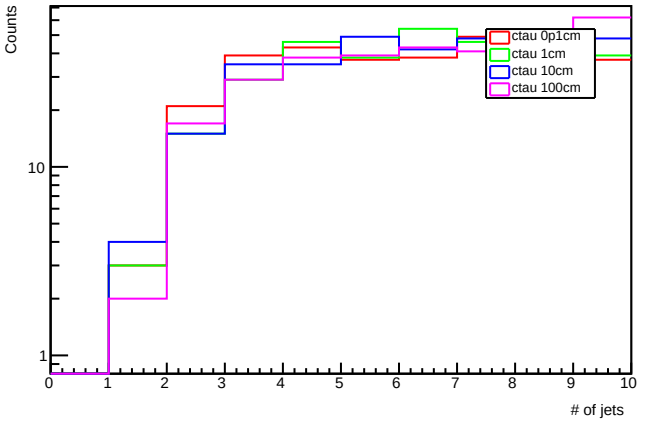
gen number of mu: j1pt >120, at most 2 jets w/ pt >30 GeV



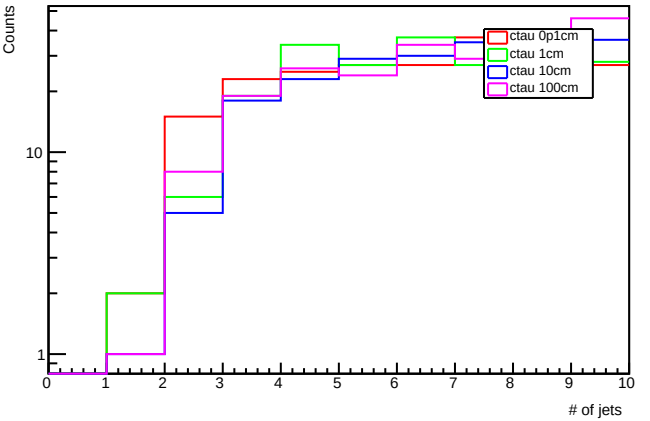
gen number of mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



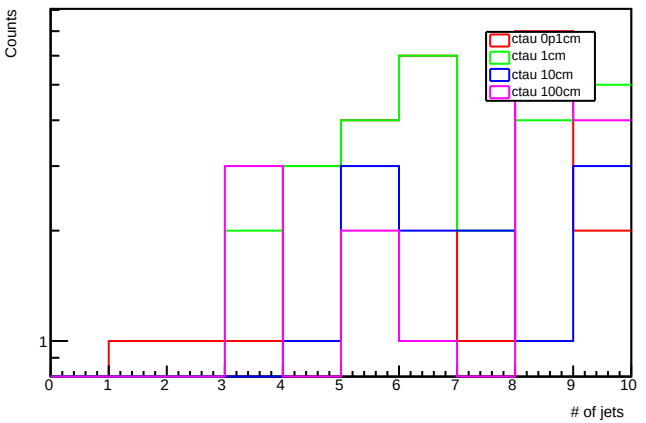
gen number of jets: no cuts



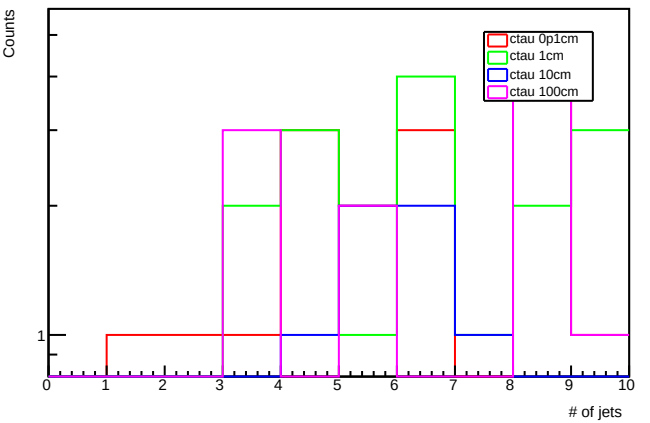
gen number of jets: n_jet >=1, j1pt > 30 GeV



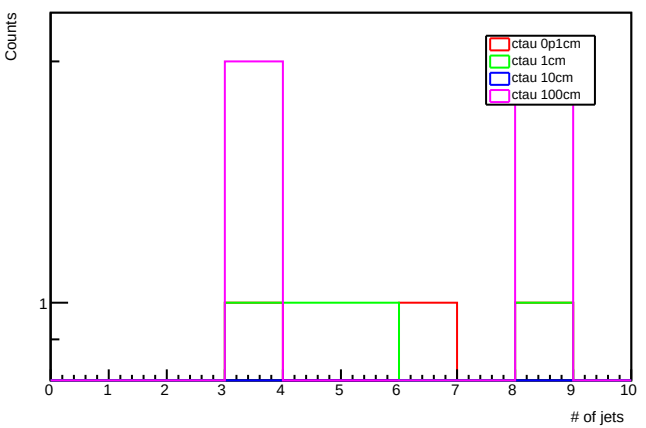
gen number of jets: MET > 120 GeV



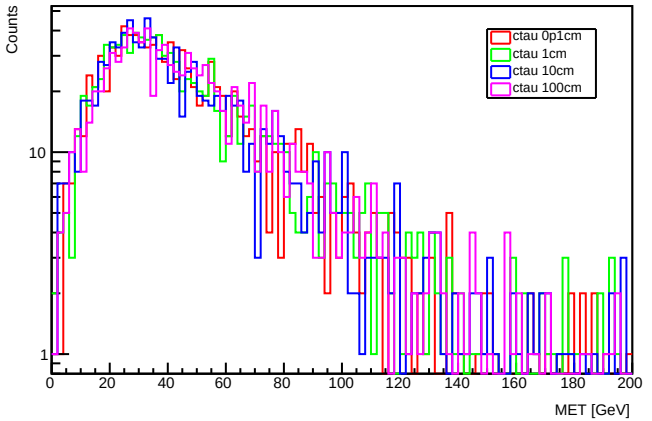
gen number of jets: j1pt >120, at most 2 jets w/ pt >30 GeV



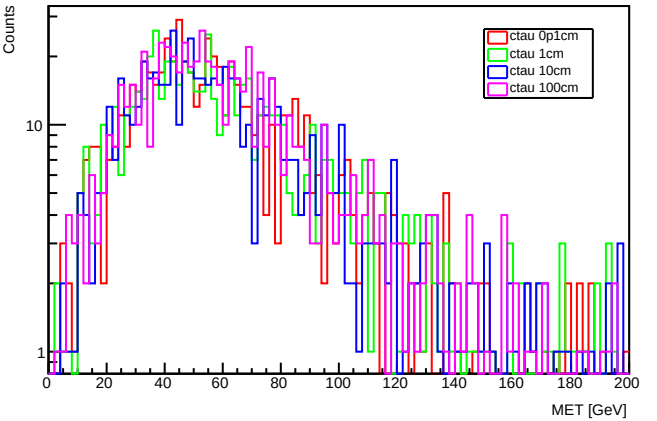
gen number of jets: at least 2 mu w/ pt > 2 GeV and eta<2.5



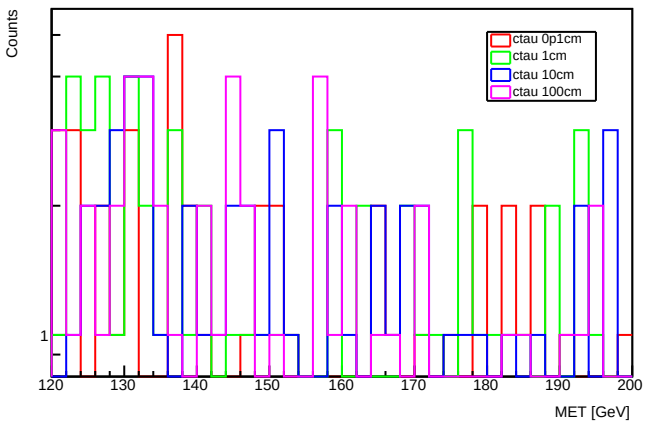
reco leading MET: no cuts



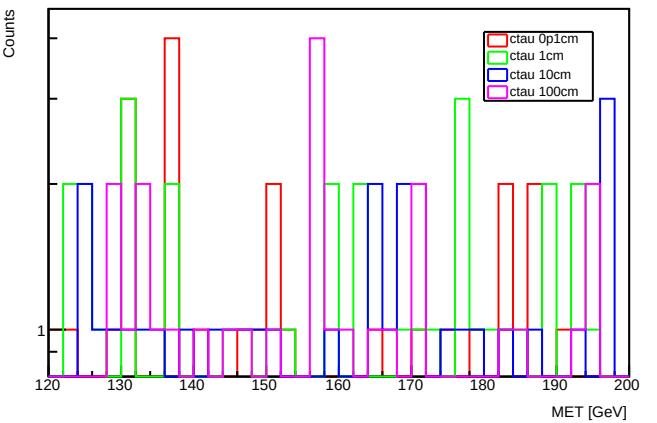
reco leading MET: n_jet >=1, j1pt > 30 GeV



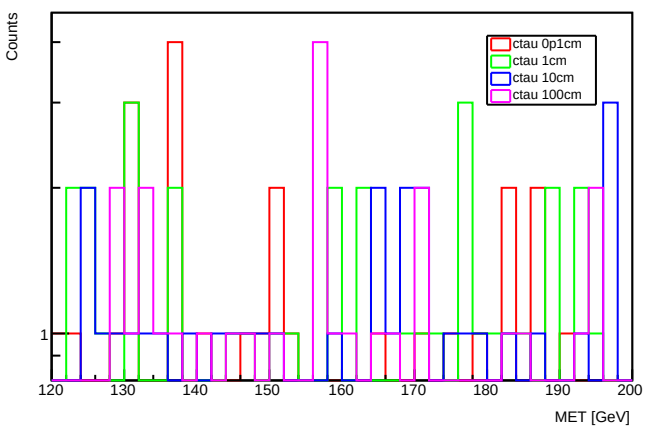
reco leading MET: MET > 120 GeV



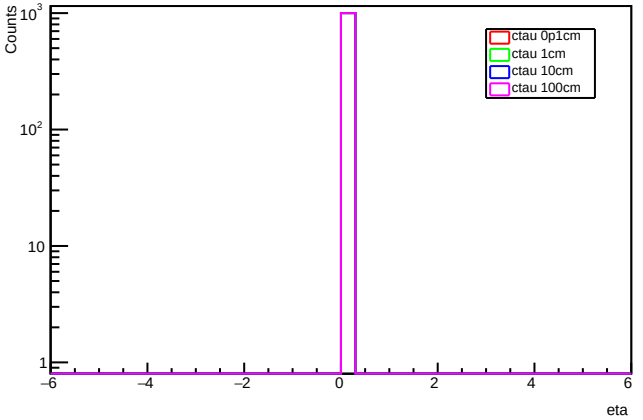
reco leading MET: j1pt >120, at most 2 jets w/ pt >30 GeV



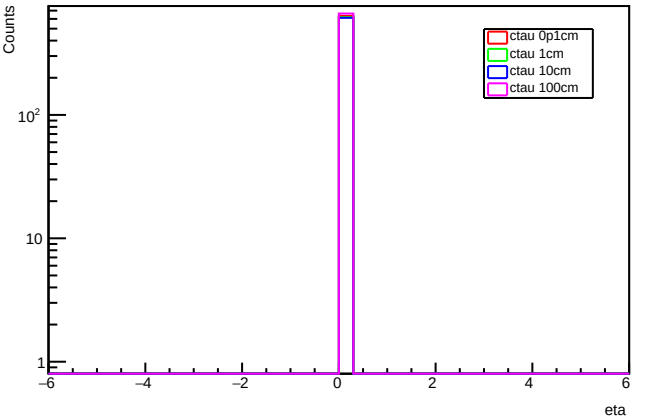
reco leading MET: at least 2 mu w/ pt > 2 GeV and eta<2.5



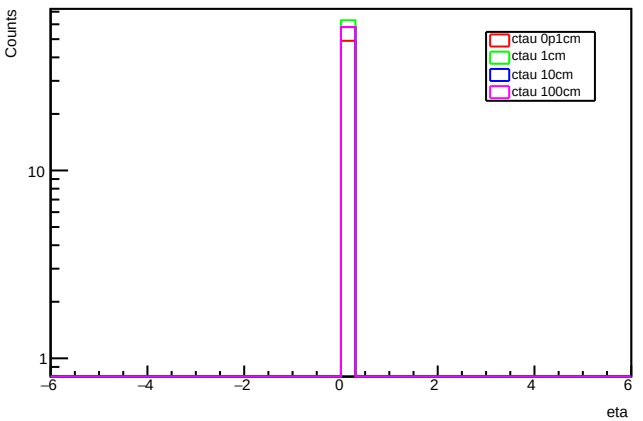
reco leading Met eta: no cuts



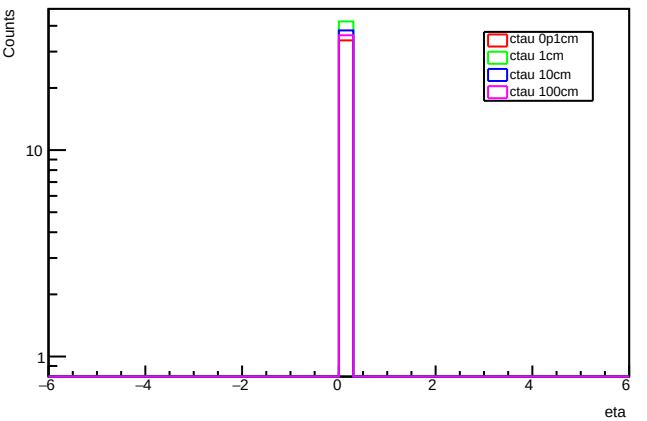
reco leading Met eta: n_jet >=1, j1pt > 30 GeV



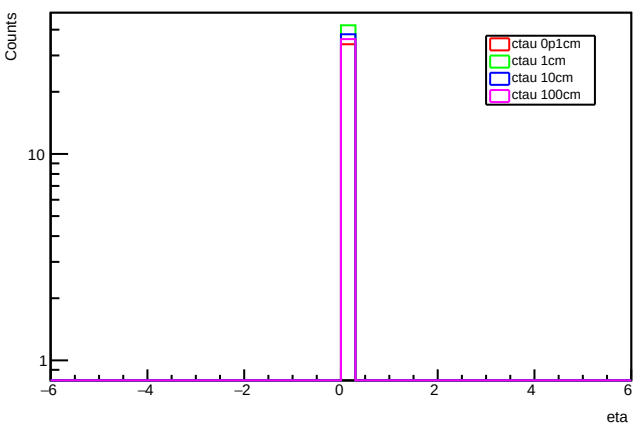
reco leading Met eta: MET > 120 GeV



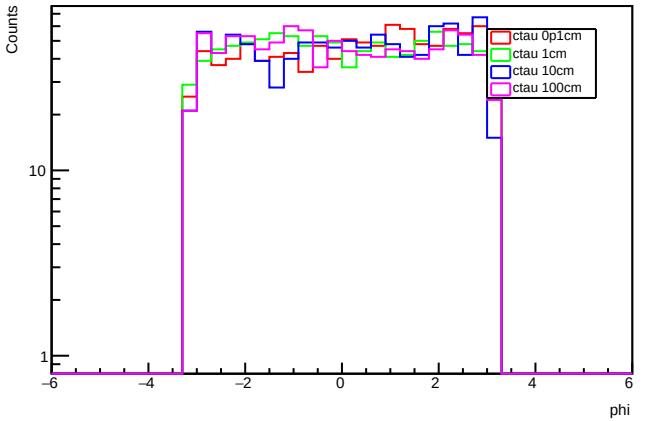
reco leading Met eta: j1pt >120, at most 2 jets w/ pt >30 GeV



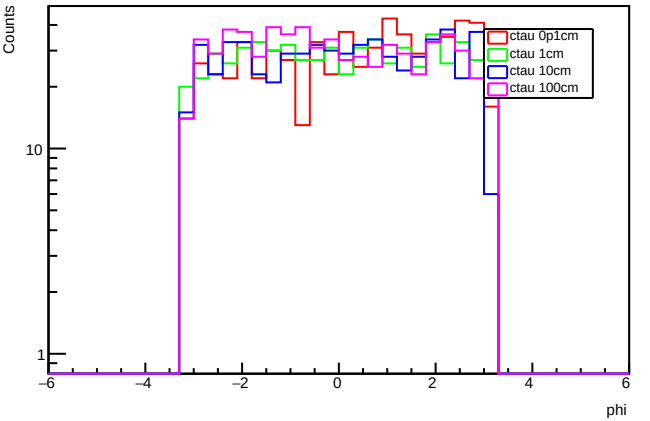
reco leading Met eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



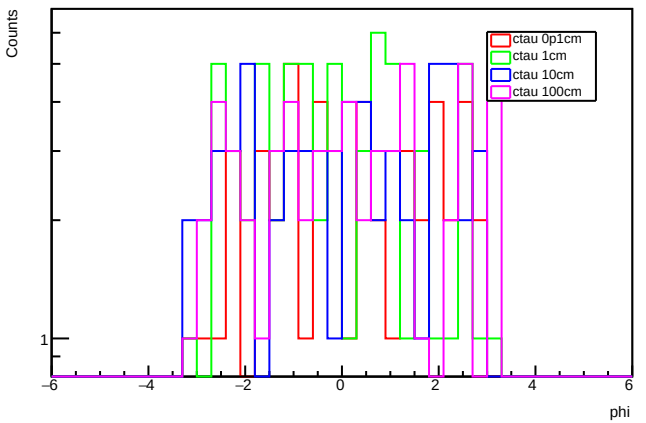
reco leading Met phi: no cuts



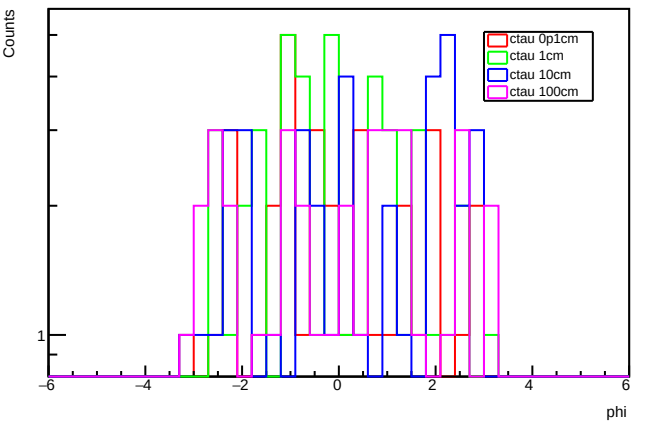
reco leading Met phi: n_jet >=1, j1pt > 30 GeV



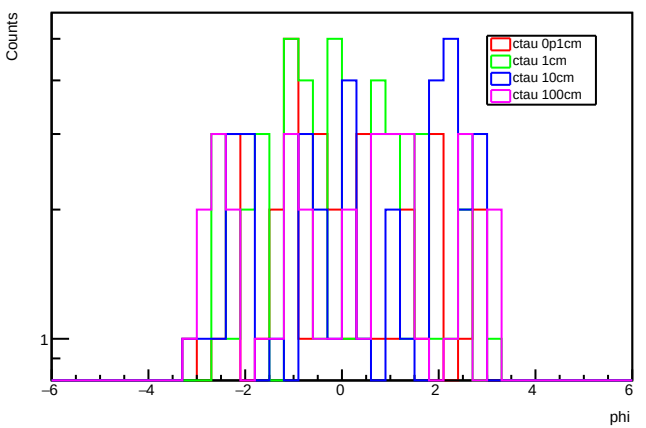
reco leading Met phi: MET > 120 GeV



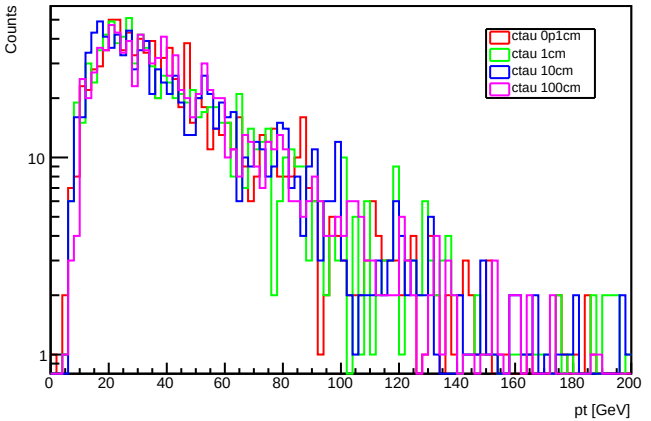
reco leading Met phi: j1pt >120, at most 2 jets w/ pt >30 GeV



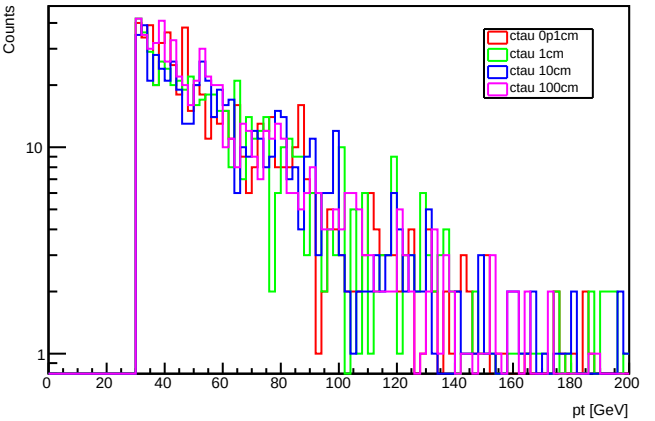
reco leading Met phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



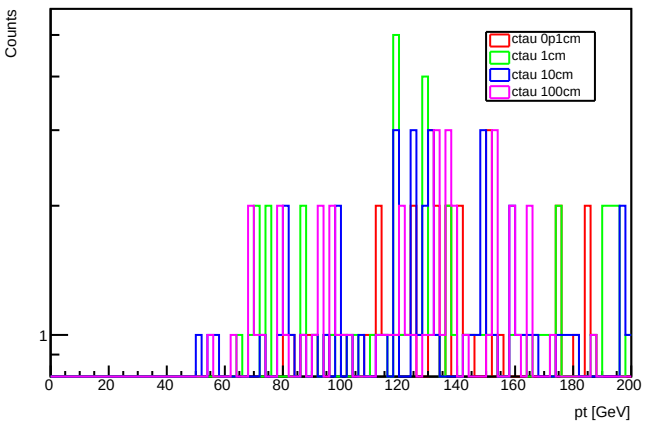
reco leading Jet pt: no cuts



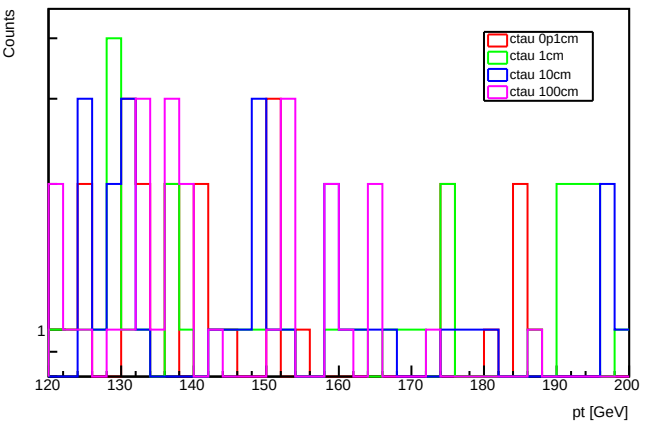
reco leading Jet pt: n_jet >=1, j1pt > 30 GeV



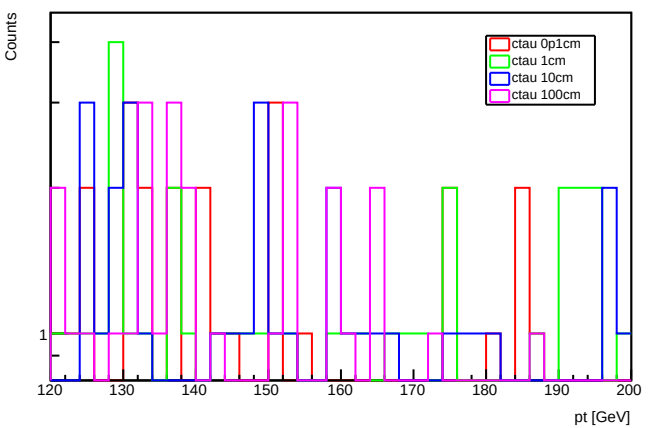
reco leading Jet pt: MET > 120 GeV



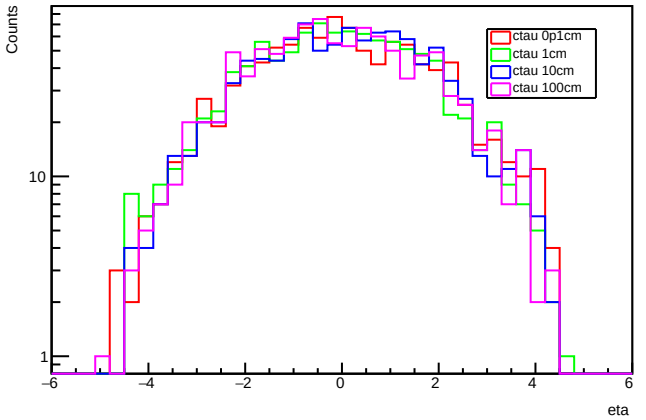
reco leading Jet pt: j1pt >120, at most 2 jets w/ pt >30 GeV



