

Top Discriminator Efficiencies and Signal Over Bkg for several selection Categories

NTUA

GIANNIS PAPAKRIVOPOULOS

GEORGE BAKAS

Overview

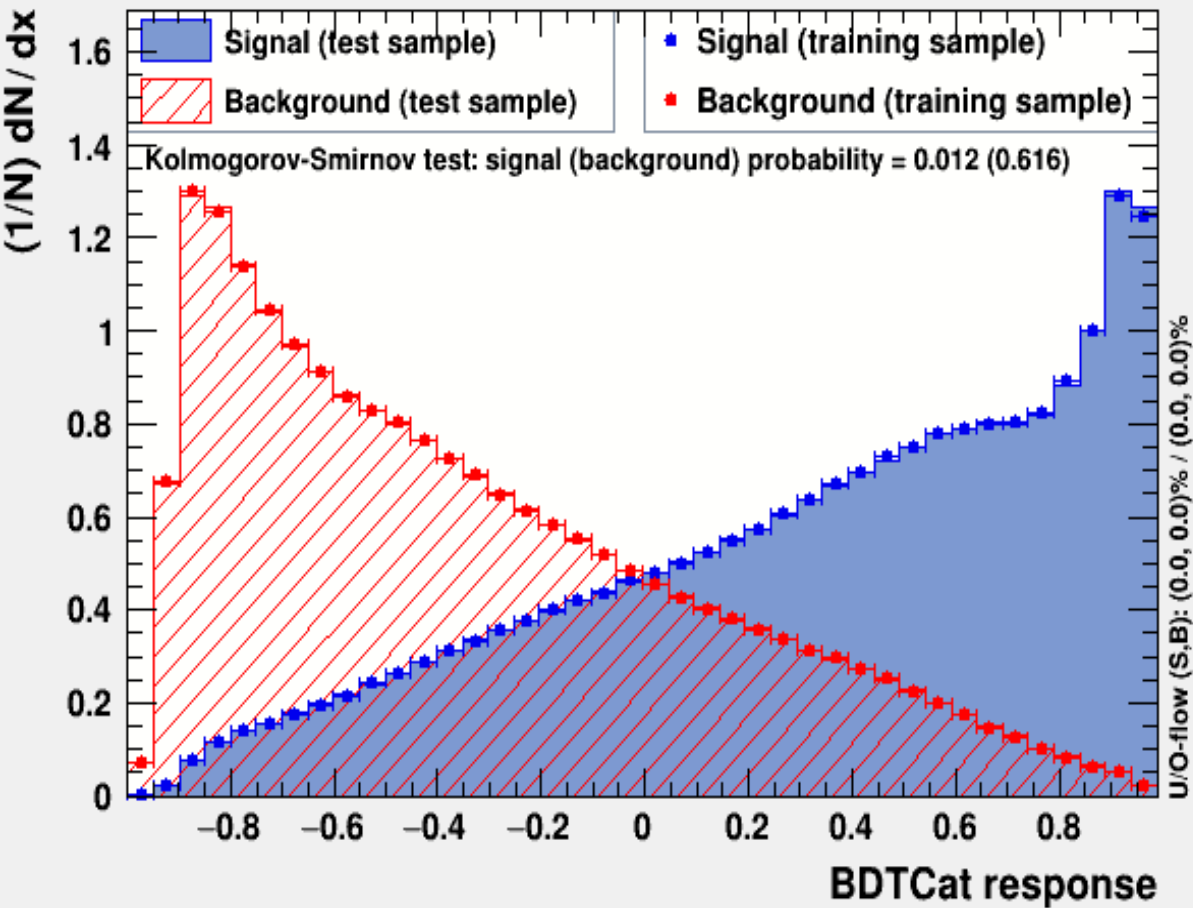
- Efficiencies vs $m_{T\bar{T}}$ Parton
- Signal over Background for
 - Mtt samples over Bkg
 - Nominal sample over Bkg
- Yields for all samples
- All Signal over Bkg are vs m_{JJ}
- Categories:
 - 1. Both jets are top tagged and b tagged
 - 2. 1 Jet top and b tagged and other jet top tagged
 - 3. 1 Jet top and b tagged and other jet b tagged
 - 4. Both jets are top tagged
 - 5. Both jets are b tagged

Cuts:

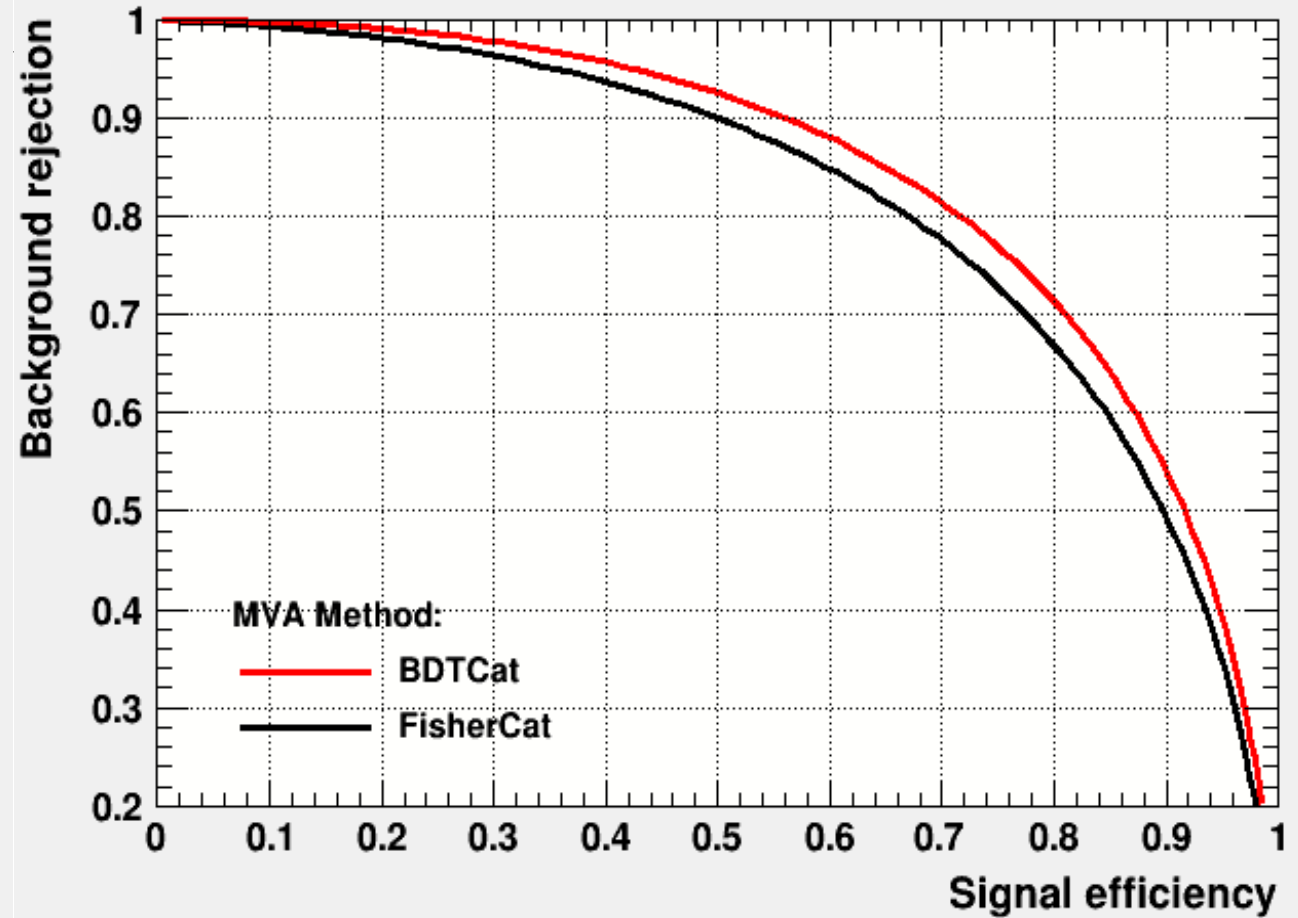
- Reco:
 - $n_{\text{Jets}} > 1$,
 - $|\text{jetEta}| < 2.4$ (both jets)
 - $\text{jetPt} > 400 \text{ GeV}$ (both jets)
 - $120 \text{ GeV} < \text{jetMassSoftDrop} < 220 \text{ GeV}$ (both jets)
- Parton:
 - $|\text{etaParton}| < 2.4$ (both partons)
 - $\text{ptTopParton} > 400 \text{ GeV}$ (both partons)
 - $m_{T\bar{T}} \text{Parton} > 1000$

Training

TMVA overtraining check for classifier: BDTCat



Background rejection versus Signal efficiency



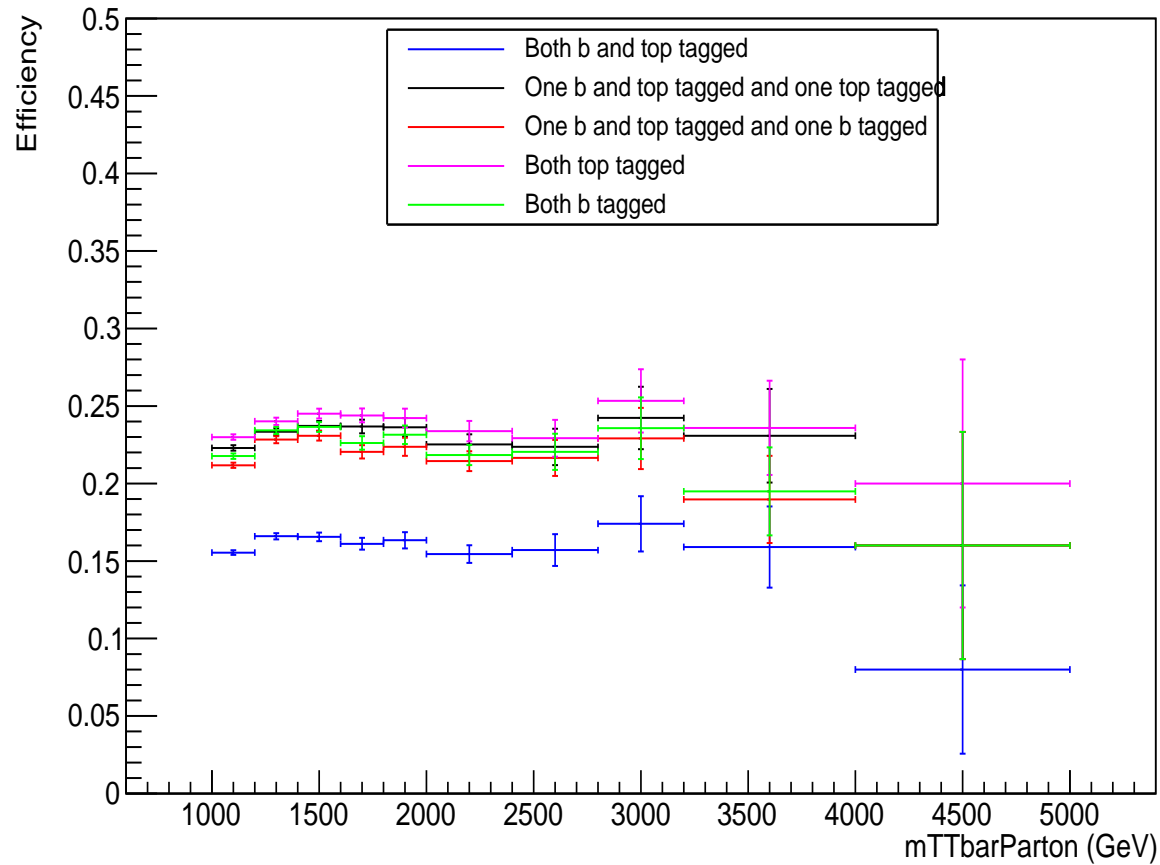
Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.0

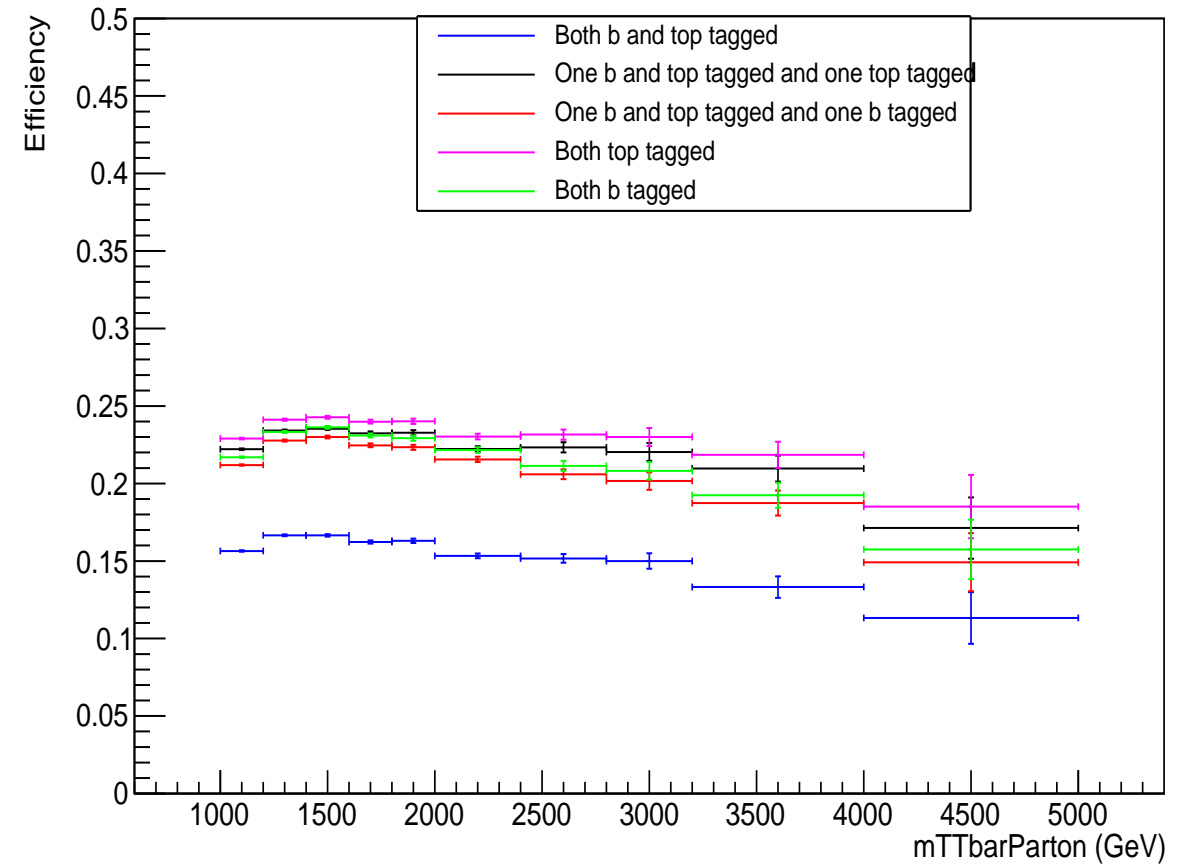
B-tagging: Loose working point

Signal Efficiency



Mtt Samples

Signal Efficiency Mtt samples



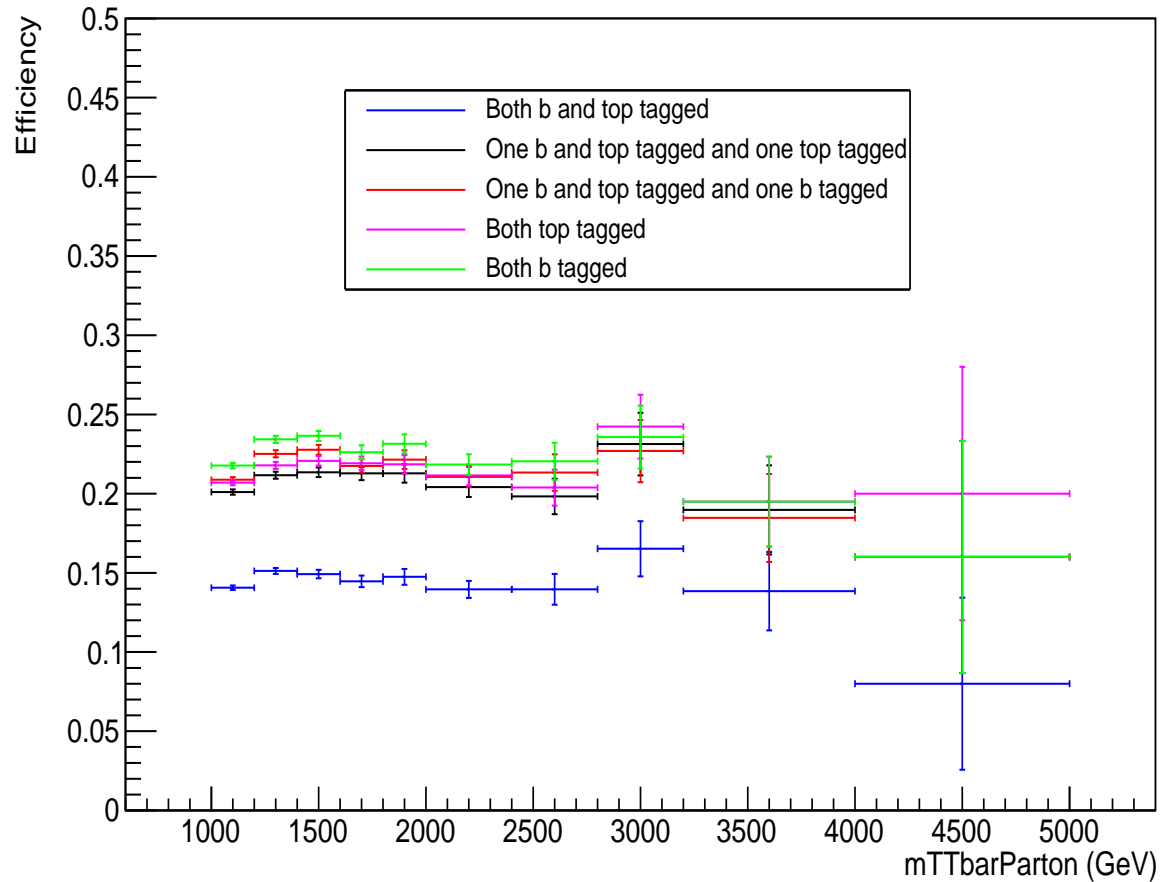
Efficiency vs mTTbarParton

Top tagger cut : 0.1

B-tagging: Loose working point

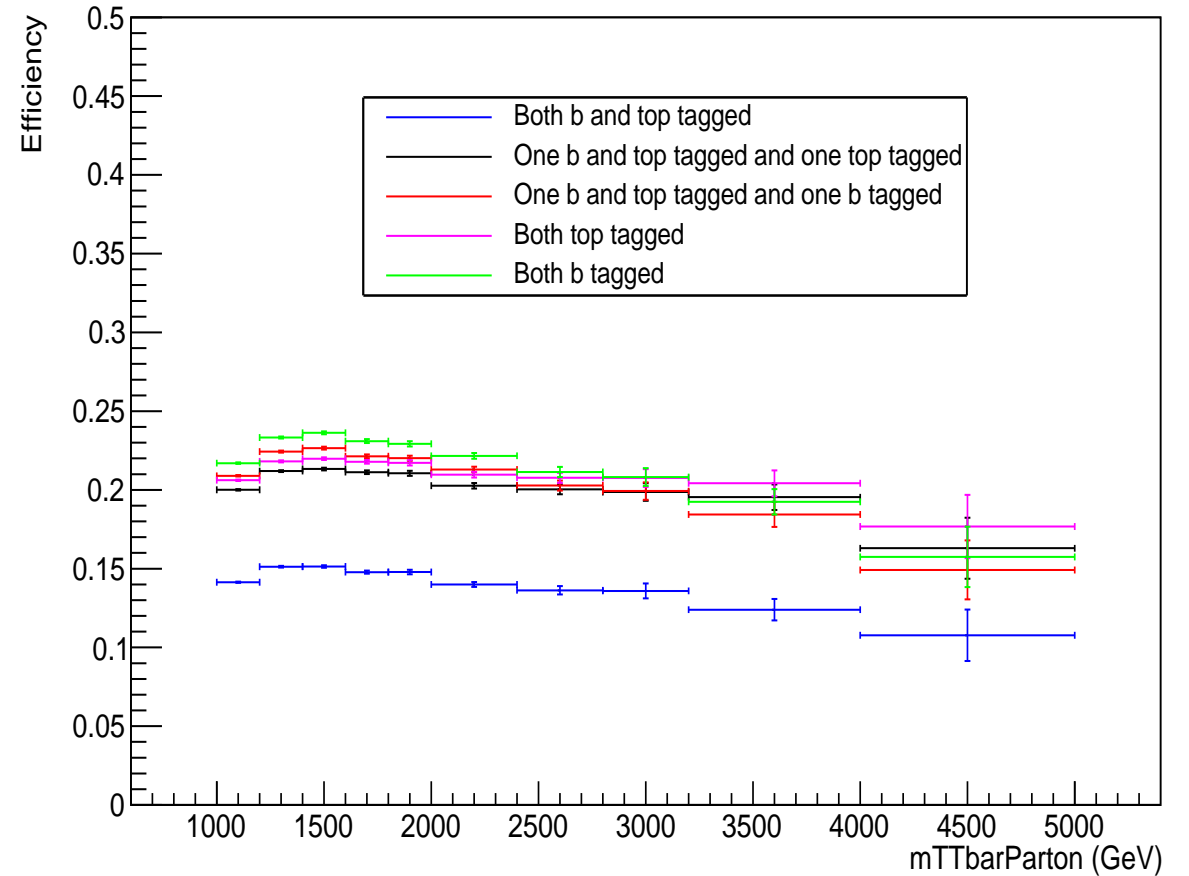
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Efficiency



Mtt Samples

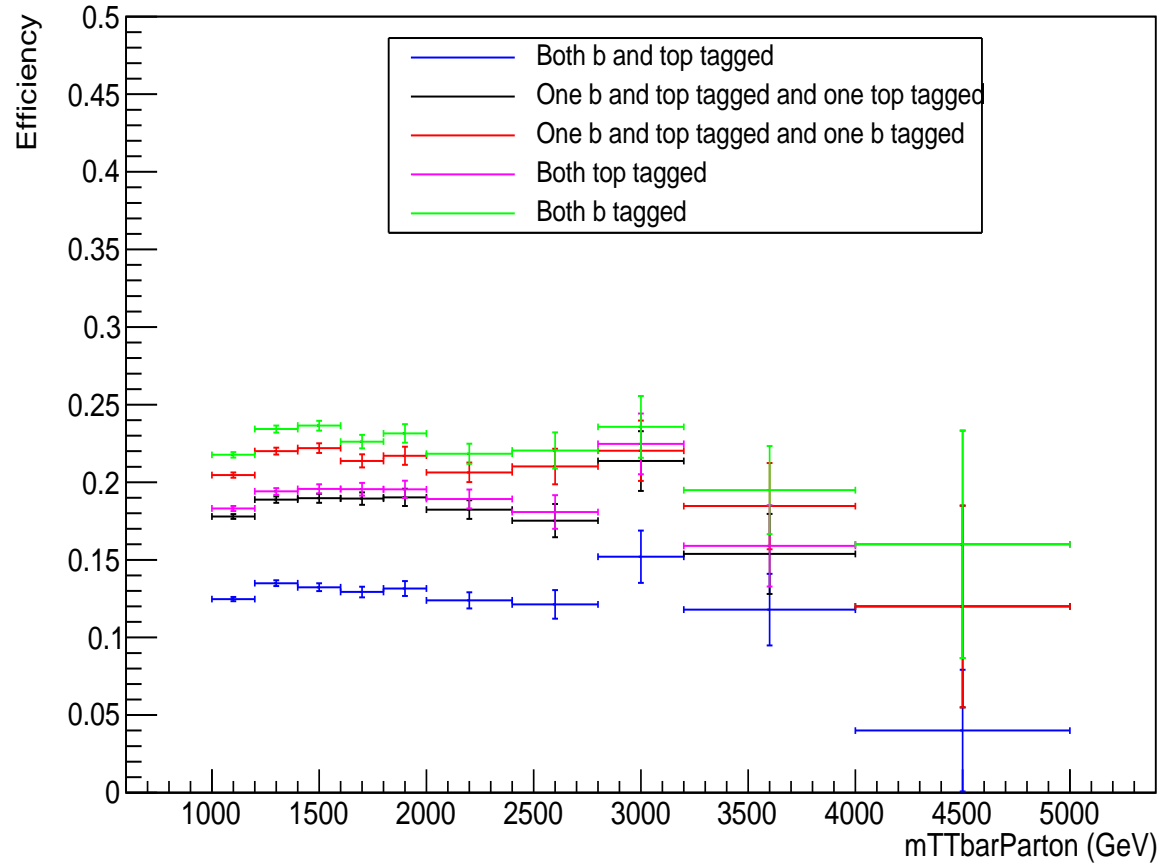
Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Efficiency