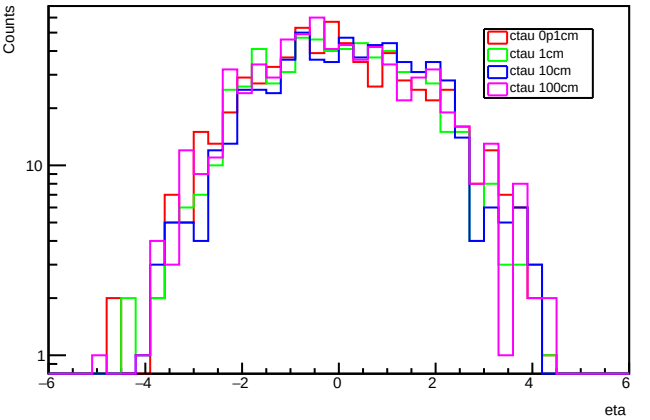
reco leading Jet pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



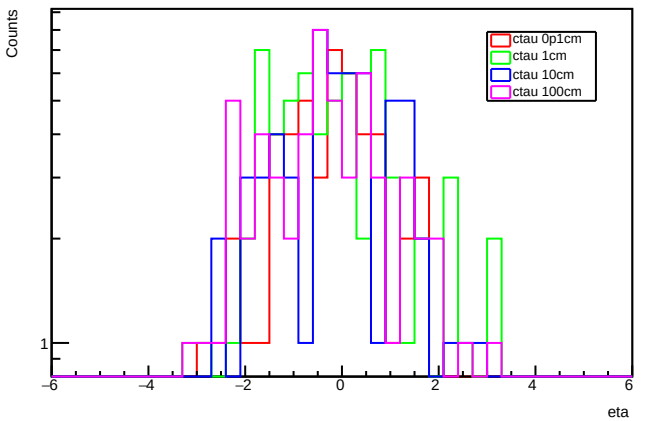
reco leading Jet eta: no cuts



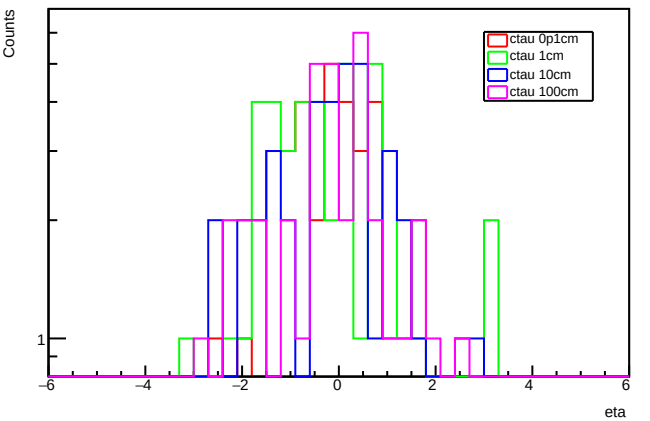
reco leading Jet eta: n_jet >=1, j1pt > 30 GeV



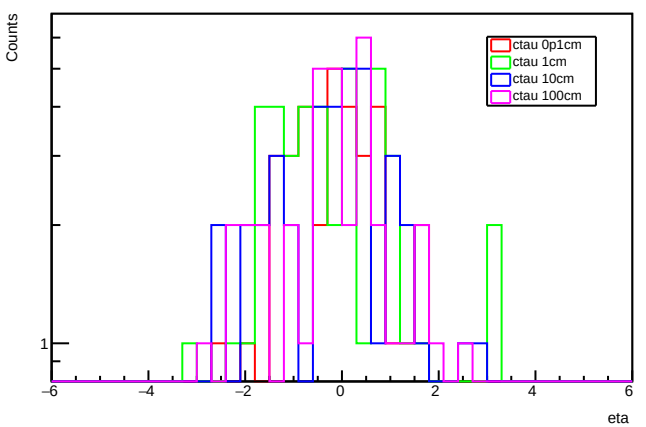
reco leading Jet eta: MET > 120 GeV



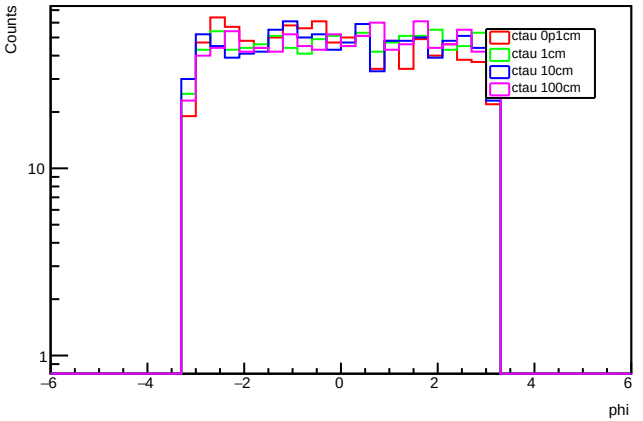
reco leading Jet eta: j1pt >120, at most 2 jets w/ pt >30 GeV



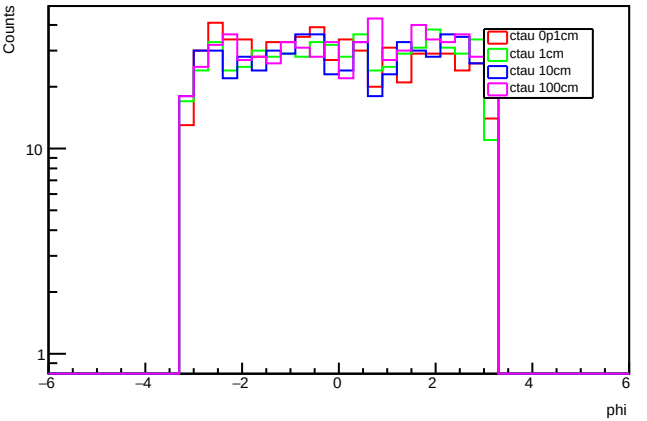
reco leading Jet eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



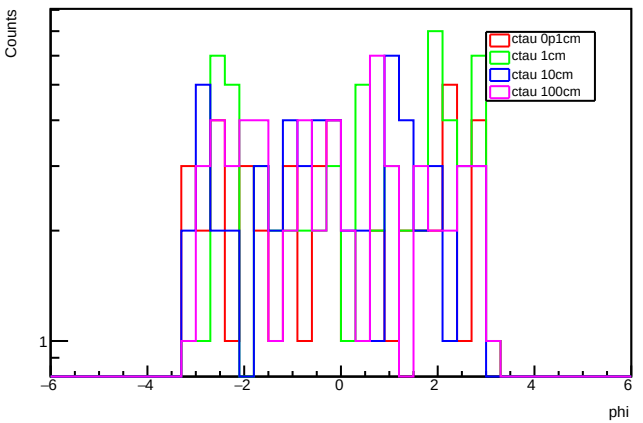
reco leading Jet phi: no cuts



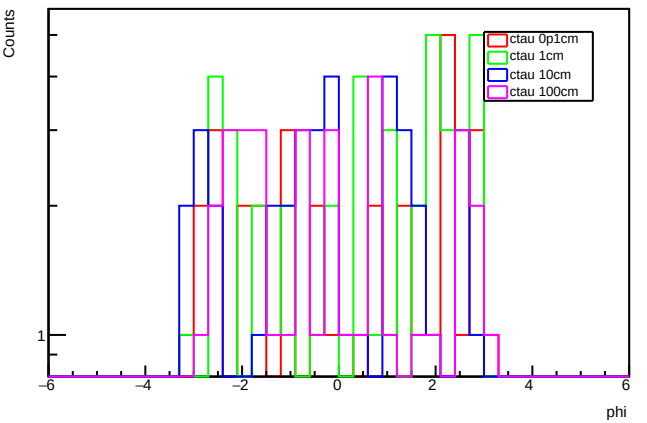
reco leading Jet phi: n_jet >=1, j1pt > 30 GeV



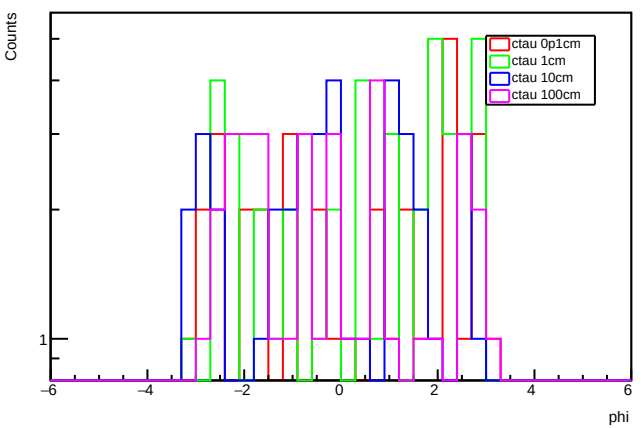
reco leading Jet phi: MET > 120 GeV



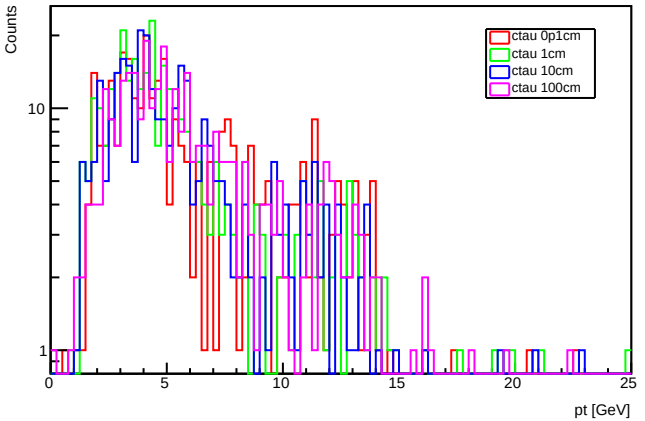
reco leading Jet phi: j1pt >120, at most 2 jets w/ pt >30 GeV



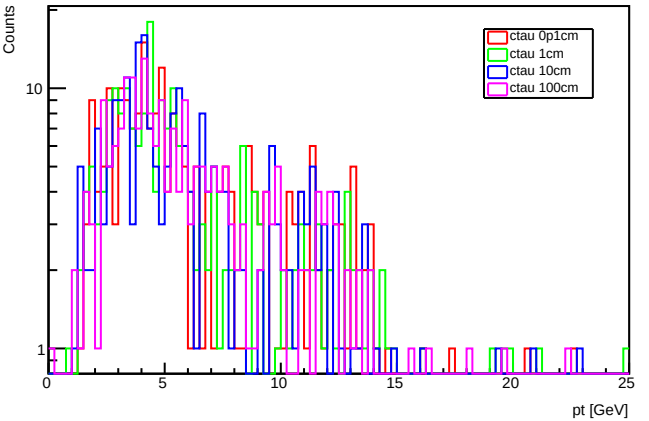
reco leading Jet phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



reco leading Mu pt: no cuts



reco leading Mu pt: n_jet >=1, j1pt > 30 GeV



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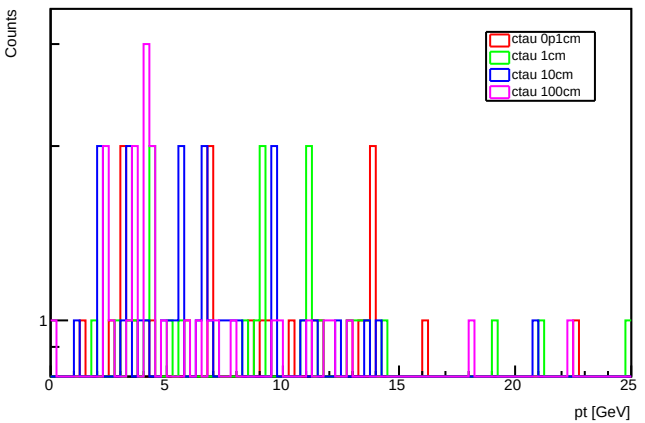
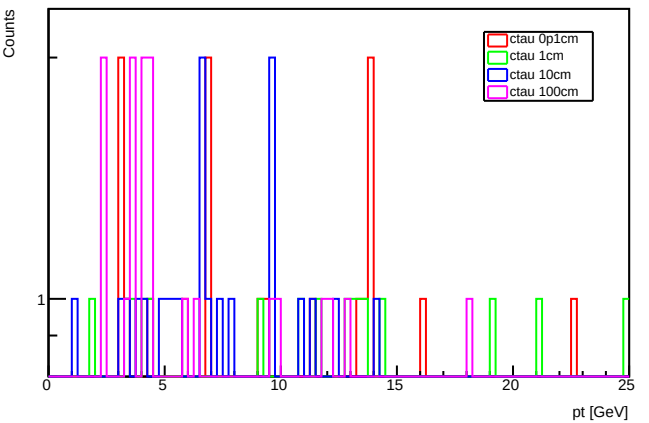
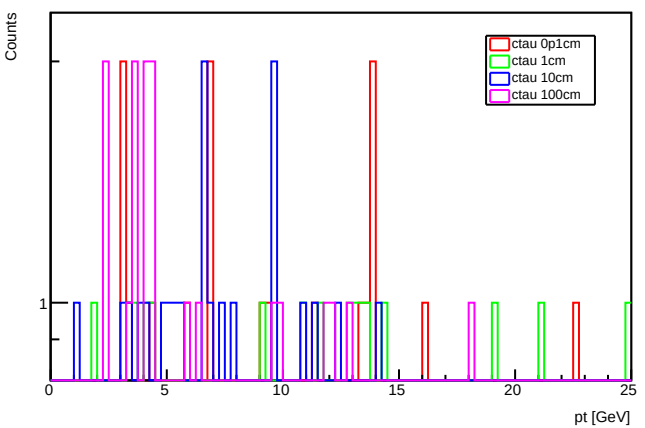


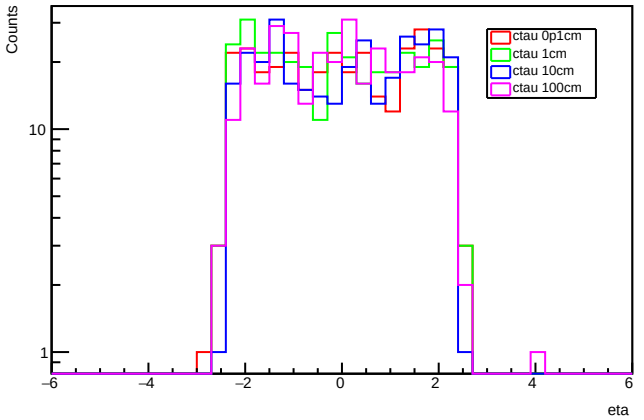
reco leading Mu pt: j1pt >120, at most 2 jets w/ pt >30 GeV



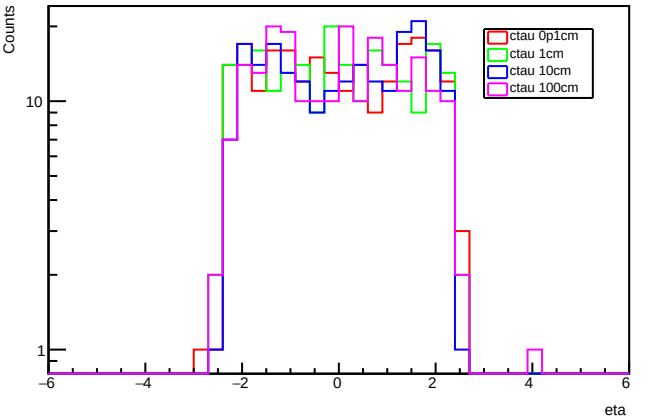
reco leading Mu pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



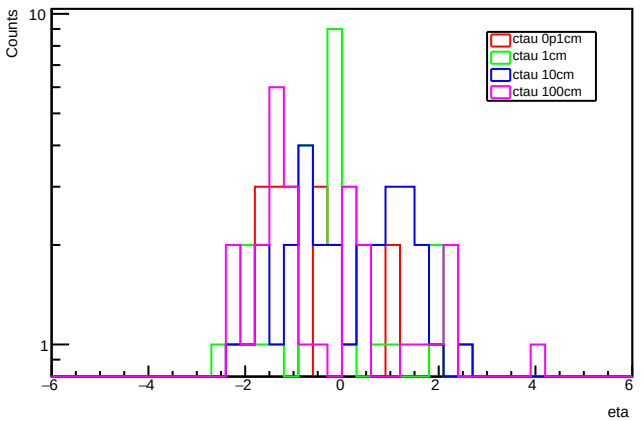
reco leading Mu eta: no cuts



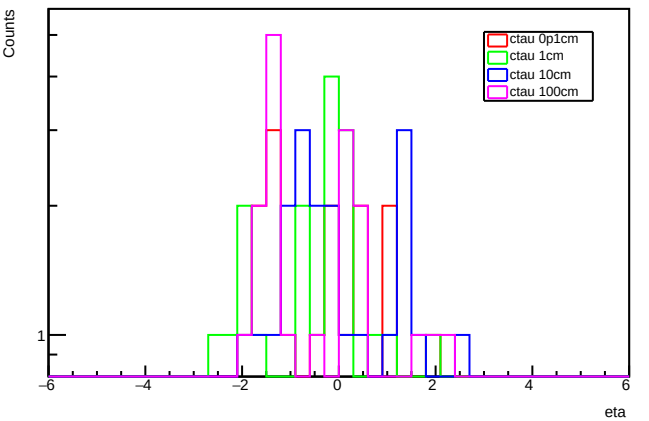
reco leading Mu eta: n_jet >=1, j1pt > 30 GeV



reco leading Mu eta: MET > 120 GeV



reco leading Mu eta: j1pt >120, at most 2 jets w/ pt >30 GeV



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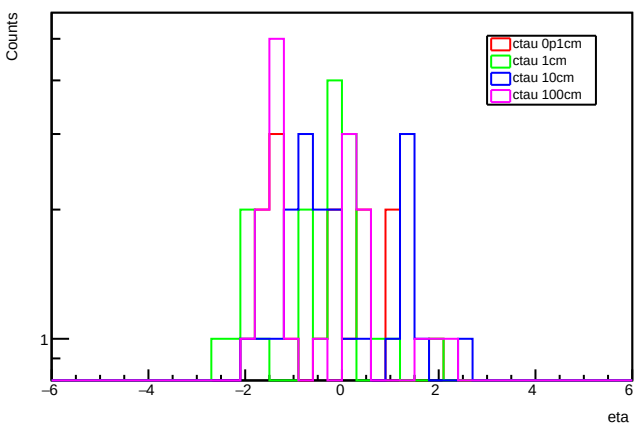
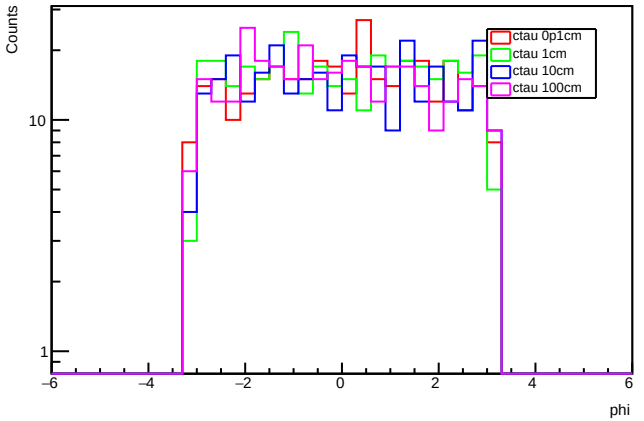
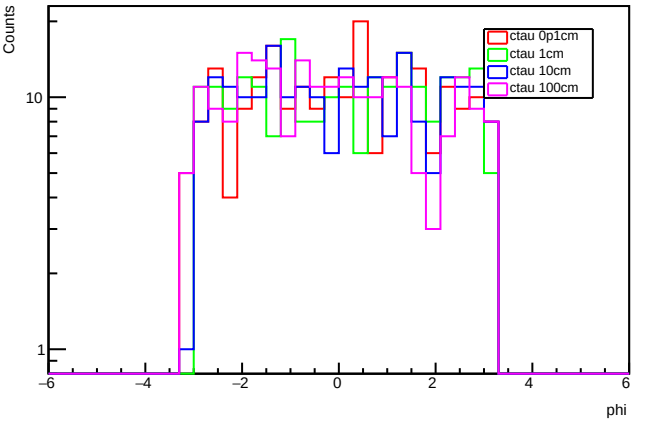


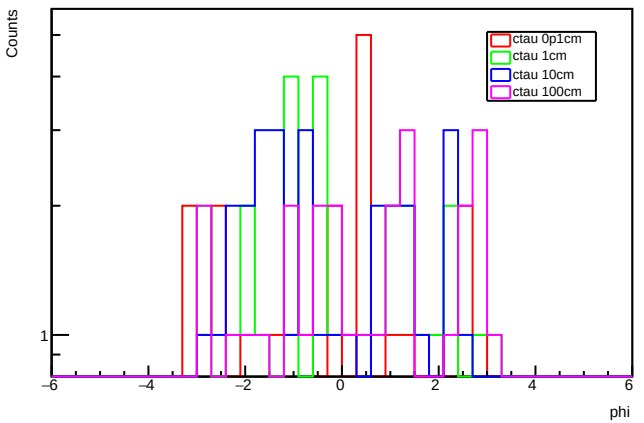
reco leading Mu phi: no cuts



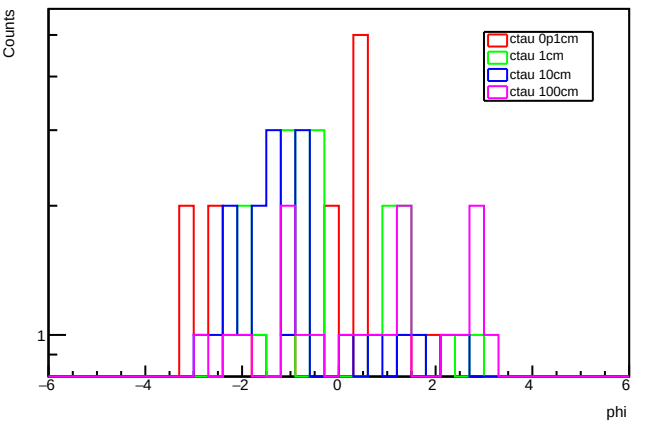
reco leading Mu phi: n_jet >=1, j1pt > 30 GeV



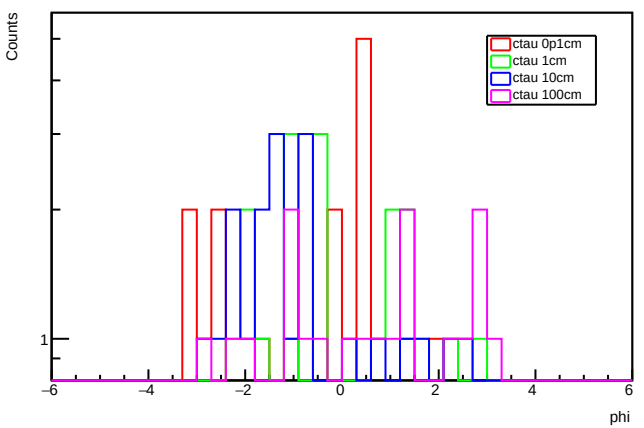
reco leading Mu phi: MET > 120 GeV



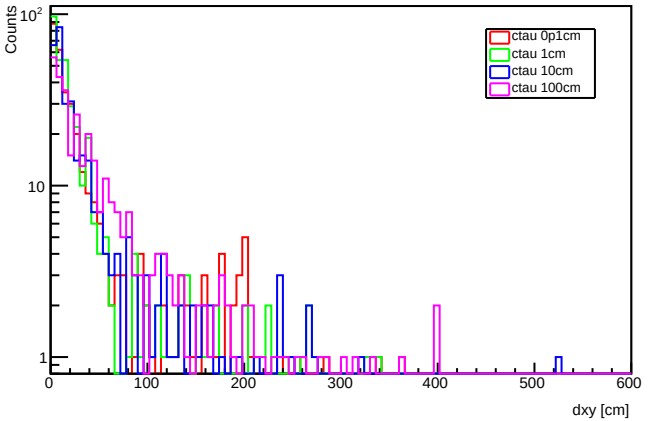
reco leading Mu phi: j1pt >120, at most 2 jets w/ pt >30 GeV