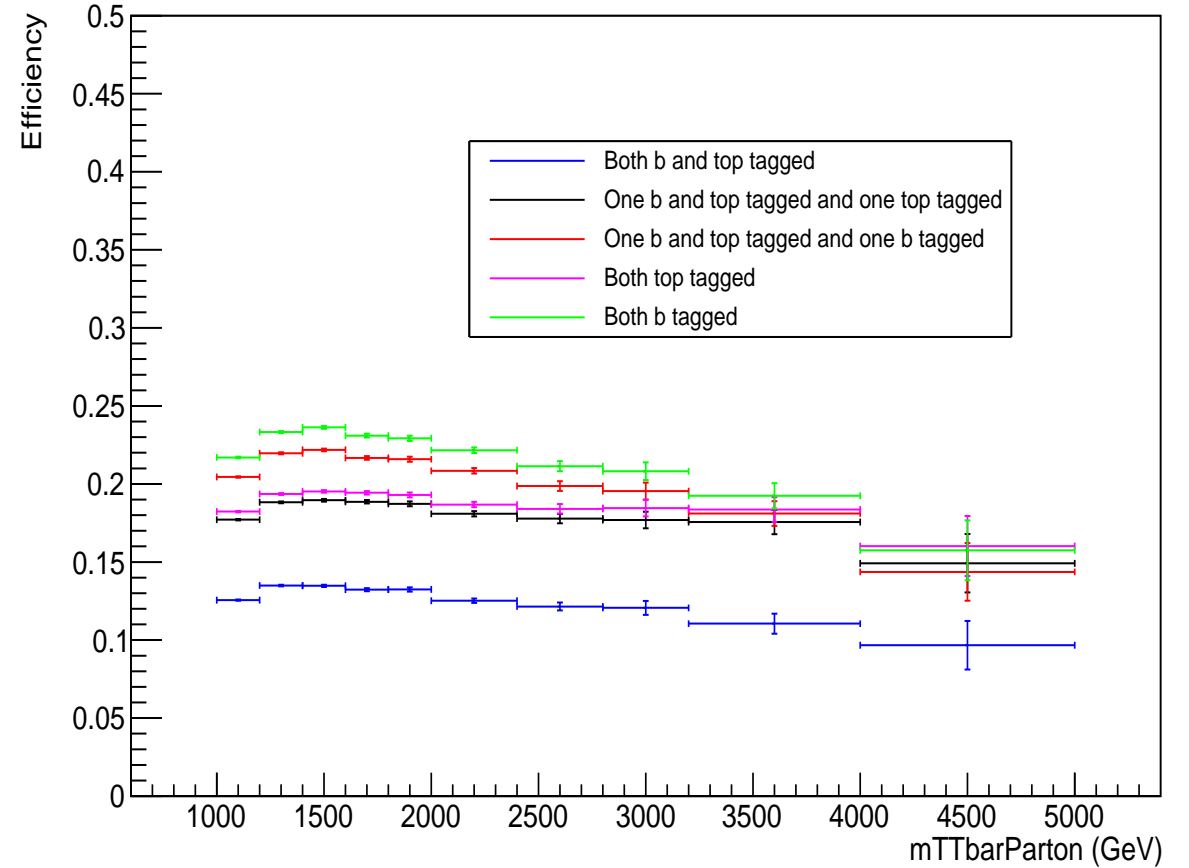


Top tagger cut : 0.2

B-tagging: Loose working point

Mtt Samples

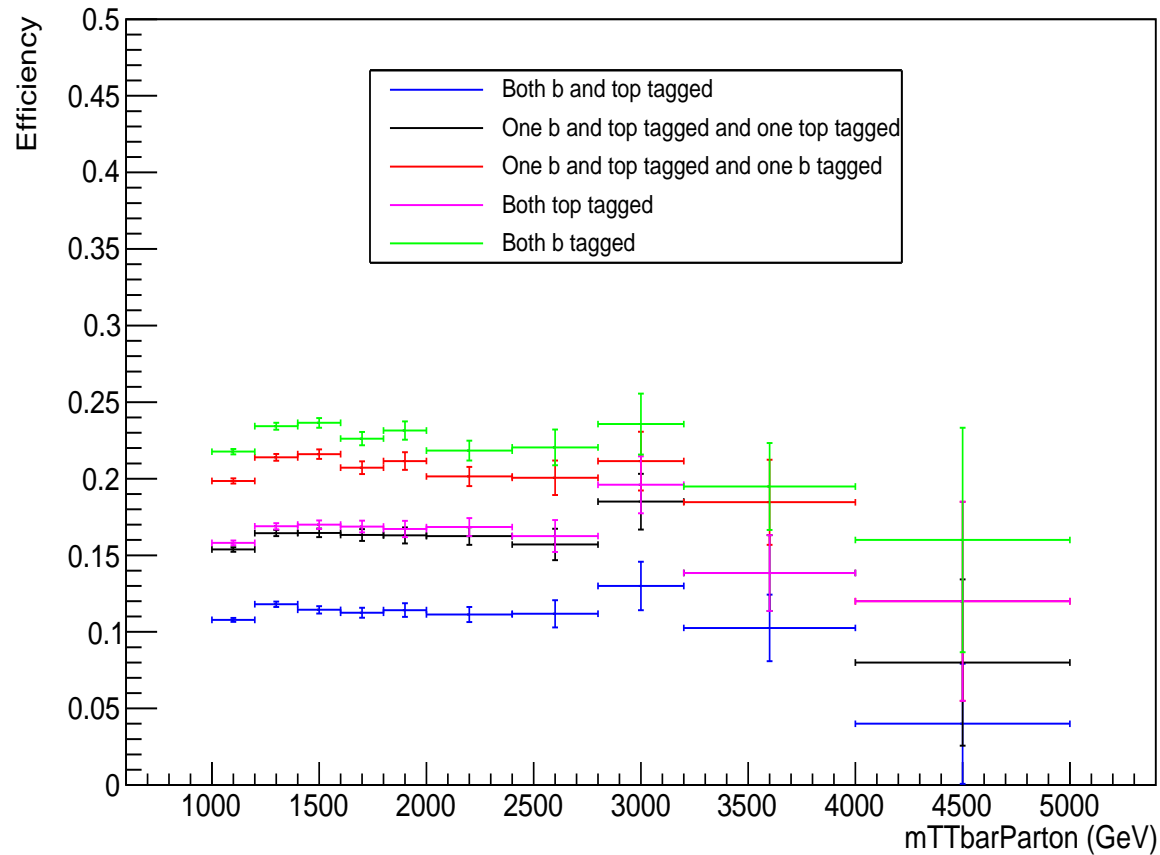
Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Efficiency

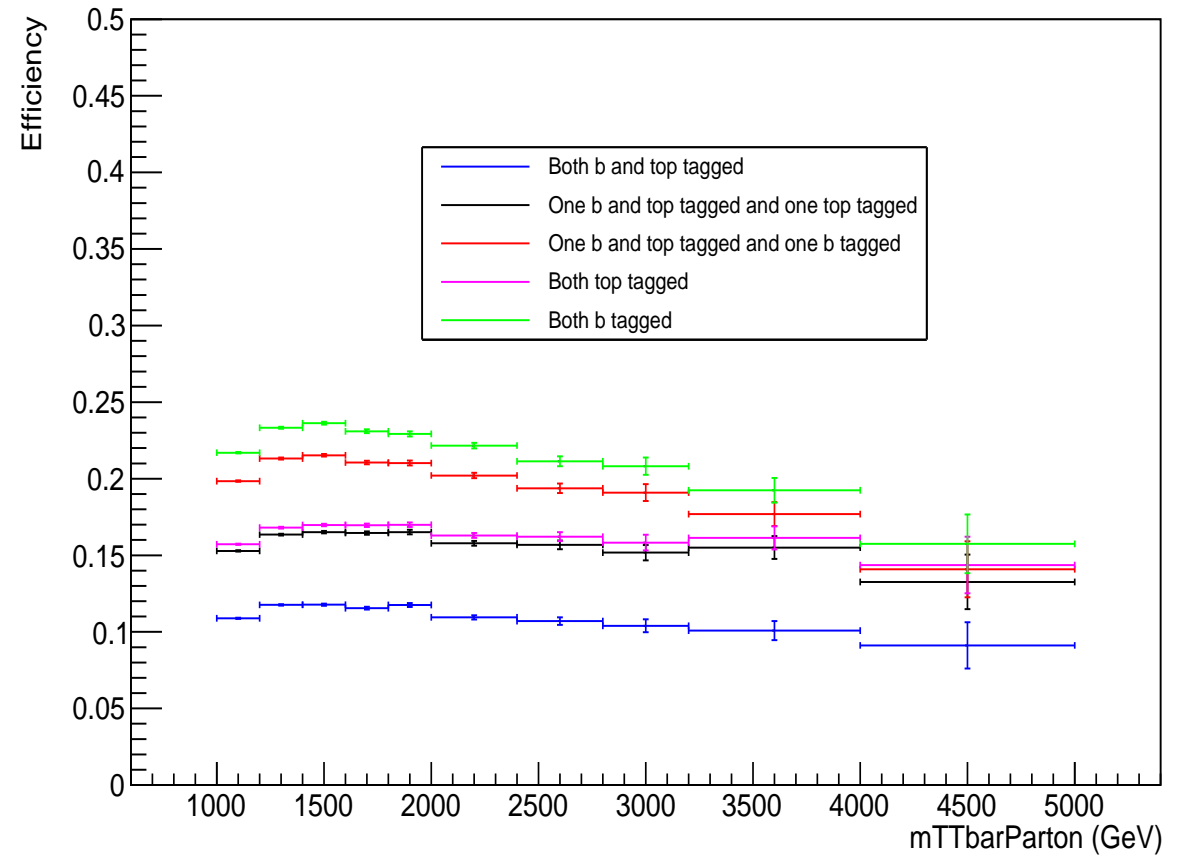


Top tagger cut : 0.3

B-tagging: Loose working point

Mtt Samples

Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

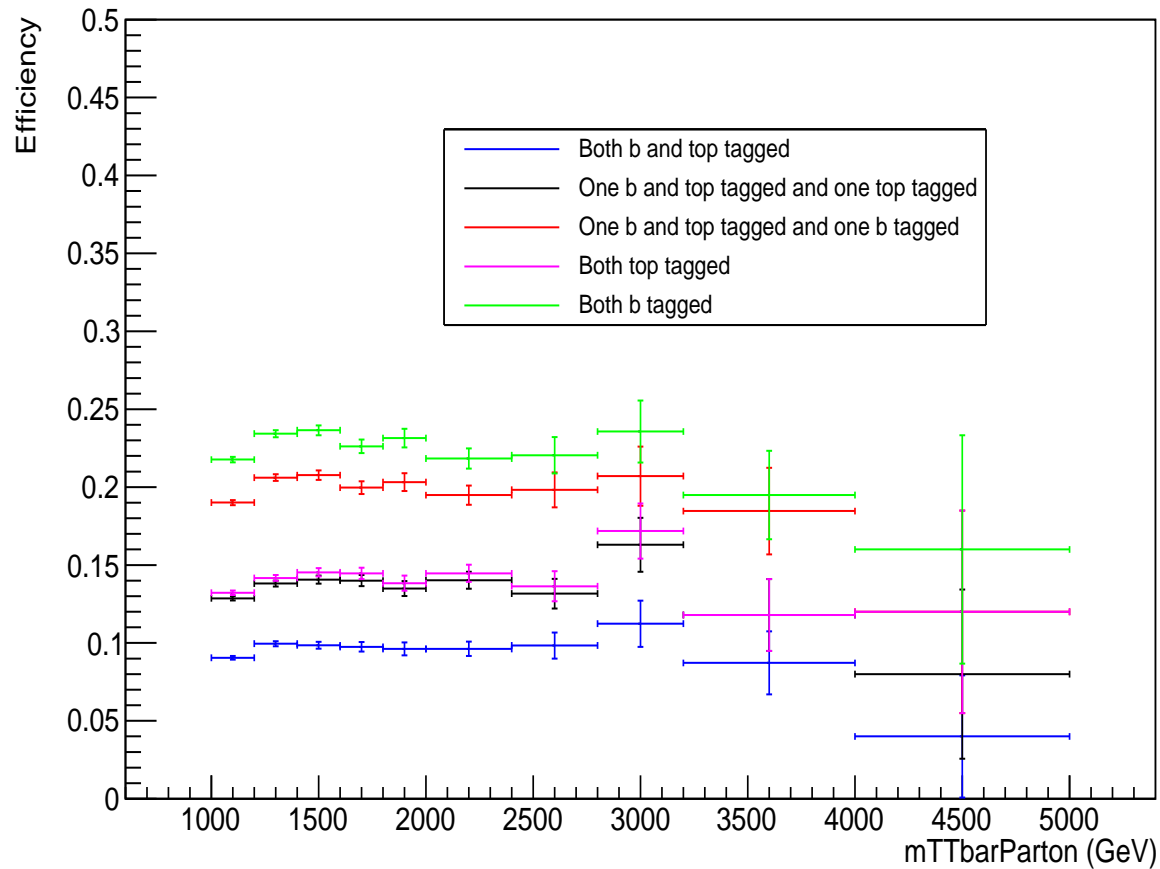
Top tagger cut : 0.4

B-tagging: Loose working point

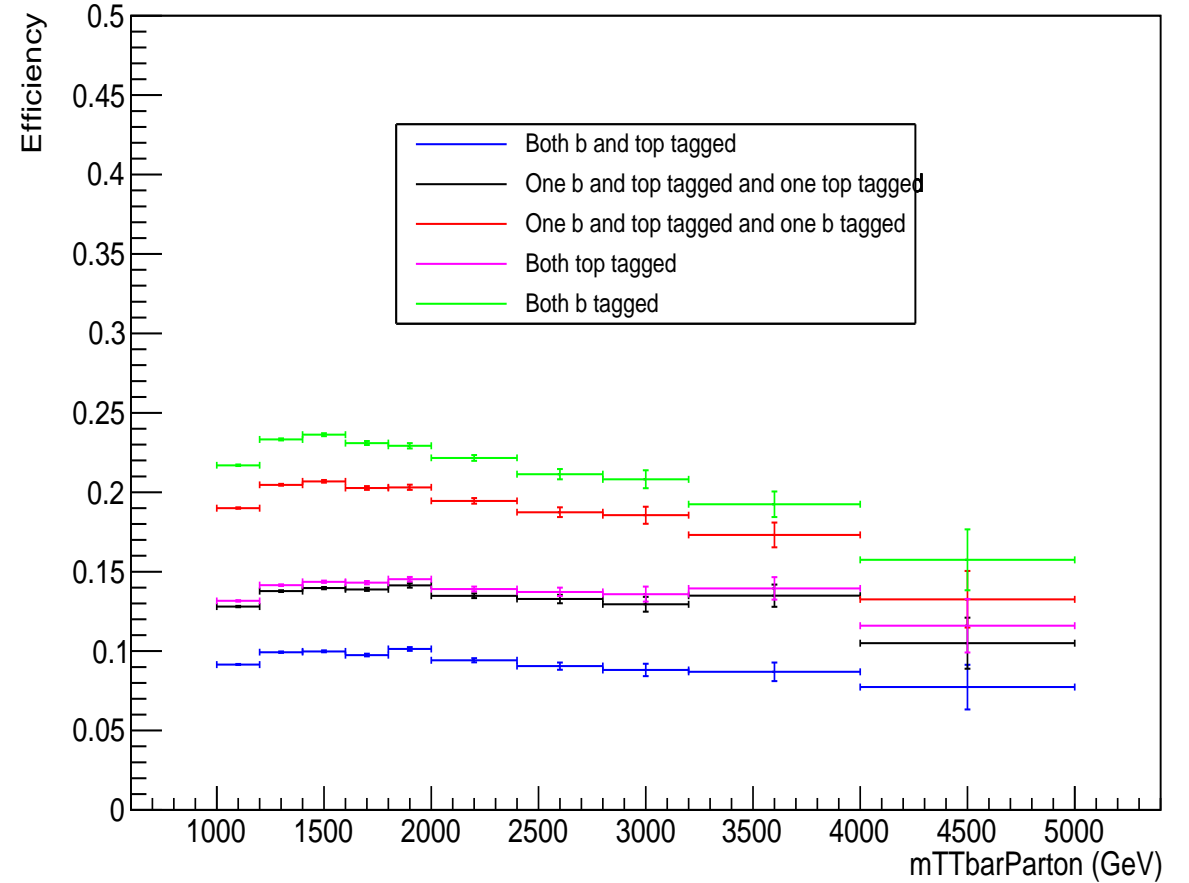
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

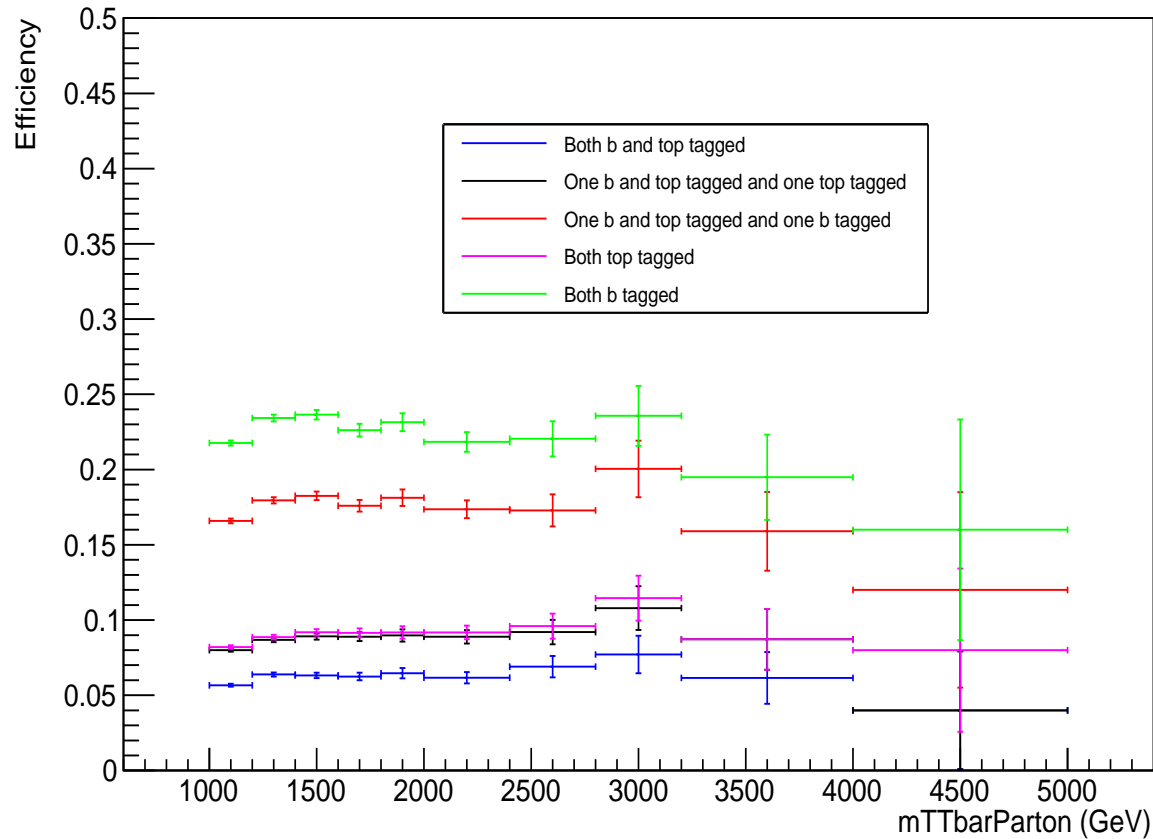
Top tagger cut : 0.6

B-tagging: Loose working point

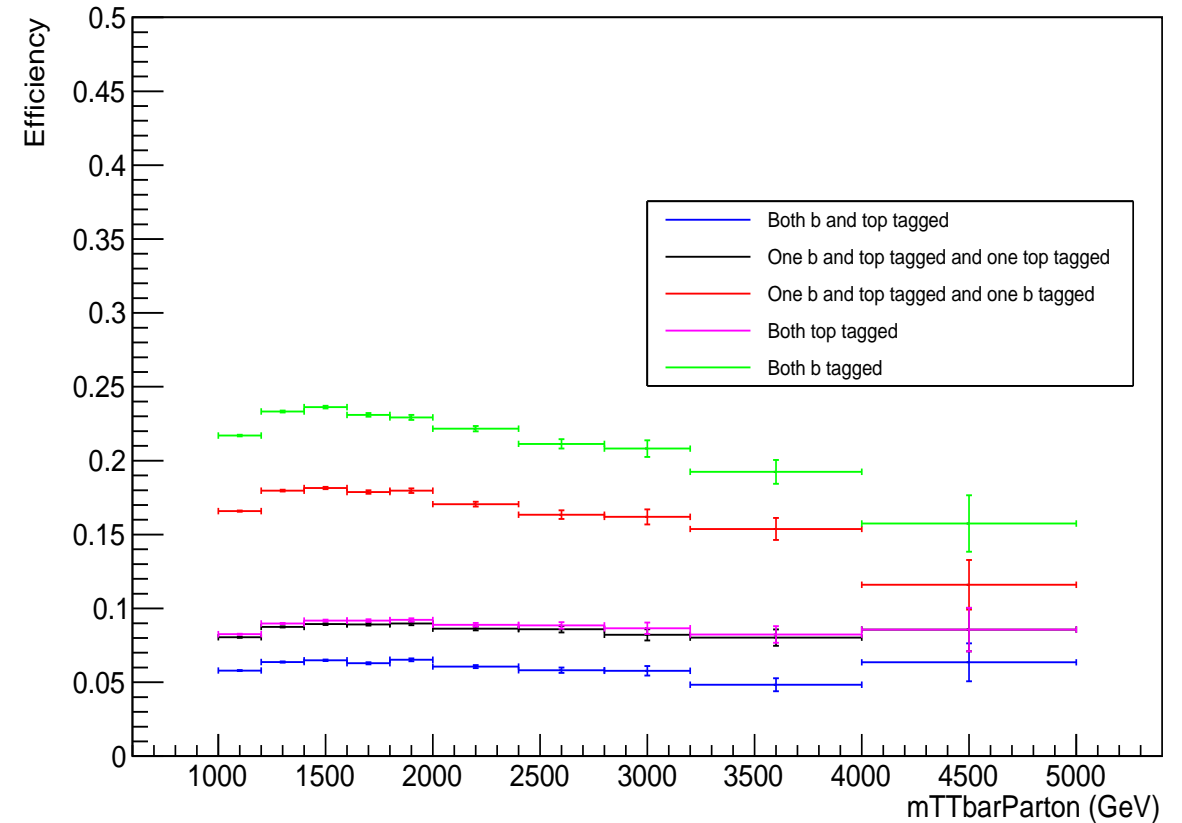
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

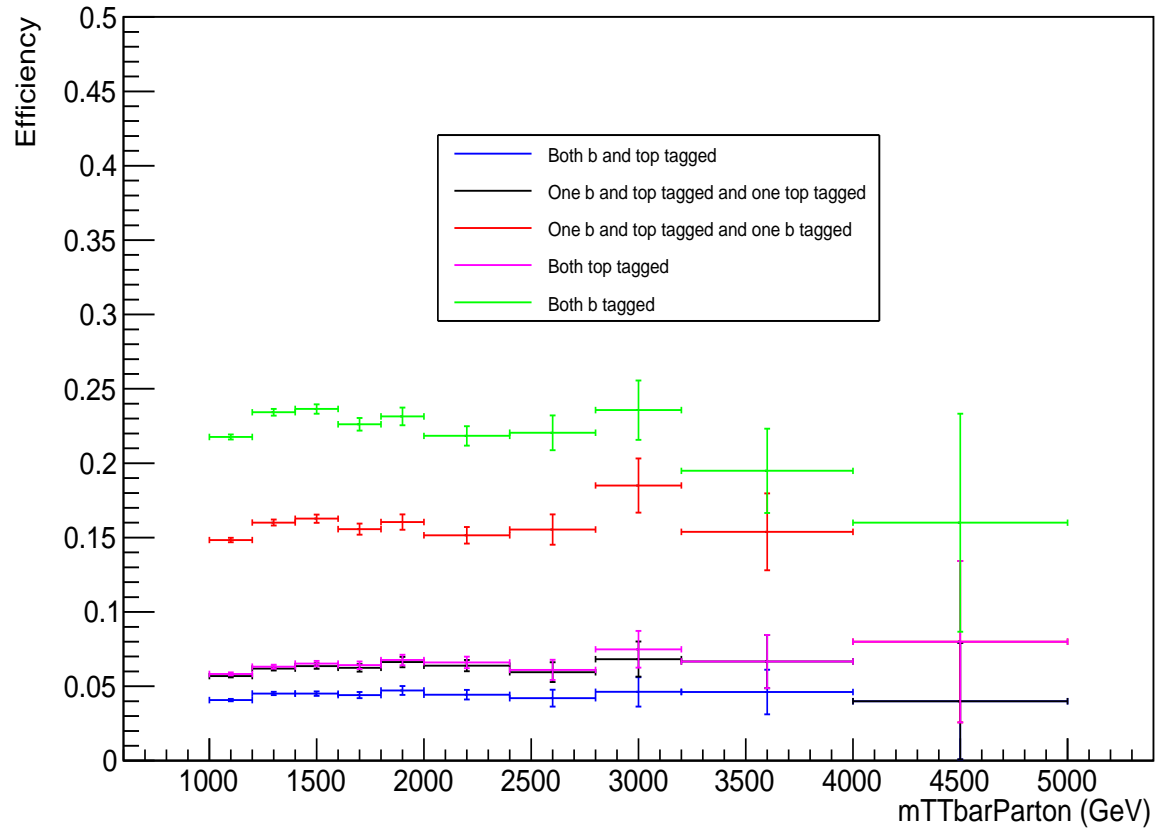
Top tagger cut : 0.7

B-tagging: Loose working point

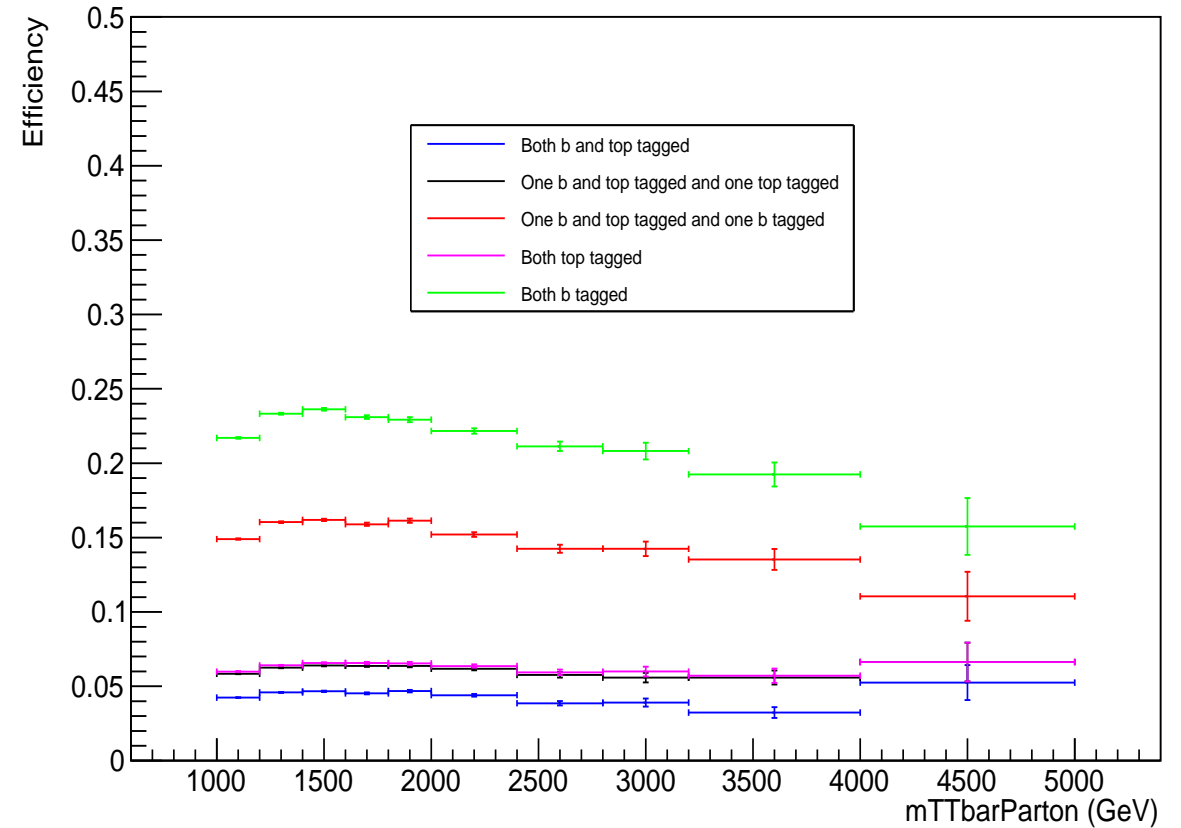
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

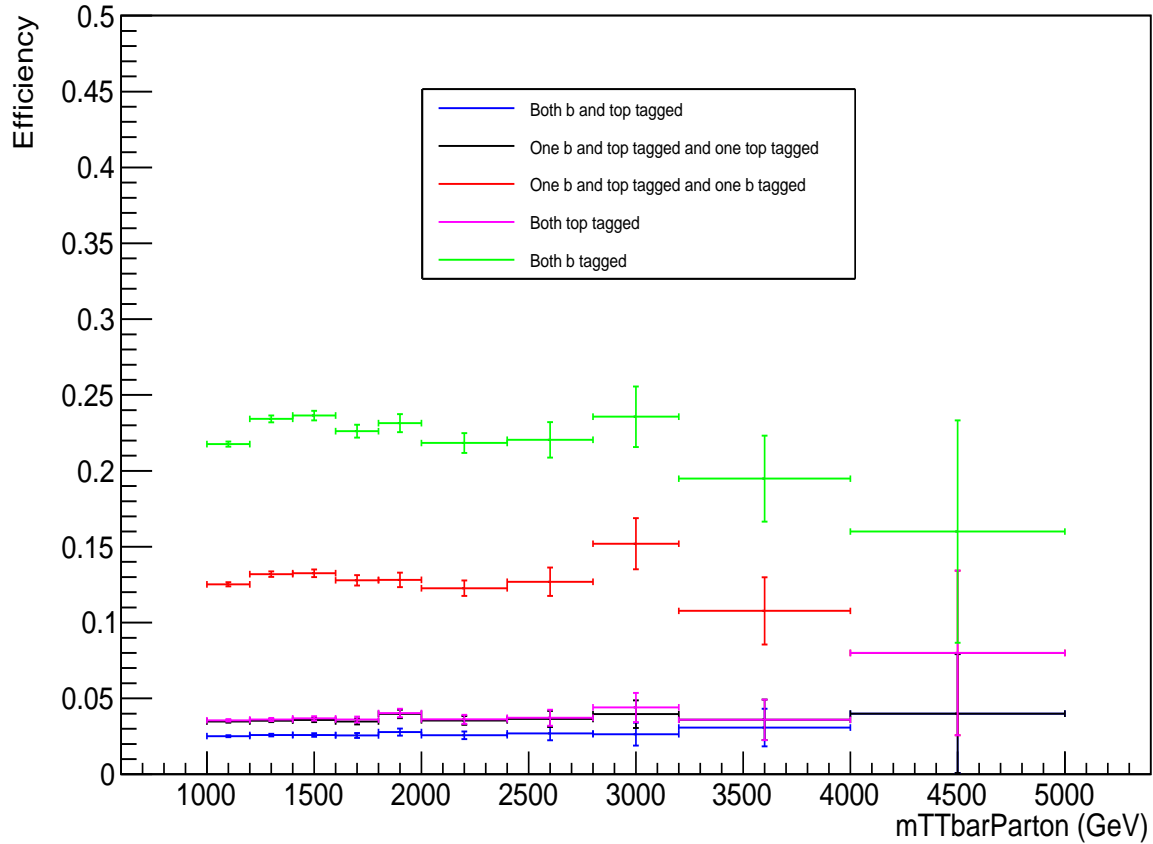
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.8

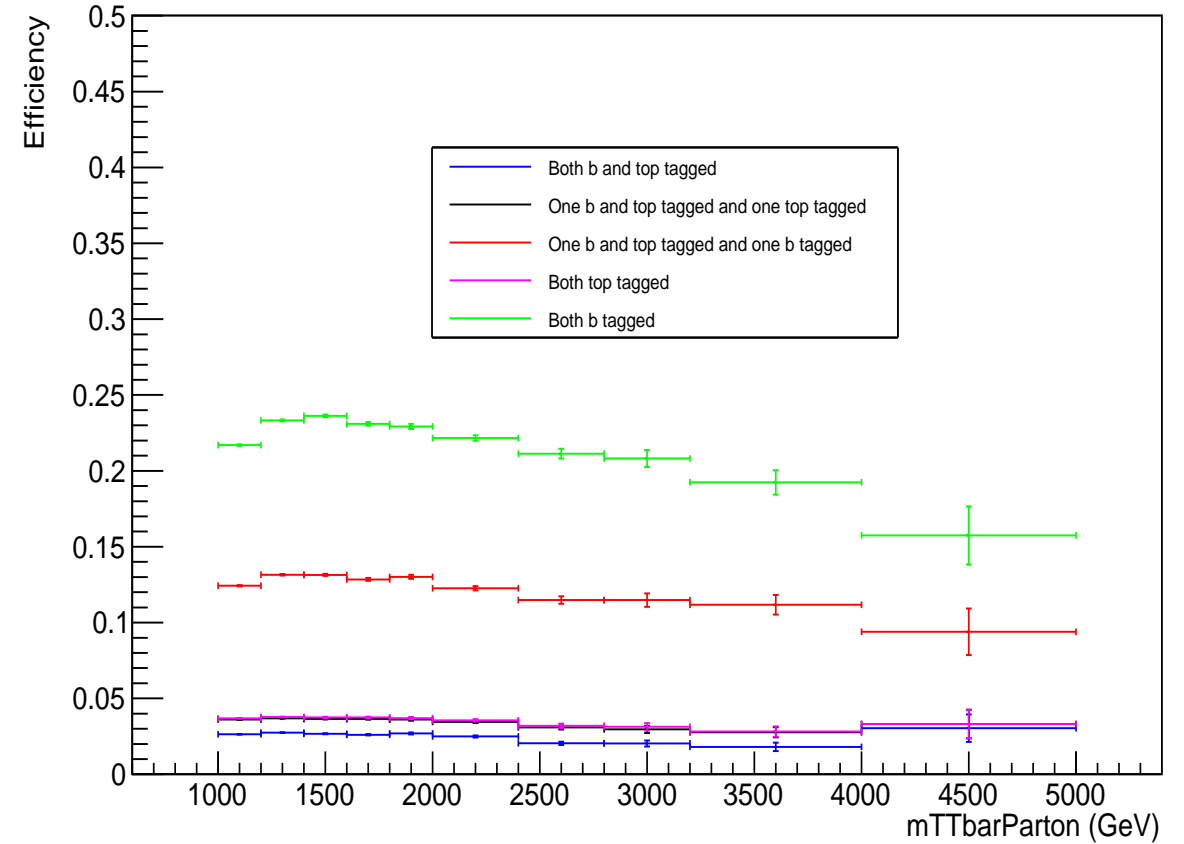
B-tagging: Loose working point

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

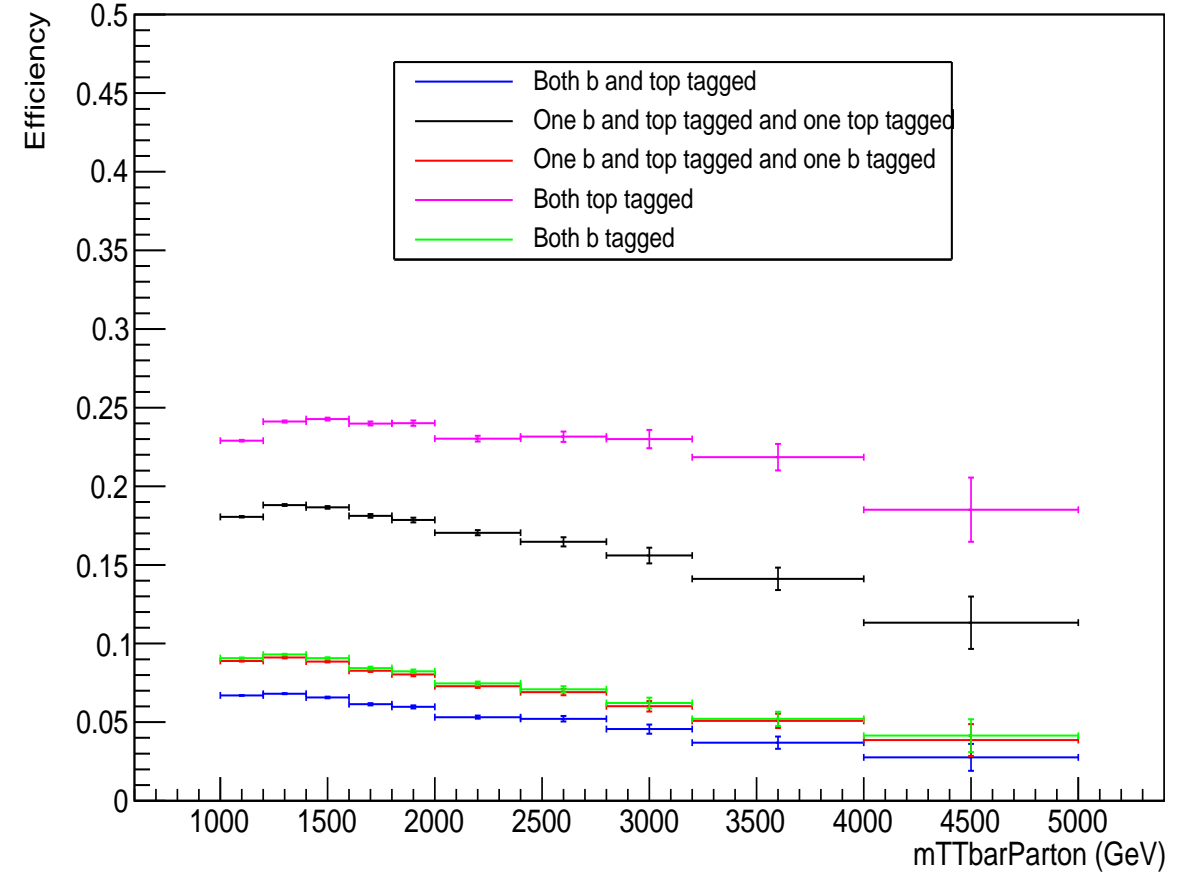
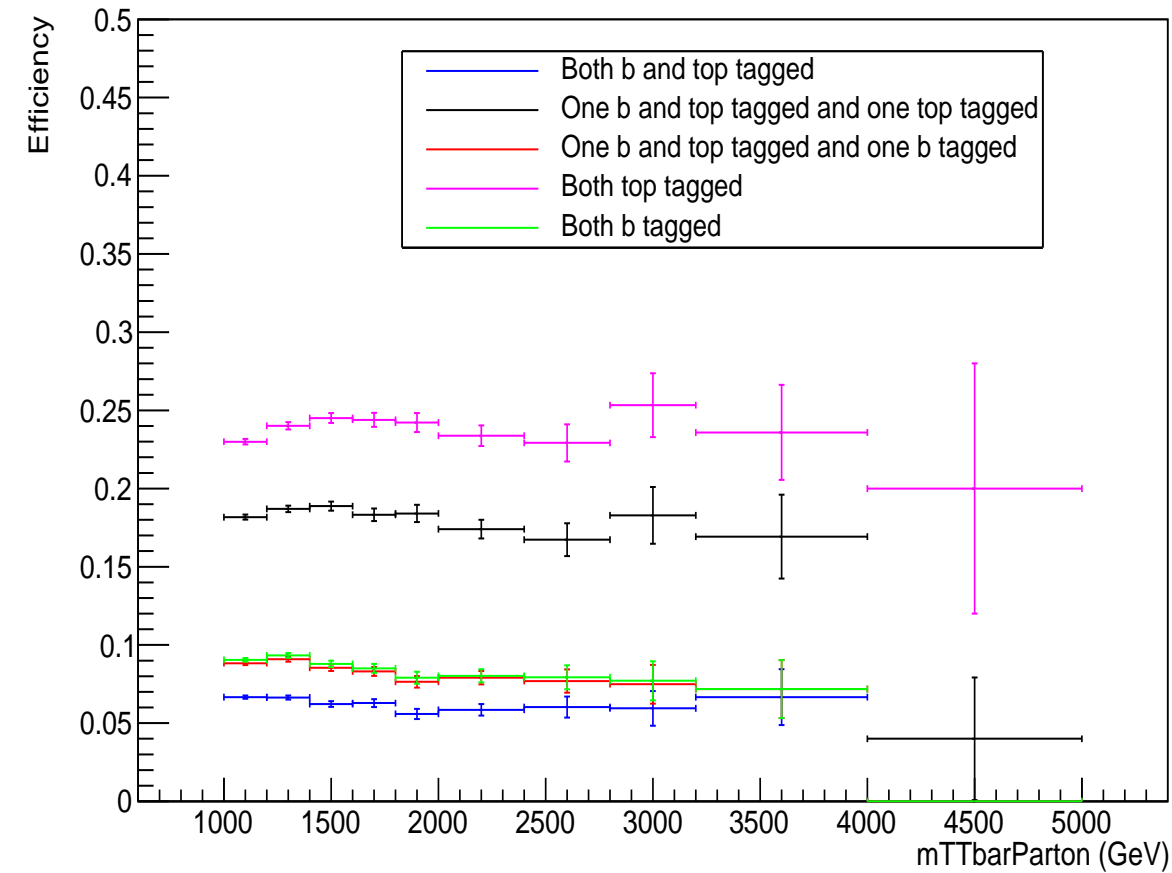
Signal Efficiency

Top tagger cut : 0.0

B-tagging: Medium working point

Mtt Samples

Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

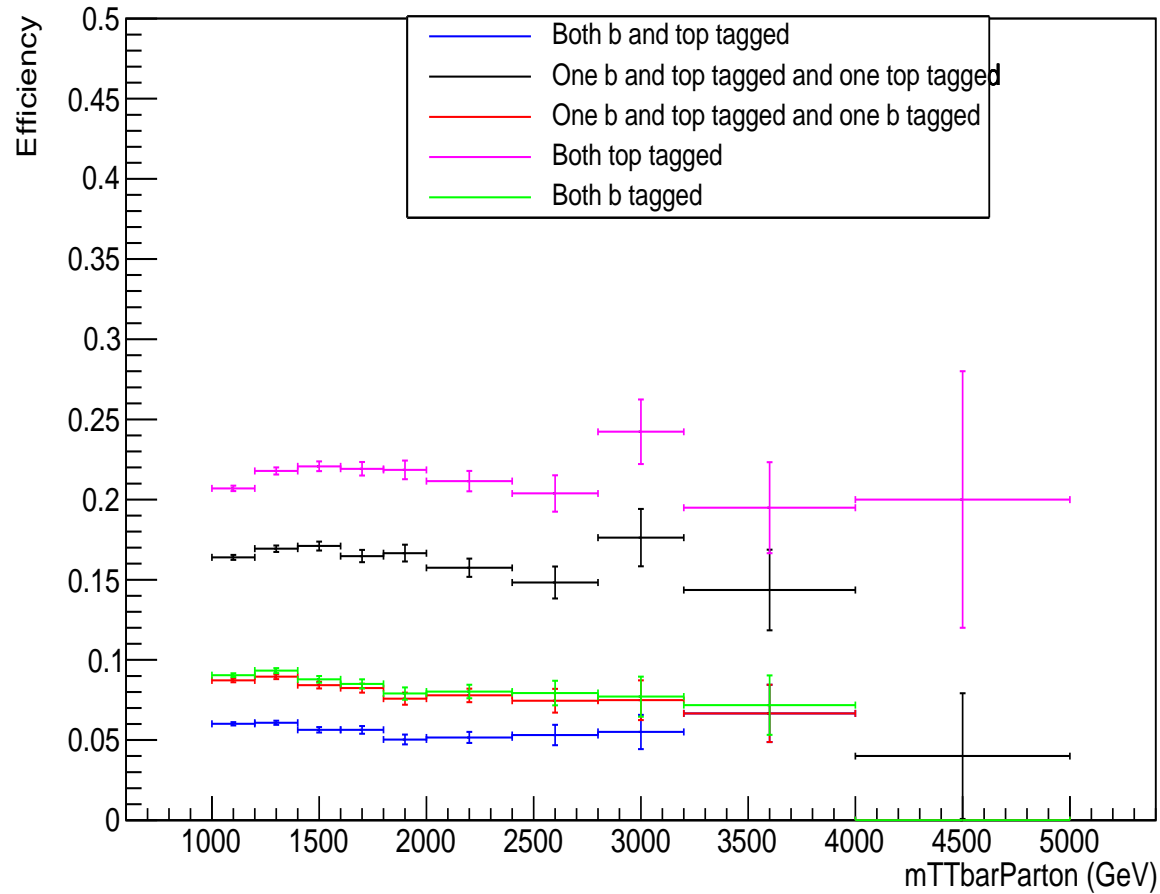
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.1

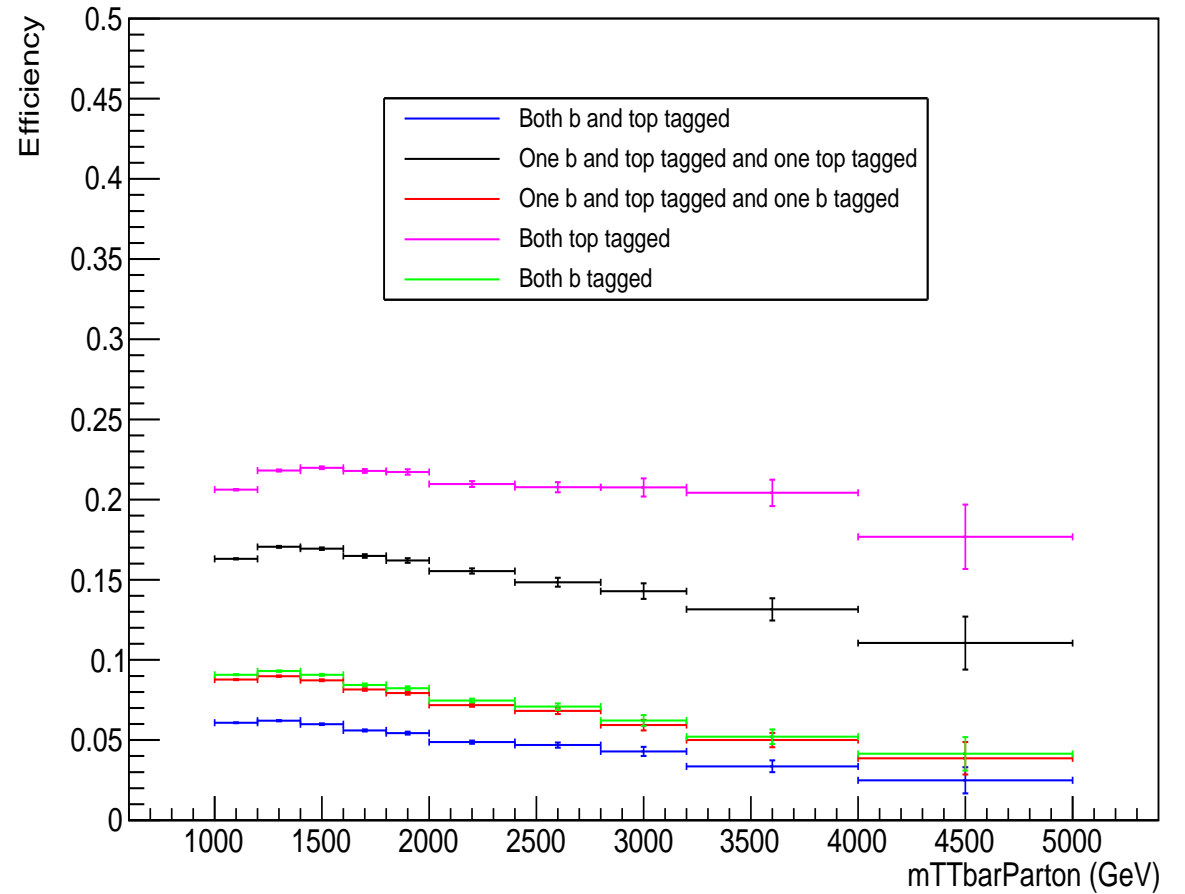
B-tagging: Medium working point

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

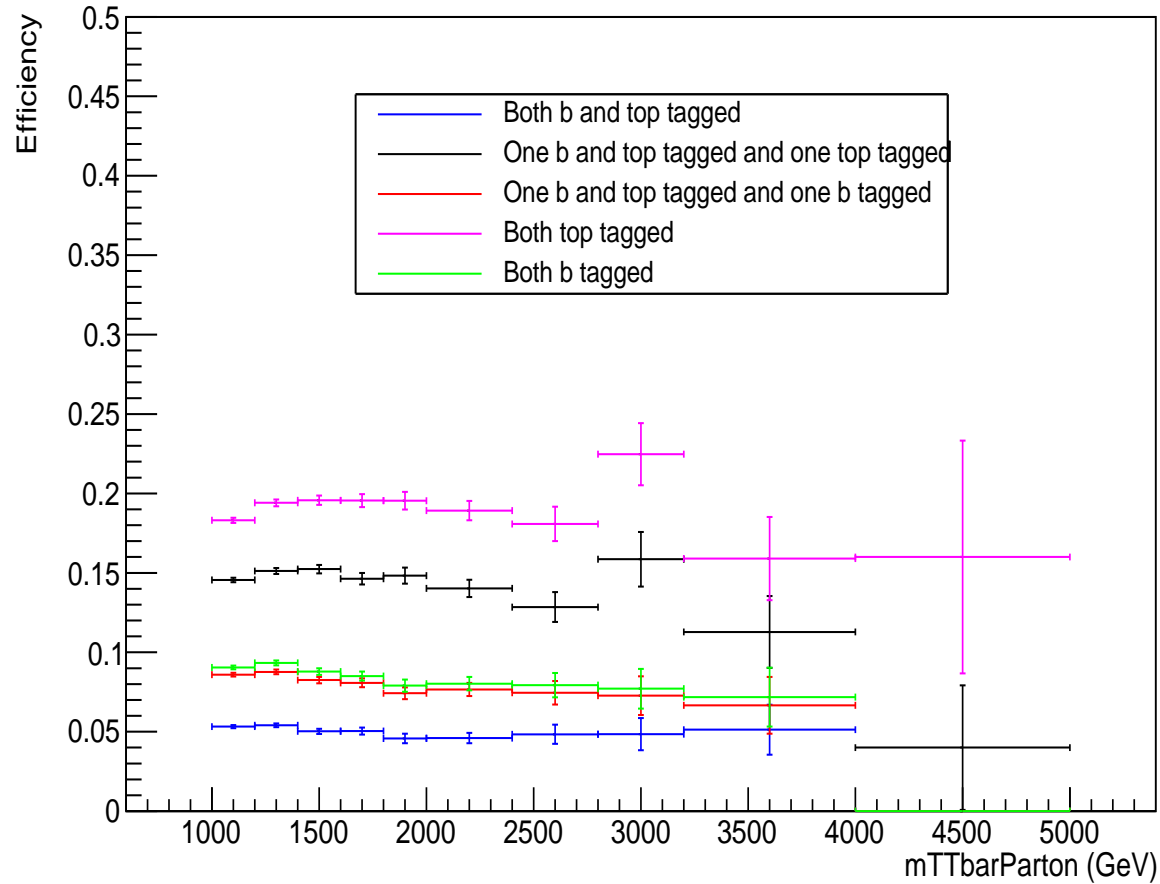
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.2

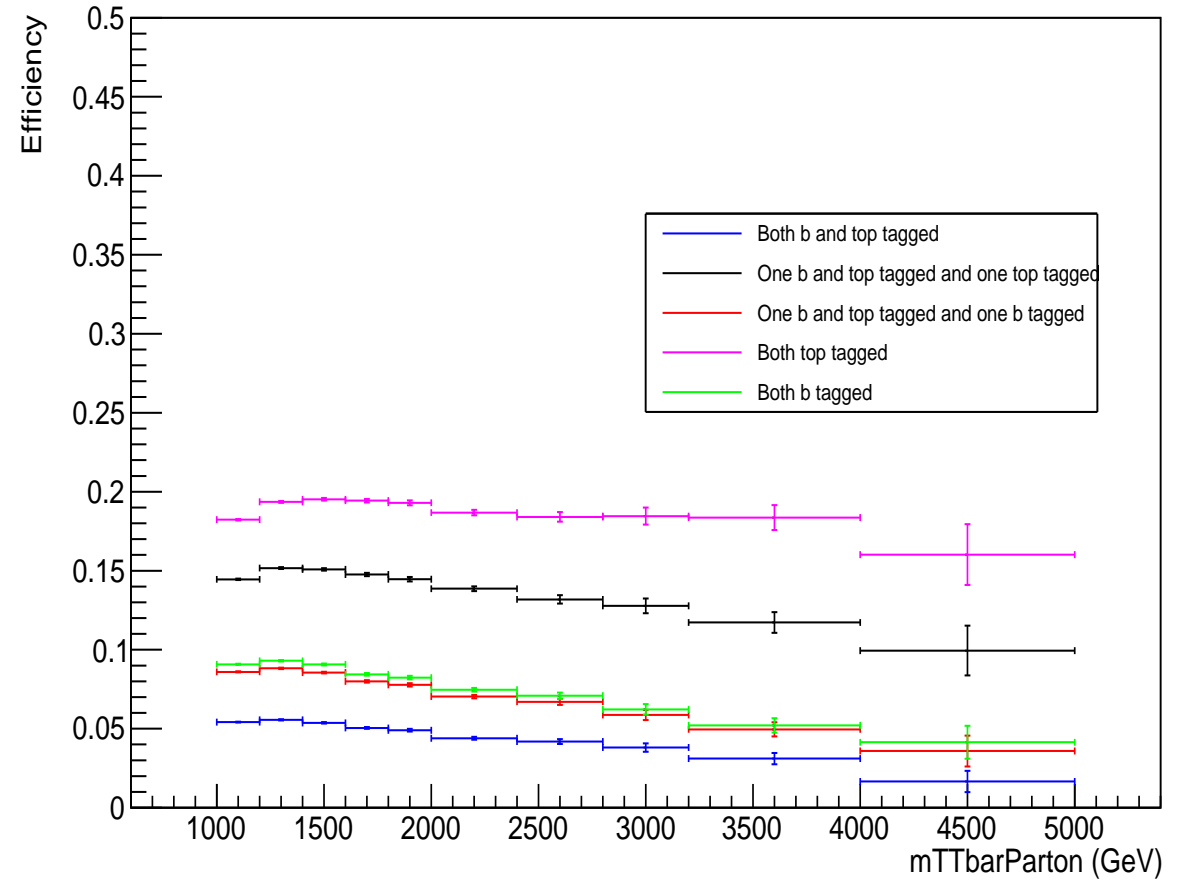
B-tagging: Medium working point

Mtt Samples

Signal Efficiency



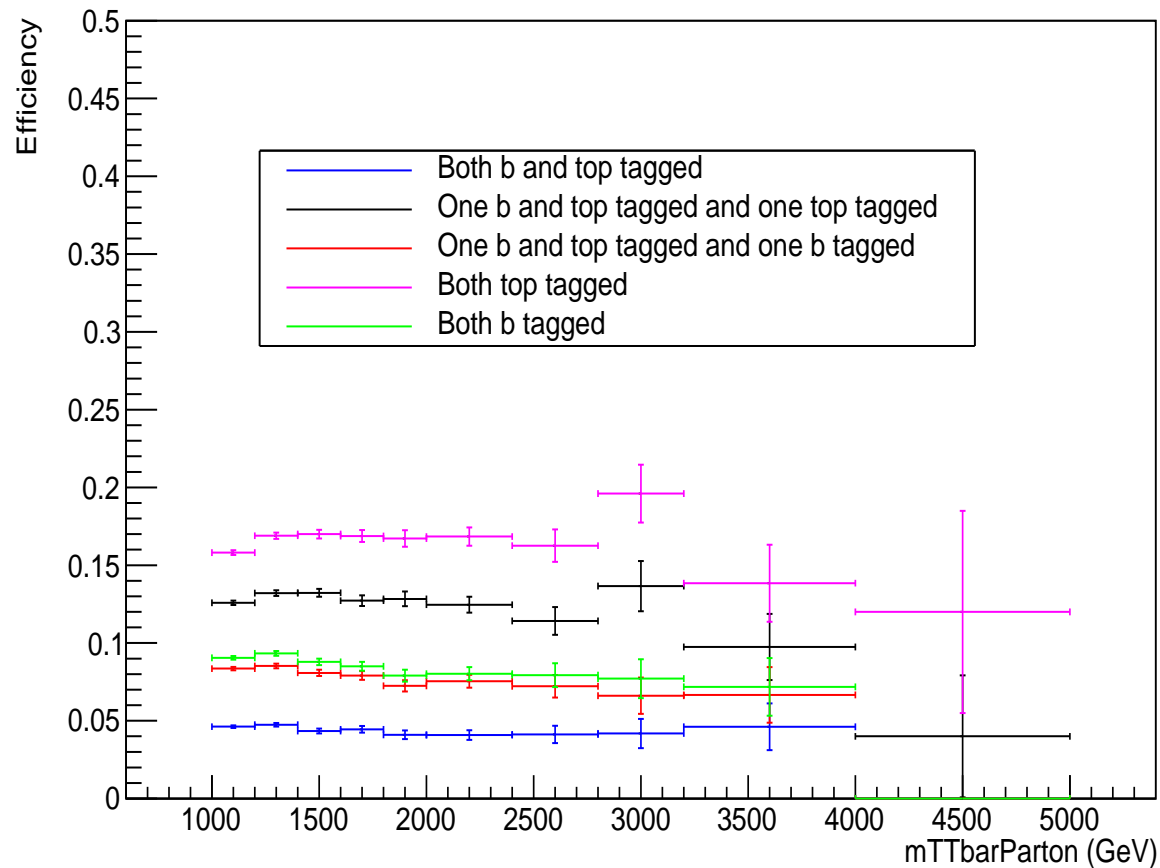
Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Efficiency