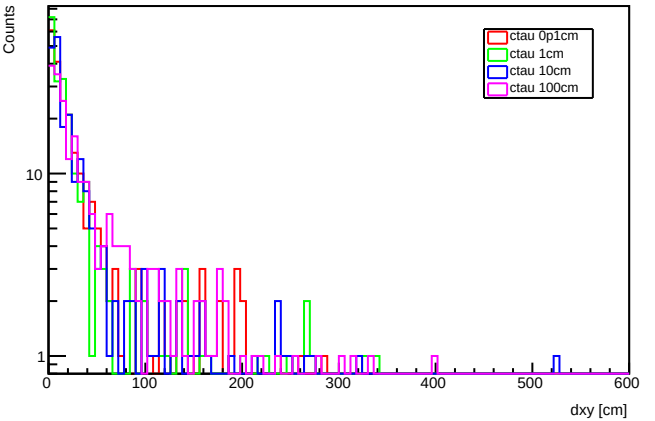
reco leading Mu phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



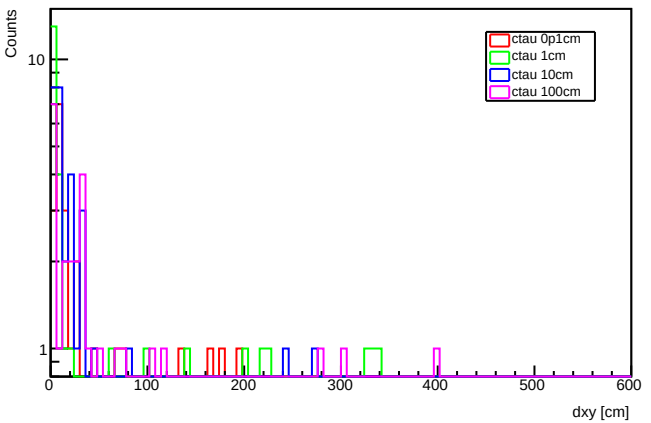
reco leading Mu vxy: no cuts



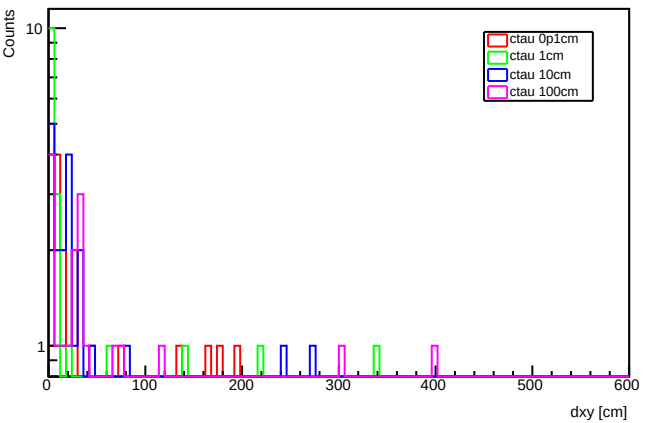
reco leading Mu vxy: n_jet >=1, j1pt > 30 GeV



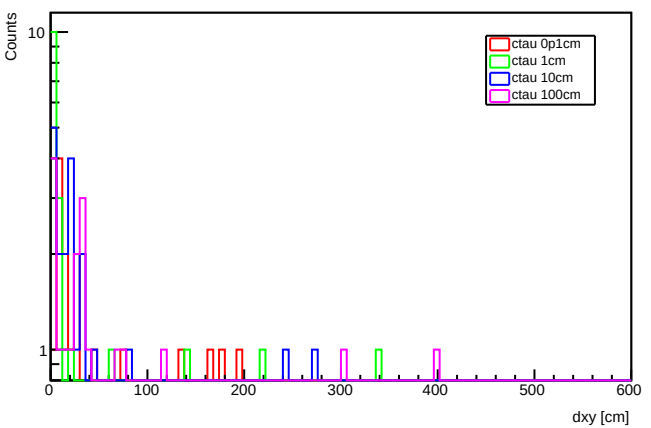
reco leading Mu vxy: MET > 120 GeV



reco leading Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



reco leading Mu vxy: at least 2 mu w/ pt > 2 GeV and eta<2.5



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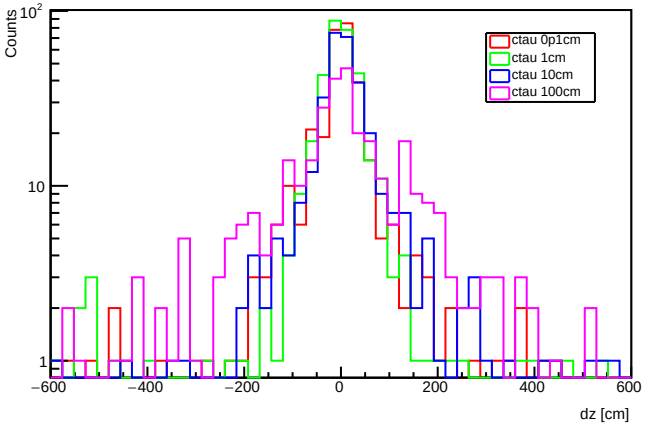

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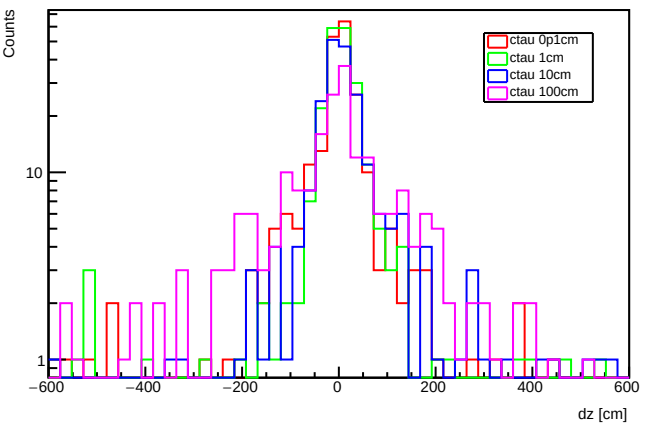
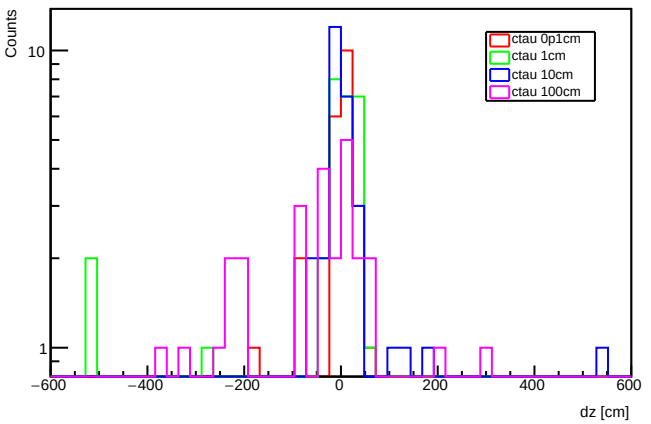
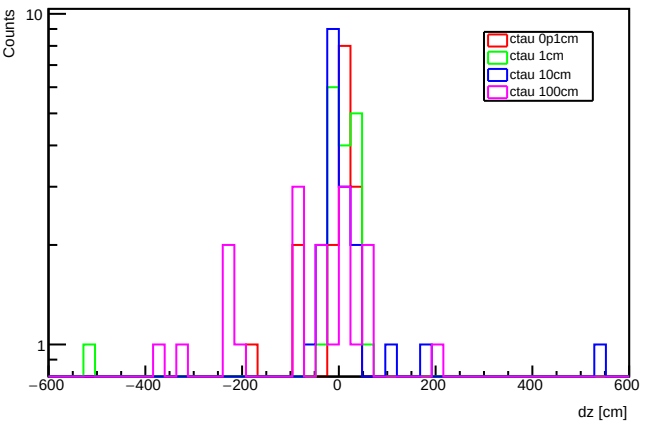


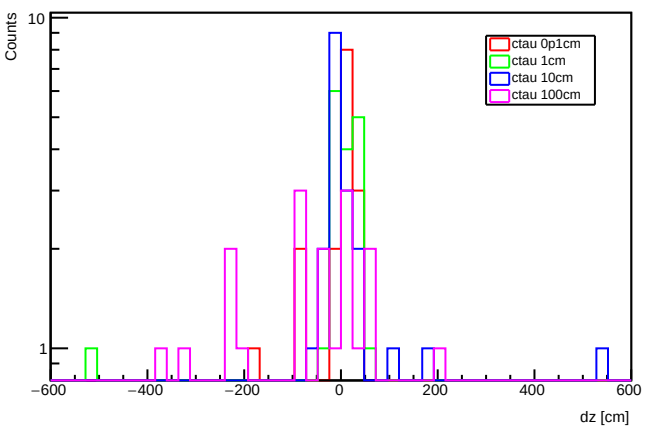
reco leading Mu vz: MET > 120 GeV



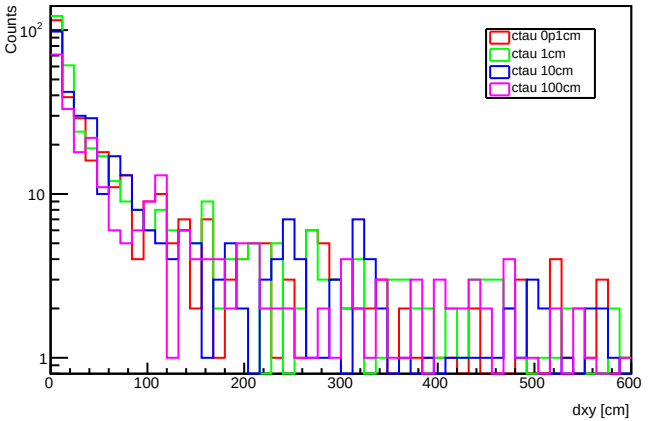
reco leading Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



reco leading Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



reco all Mu vxy: no cuts



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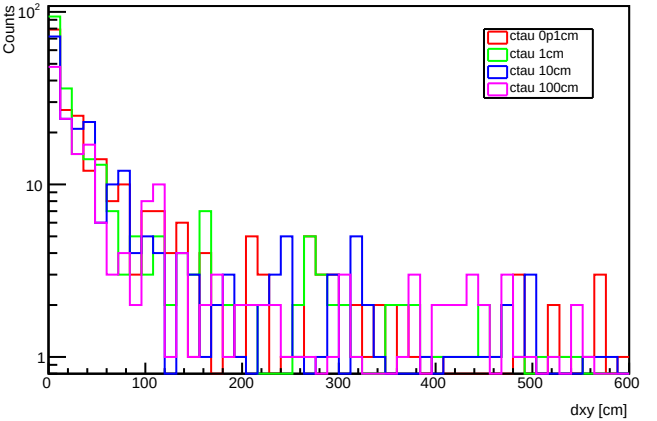

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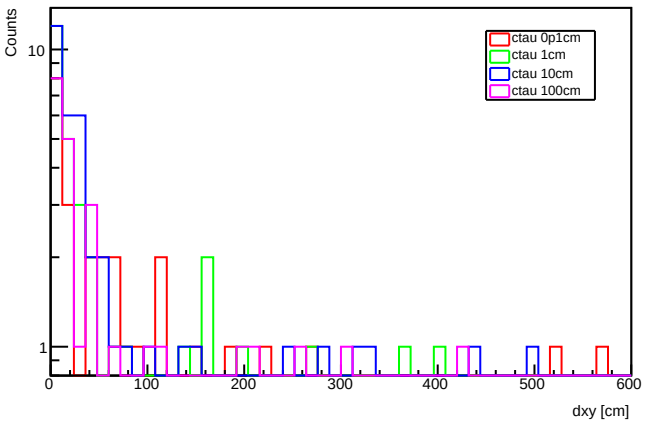
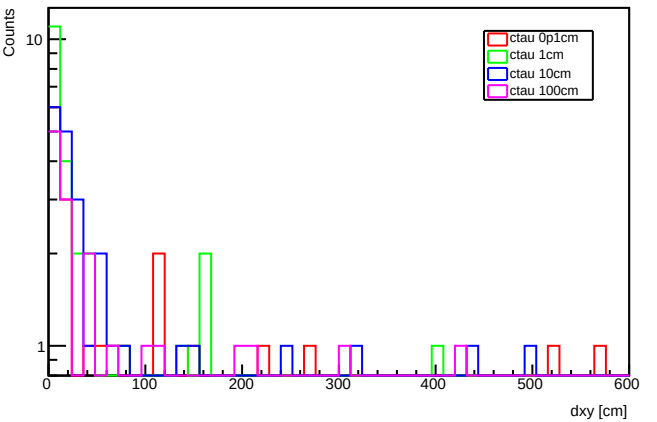
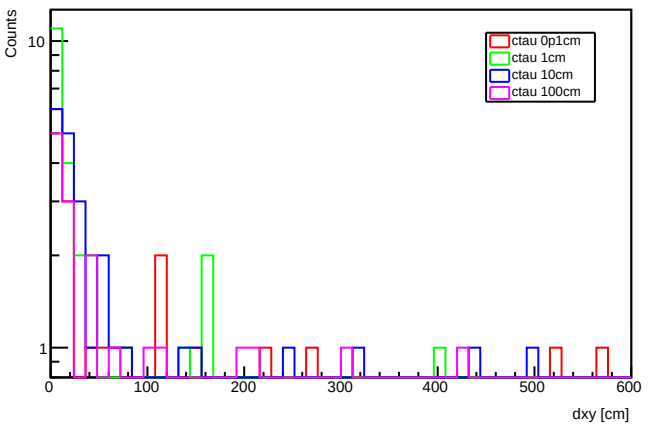


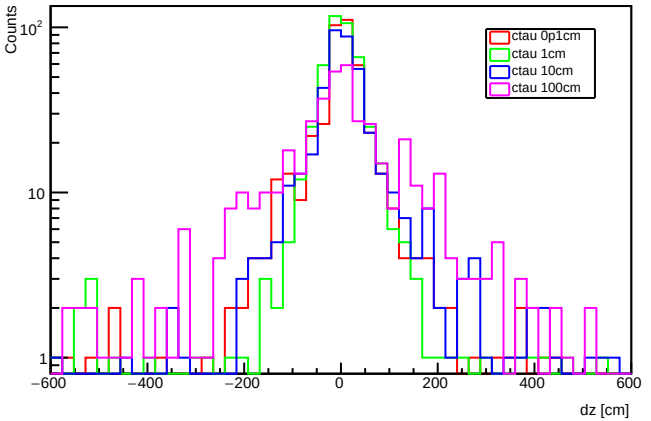
reco all Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



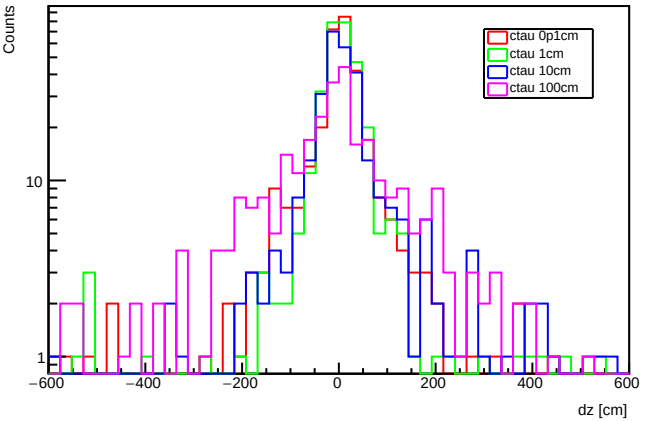
reco all Mu vxy: at least 2 mu w/ pt > 2 GeV and eta<2.5



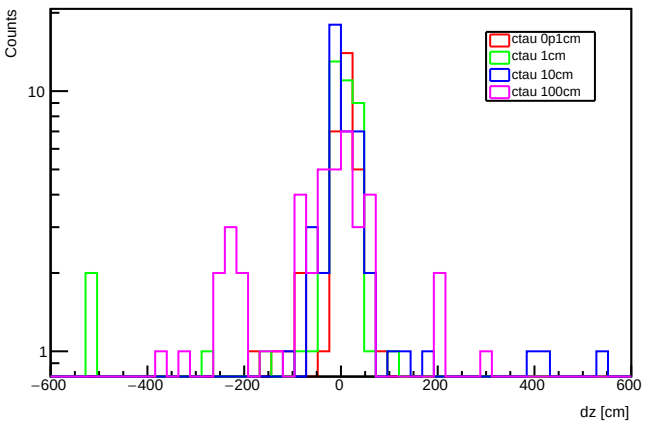
reco all Mu vz: no cuts



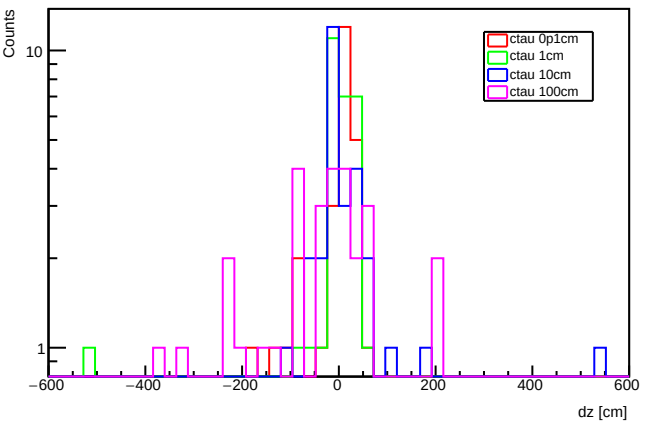
reco all Mu vz: n_jet >=1, j1pt > 30 GeV



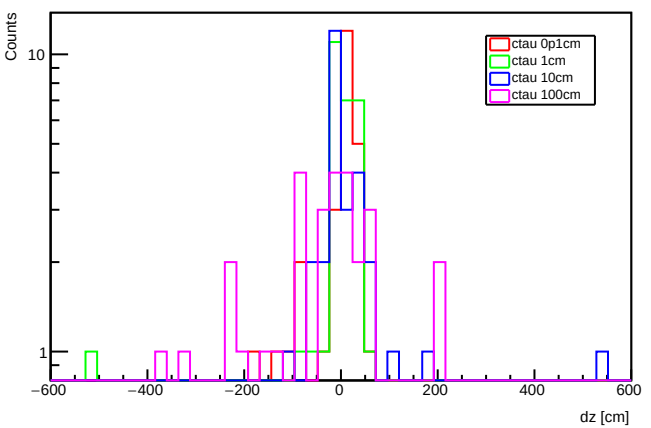
reco all Mu vz: MET > 120 GeV



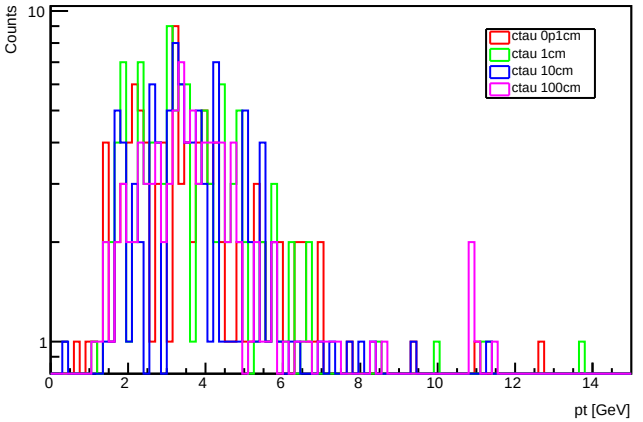
reco all Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



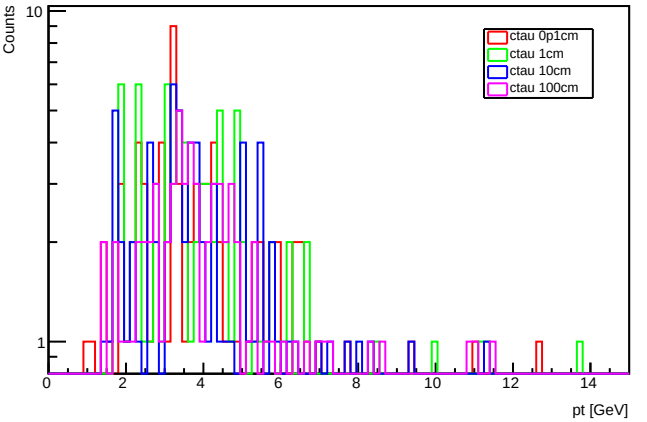
reco all Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



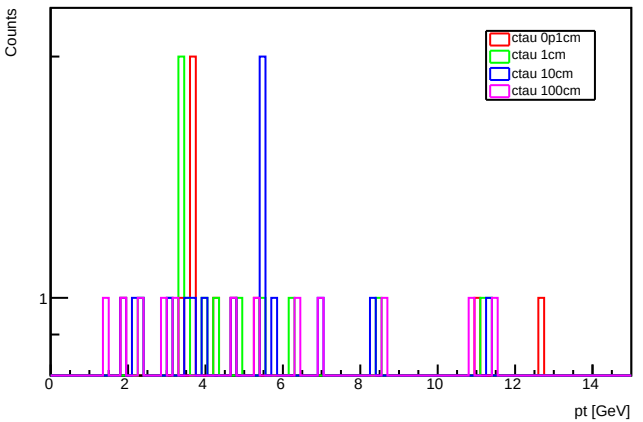
reco subleading Mu pt: no cuts



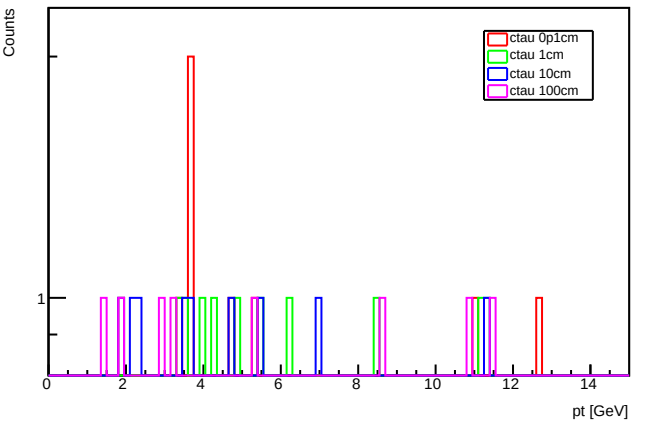
reco subleading Mu pt: n_jet >=1, j1pt > 30 GeV



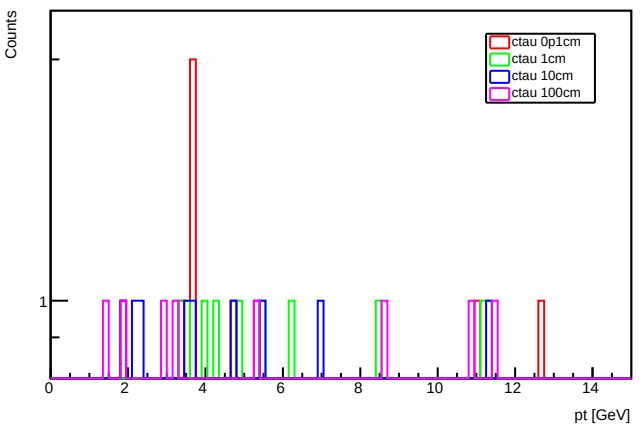
reco subleading Mu pt: MET > 120 GeV



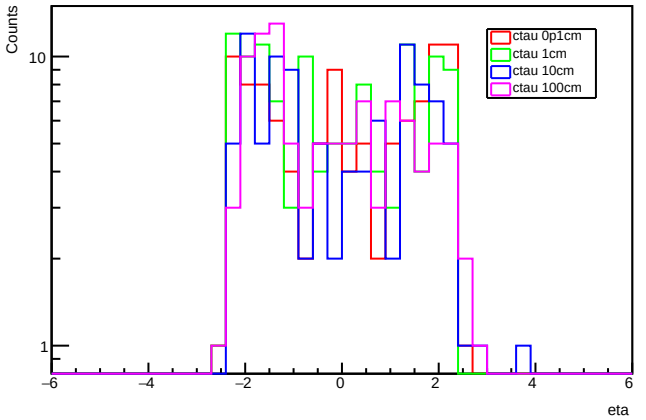
reco subleading Mu pt: j1pt >120, at most 2 jets w/ pt >30 GeV