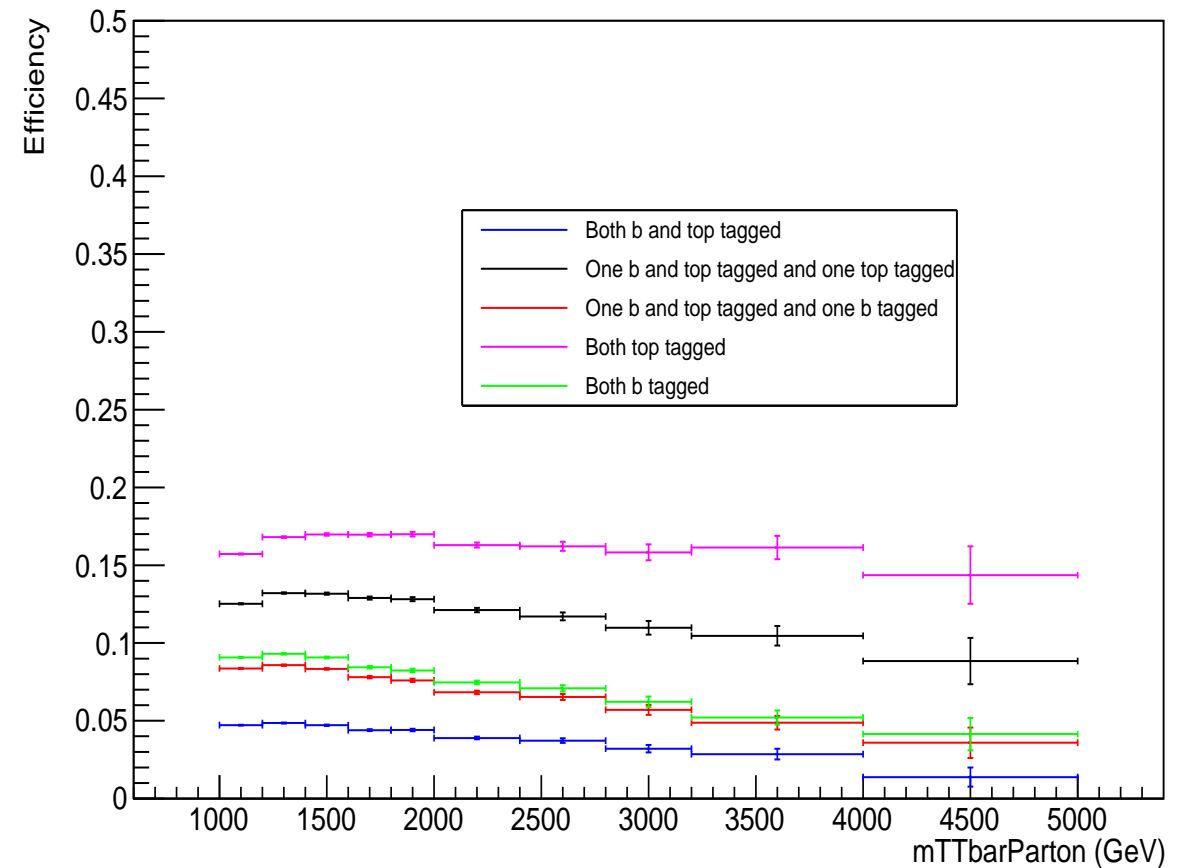


Top tagger cut : 0.3

B-tagging: Medium working point

Mtt Samples

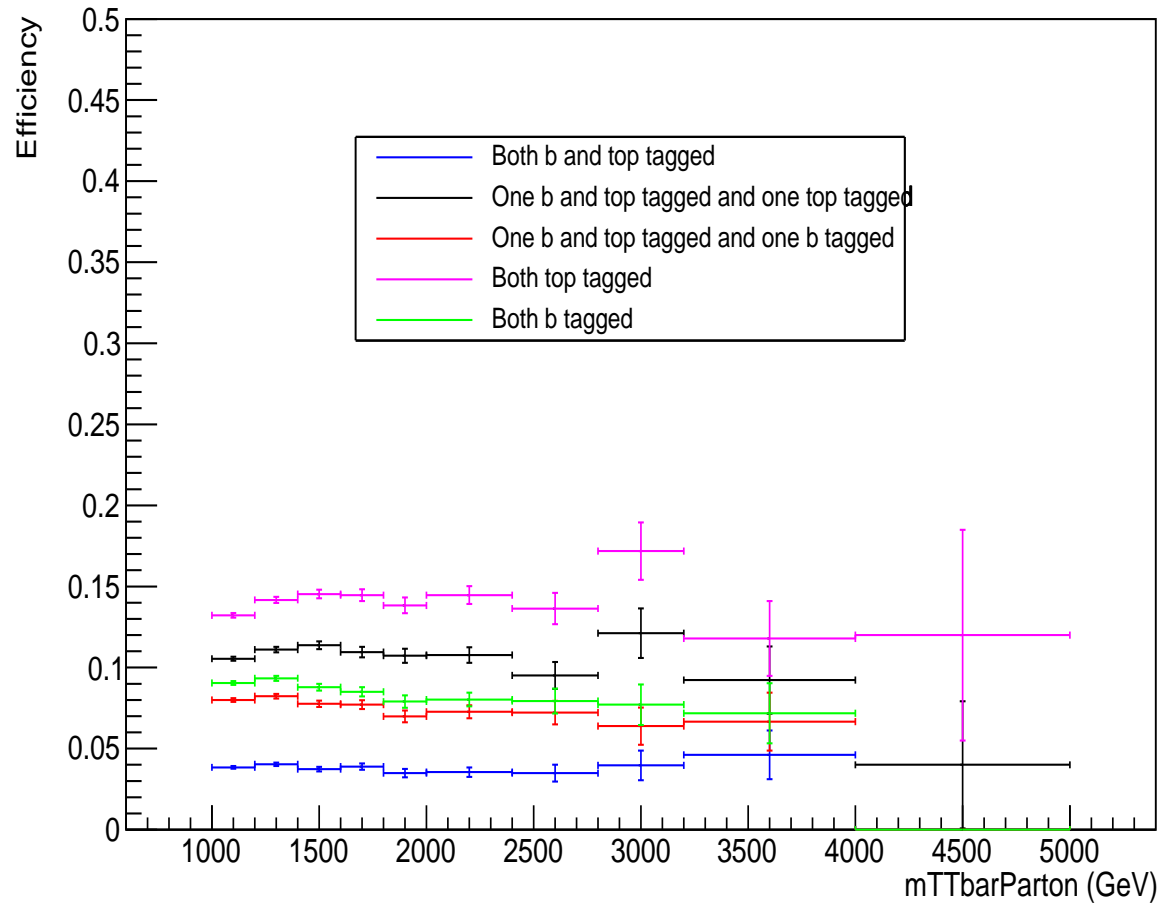
Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Efficiency

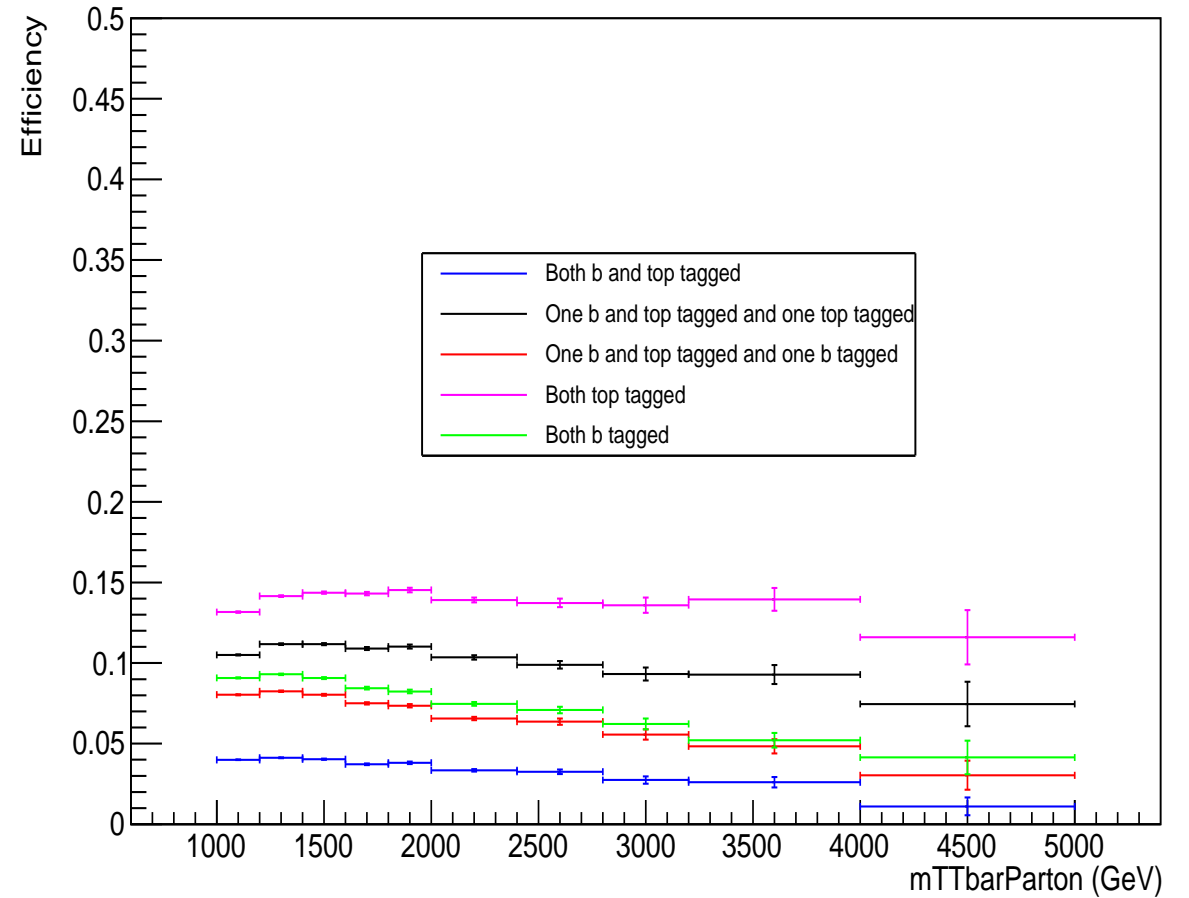


Top tagger cut : 0.4

B-tagging: Medium working point

Mtt Samples

Signal Efficiency Mtt samples



Efficiency vs mTTbarParton

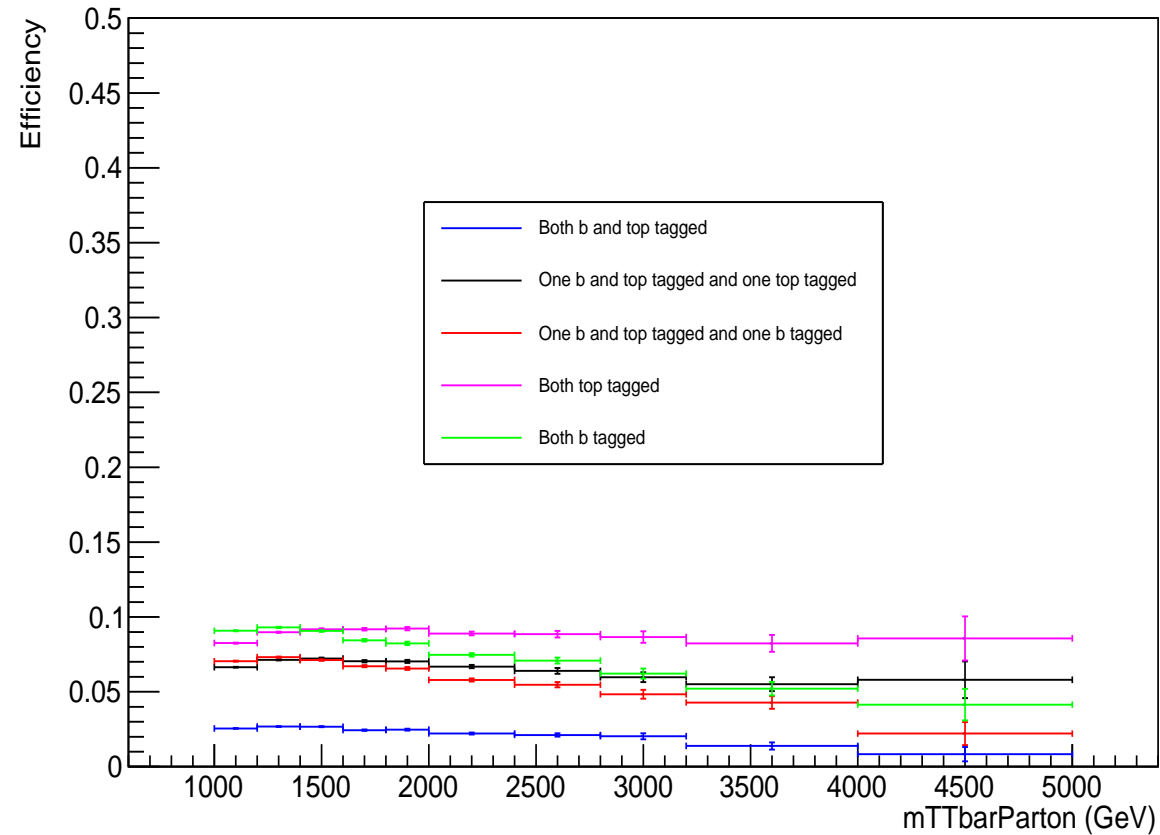
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.6

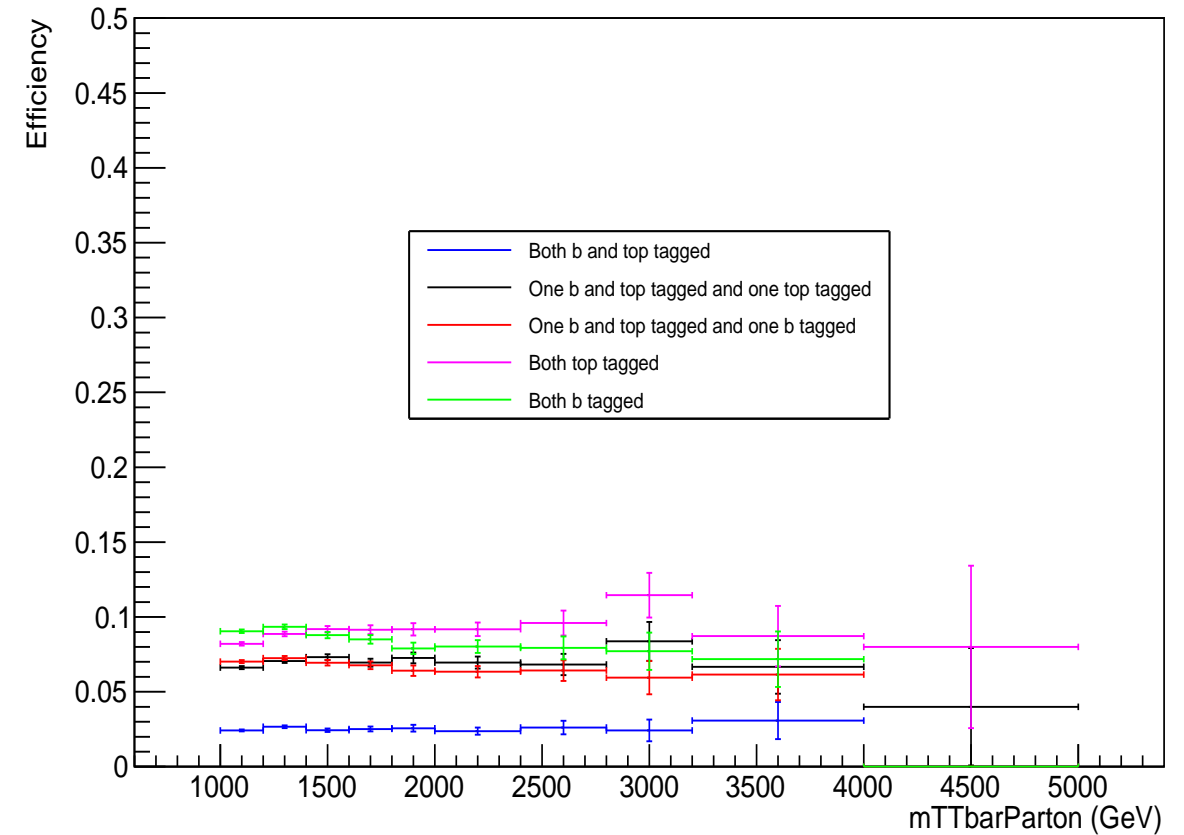
B-tagging: Medium working point

Mtt Samples

Signal Efficiency Mtt samples

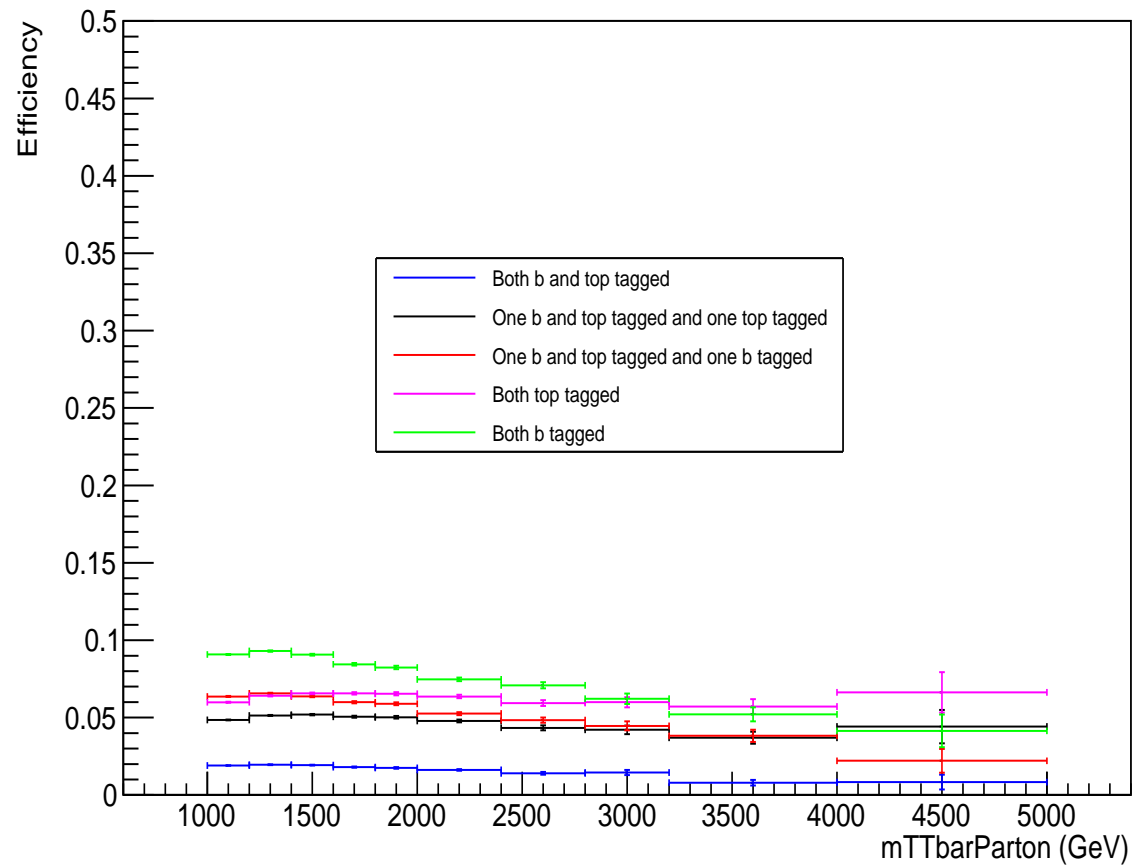


Signal Efficiency



Efficiency vs mTTbarParton

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)
Signal Efficiency Mtt samples

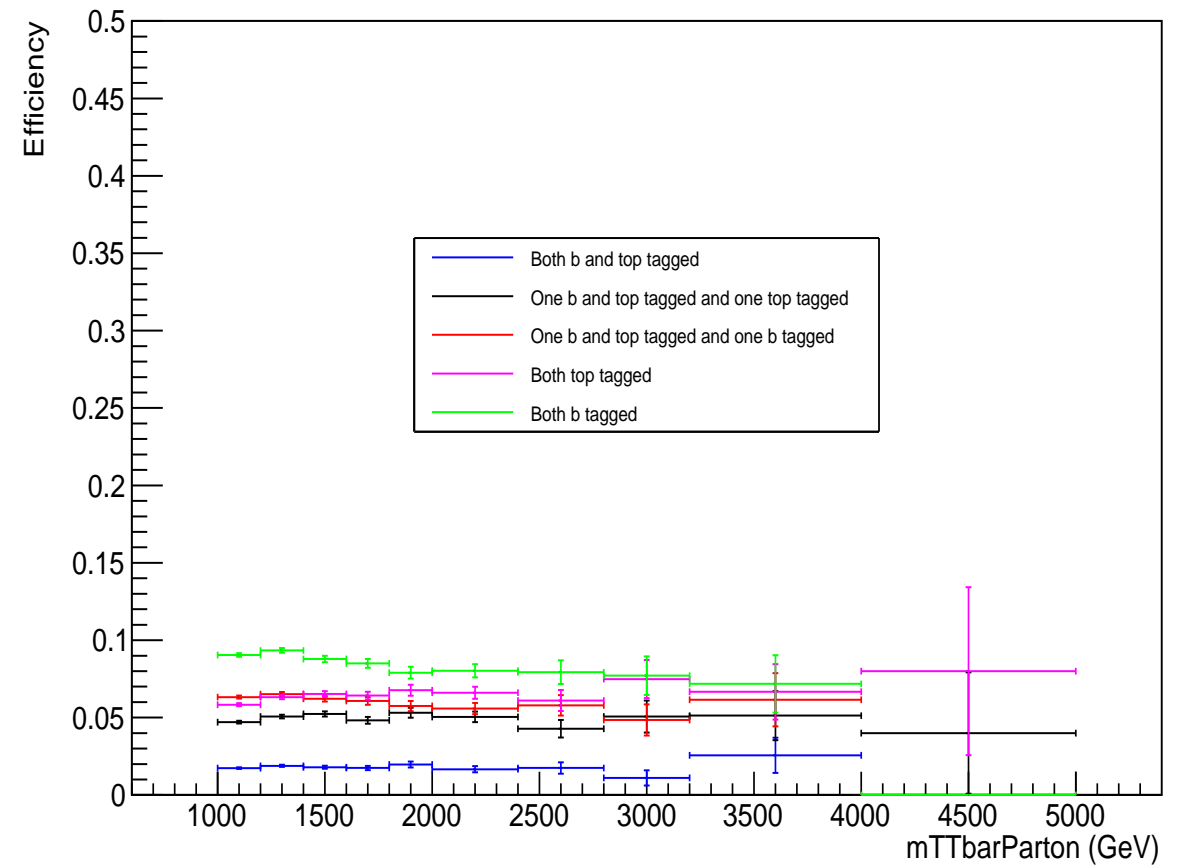


Top tagger cut : 0.7

B-tagging: Medium working point

Mtt Samples

Signal Efficiency



Efficiency vs mTTbarParton

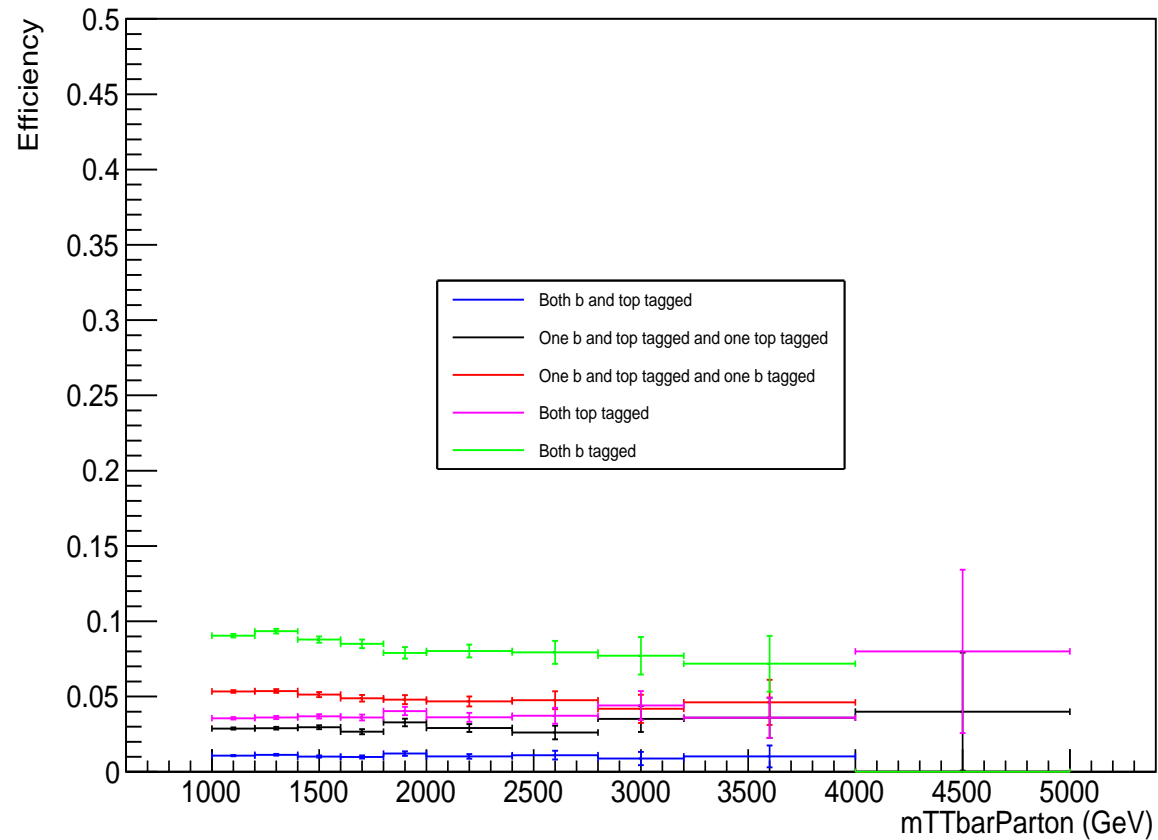
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Top tagger cut : 0.8