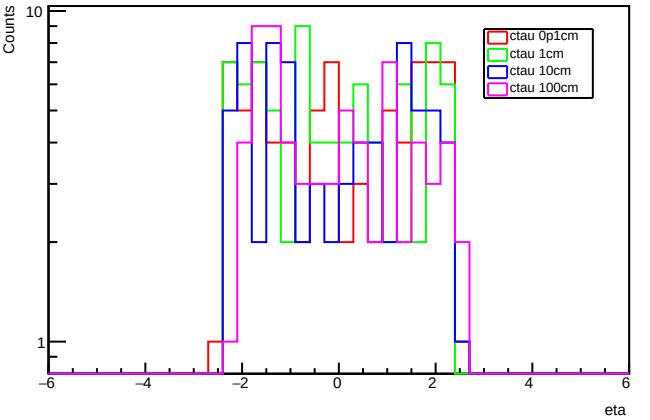
reco subleading Mu pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



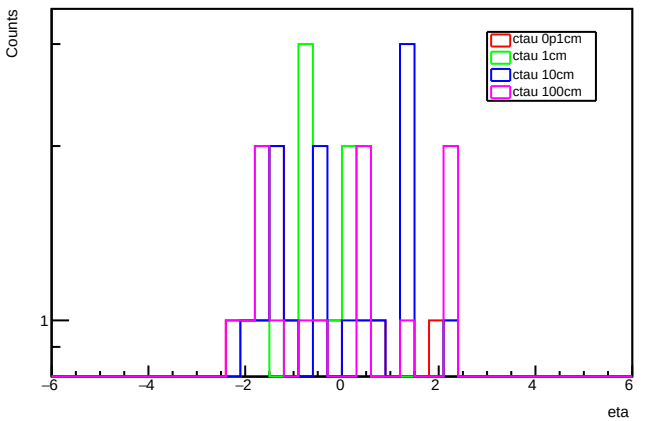
reco subleading Mu eta: no cuts



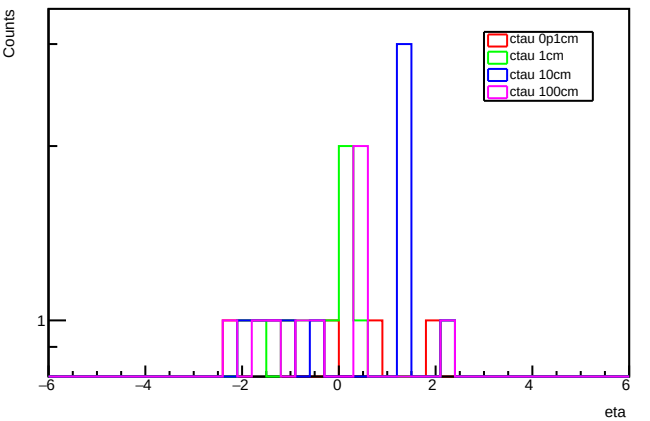
reco subleading Mu eta: n_jet >=1, j1pt > 30 GeV



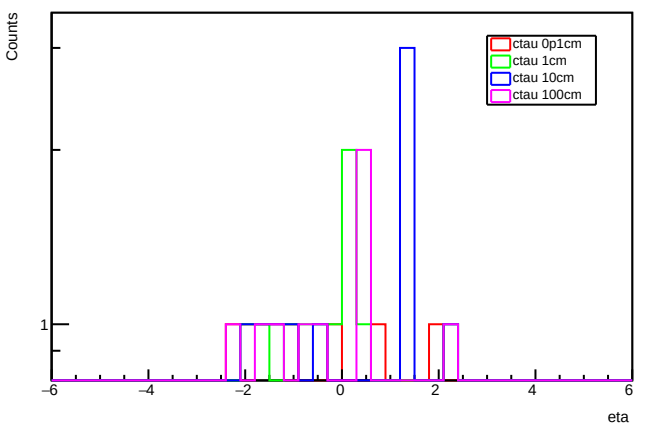
reco subleading Mu eta: MET > 120 GeV



reco subleading Mu eta: j1pt >120, at most 2 jets w/ pt >30 GeV



reco subleading Mu eta: at least 2 mu w/ pt > 2 GeV and eta<2.5



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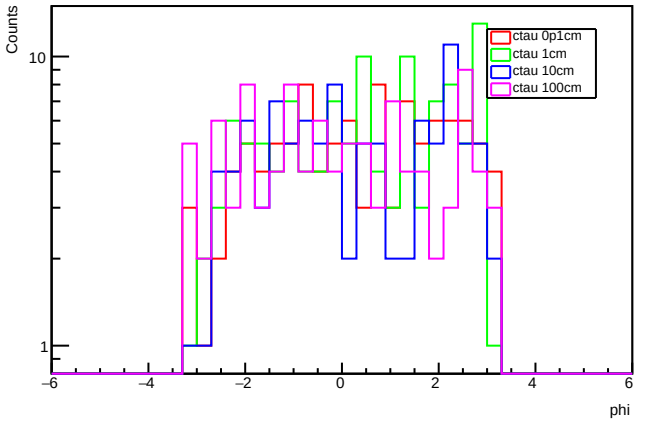
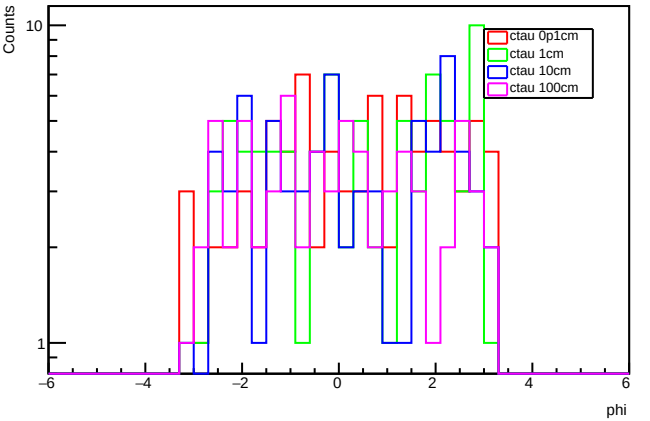
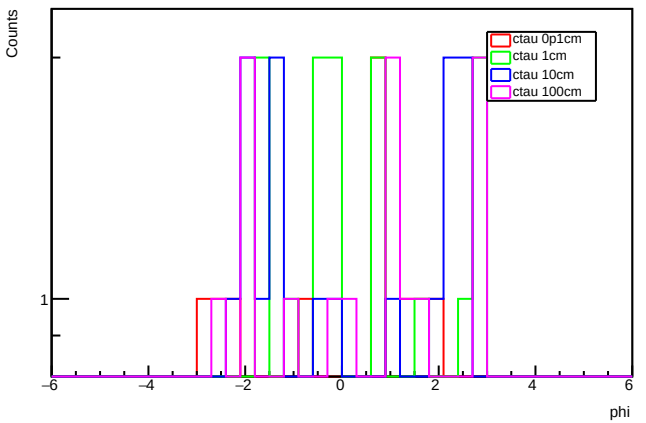


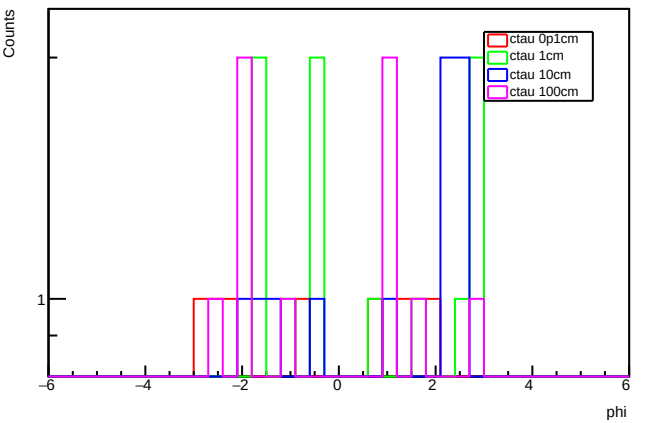
reco subleading Mu phi: n_jet >=1, j1pt > 30 GeV



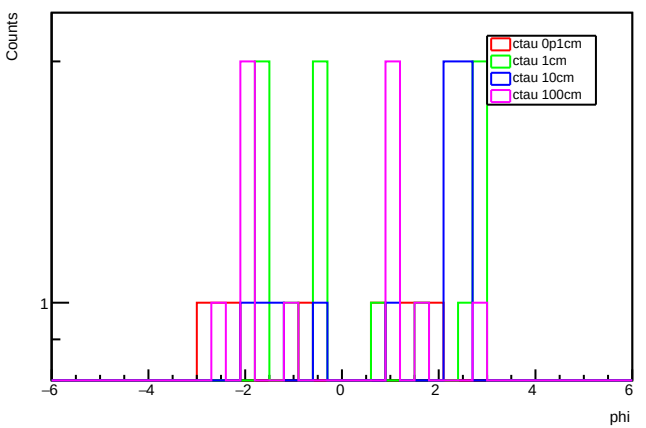
reco subleading Mu phi: MET > 120 GeV



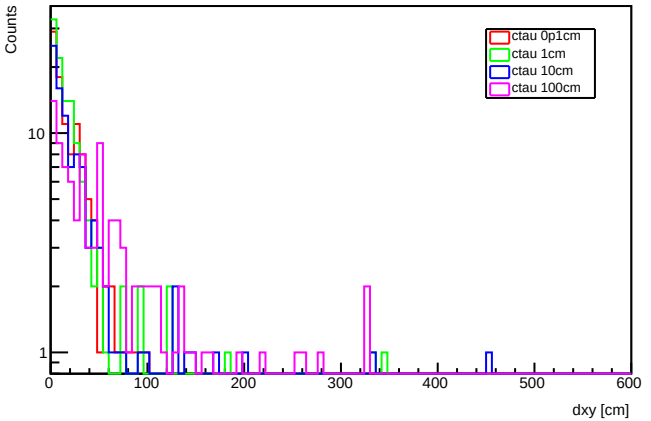
reco subleading Mu phi: j1pt >120, at most 2 jets w/ pt >30 GeV



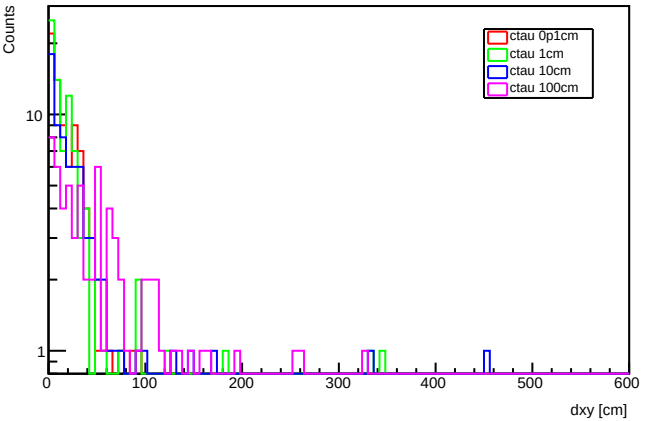
reco subleading Mu phi: at least 2 mu w/ pt > 2 GeV and eta<2.5



reco subleading Mu vxy: no cuts



reco subleading Mu vxy: n_jet >=1, j1pt > 30 GeV



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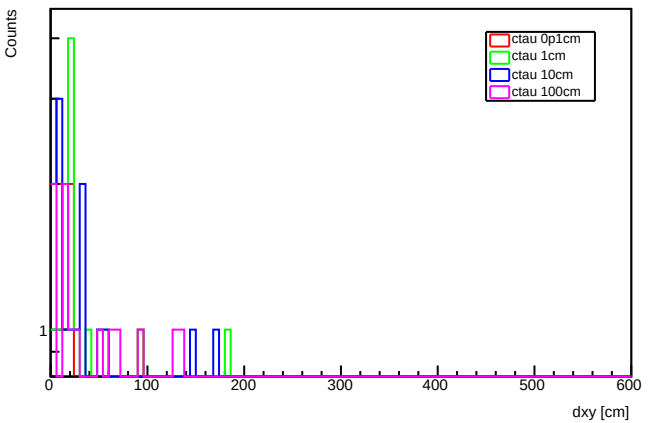
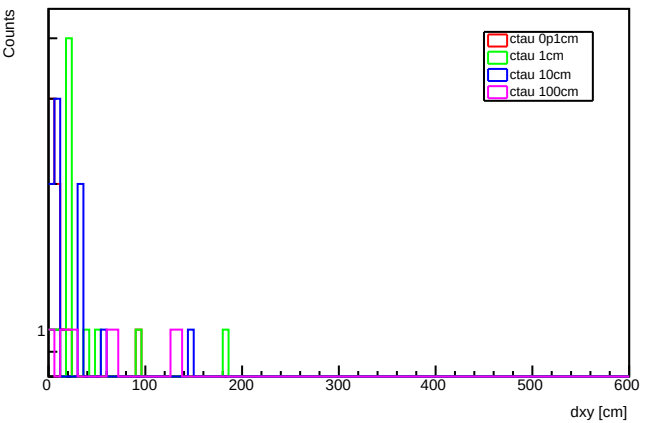
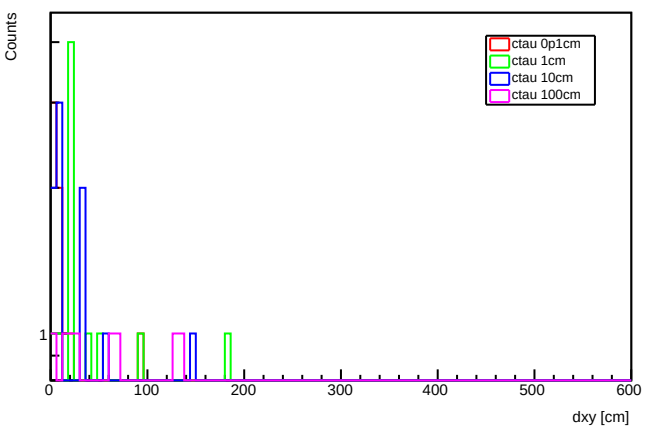


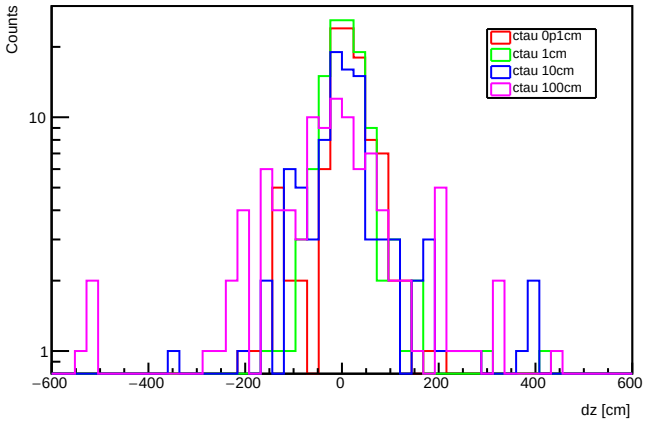
reco subleading Mu vxy: j1pt >120, at most 2 jets w/ pt >30 GeV



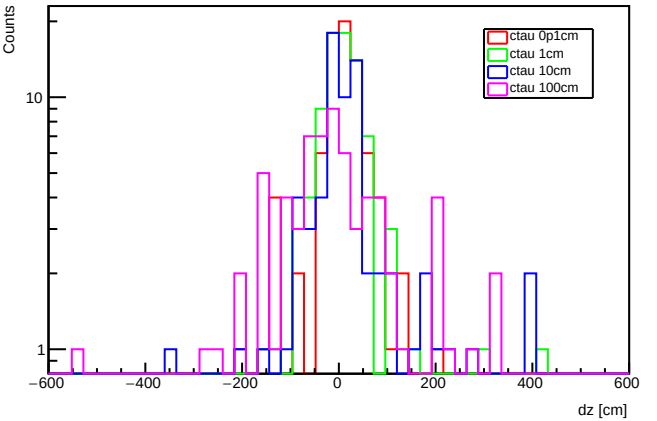
reco subleading Mu vxy: at least 2 mu w/ pt > 2 GeV and eta<2.5



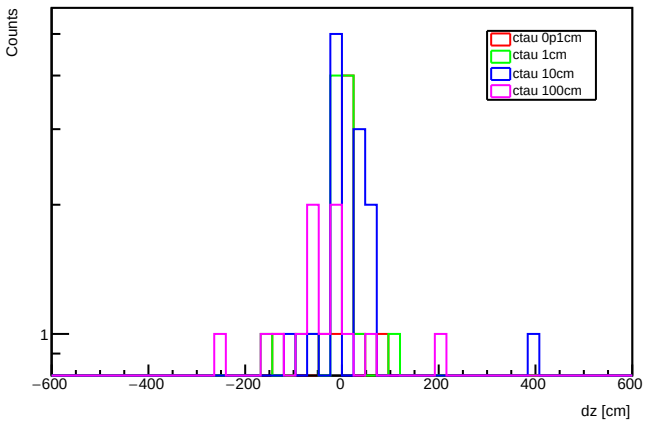
reco subleading Mu vz: no cuts



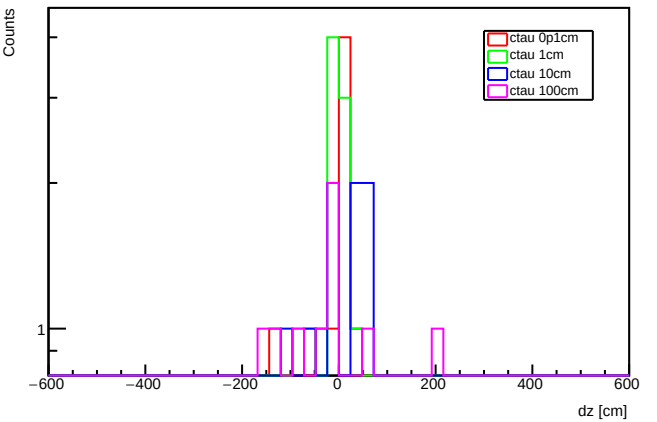
reco subleading Mu vz: n_jet >=1, j1pt > 30 GeV



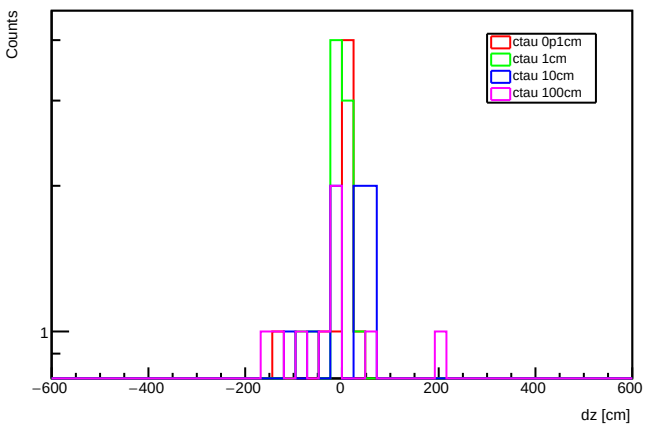
reco subleading Mu vz: MET > 120 GeV



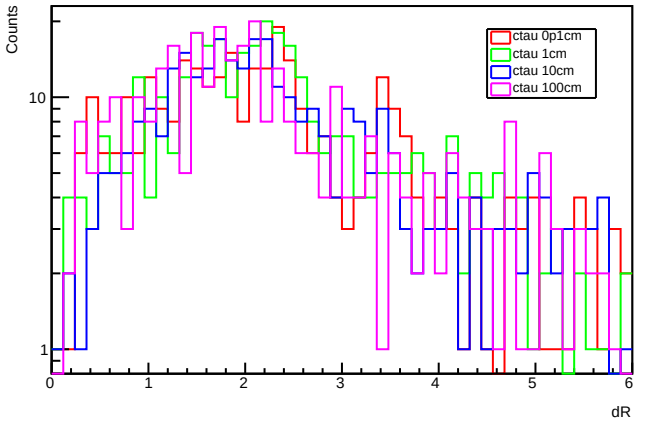
reco subleading Mu vz: j1pt >120, at most 2 jets w/ pt >30 GeV



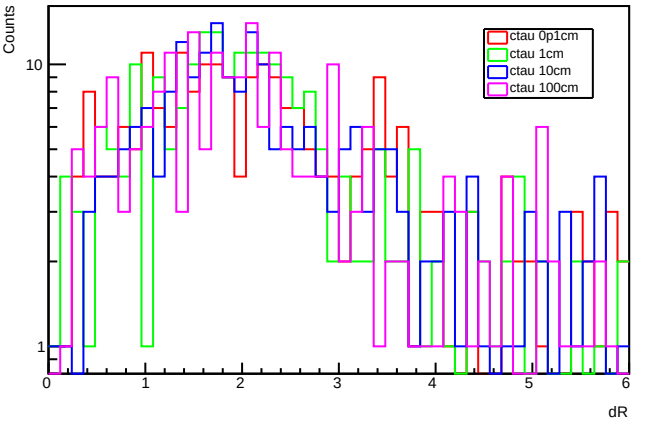
reco subleading Mu vz: at least 2 mu w/ pt > 2 GeV and eta<2.5



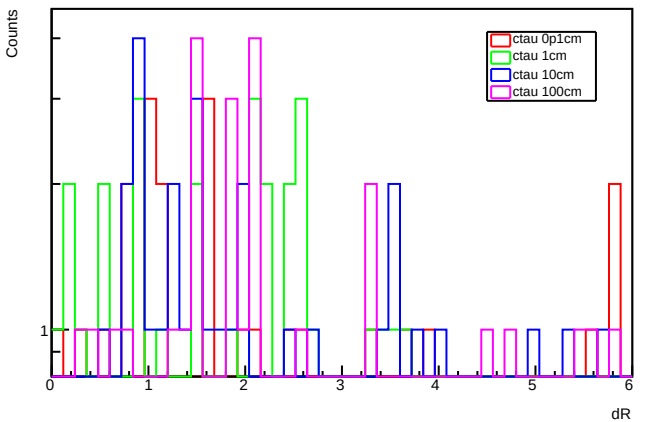
dR: reco leading mu and subleading mu: no cuts



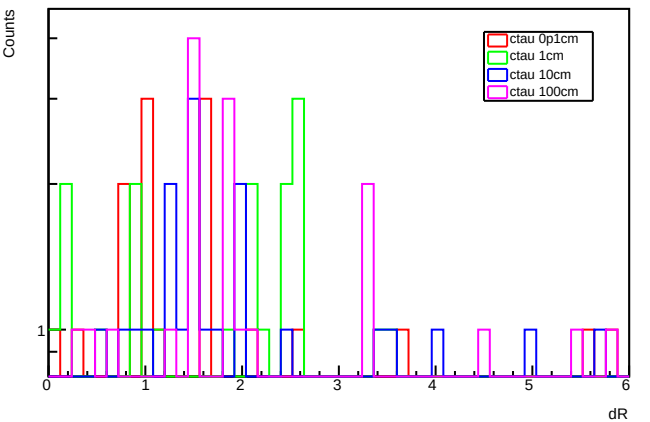
dR: reco leading mu and subleading mu: n_jet >=1, j1pt > 30 GeV



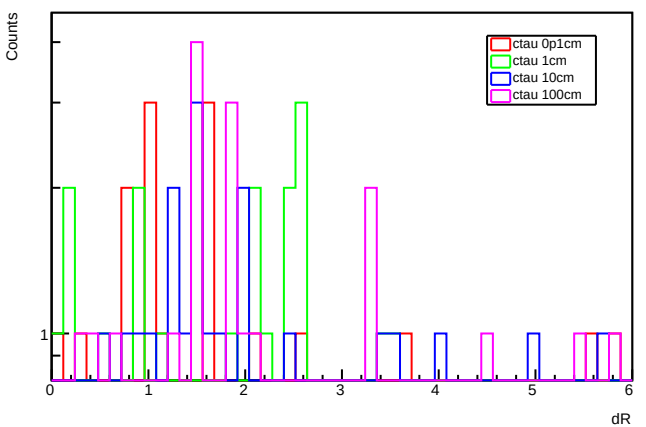
dR: reco leading mu and subleading mu: MET > 120 GeV



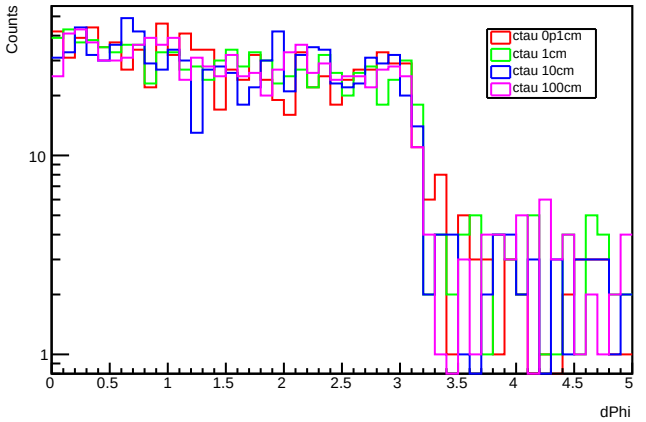
dR: reco leading mu and subleading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



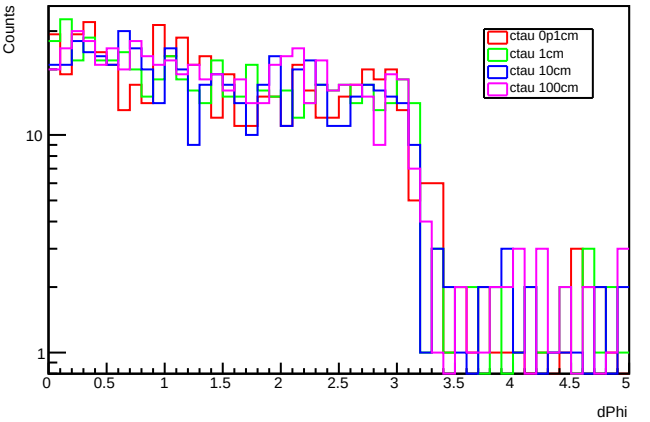
dR: reco leading mu and subleading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



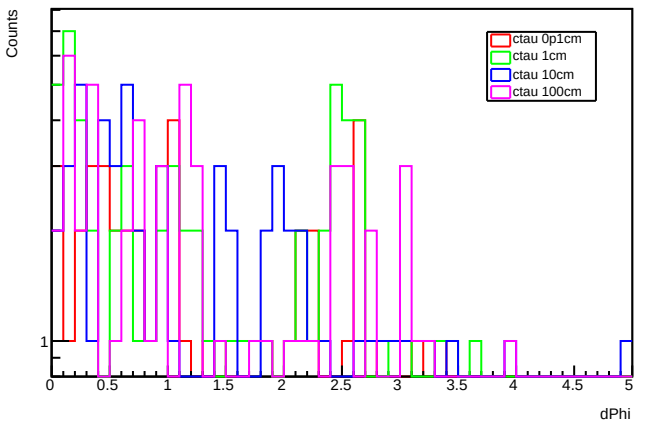
dPhi: reco MET and leading mu: no cuts



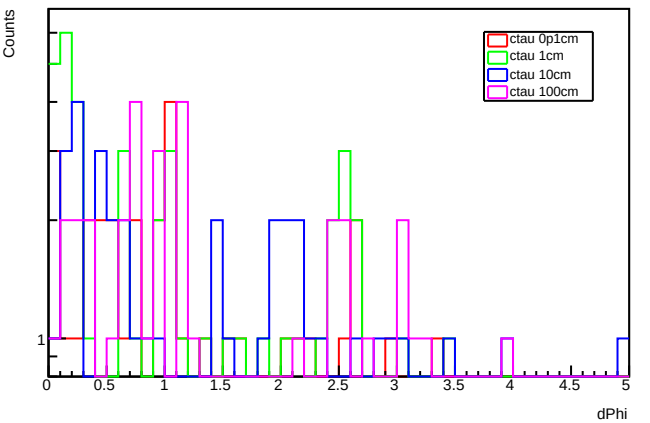
dPhi: reco MET and leading mu: n_jet >=1, j1pt > 30 GeV



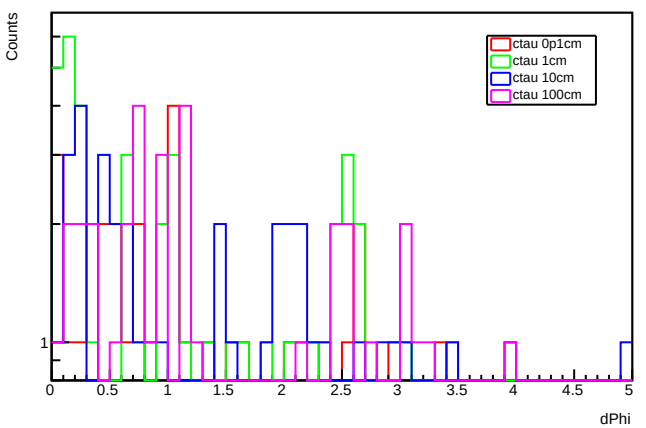
dPhi: reco MET and leading mu: MET > 120 GeV



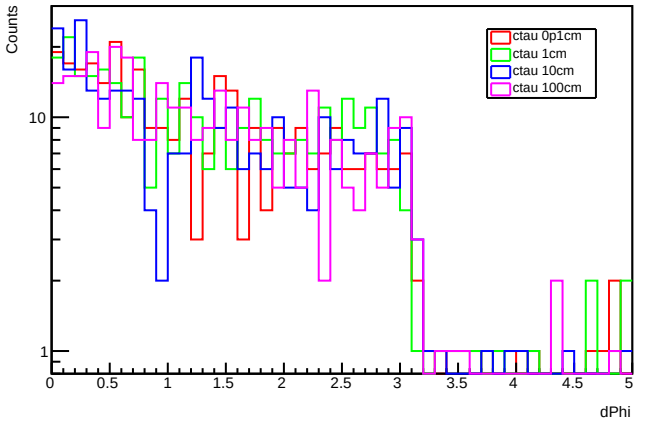
dPhi: reco MET and leading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



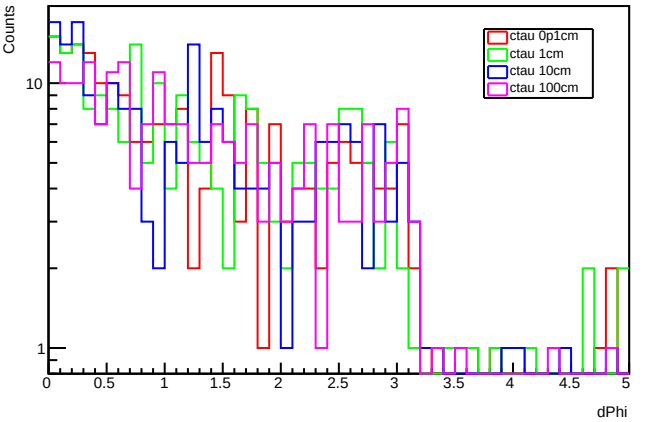
dPhi: reco MET and leading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



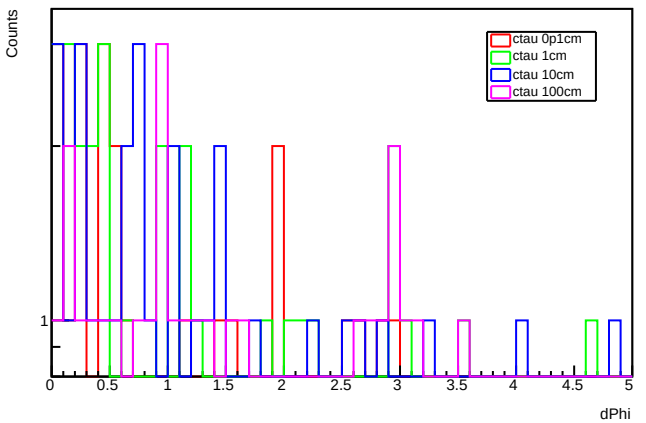
dPhi: reco leading mu and subleading mu: no cuts



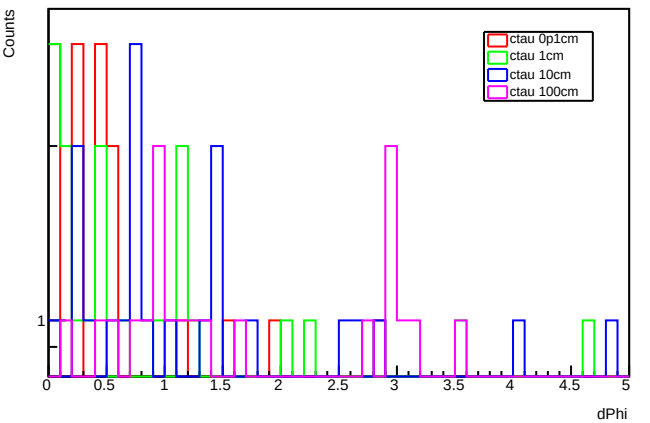
dPhi: reco leading mu and subleading mu: n_jet >=1, j1pt > 30 GeV



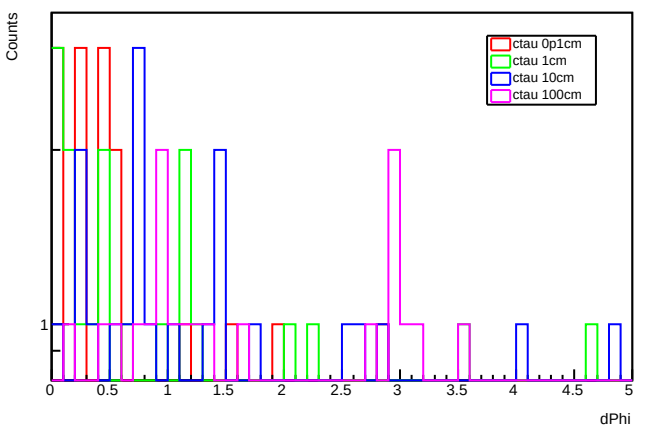
dPhi: reco leading mu and subleading mu: MET > 120 GeV



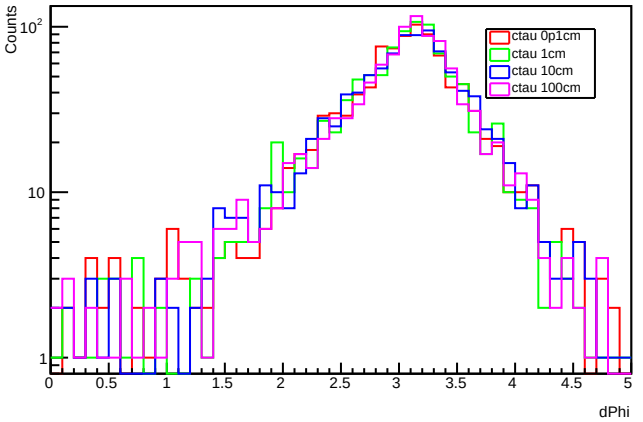
dPhi: reco leading mu and subleading mu: j1pt >120, at most 2 jets w/ pt >30 GeV



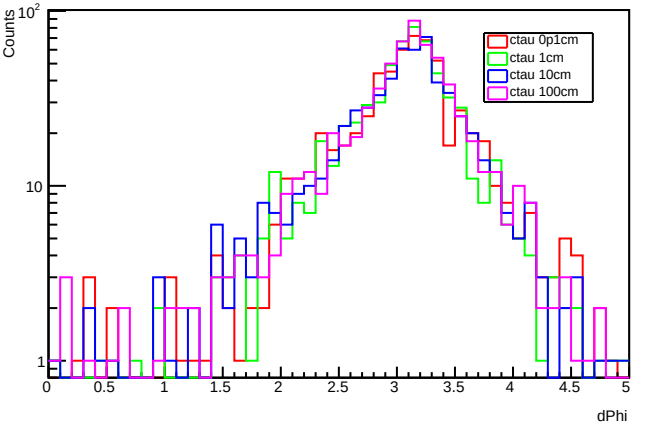
dPhi: reco leading mu and subleading mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



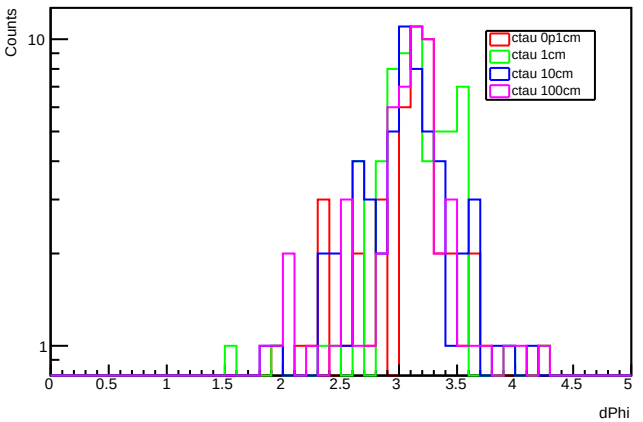
dPhi: reco MET and leading jet: no cuts



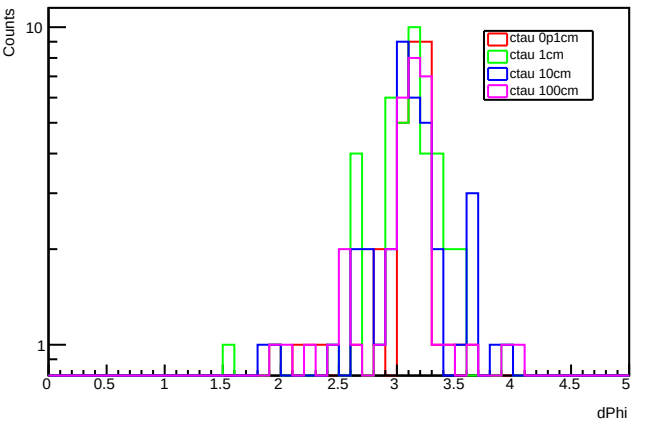
dPhi: reco MET and leading jet: n_jet >=1, j1pt > 30 GeV



dPhi: reco MET and leading jet: MET > 120 GeV



dPhi: reco MET and leading jet: j1pt >120, at most 2 jets w/ pt >30 GeV



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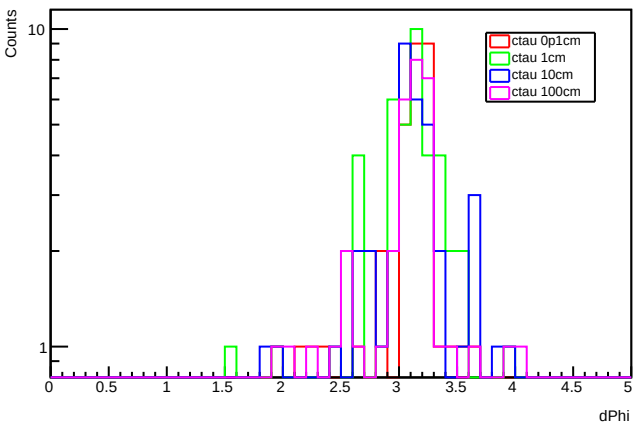
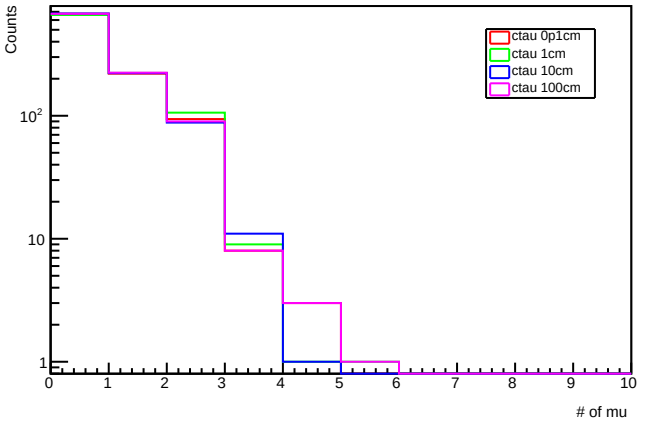
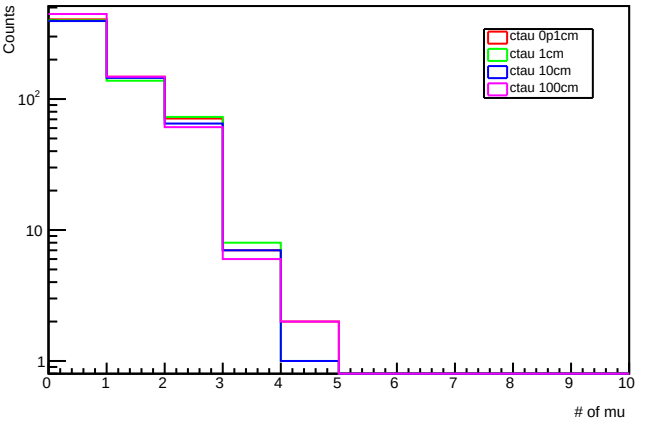


reco number of mu: no cuts



reco number of mu: n_jet >=1, j1pt > 30 GeV



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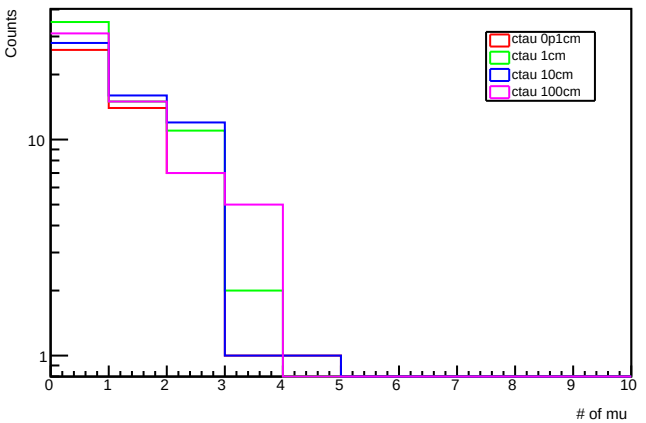

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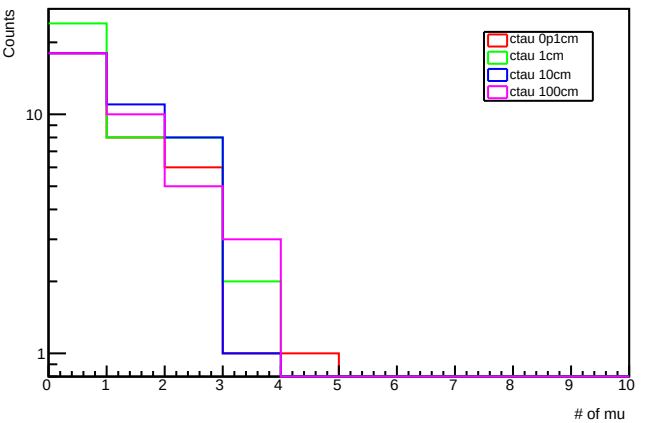
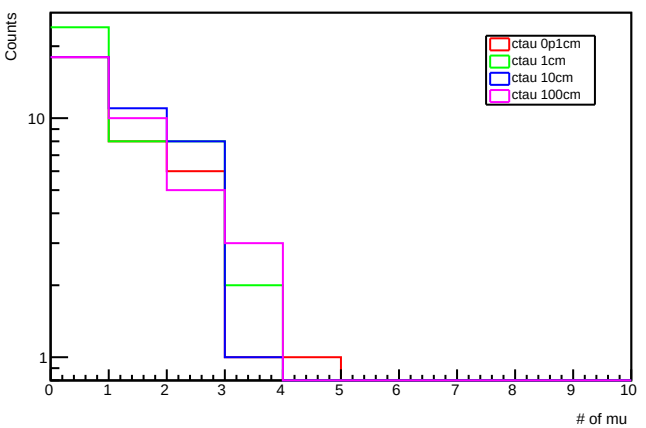


reco number of mu: at least 2 mu w/ pt > 2 GeV and eta<2.5



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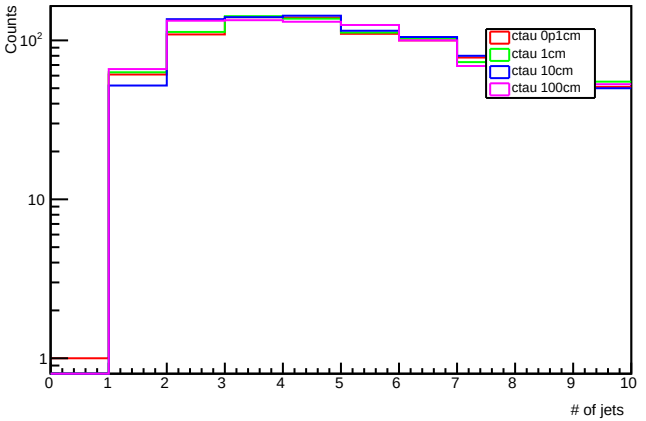
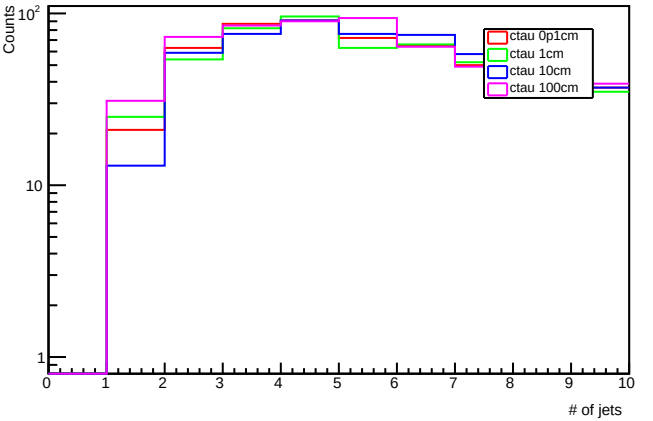
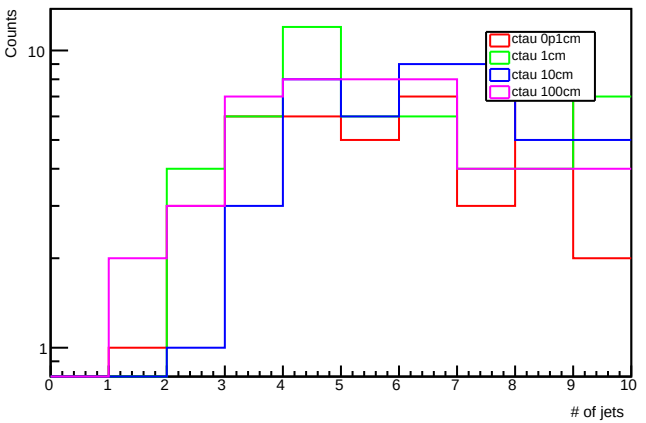


reco number of jets: n_jet >=1, j1pt > 30 GeV



reco number of jets: MET > 120 GeV



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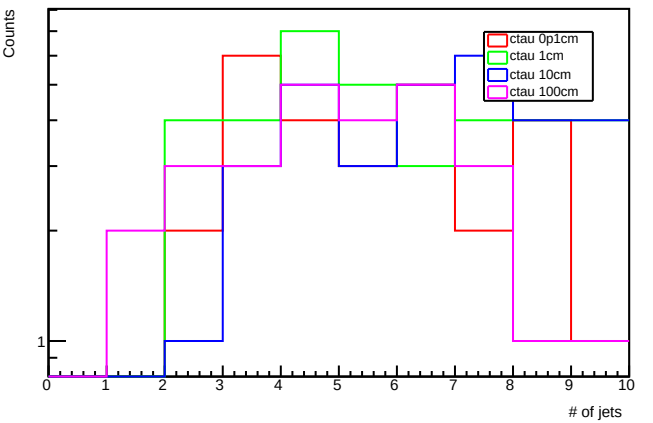

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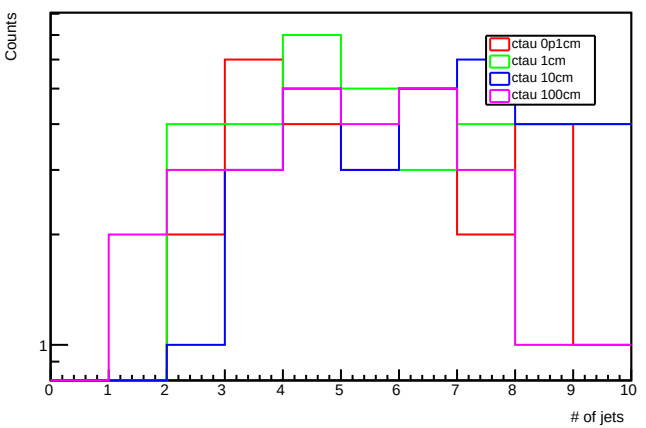
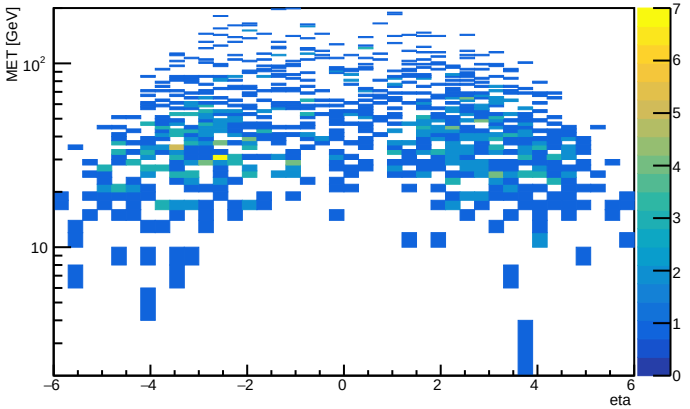
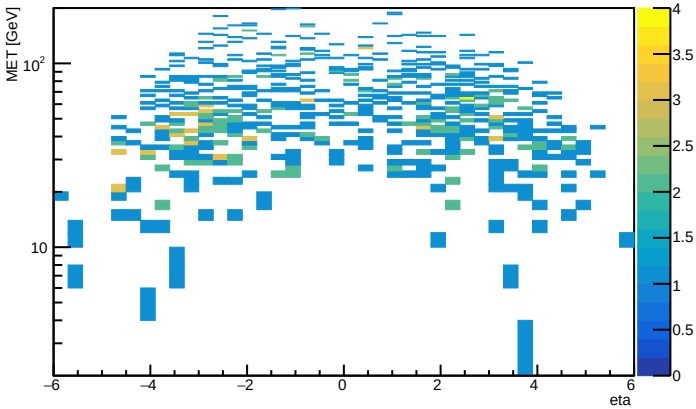