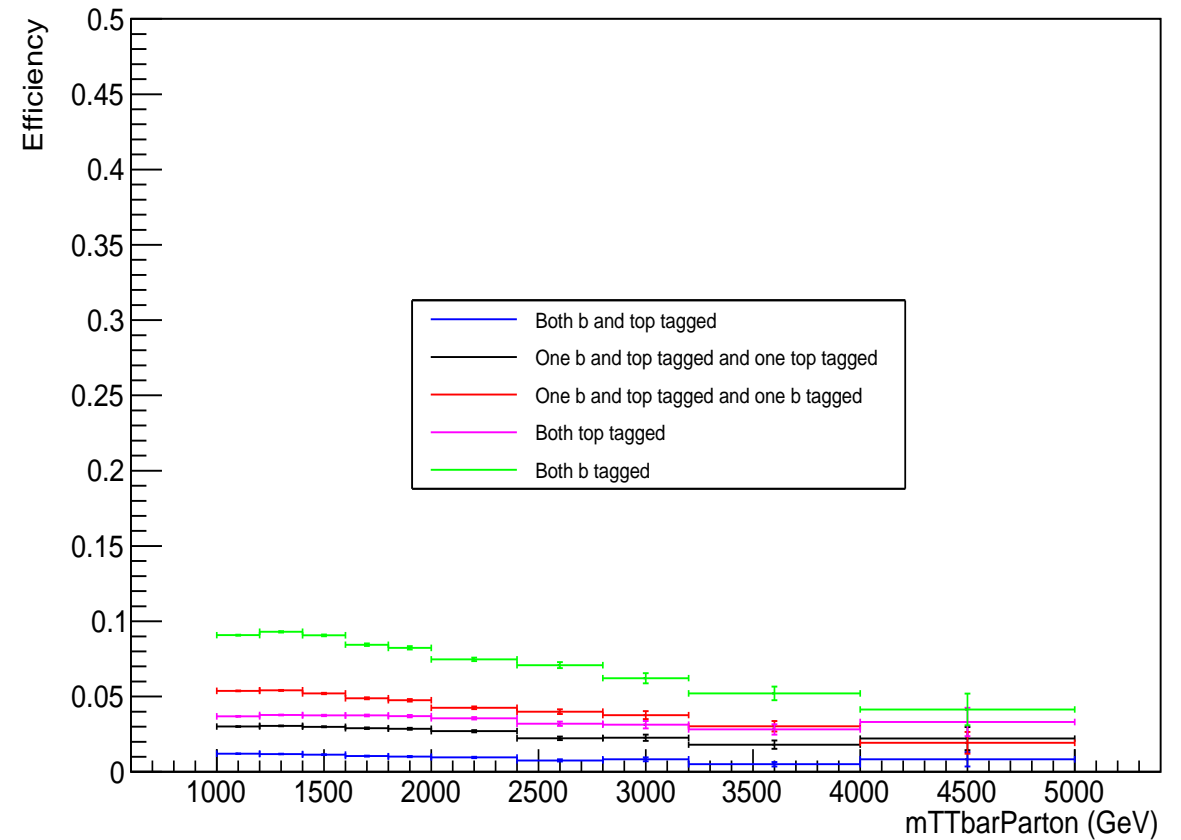
B-tagging: Medium working point

Mtt Samples

Signal Efficiency



Signal Efficiency Mtt samples

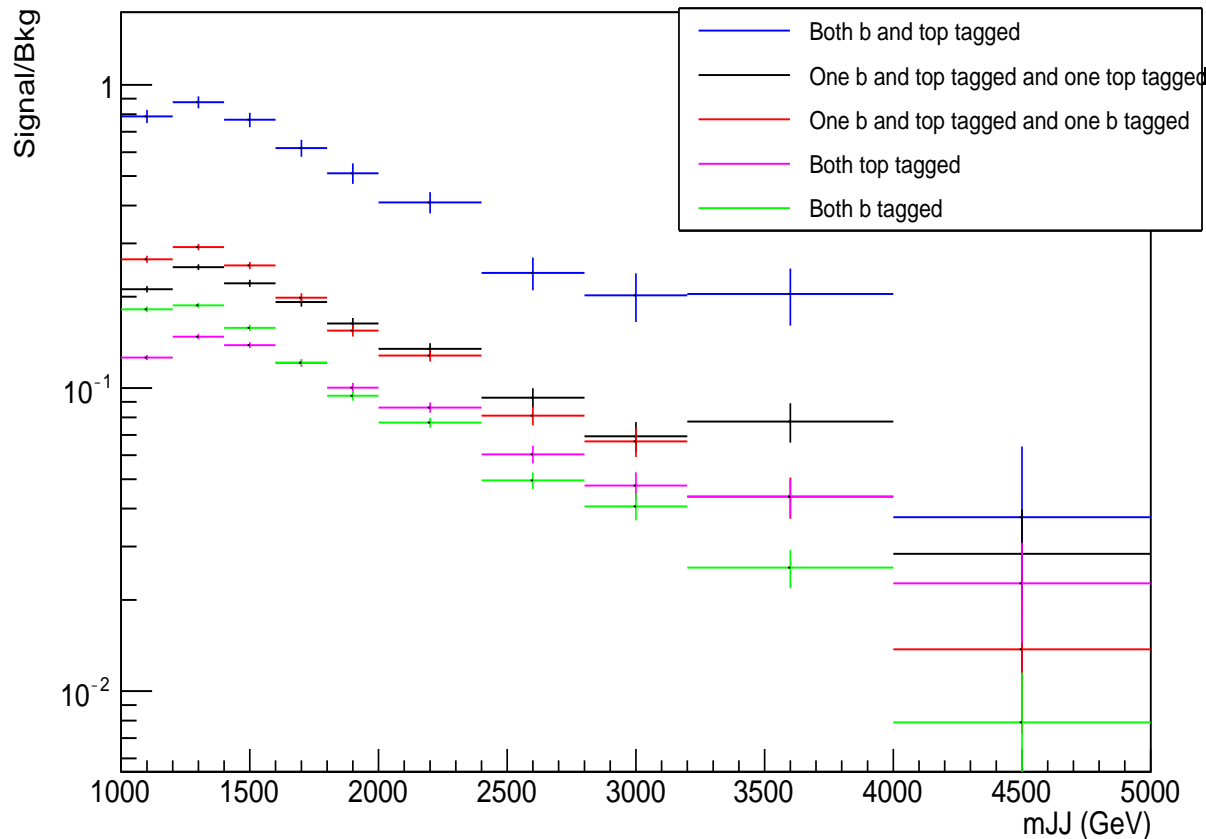


Signal over Bkg for mJJ (reco)

Top tagger cut : 0.0
B-tagging: Loose working point

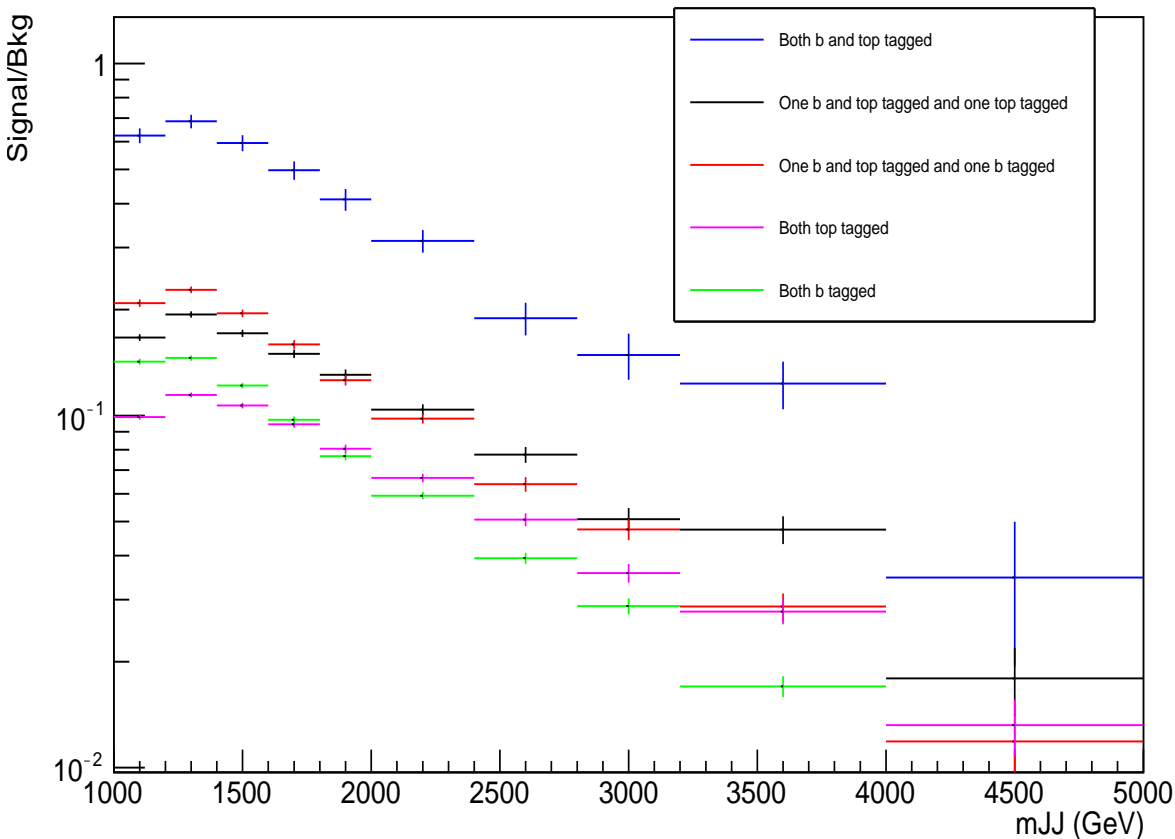
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Signal Over Background



Mtt Samples

Signal Mtt over Background



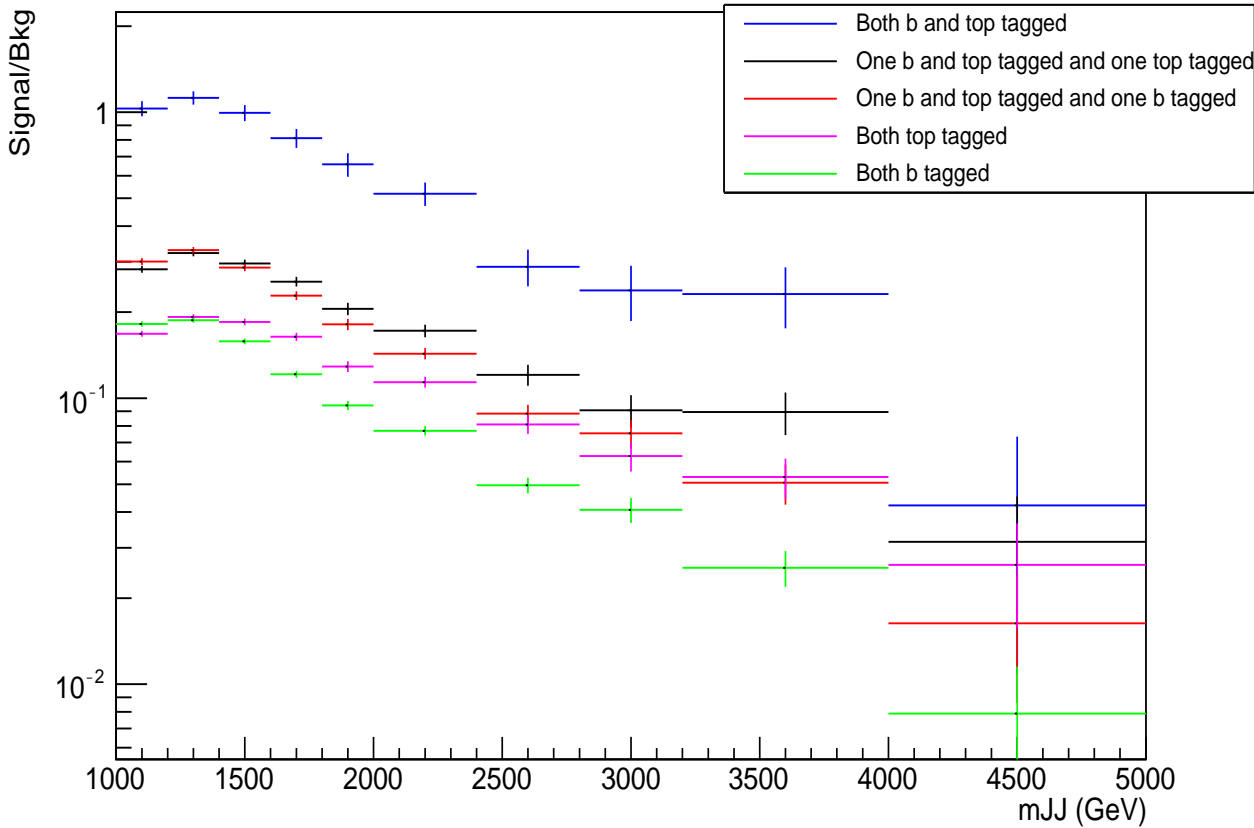
Signal over Bkg for mJJ (reco)

Top tagger cut : 0.1
B-tagging: Loose working point

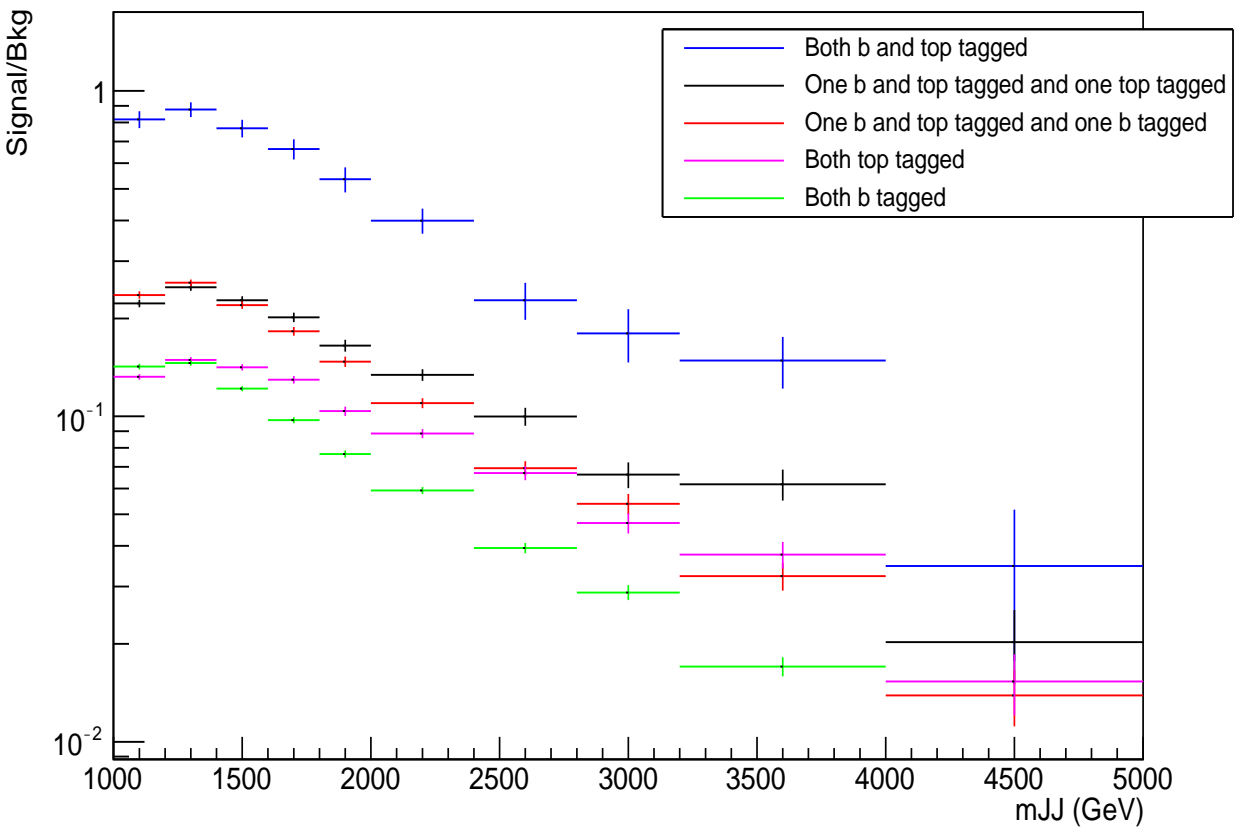
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background



Signal Mtt over Background



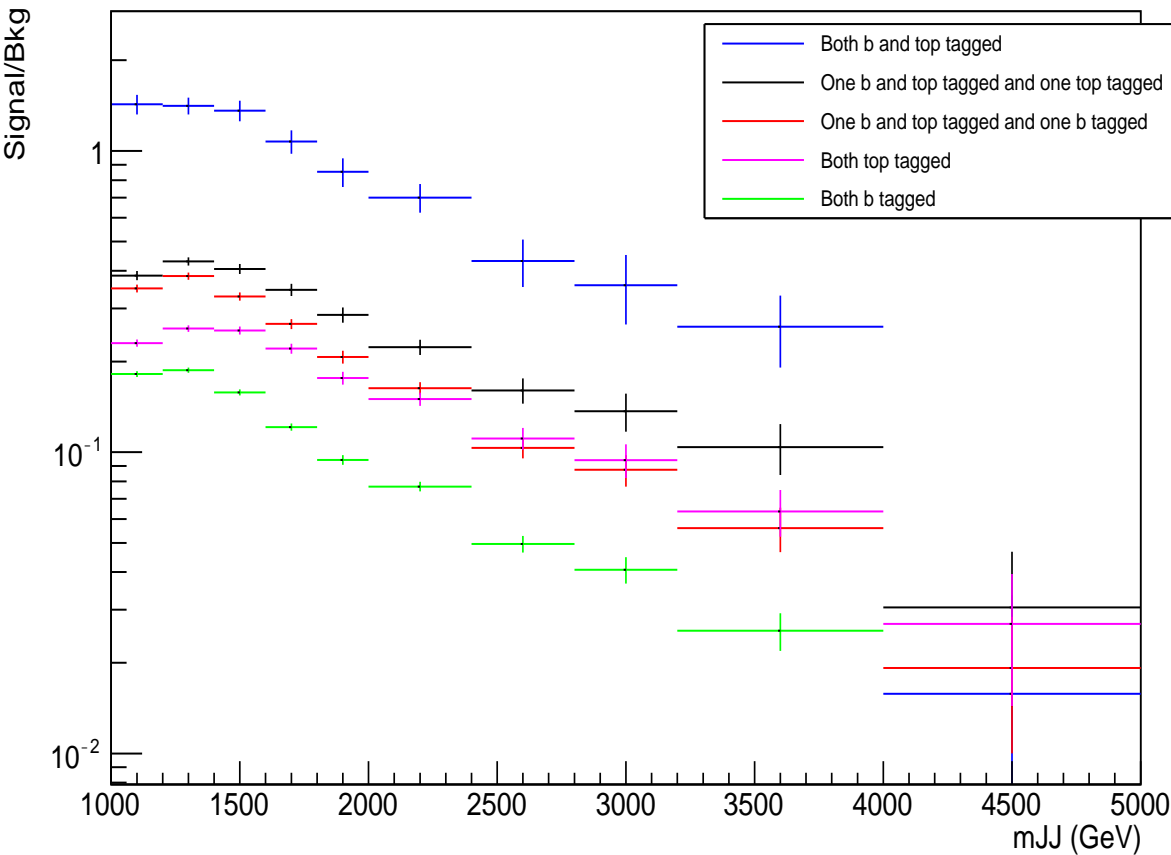
Signal over Bkg for mJJ (reco)

Top tagger cut : 0.2
B-tagging: Loose working point

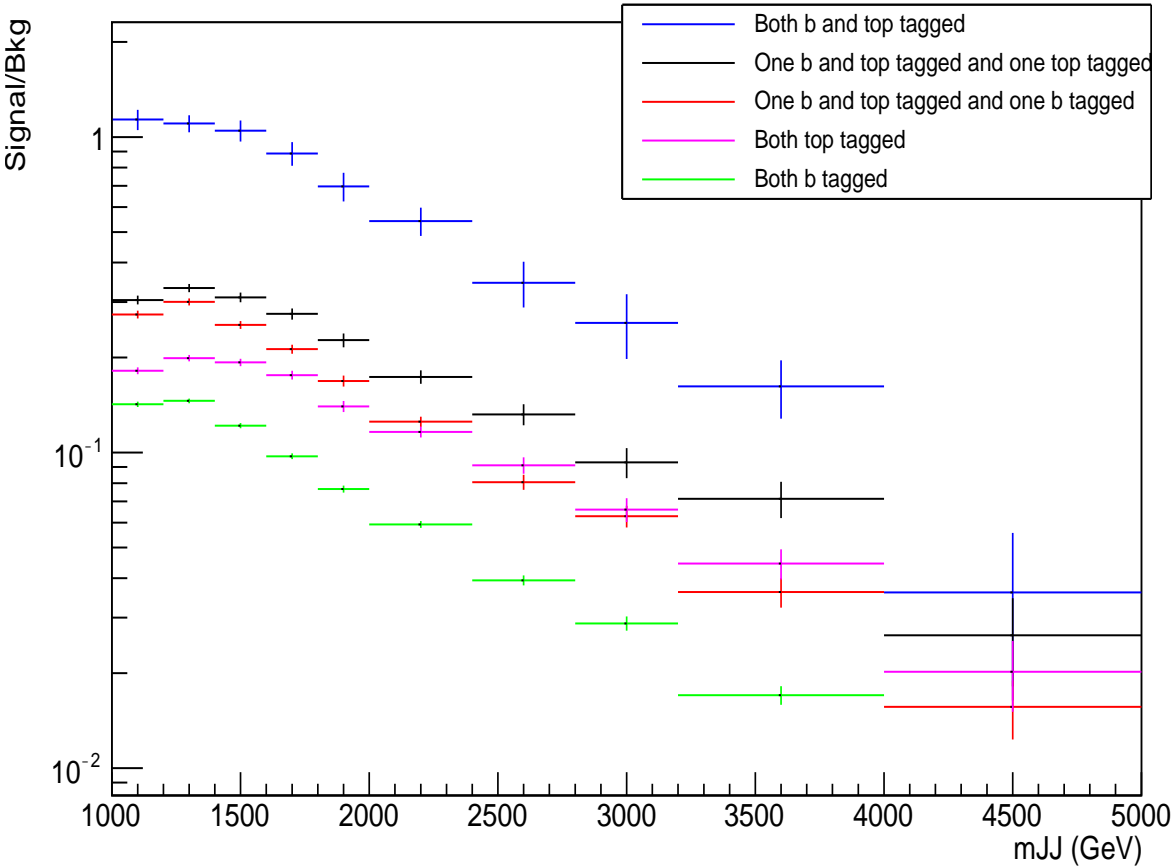
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background



Signal Mtt over Background

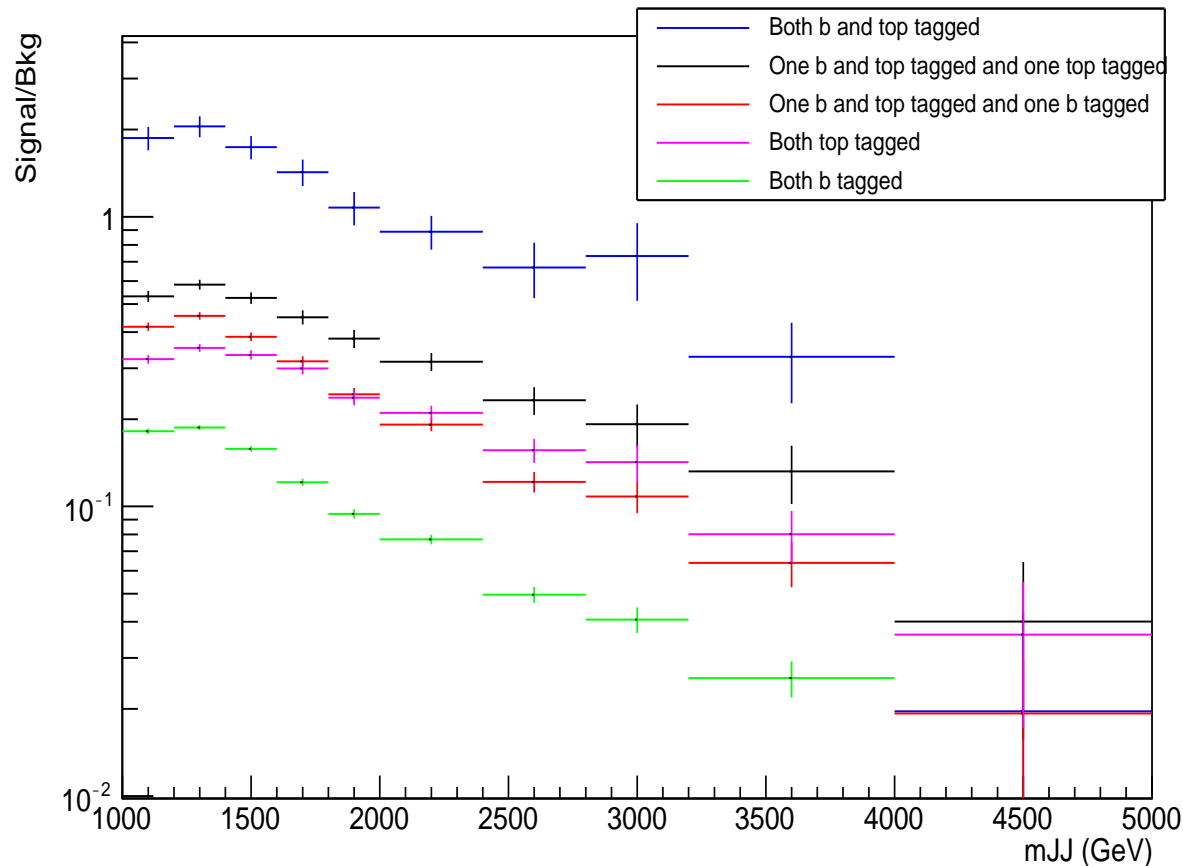


Signal over Bkg for mJJ (reco)

Top tagger cut : 0.3
B-tagging: Loose working point

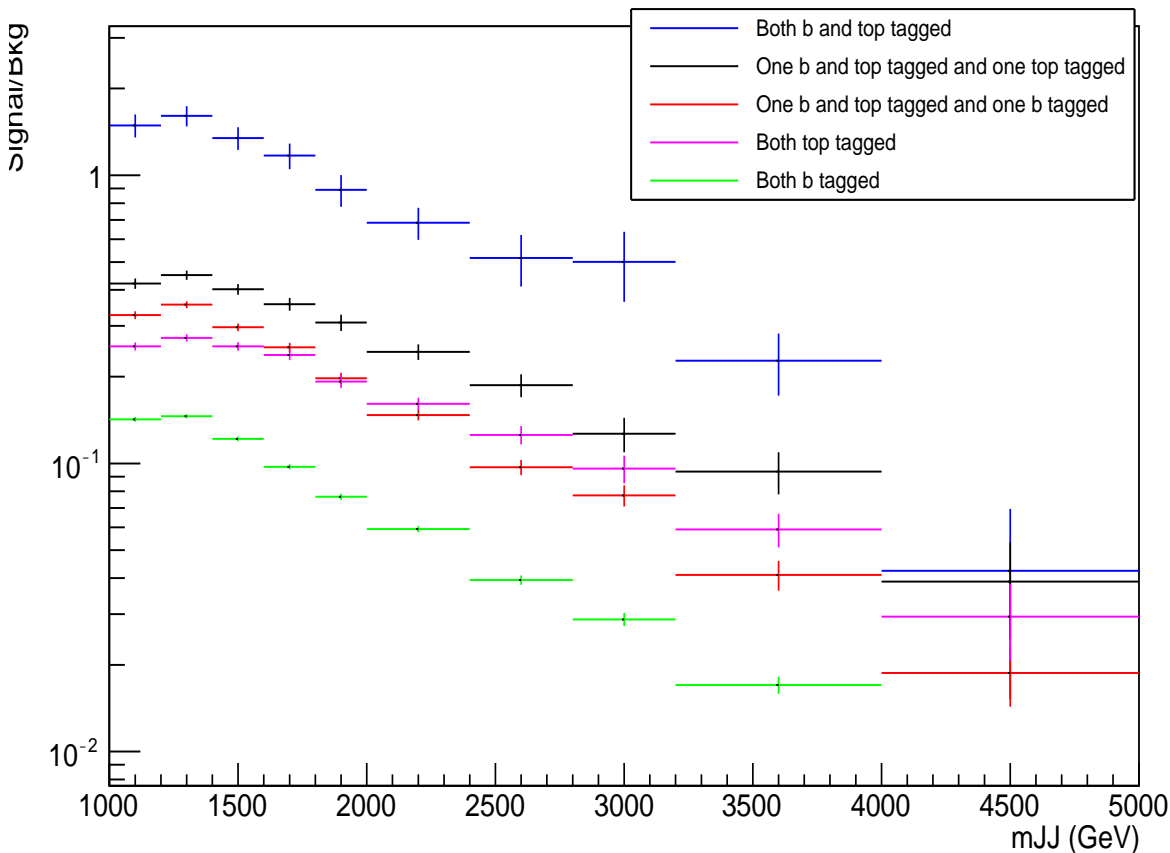
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Signal Over Background



Mtt Samples

Signal Mtt over Background



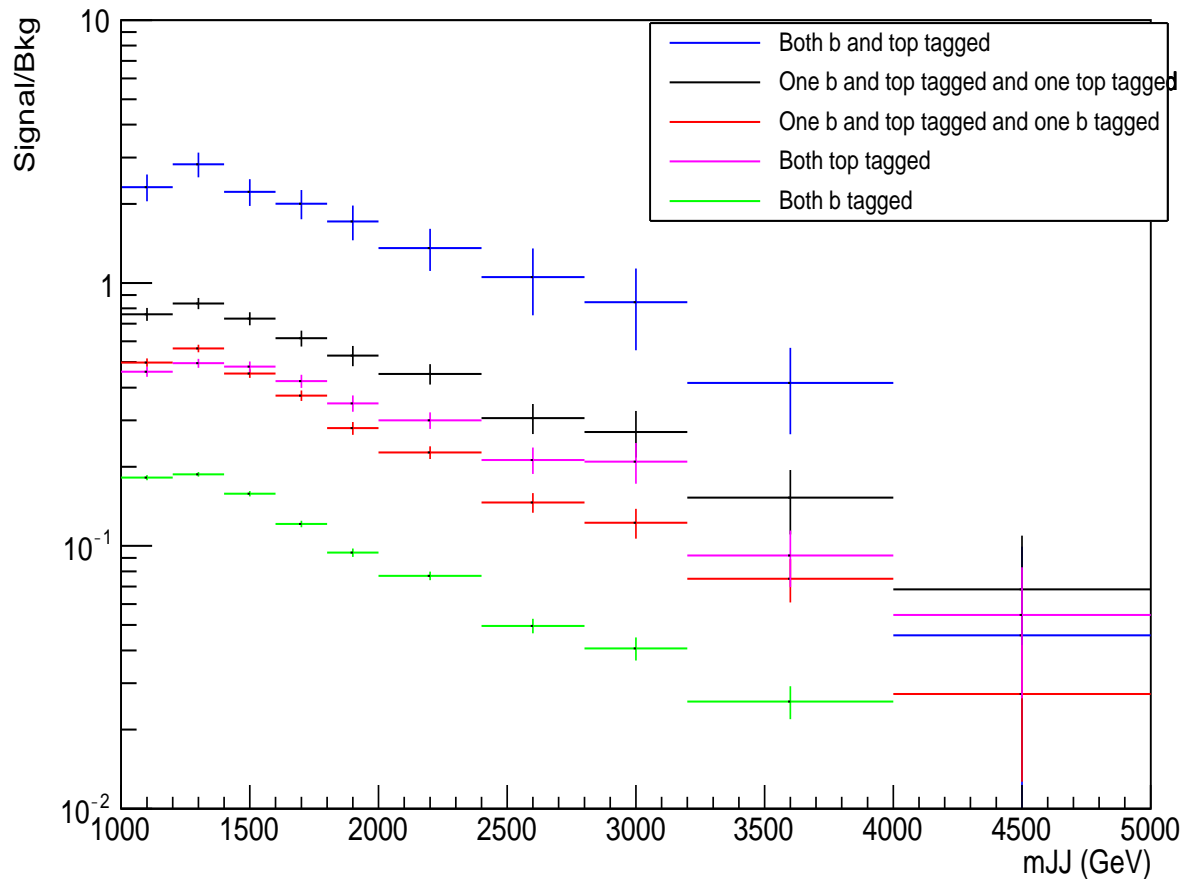
Signal over Bkg for mJJ (reco)

Top tagger cut : 0.4
B-tagging: Loose working point

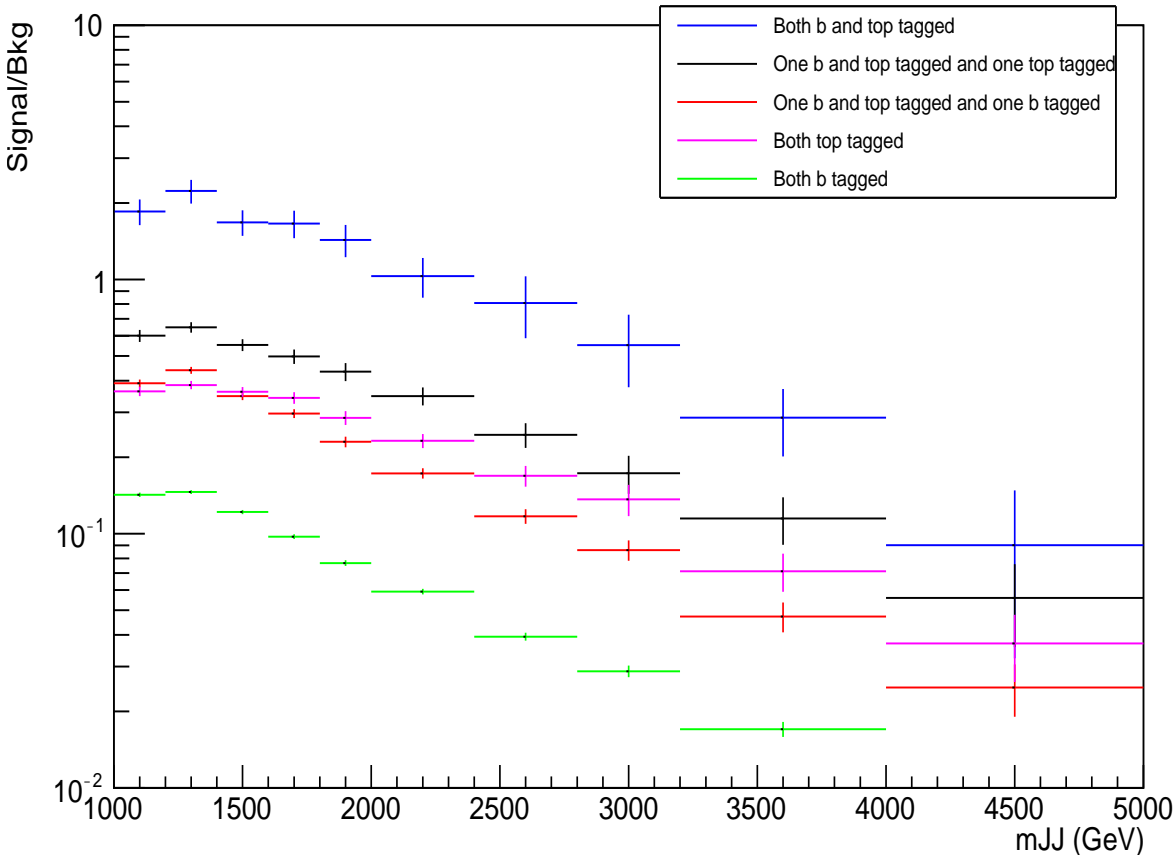
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background



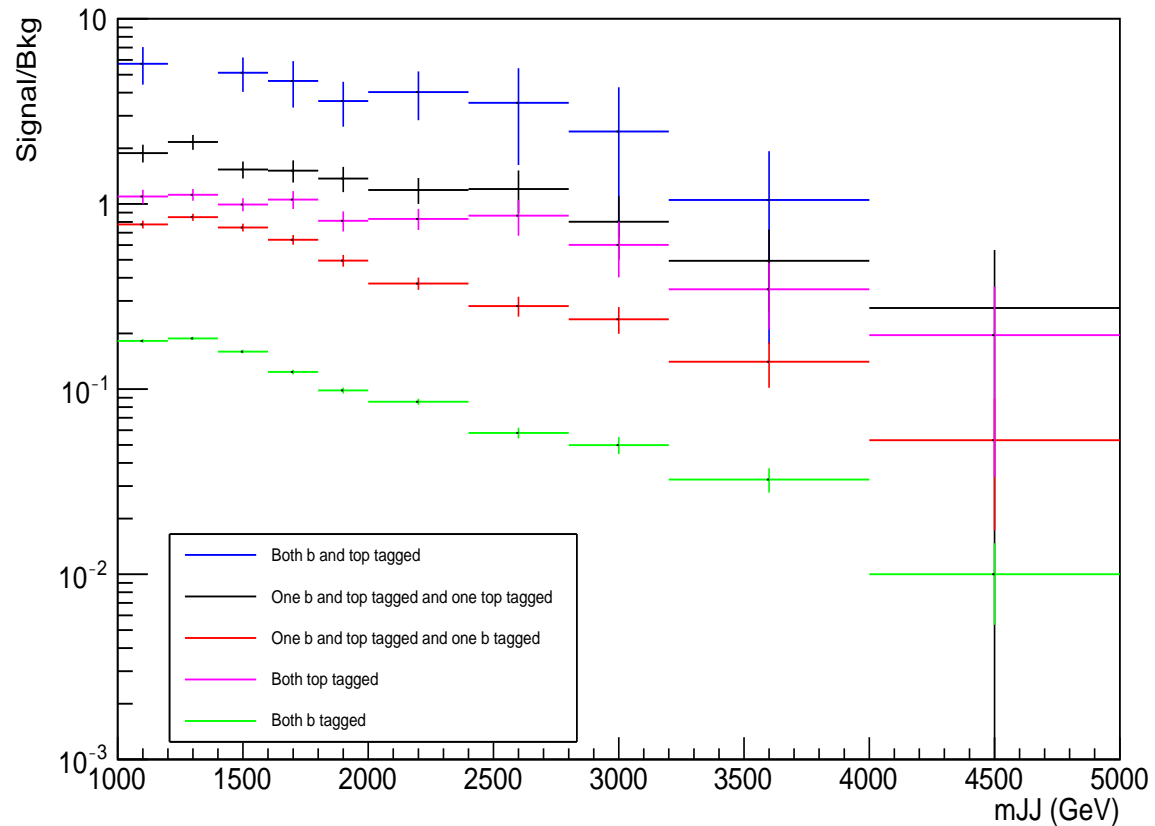
Signal Mtt over Background



Signal over Bkg for mJJ (reco)

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Signal Over Background

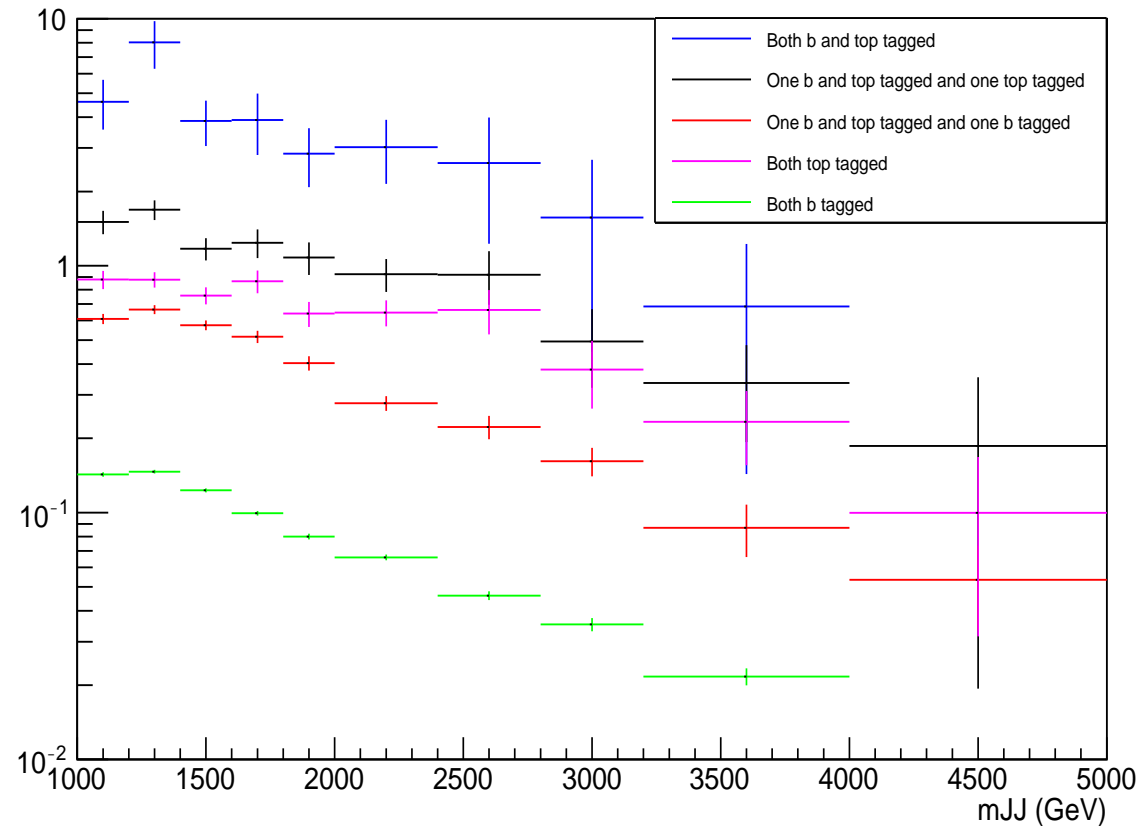


Top tagger cut : 0.6

B-tagging: Loose working point

Mtt Samples

Signal Mtt over Background



Signal over Bkg for mJJ (reco)

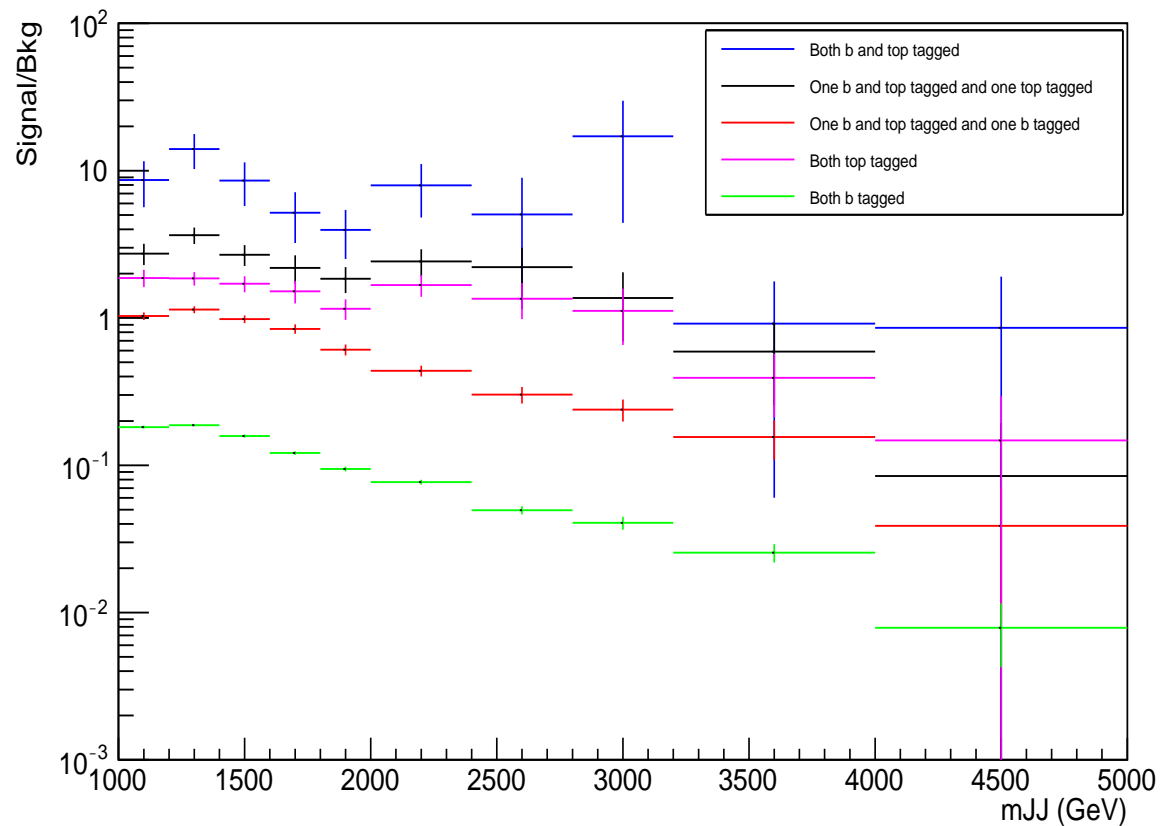
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Top tagger cut : 0.7

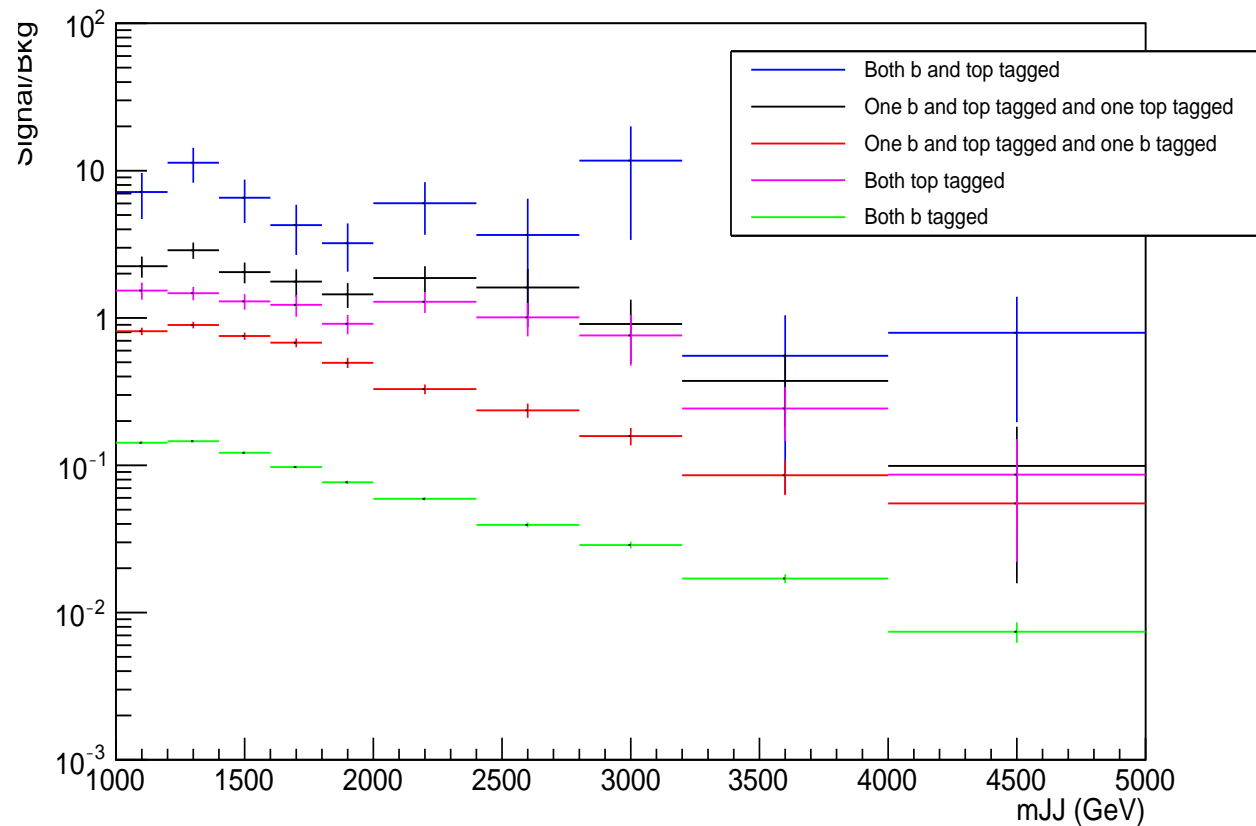
B-tagging: Loose working point

Mtt Samples

Signal Over Background



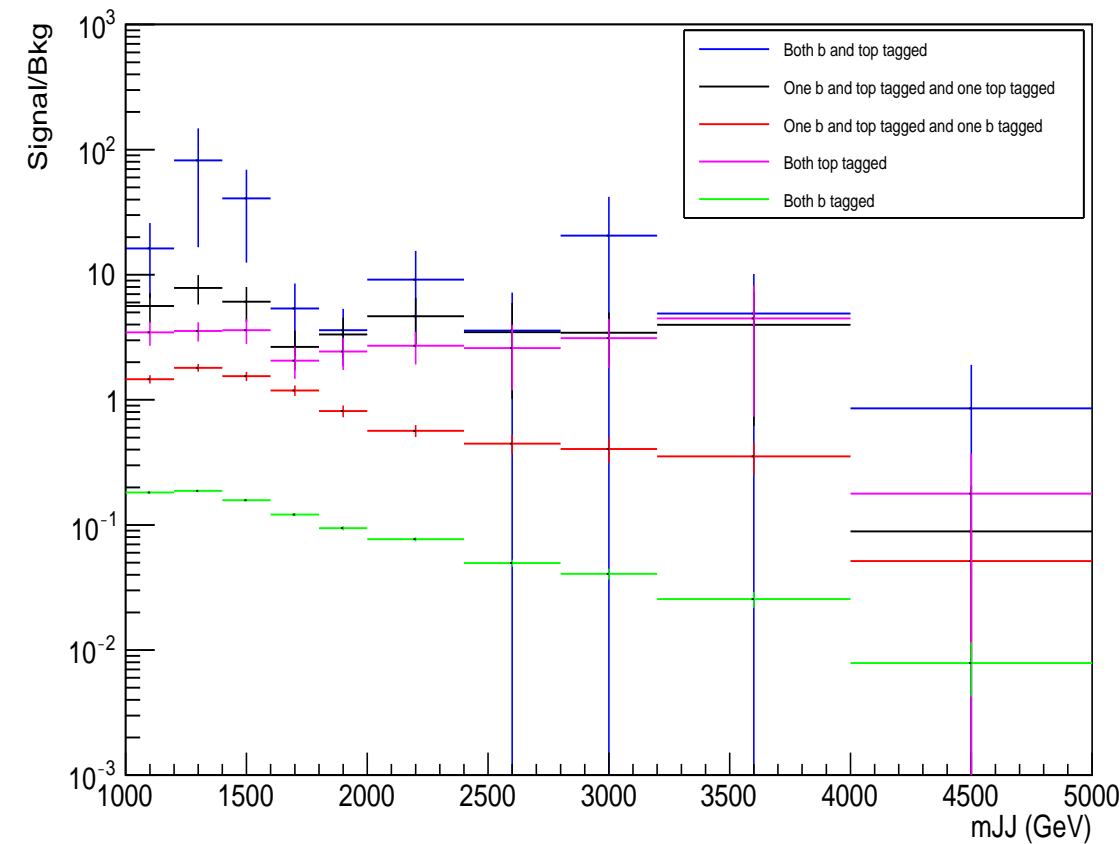
Signal Mtt over Background



Signal over Bkg for mJJ (reco)

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

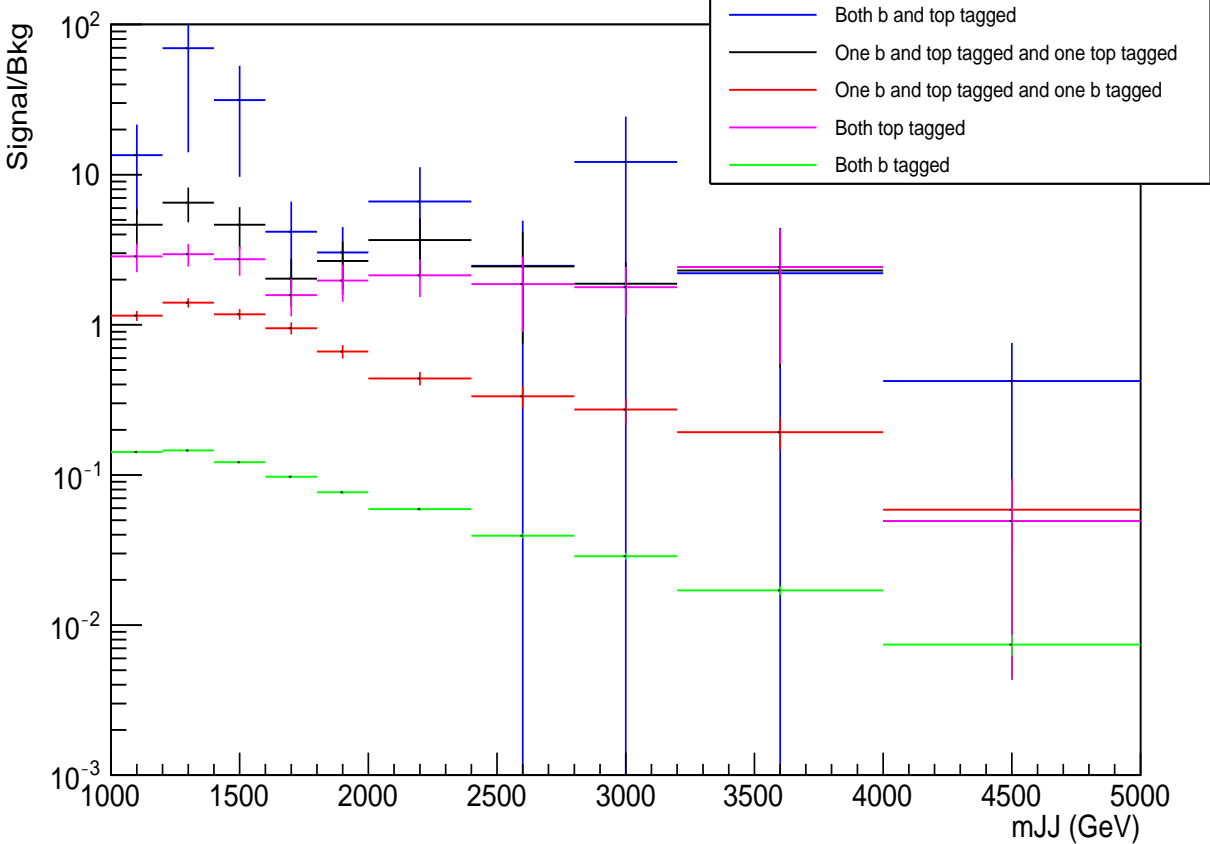
Signal Over Background



Top tagger cut : 0.8
B-tagging: Loose working point

Mtt Samples

Signal Mtt over Background



Signal over Bkg for mJJ (reco)