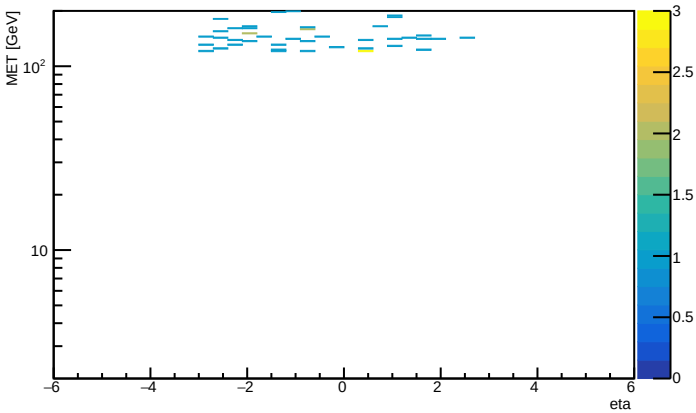
ctau 0p1cm gen leading Met eta vs pt: no cuts



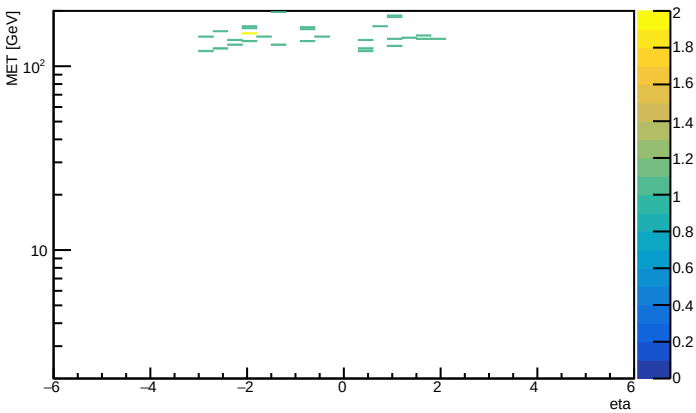
ctau 0p1cm gen leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



ctau 0p1cm gen leading Met eta vs pt: MET > 120 GeV



ctau 0p1cm gen leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV



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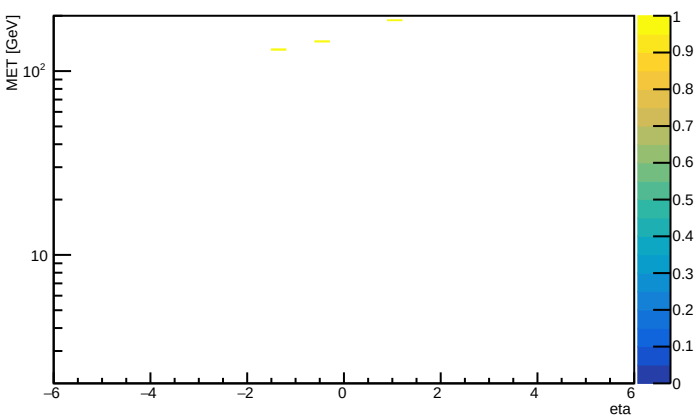
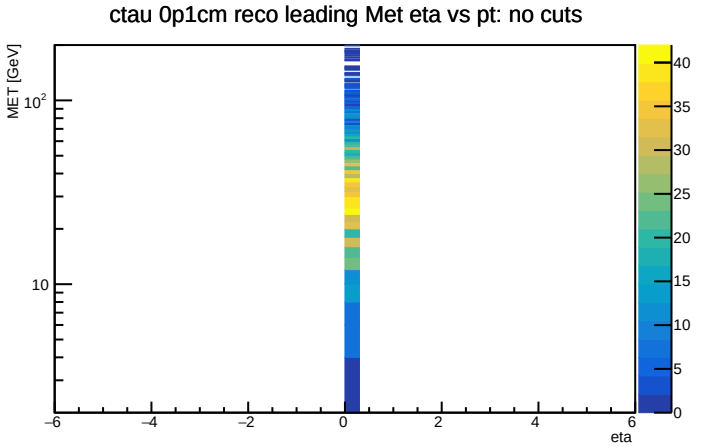
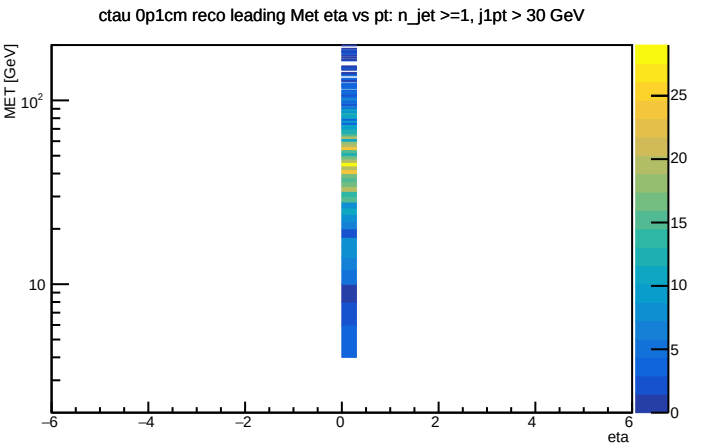



ctau 0p1cm reco leading Met eta vs pt: no cuts
MET [GeV]
eta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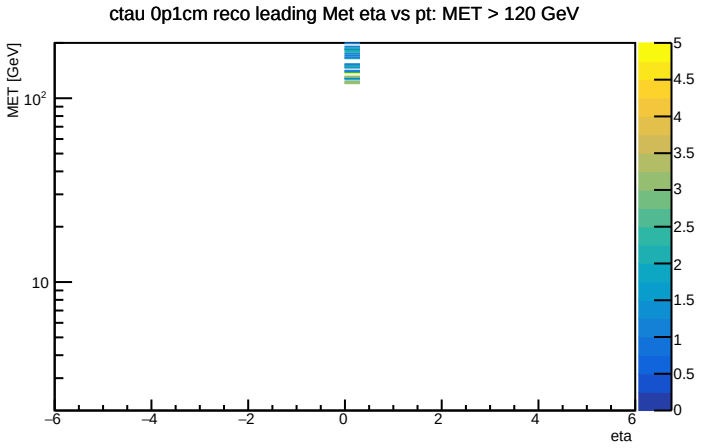
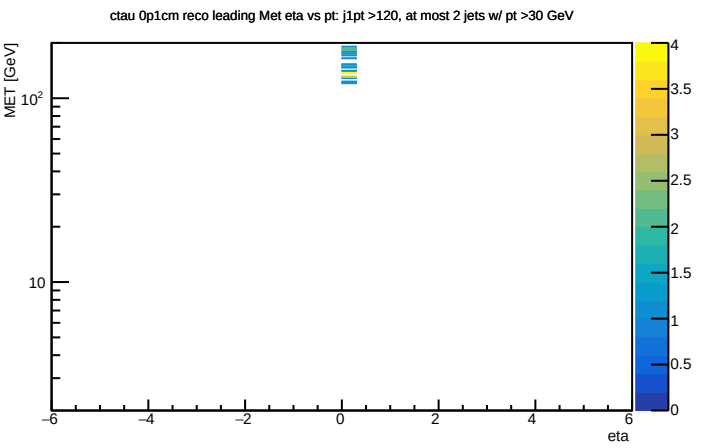
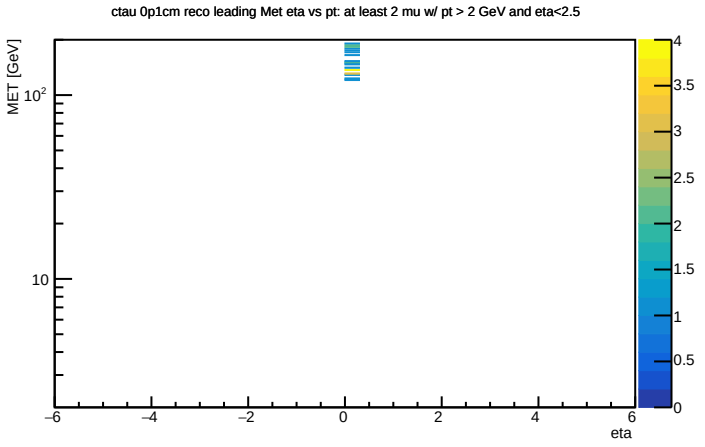
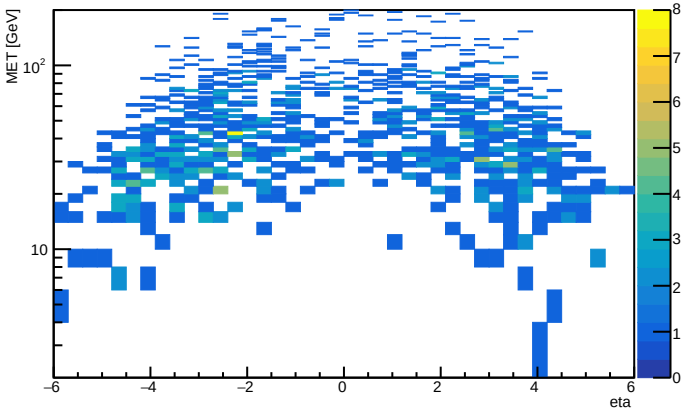
MET [GeV]
eta


ctau 0p1cm reco leading Met eta vs pt: MET > 120 GeV
MET [GeV]
eta

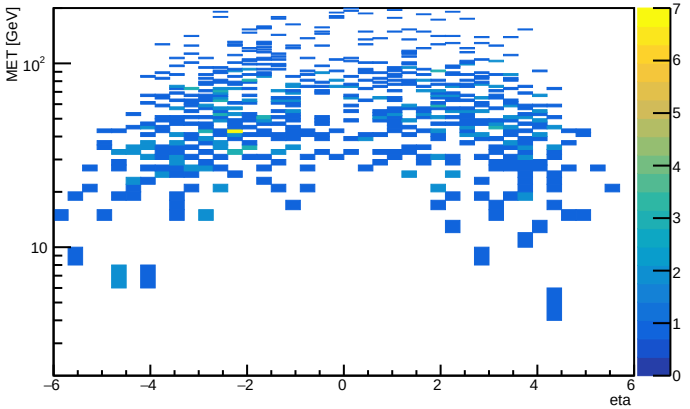

ctau 0p1cm reco leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV
MET [GeV]
eta


ctau 0p1cm reco leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5
MET [GeV]
eta

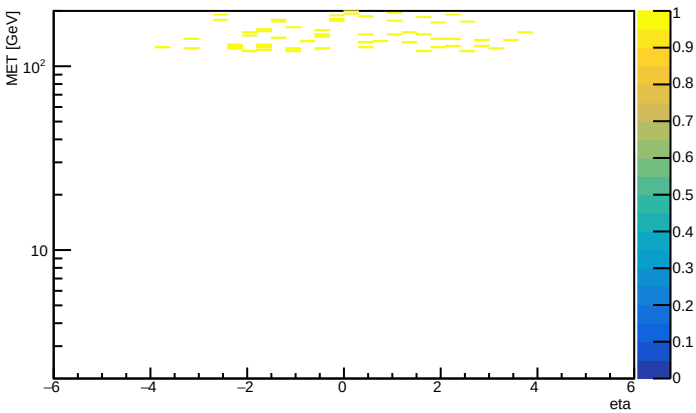
ctau 1cm gen leading Met eta vs pt: no cuts



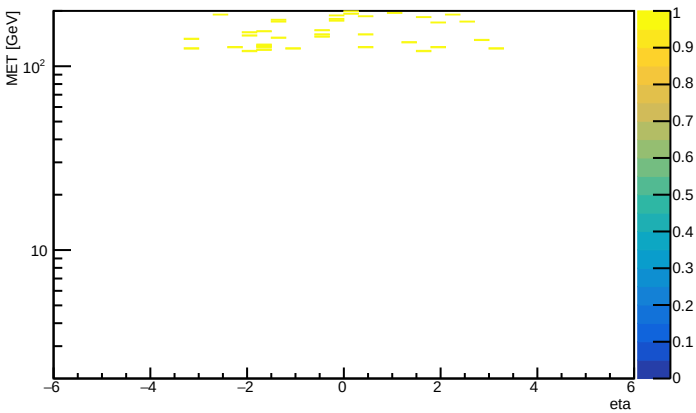
ctau 1cm gen leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



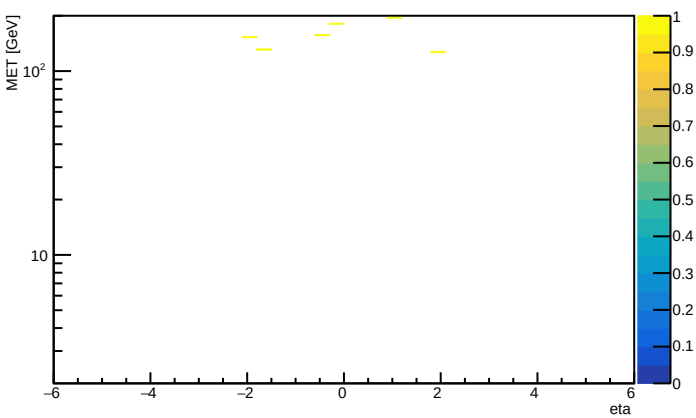
ctau 1cm gen leading Met eta vs pt: MET > 120 GeV



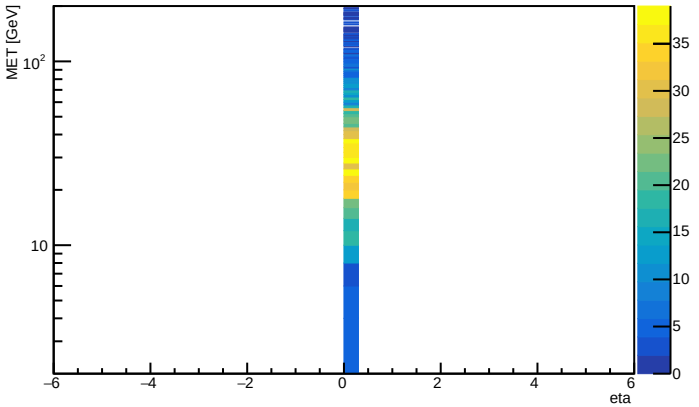
ctau 1cm gen leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV



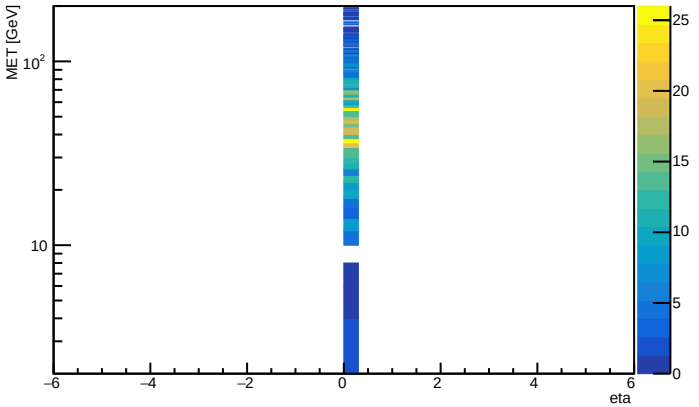
ctau 1cm gen leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



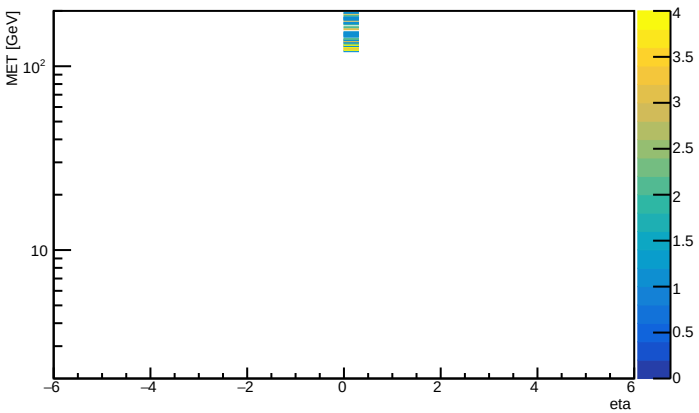
ctau 1cm reco leading Met eta vs pt: no cuts



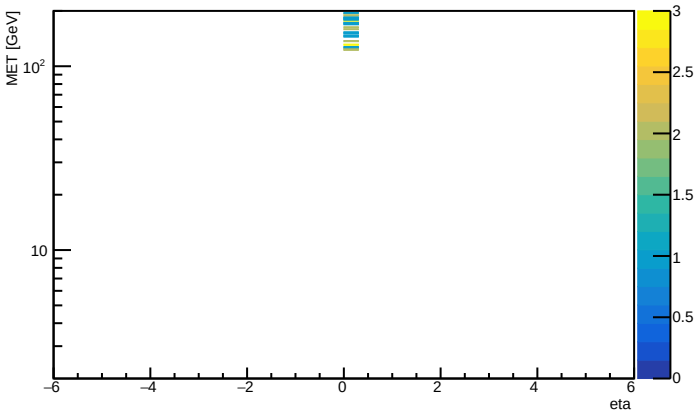
ctau 1cm reco leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



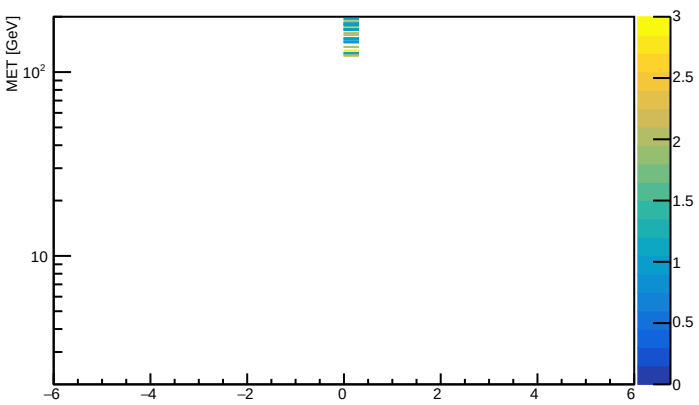
ctau 1cm reco leading Met eta vs pt: MET > 120 GeV



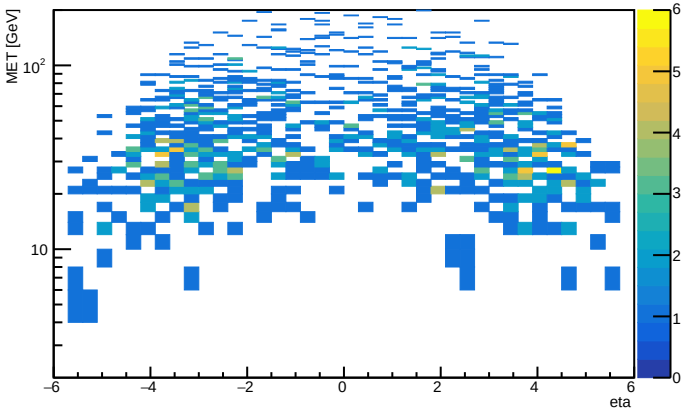
ctau 1cm reco leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV



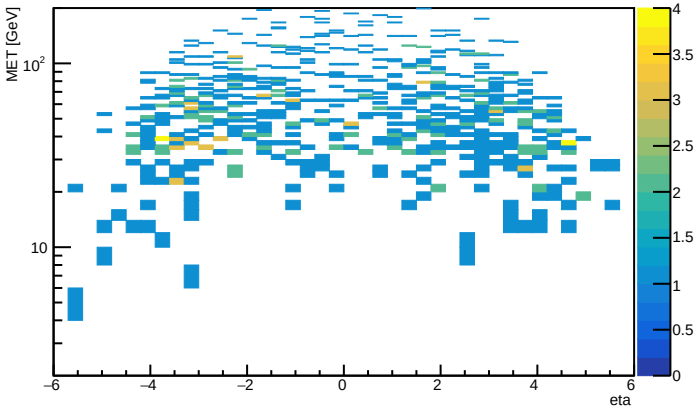
ctau 1cm reco leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



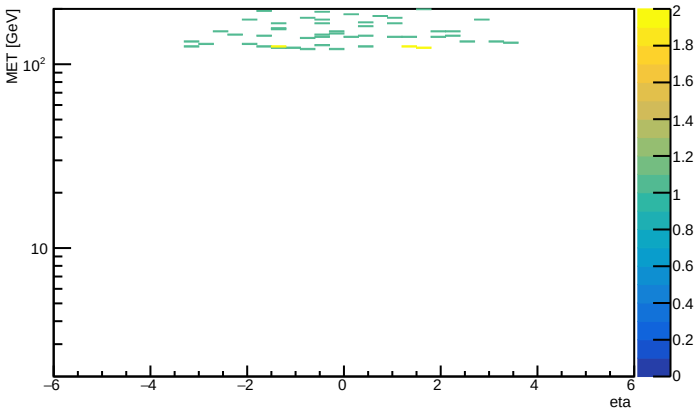
ctau 10cm gen leading Met eta vs pt: no cuts



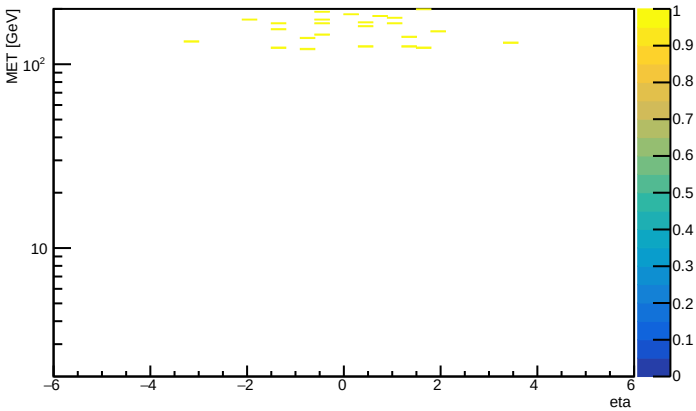
ctau 10cm gen leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



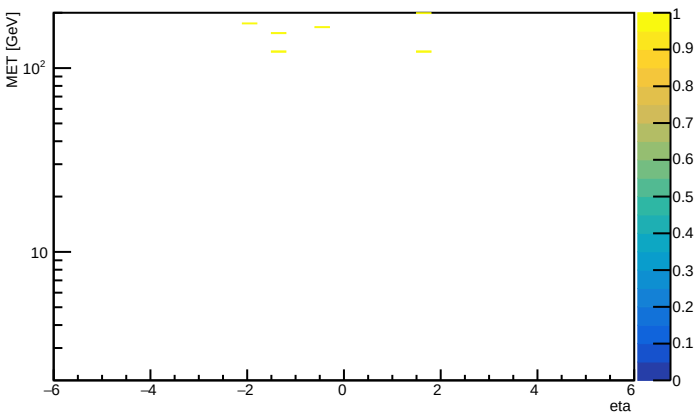
ctau 10cm gen leading Met eta vs pt: MET > 120 GeV

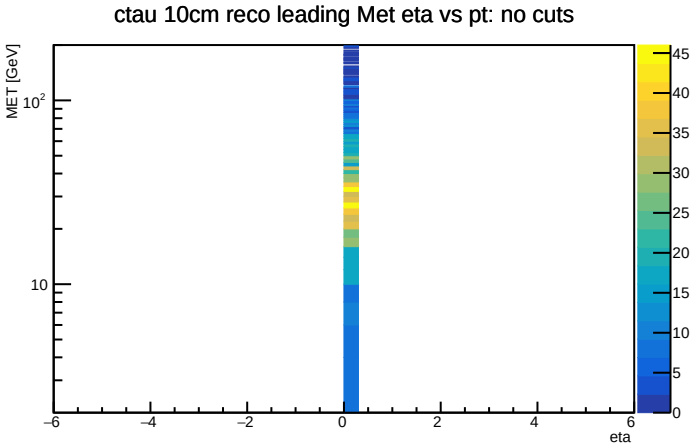


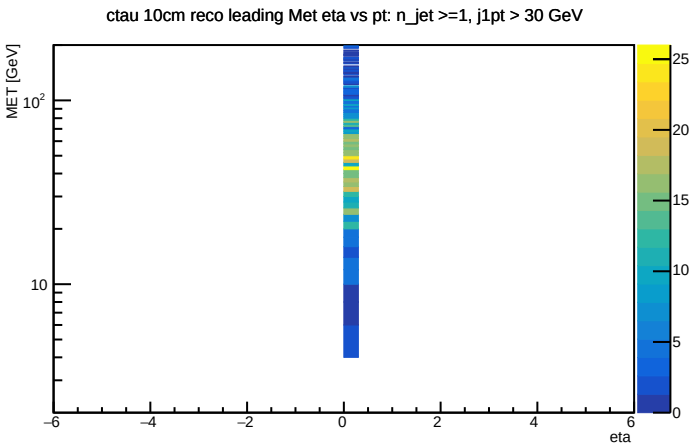
ctau 10cm gen leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV