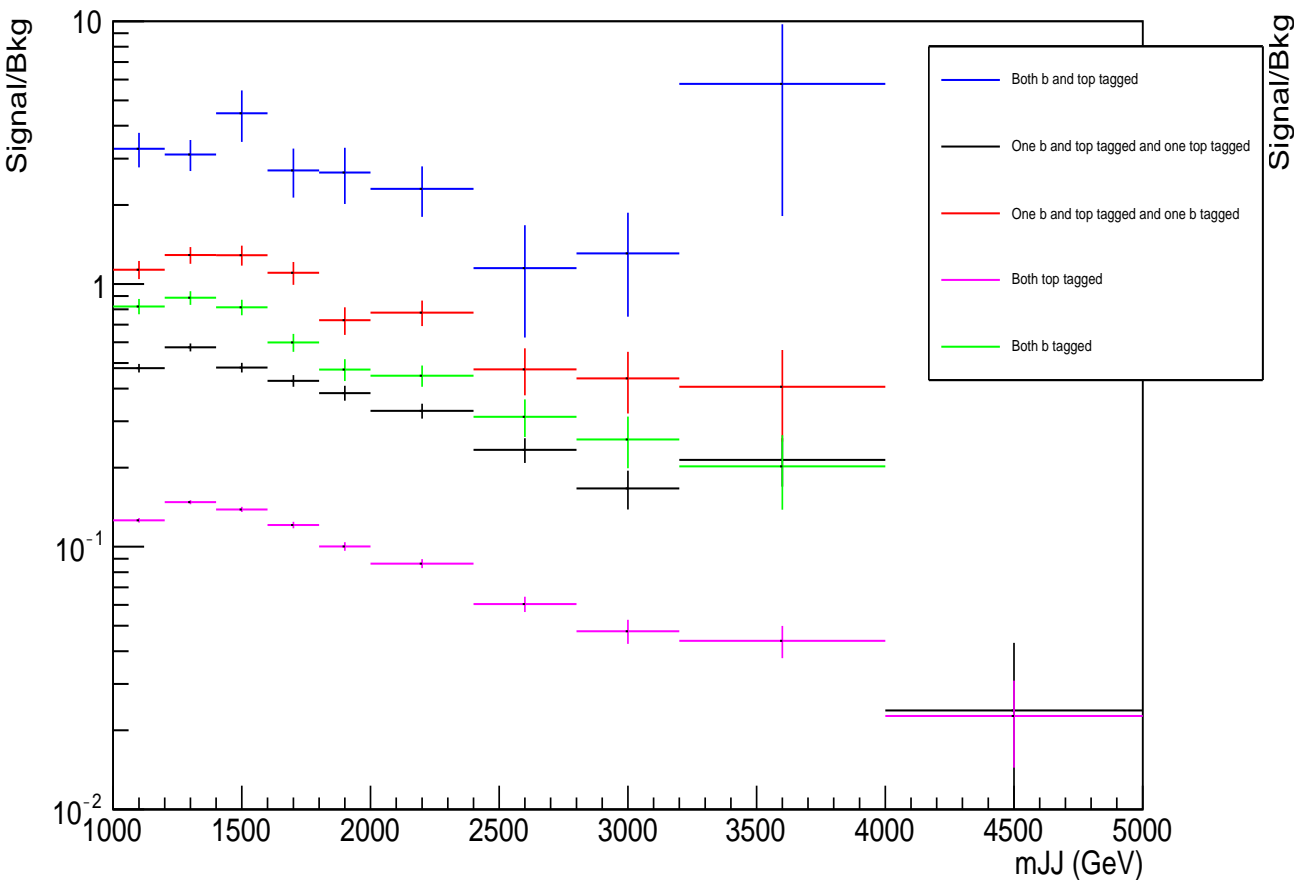
Top tagger cut : 0.0

B-tagging: Medium working point

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

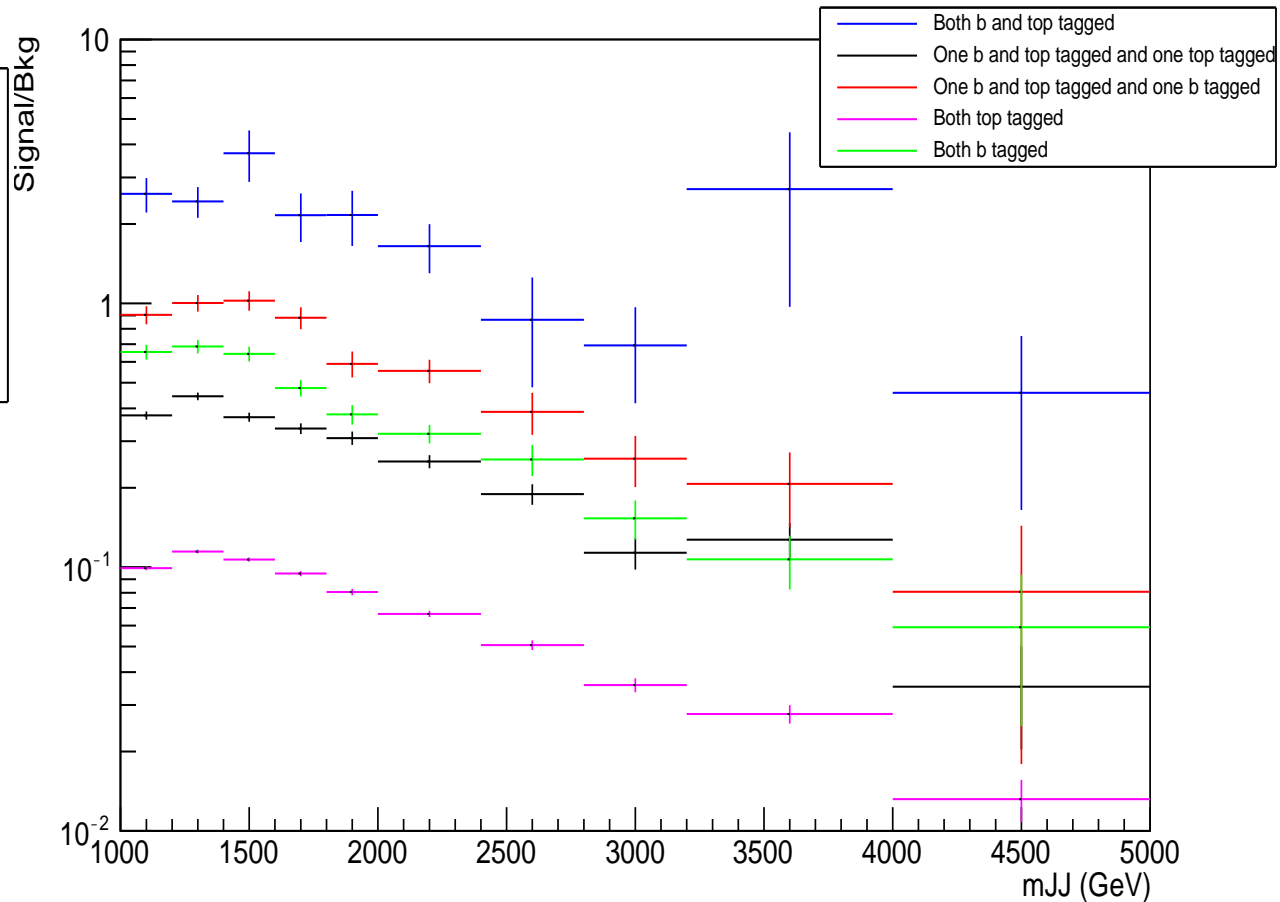
Over Bkg (All Categories)

Signal Over Background



Mtt Samples

Signal Mtt over Background



Signal over Bkg for mJJ (reco)

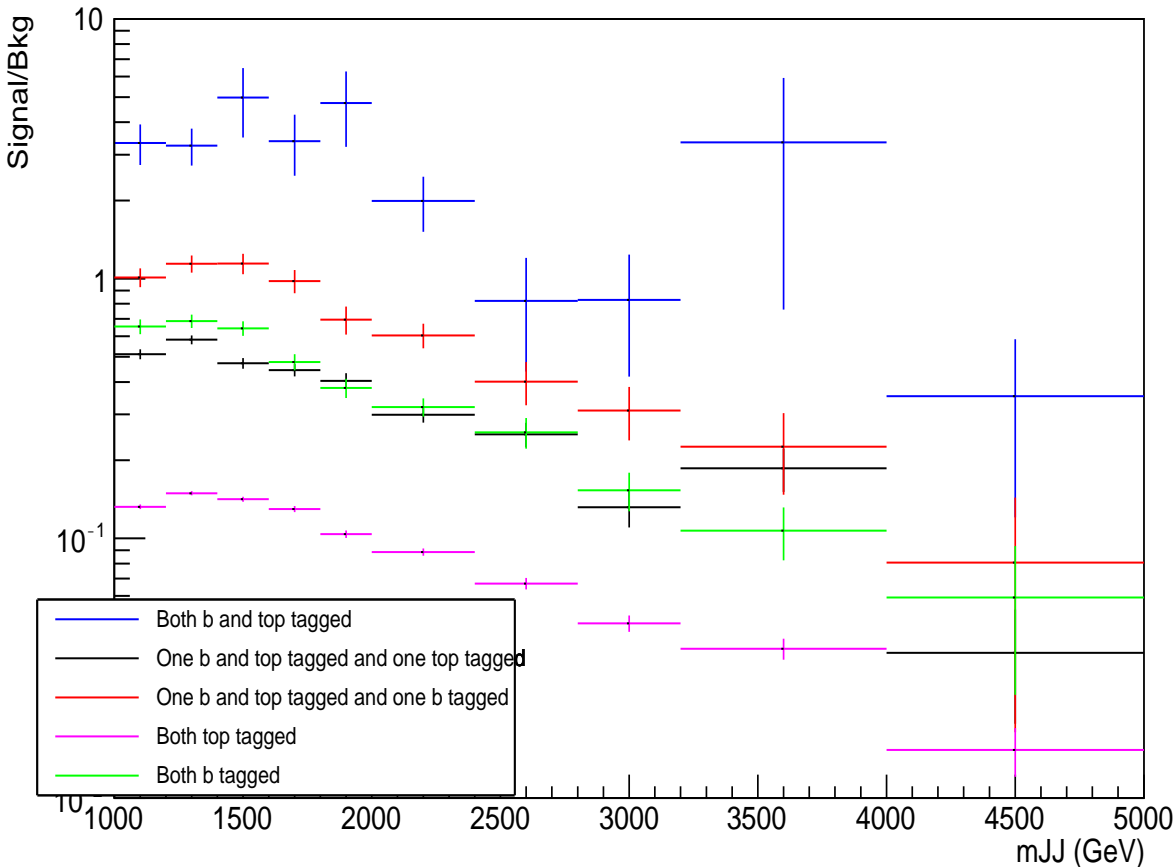
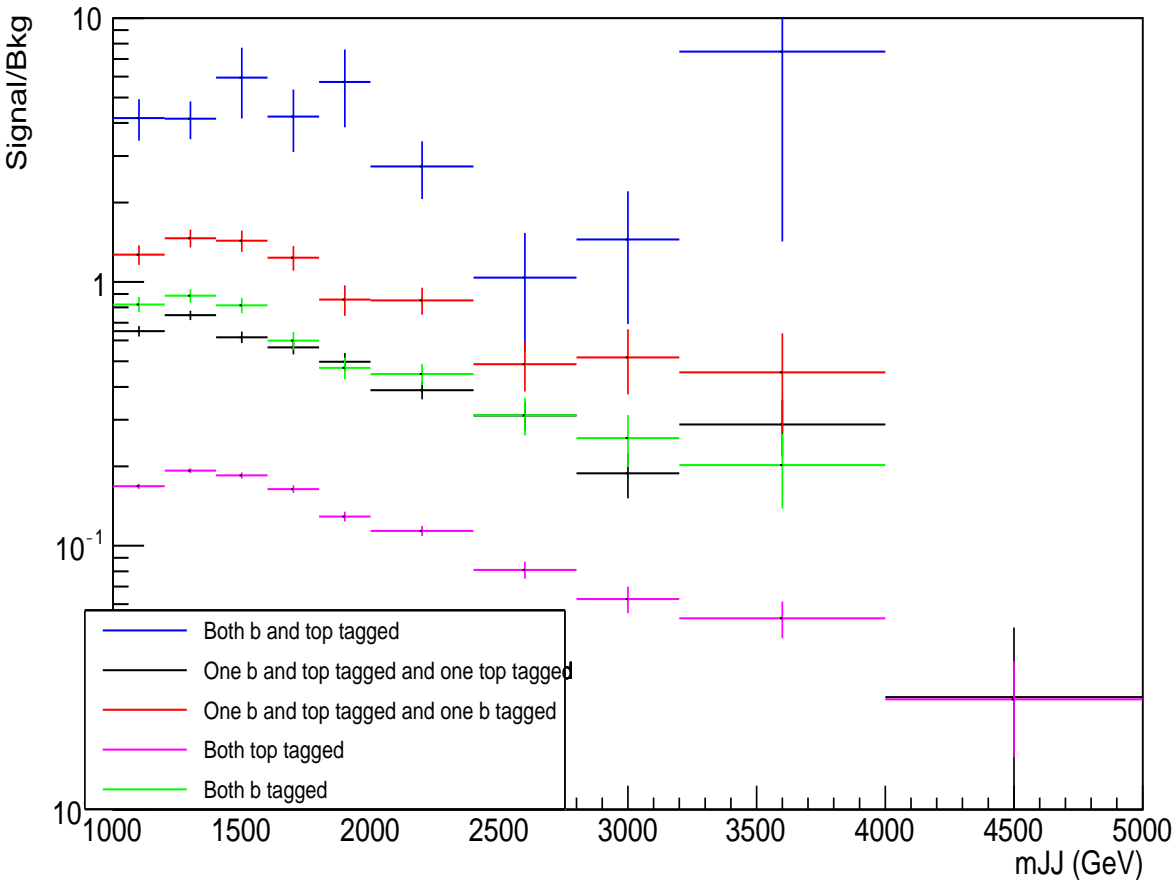
Top tagger cut : 0.1
B-tagging: Medium working point

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background

Signal Mtt over Background

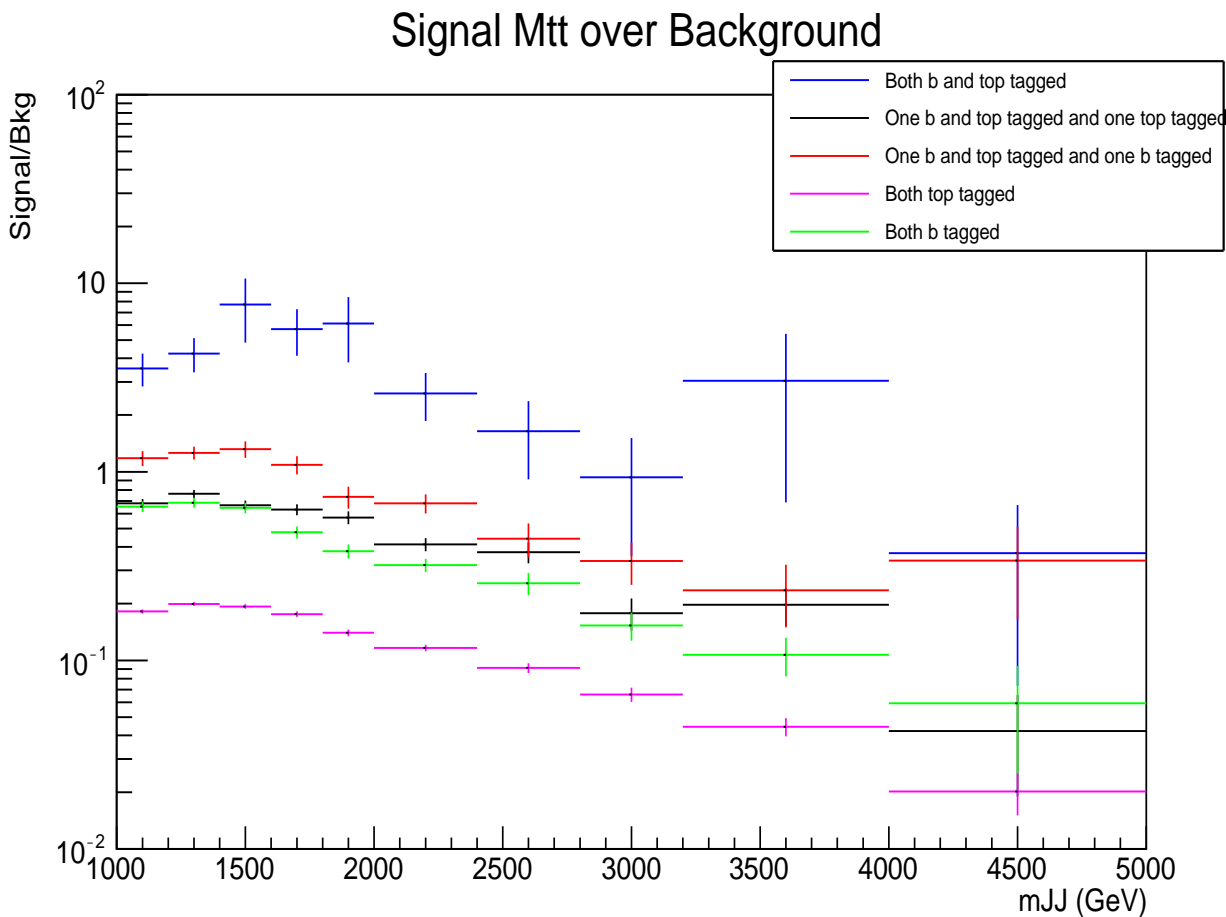
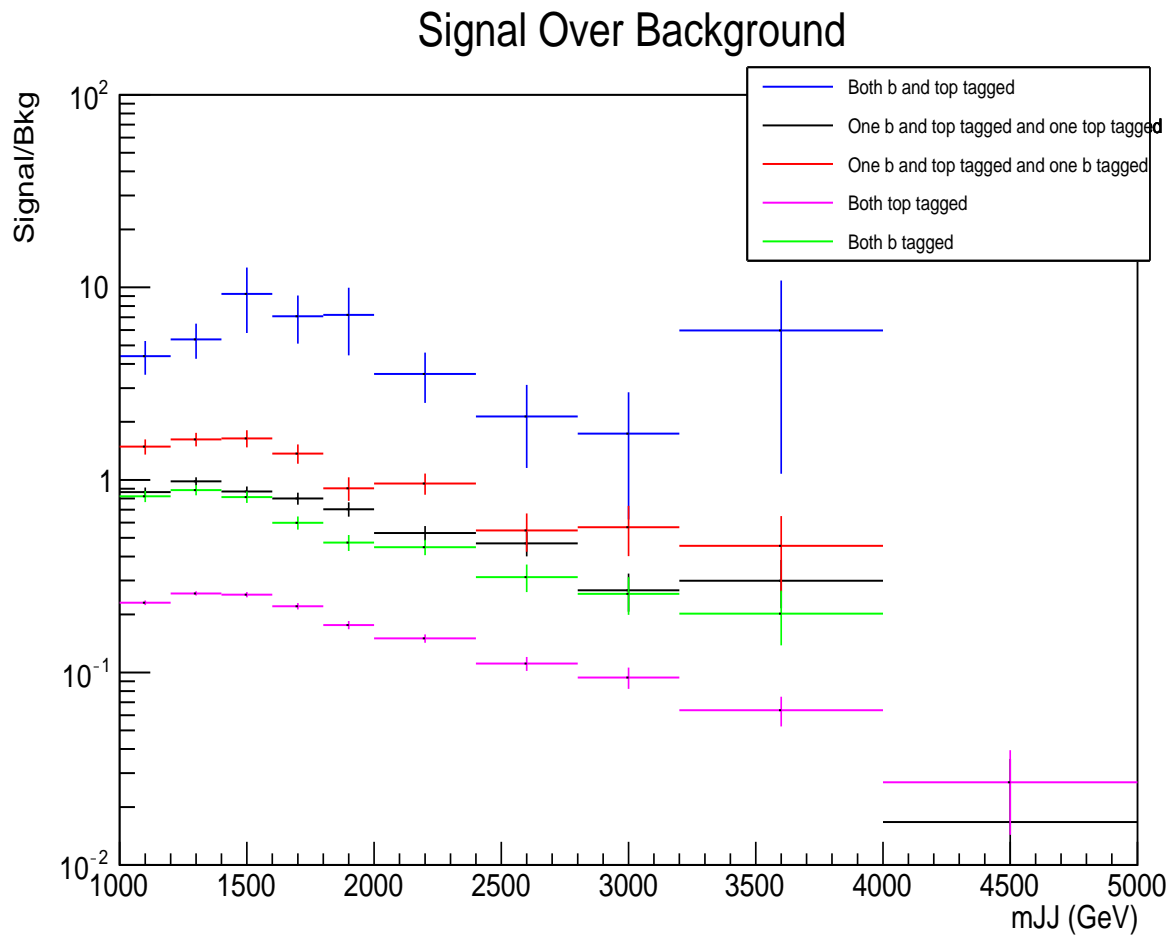


Signal over Bkg for mJJ (reco)

Top tagger cut : 0.2
B-tagging: Medium working point

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

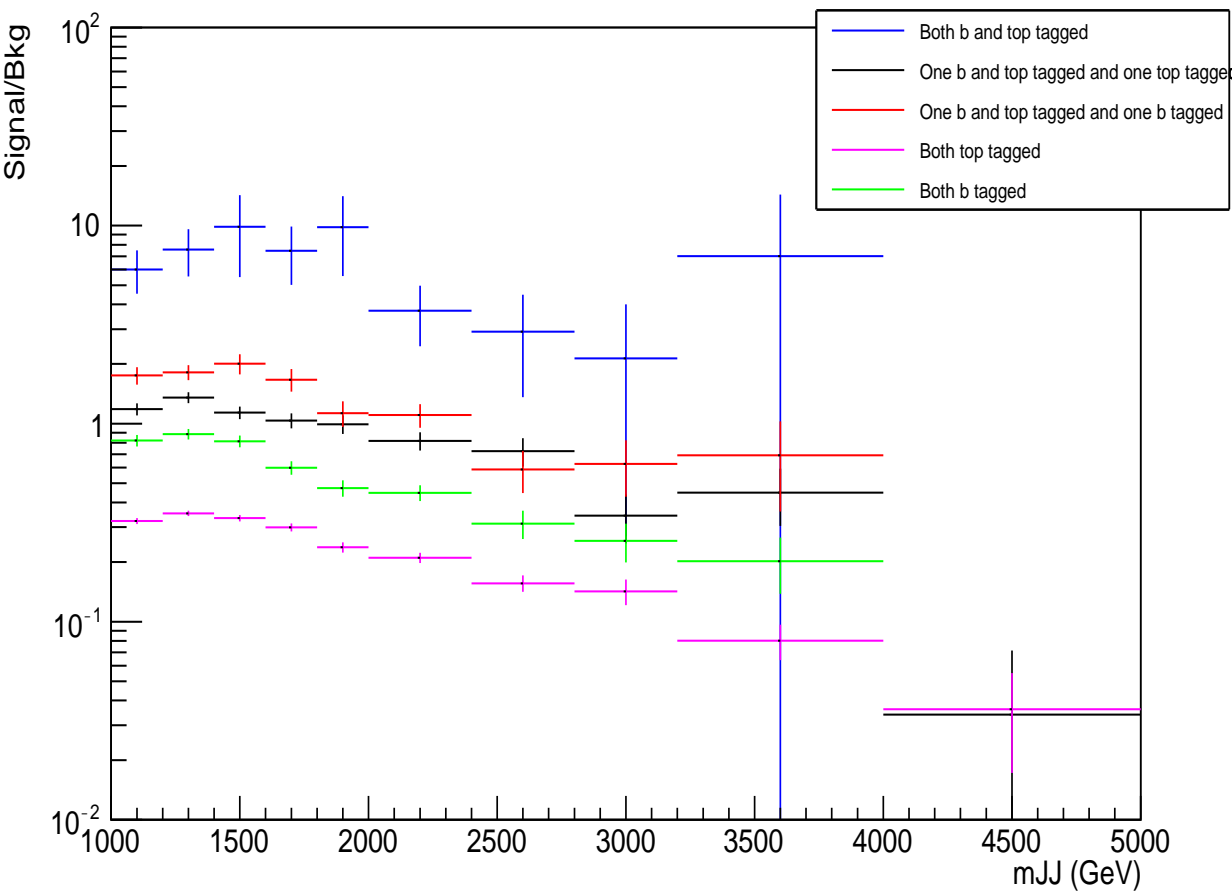


Signal over Bkg for mJJ (reco)

Top tagger cut : 0.3
B-tagging: Medium working point

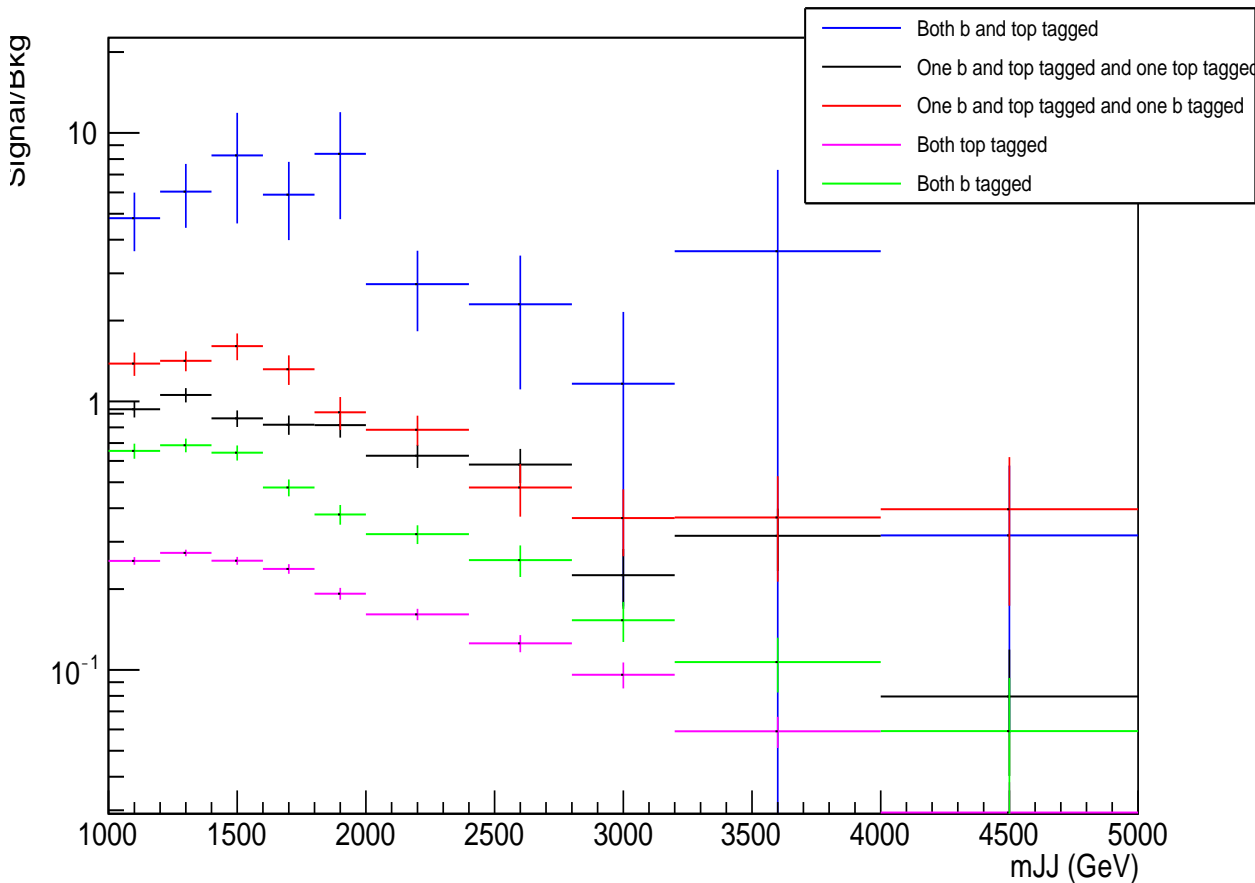
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8