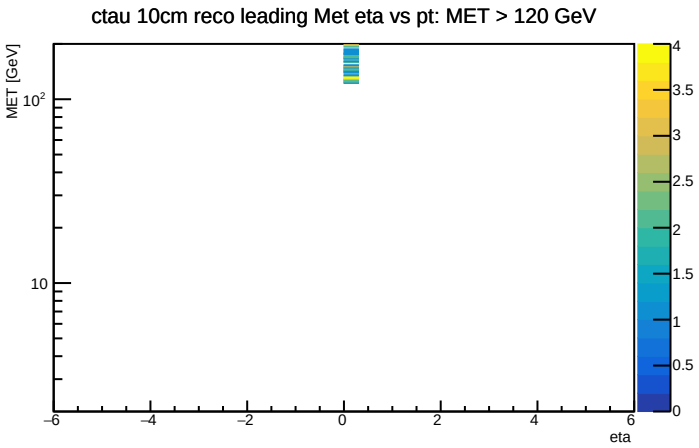


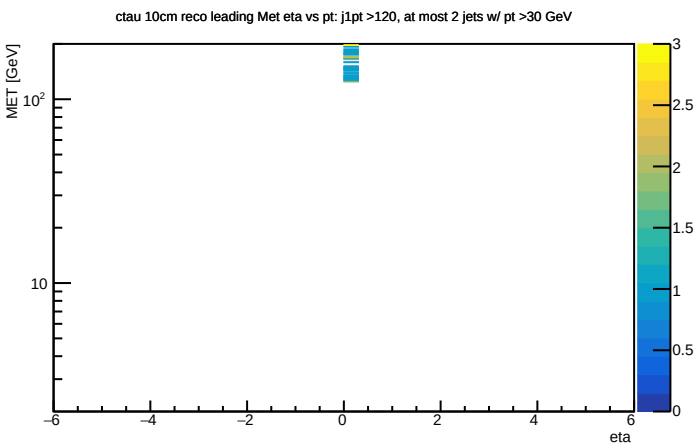
ctau 10cm gen leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5

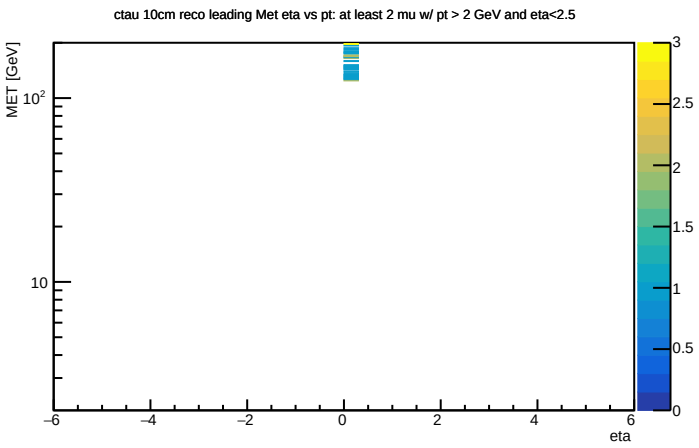



ctau 10cm reco leading Met eta vs pt: no cuts
MET [GeV]
eta

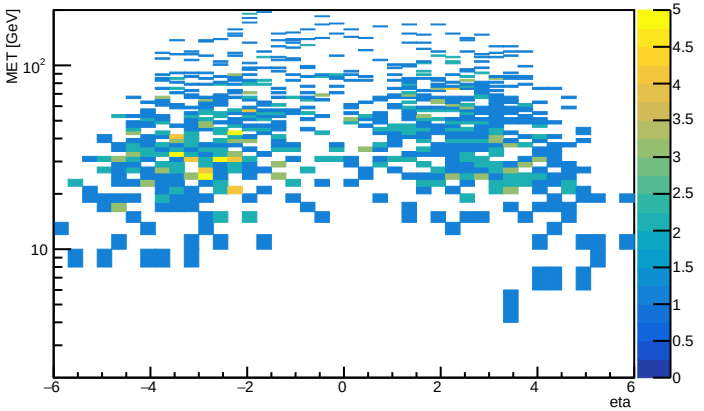

ctau 10cm reco leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV
MET [GeV]
eta


ctau 10cm reco leading Met eta vs pt: MET > 120 GeV
MET [GeV]
eta

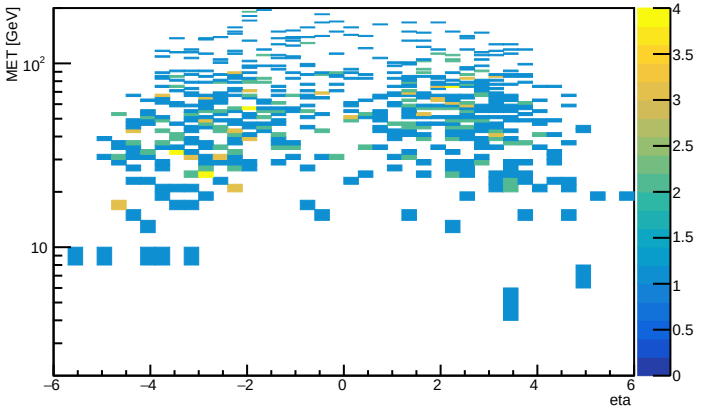

ctau 10cm reco leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV
MET [GeV]
eta


ctau 10cm reco leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5
MET [GeV]
eta

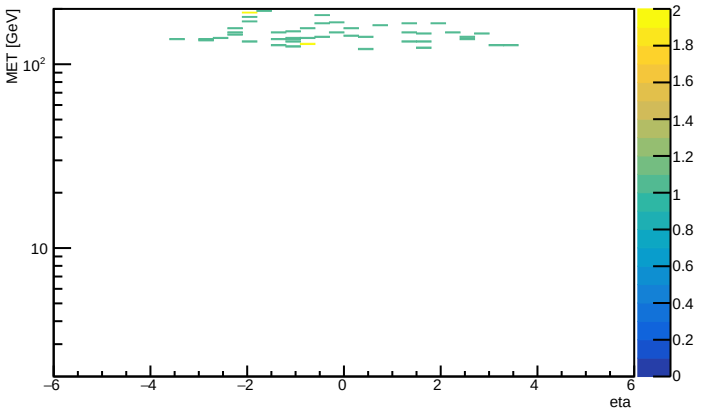
ctau 100cm gen leading Met eta vs pt: no cuts



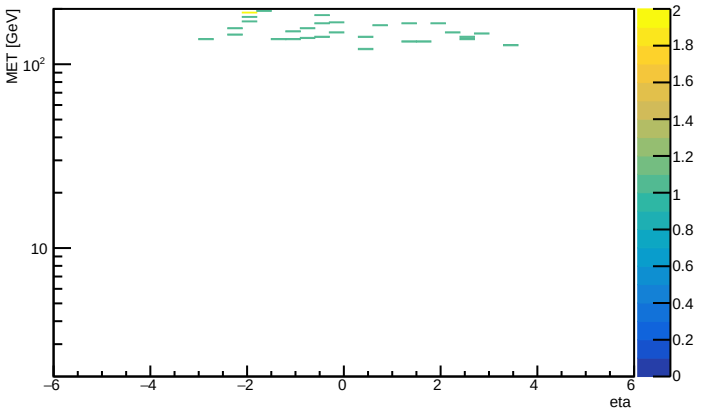
ctau 100cm gen leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



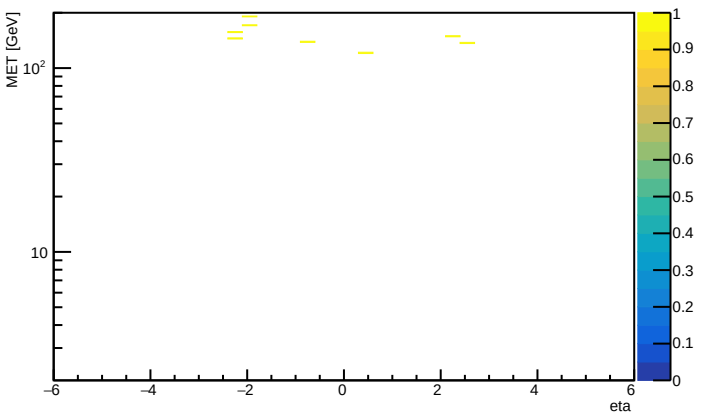
ctau 100cm gen leading Met eta vs pt: MET > 120 GeV



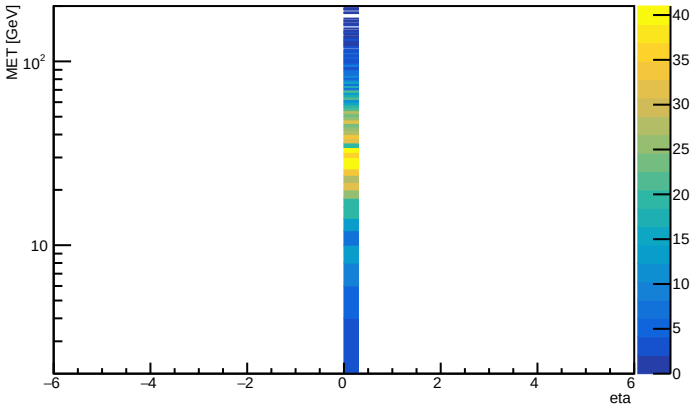
ctau 100cm gen leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV



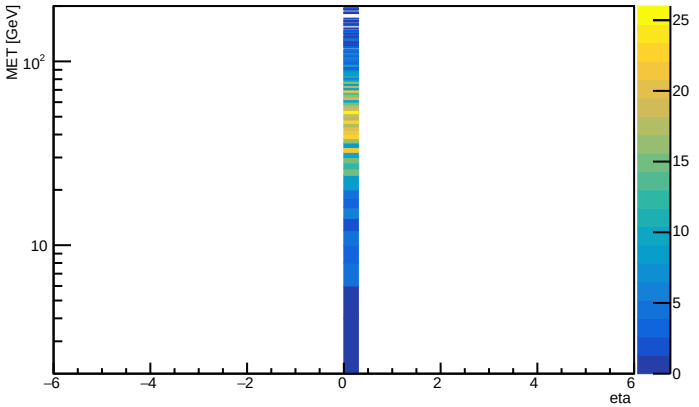
ctau 100cm gen leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5



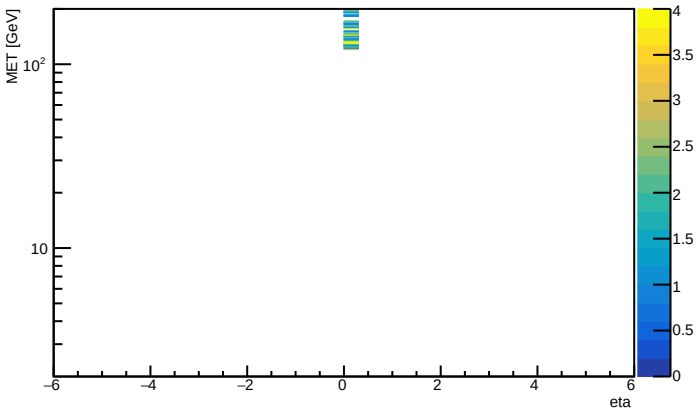
ctau 100cm reco leading Met eta vs pt: no cuts



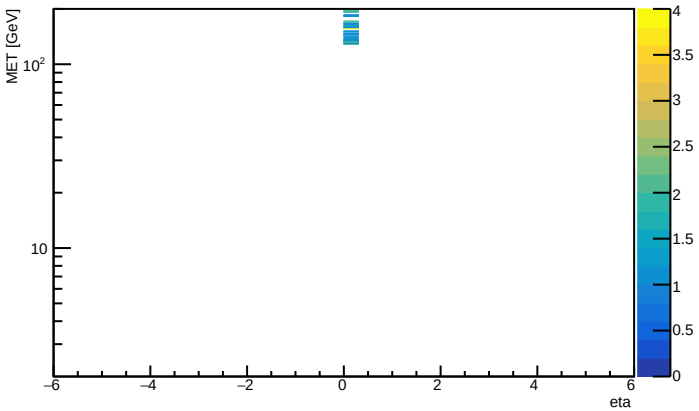
ctau 100cm reco leading Met eta vs pt: n_jet >=1, j1pt > 30 GeV



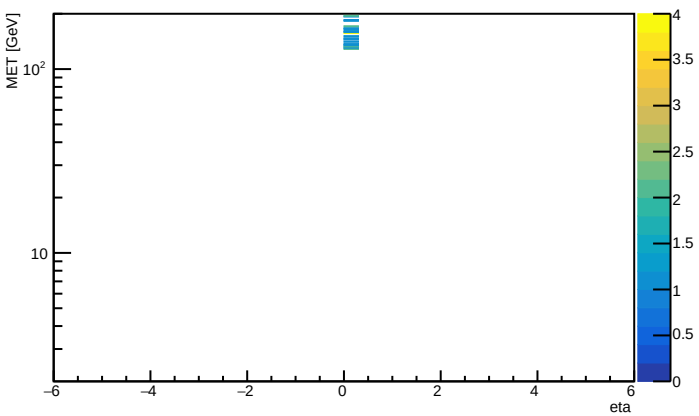
ctau 100cm reco leading Met eta vs pt: MET > 120 GeV



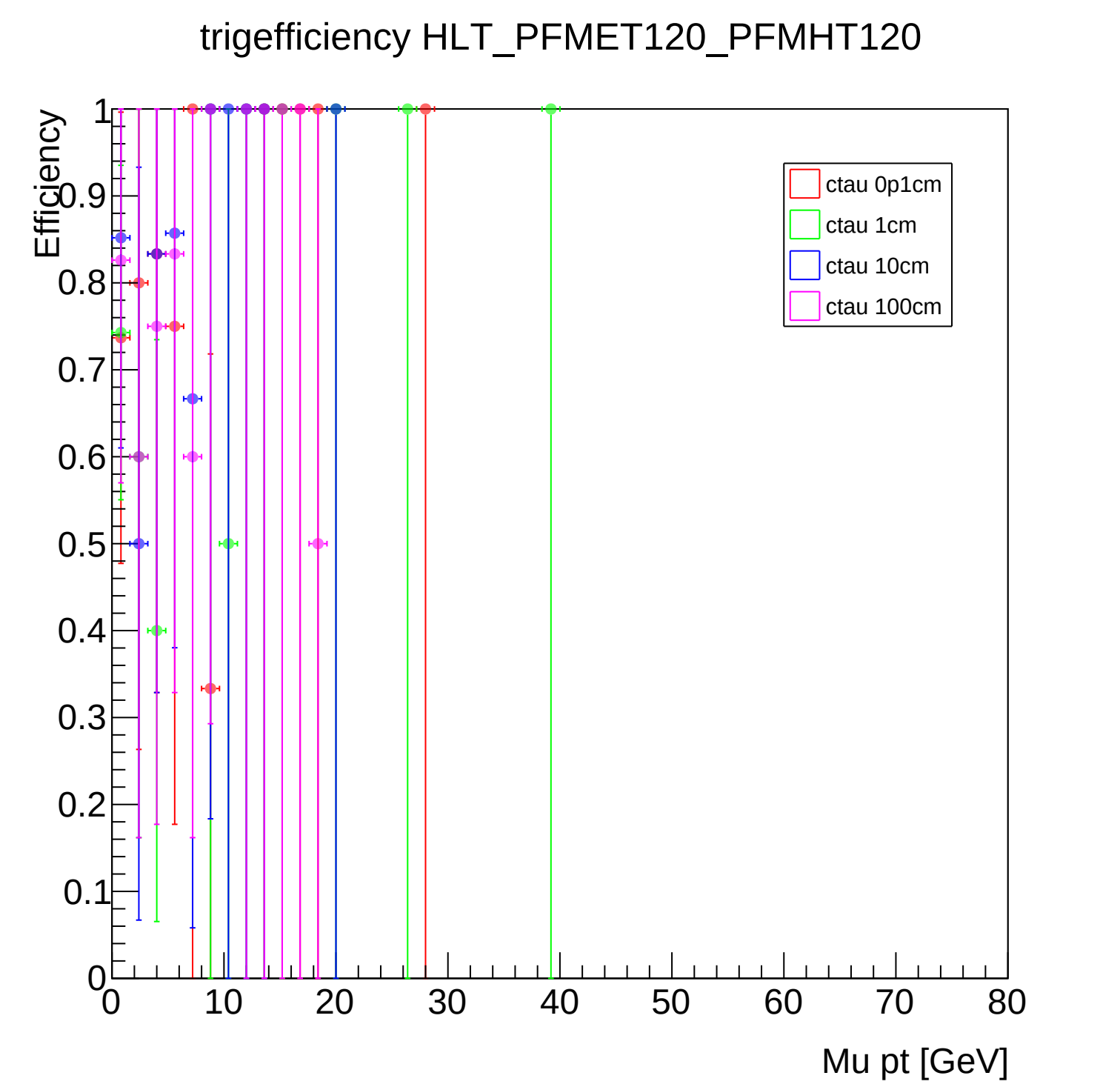
ctau 100cm reco leading Met eta vs pt: j1pt >120, at most 2 jets w/ pt >30 GeV

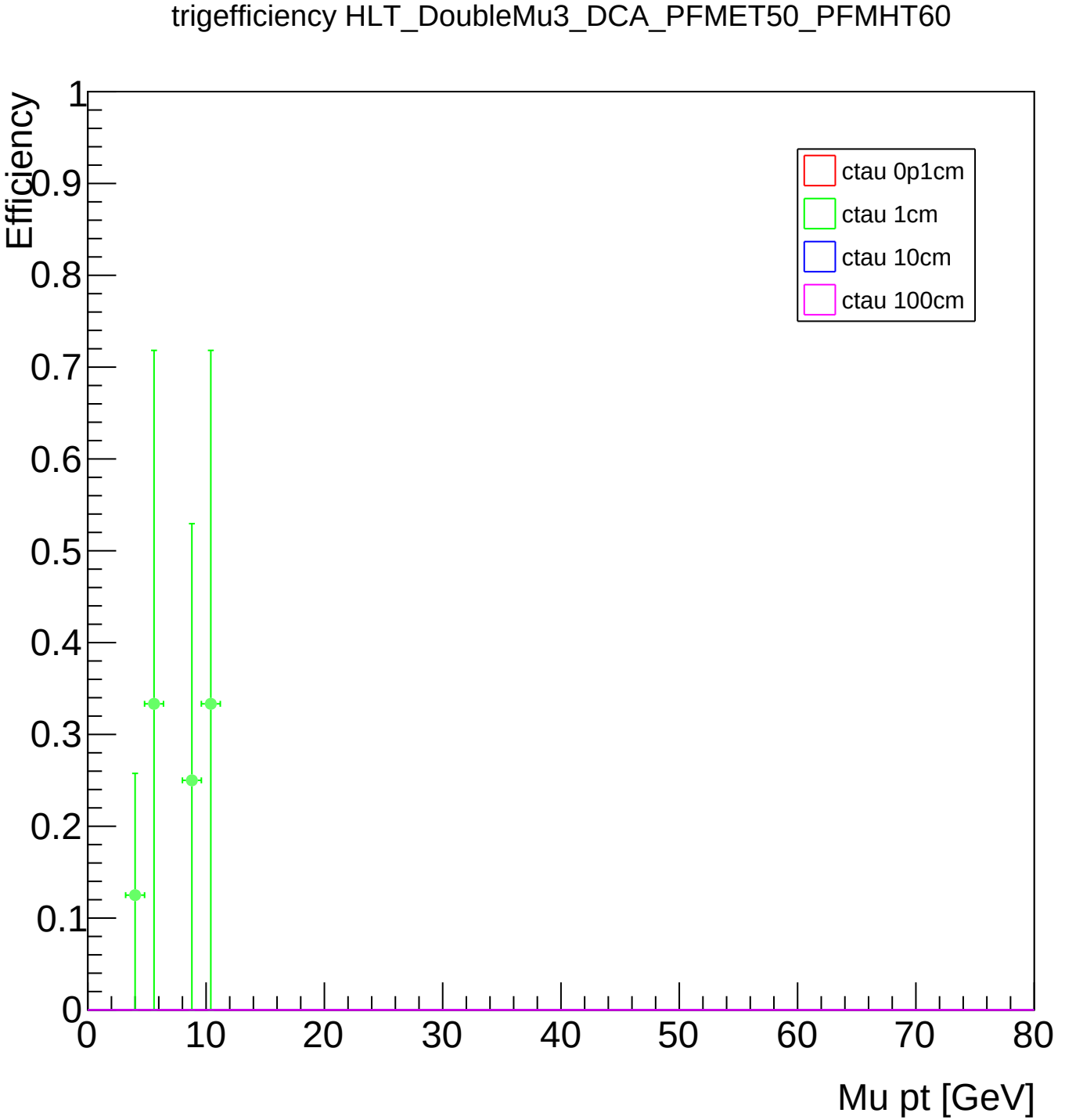


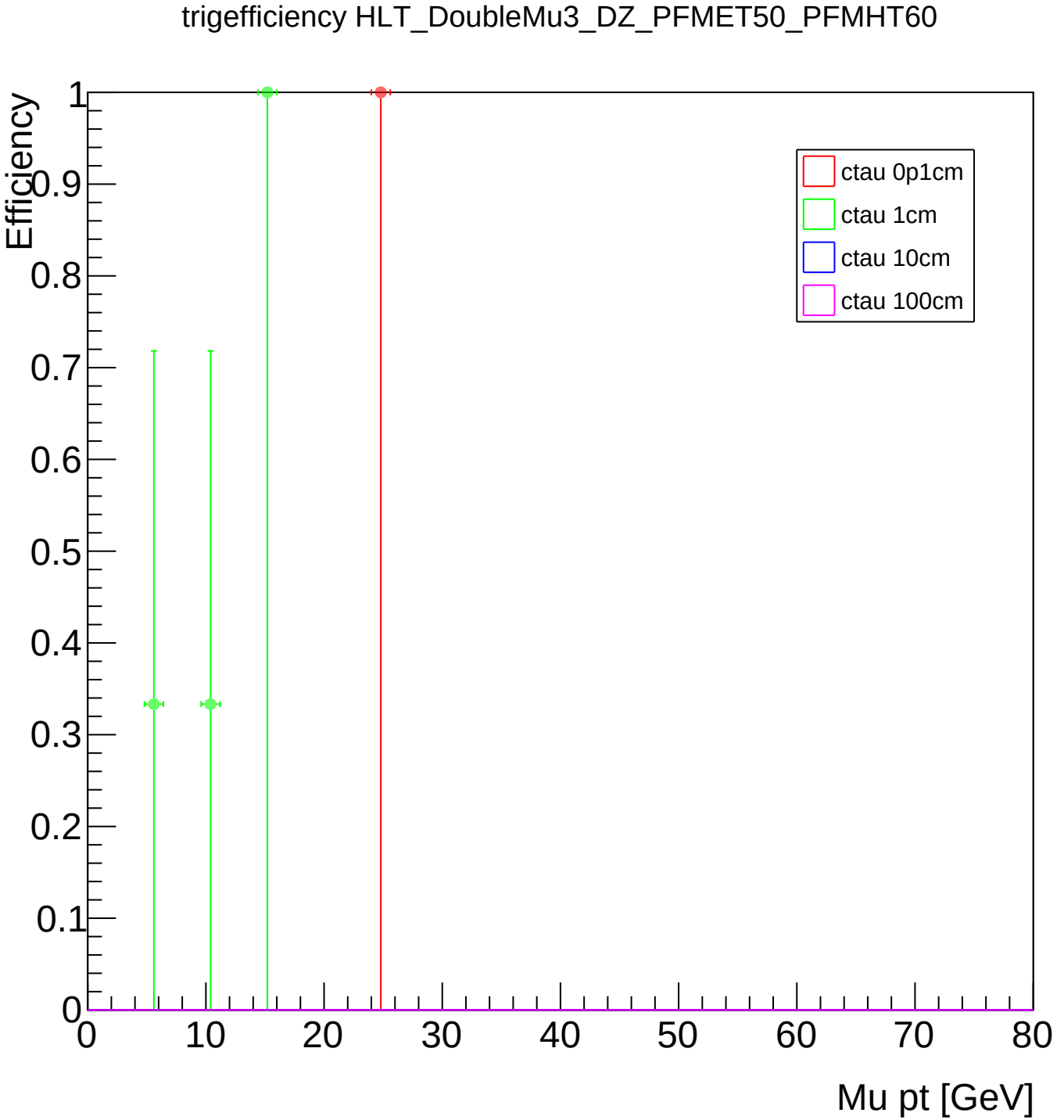
ctau 100cm reco leading Met eta vs pt: at least 2 mu w/ pt > 2 GeV and eta<2.5

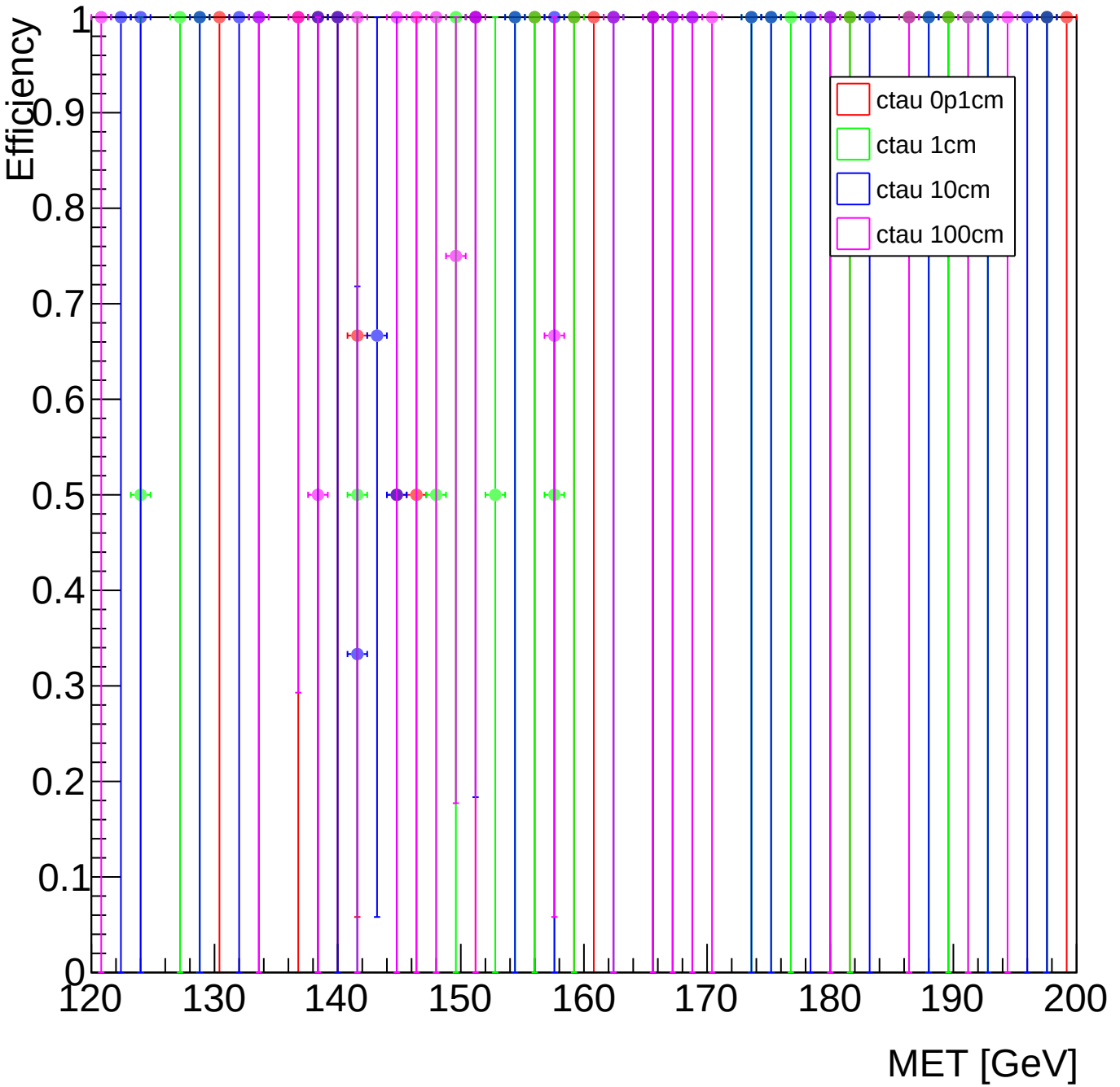


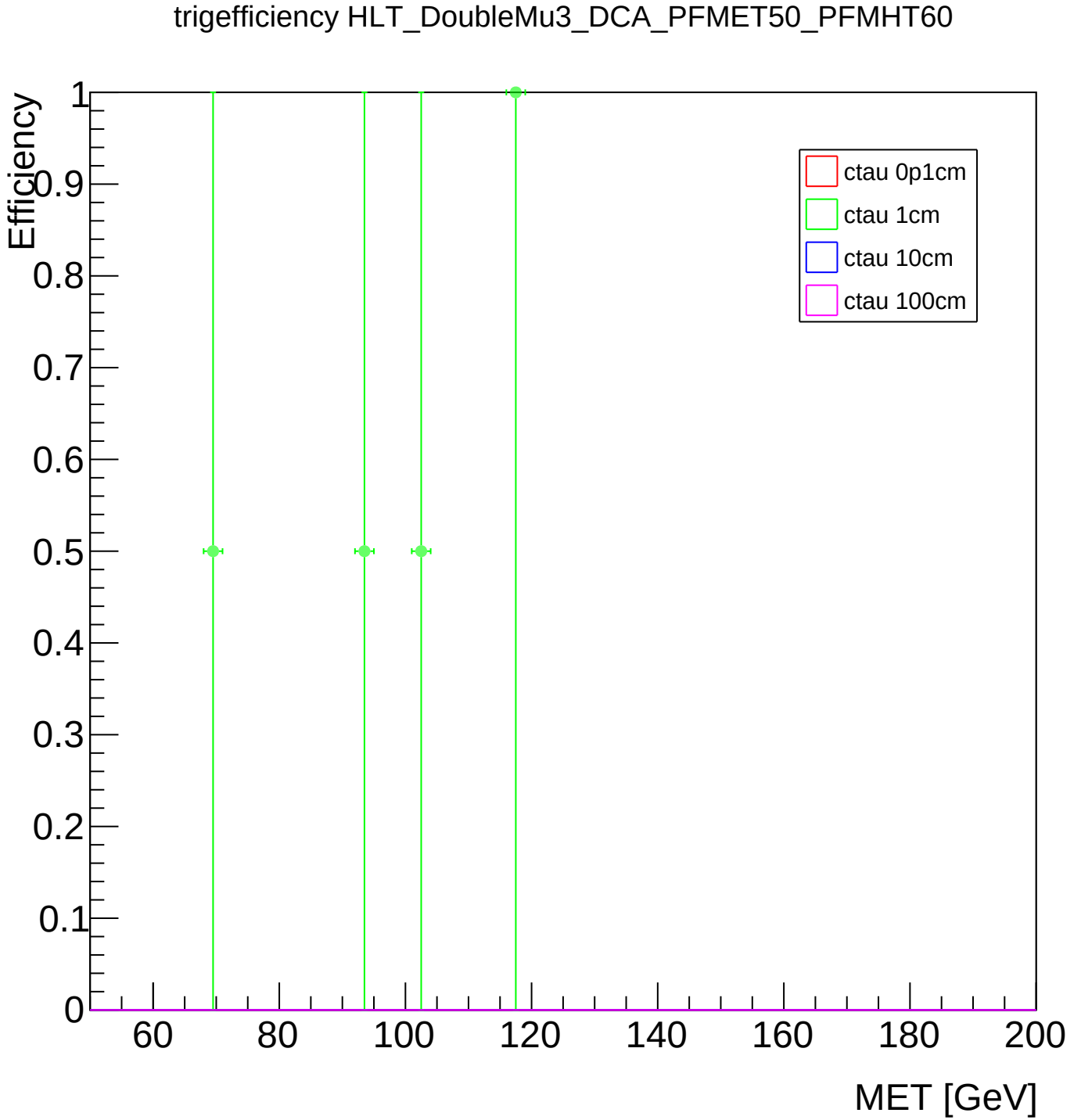
efficiencies

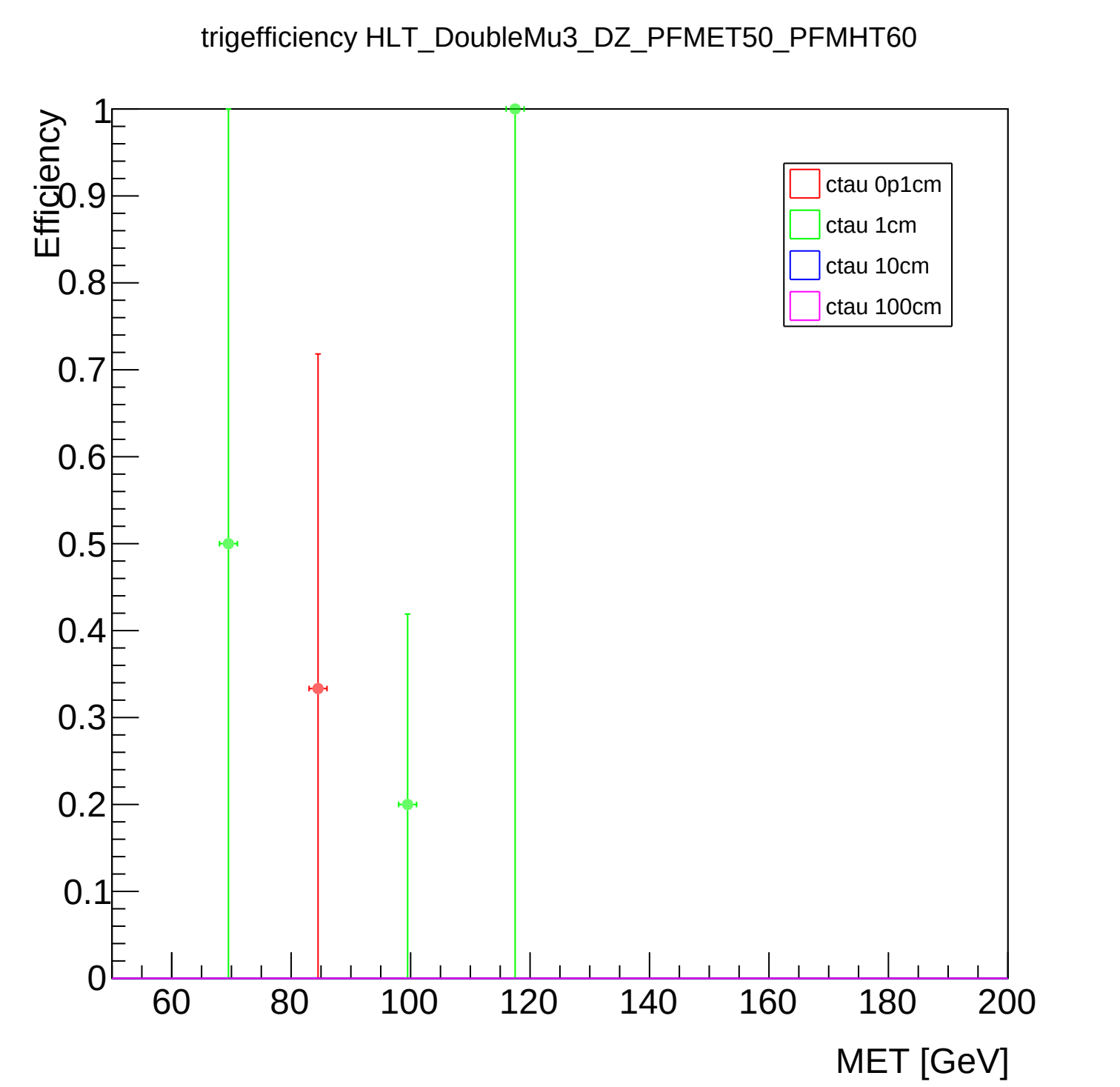

trigefficiency HLT_PFMET120_PFMHT120
Efficiency
Mu pt [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
10
20
30
40
50
60
70
80

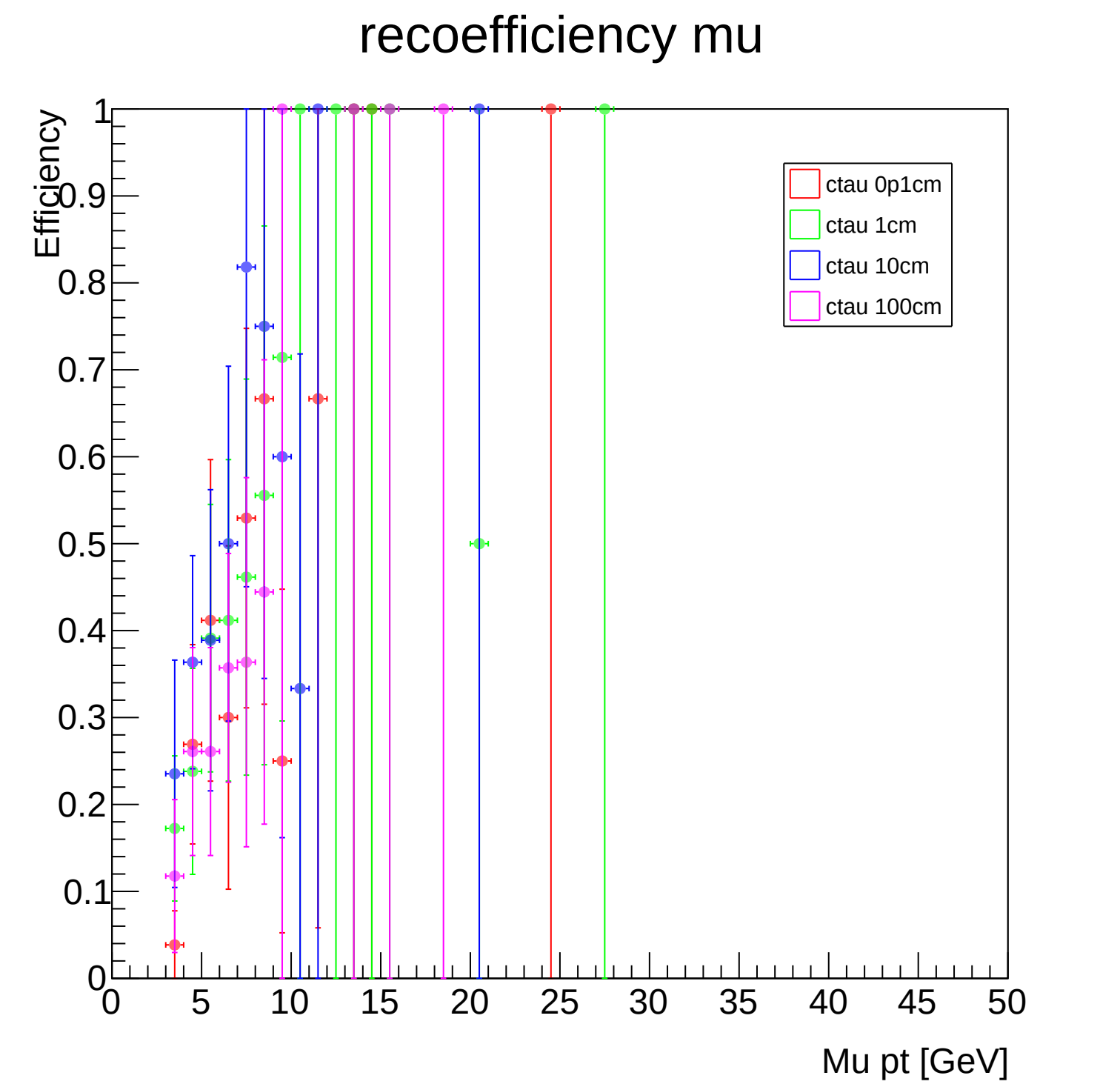

trigefficiency HLT_DoubleMu3_DCA_PFMET50_PFMHT60
Efficiency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60
70
80
Mu pt [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm

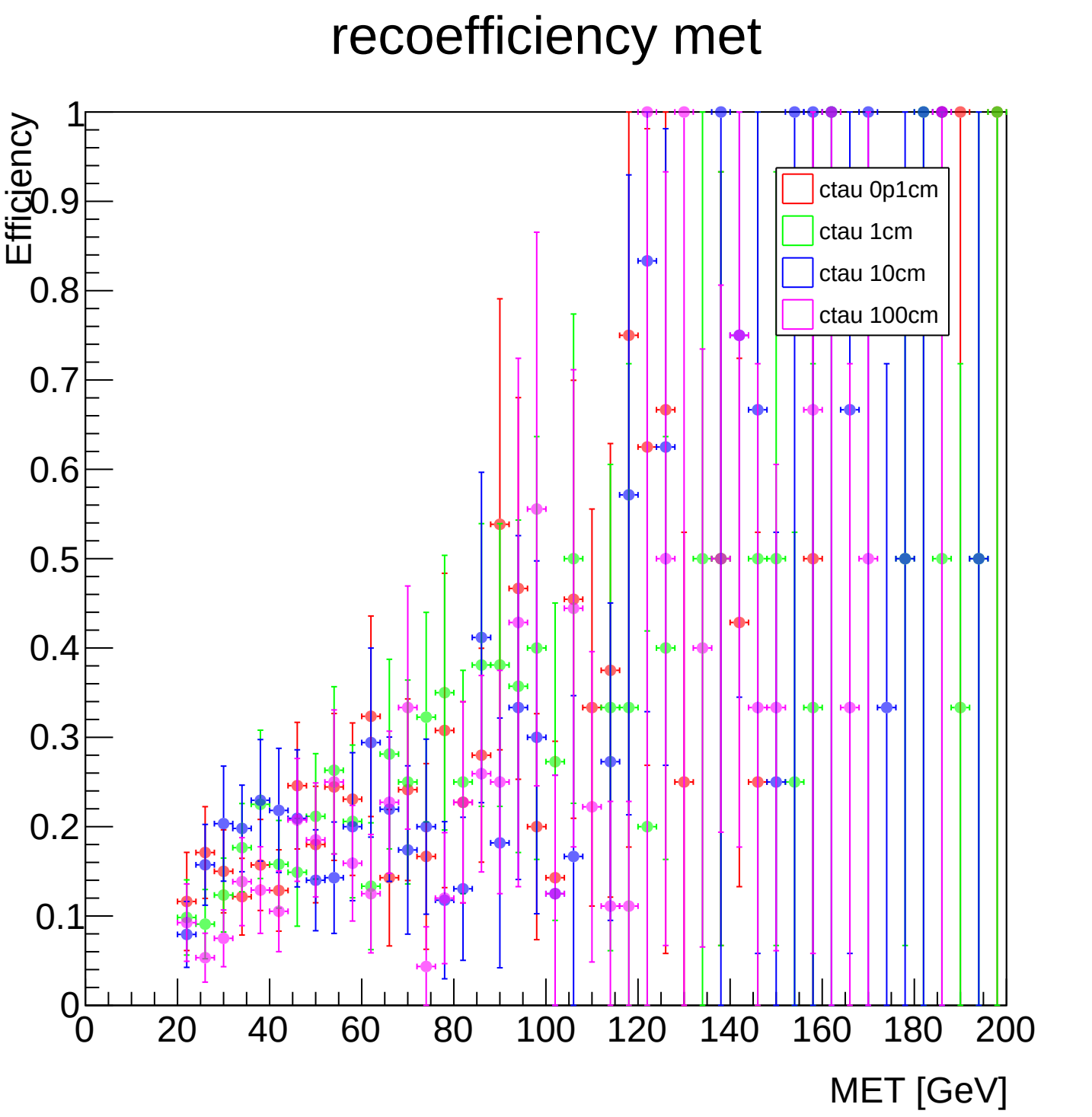

trigefficiency HLT_DoubleMu3_DZ_PFMET50_PFMHT60
Efficiency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60
70
80
Mu pt [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm

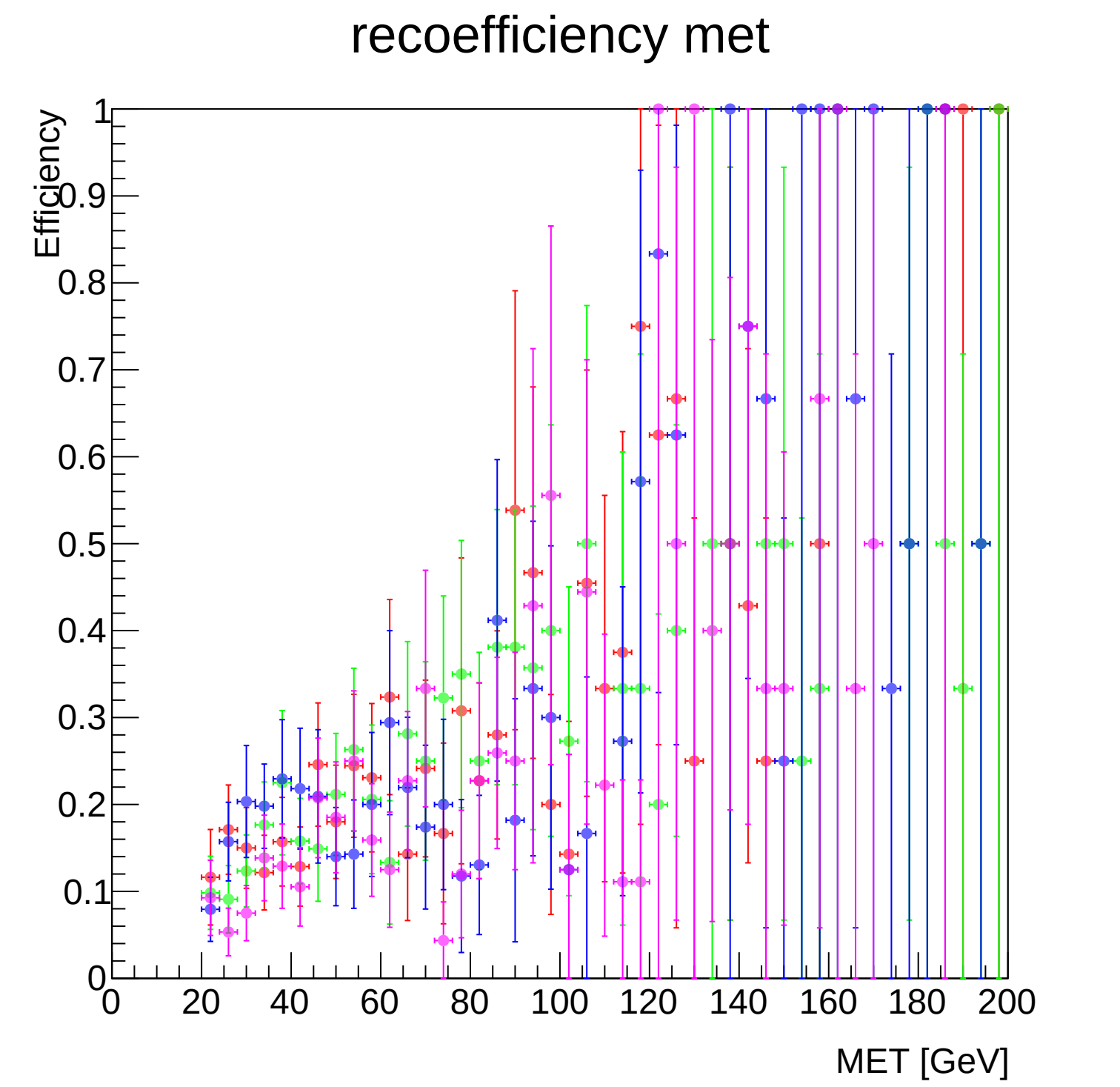

trigefficiency HLT_PFMET120_PFMHT120
Efficiency
MET [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
120
130
140
150
160
170
180
190
200


trigefficiency HLT_DoubleMu3_DCA_PFMET50_PFMHT60
Efficiency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
60
80
100
120
140
160
180
200
MET [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm


trigefficiency HLT_DoubleMu3_DZ_PFMET50_PFMHT60
Efficiency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
60
80
100
120
140
160
180
200
MET [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm


recoefficiency mu
Efficiency
Mu pt [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
5
10
15
20
25
30
35
40
45
50


recoefficiency met
Efficiency
MET [GeV]
ctau 0p1cm
ctau 1cm
ctau 10cm
ctau 100cm
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
20
40
60
80
100
120
140
160
180
200


recoefficiency met
Efficiency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
20
40
60
80
100
120
140
160
180
200
MET [GeV]