Signal Over Background



Mtt Samples

Signal Mtt over Background



Signal over Bkg for mJJ (reco)

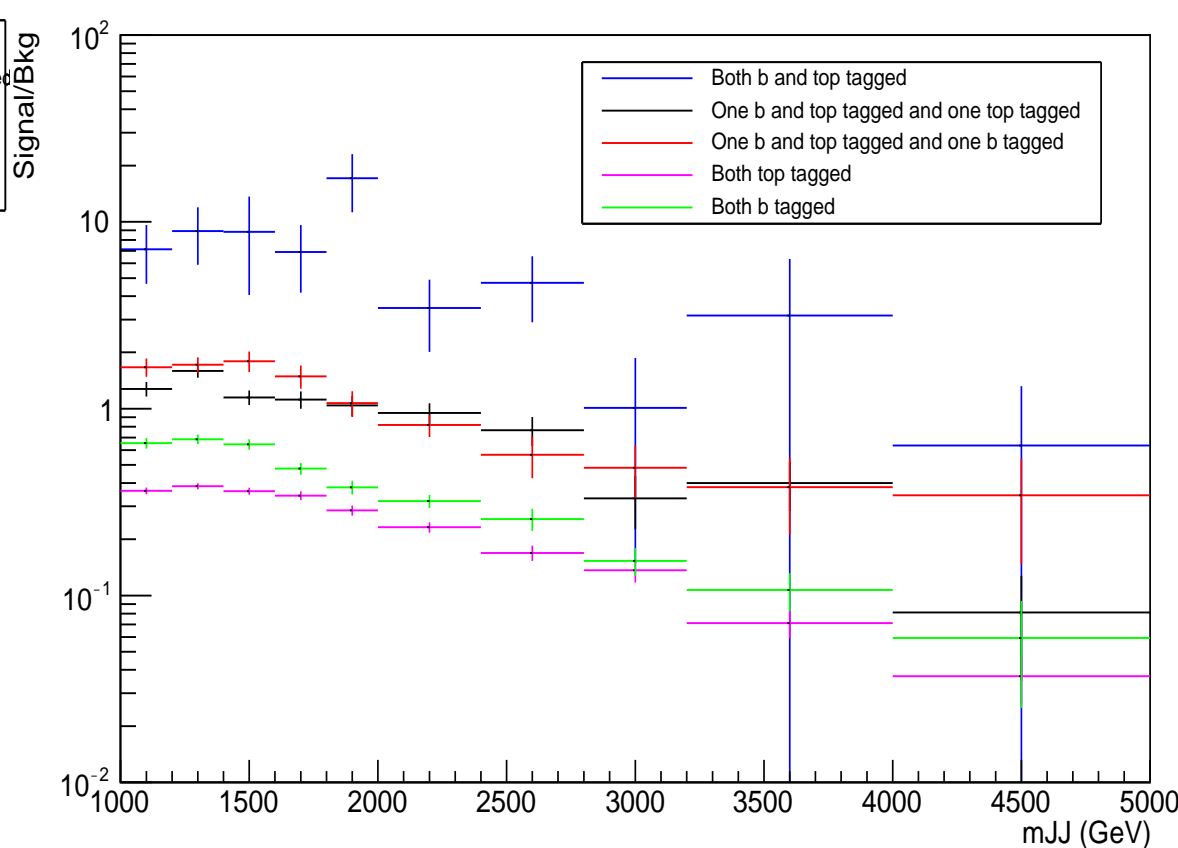
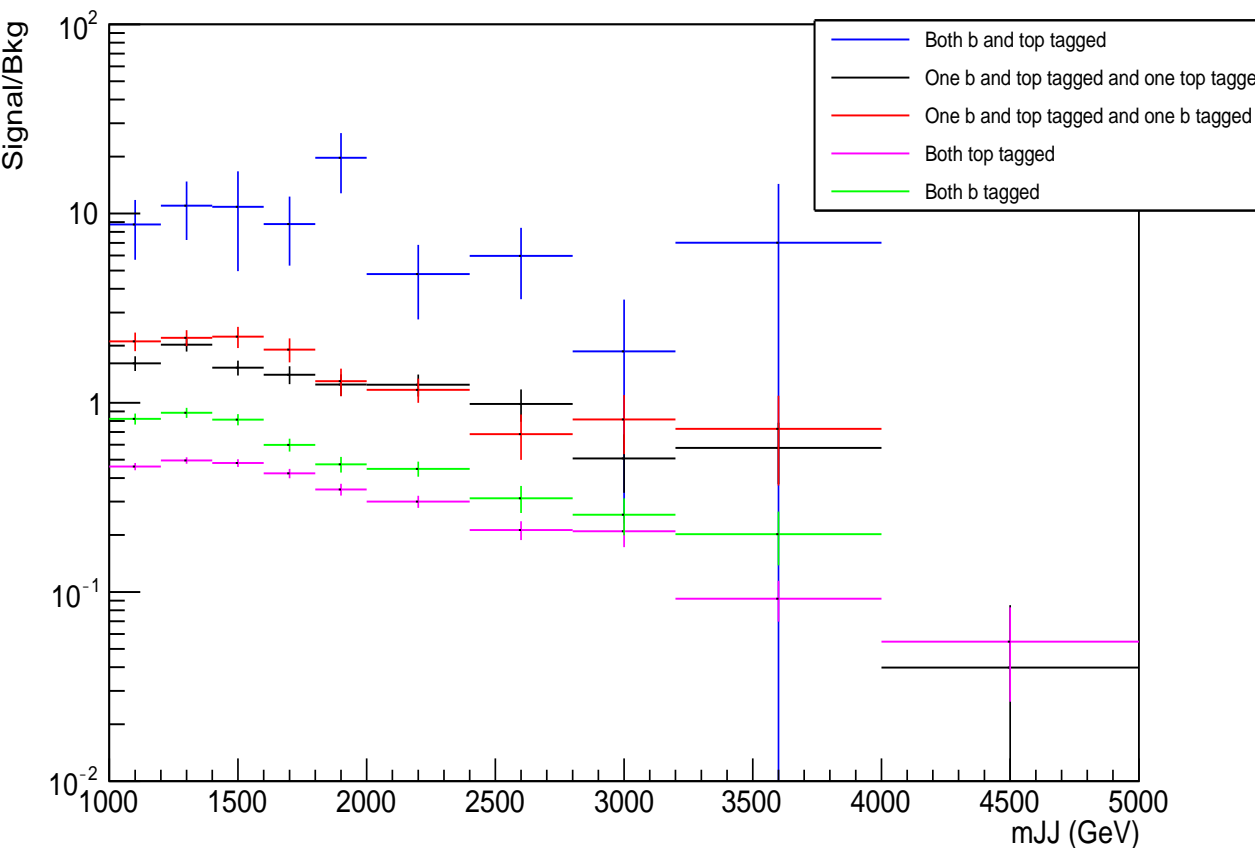
Top tagger cut : 0.4
B-tagging: Medium working point

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background

Signal Mtt over Background



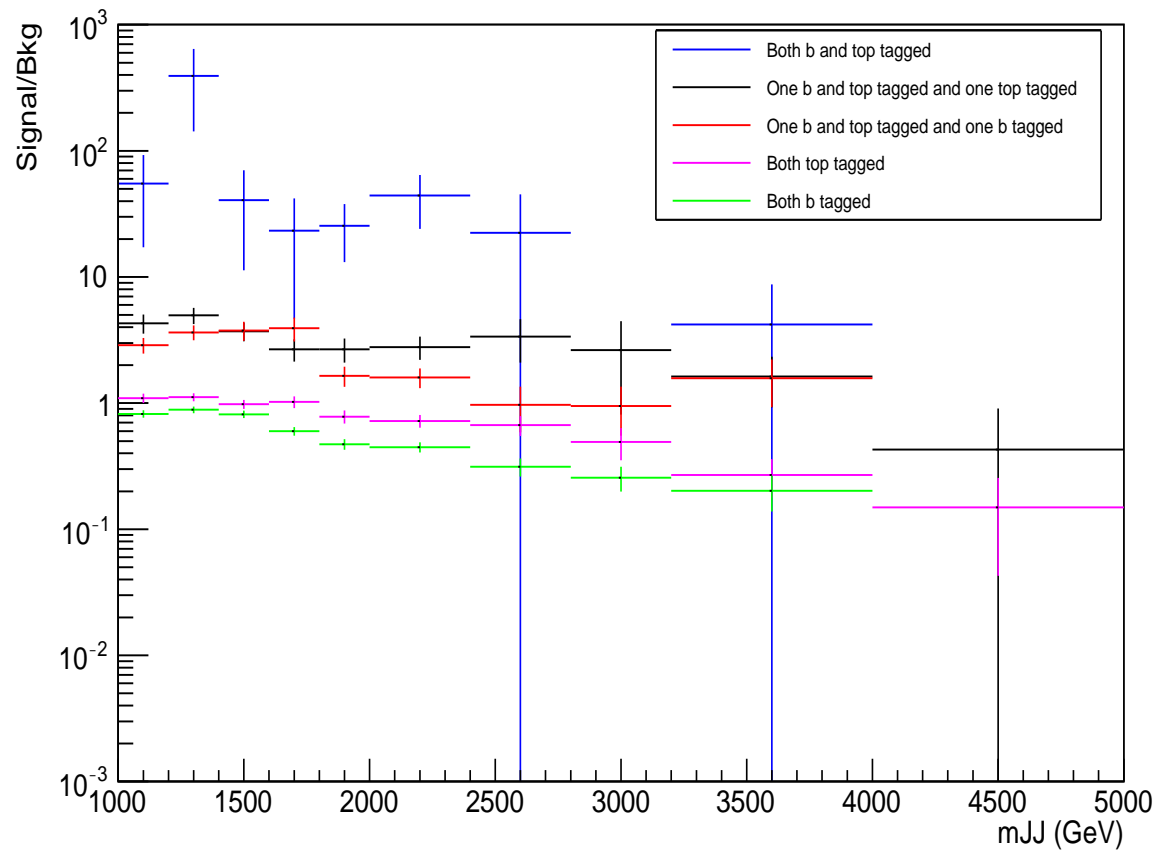
Signal over Bkg for mJJ (reco)

Top tagger cut : 0.6
B-tagging: Medium working point

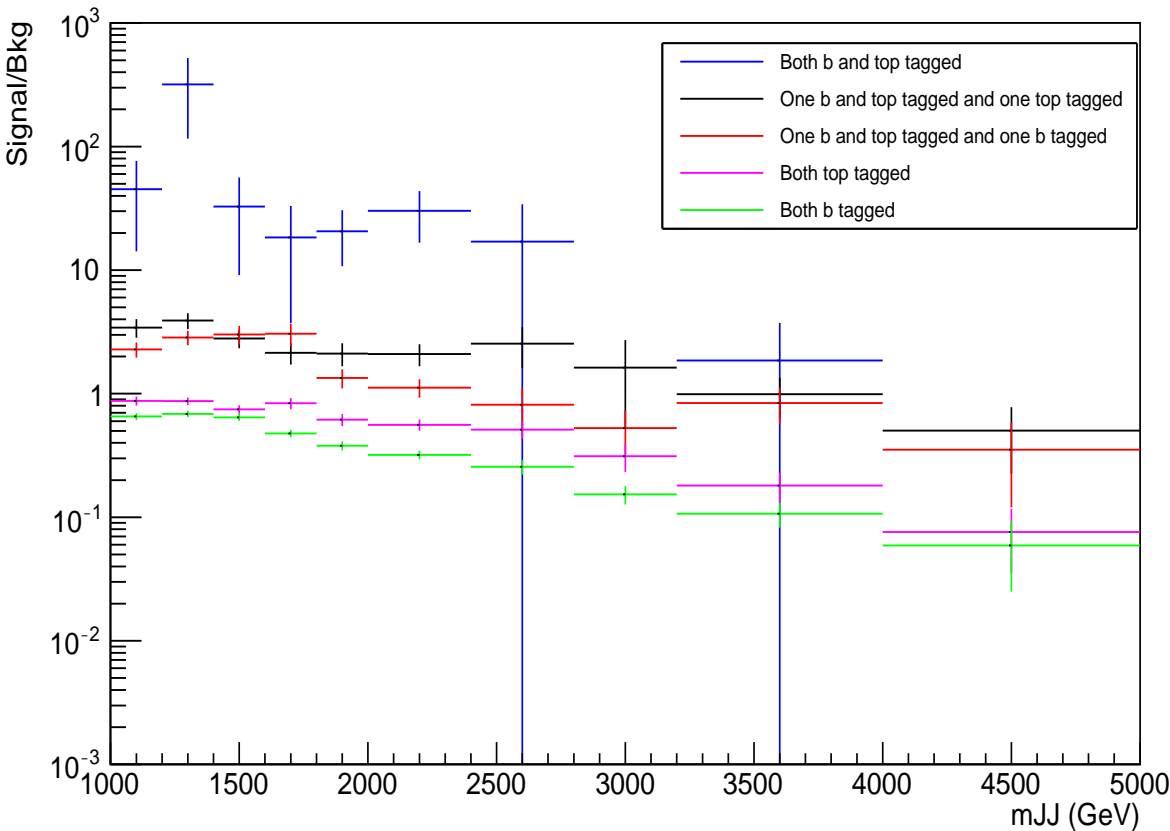
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

Signal Over Background



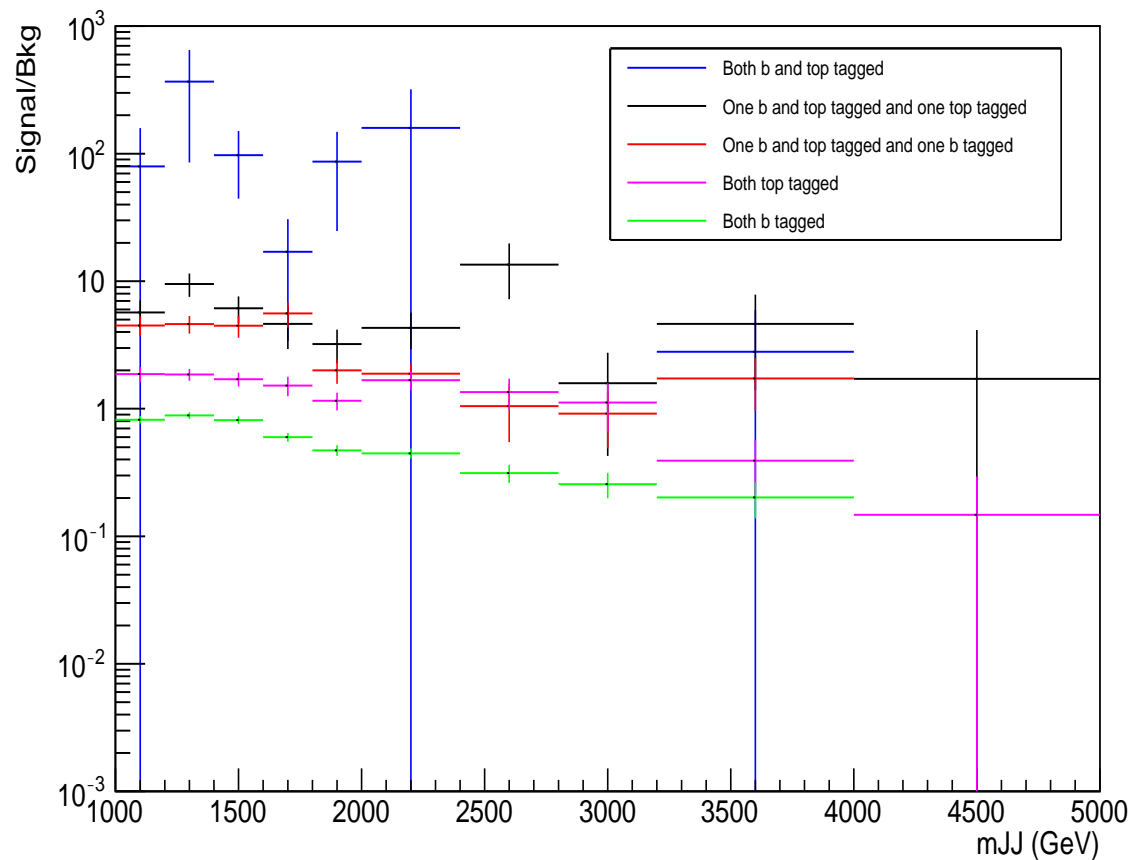
Signal Mtt over Background



Signal over Bkg for mJJ (reco)

nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Signal Over Background

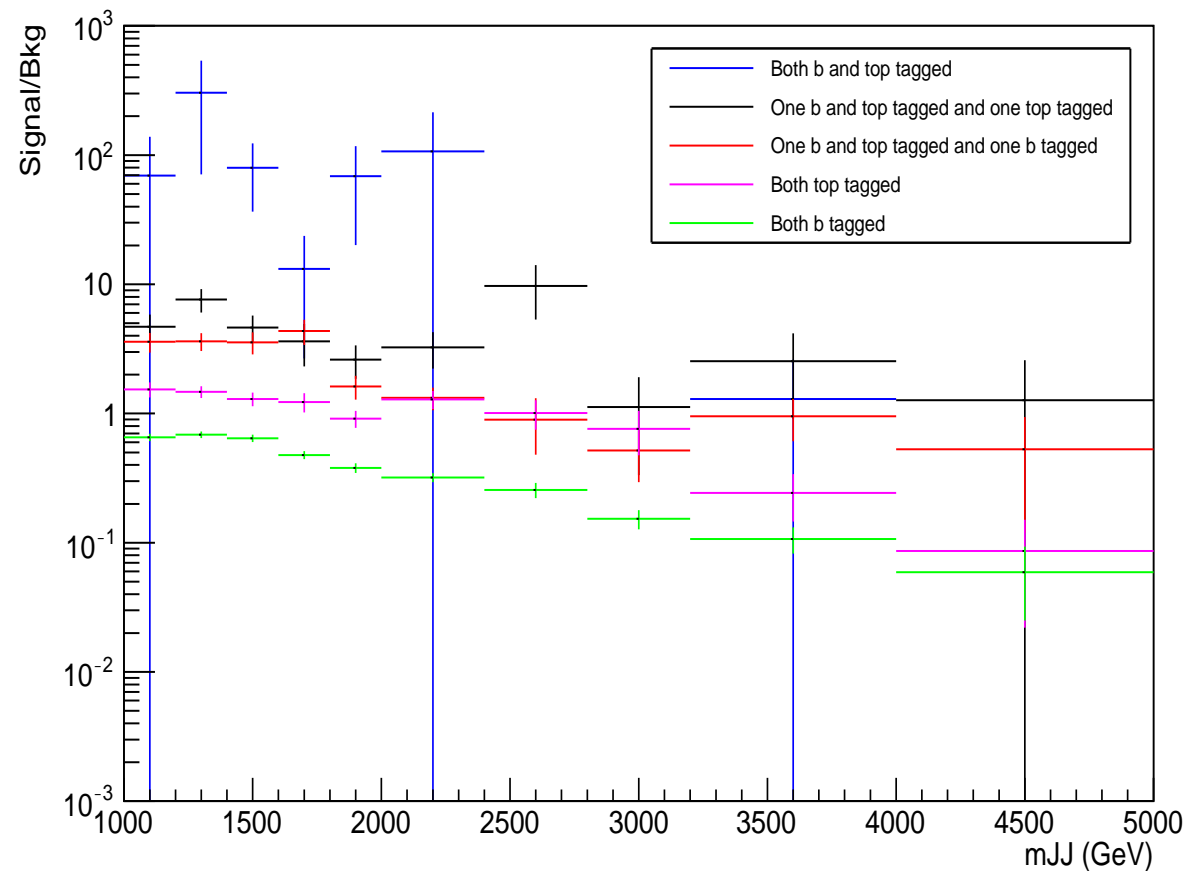


Top tagger cut : 0.7

B-tagging: Medium working point

Mtt Samples

Signal Mtt over Background



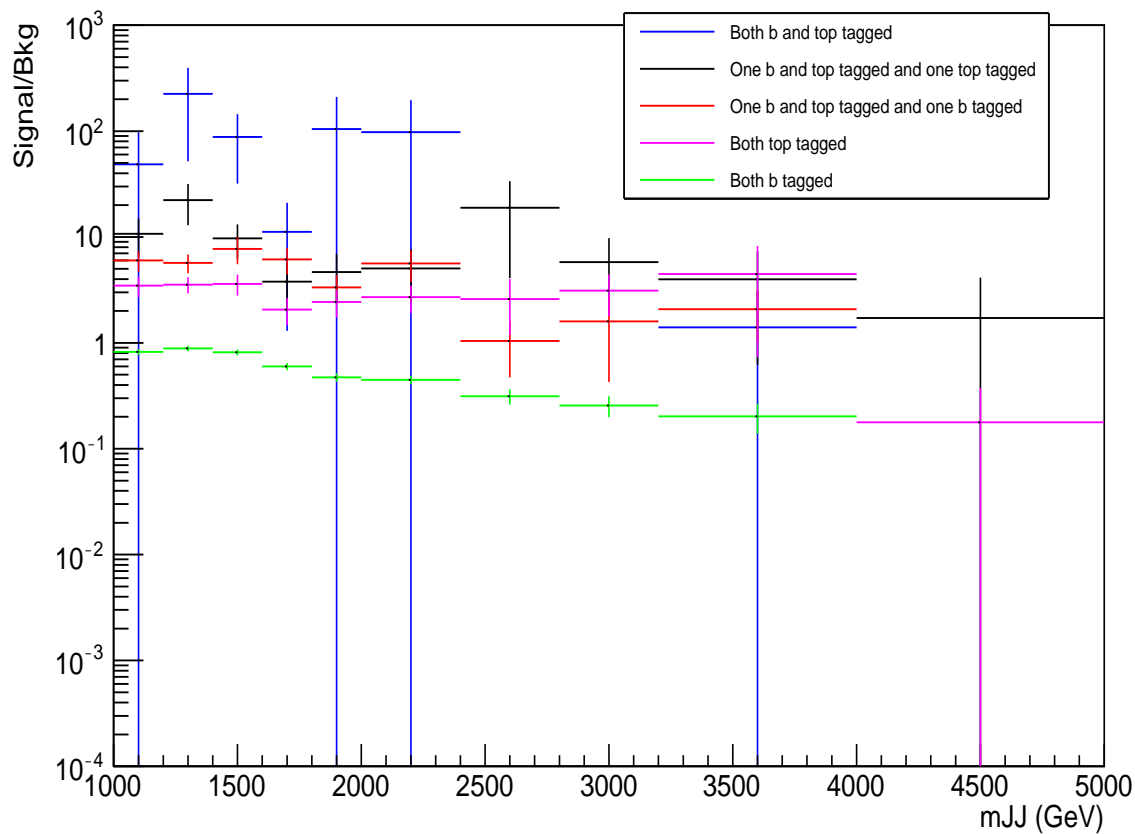
Signal over Bkg for mJJ (reco)

Top tagger cut : 0.8
B-tagging: Medium working point

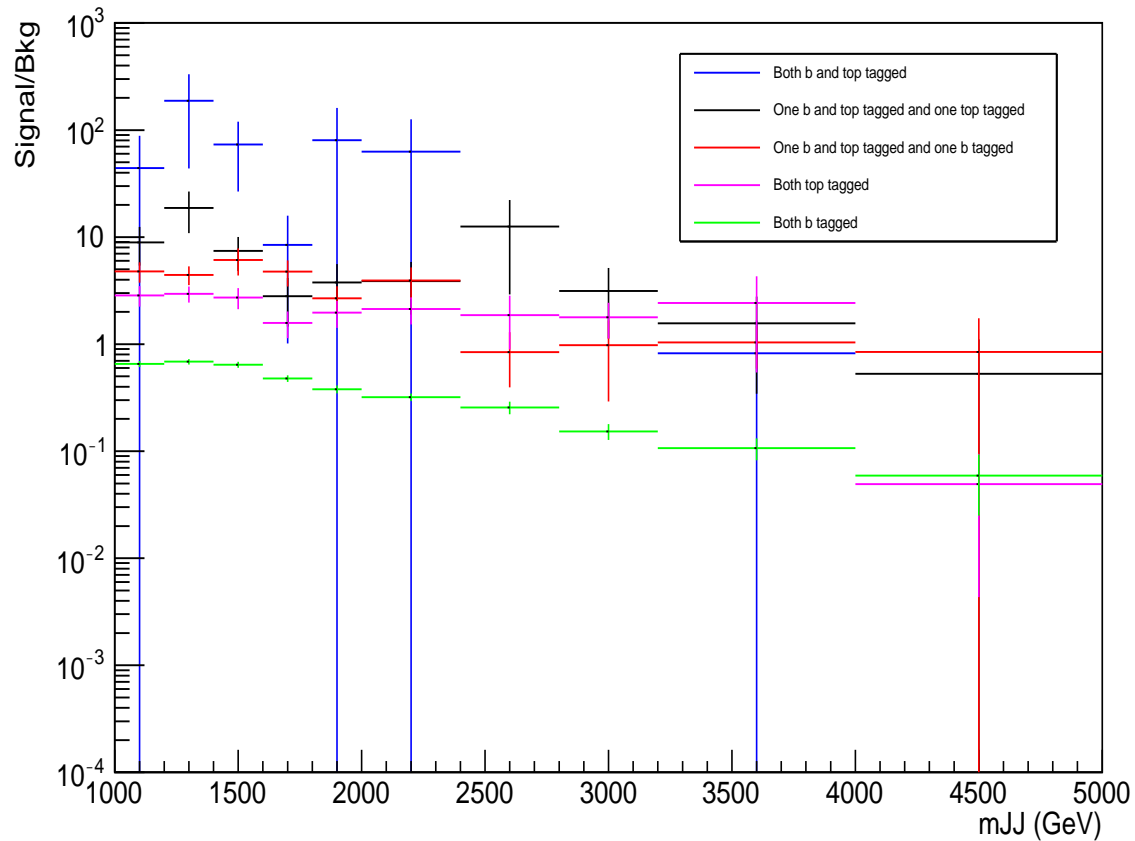
nominal TT_TuneCUETP8M2T4_13TeV-powherg-pythia8
Over Bkg (All Categories)

Mtt Samples

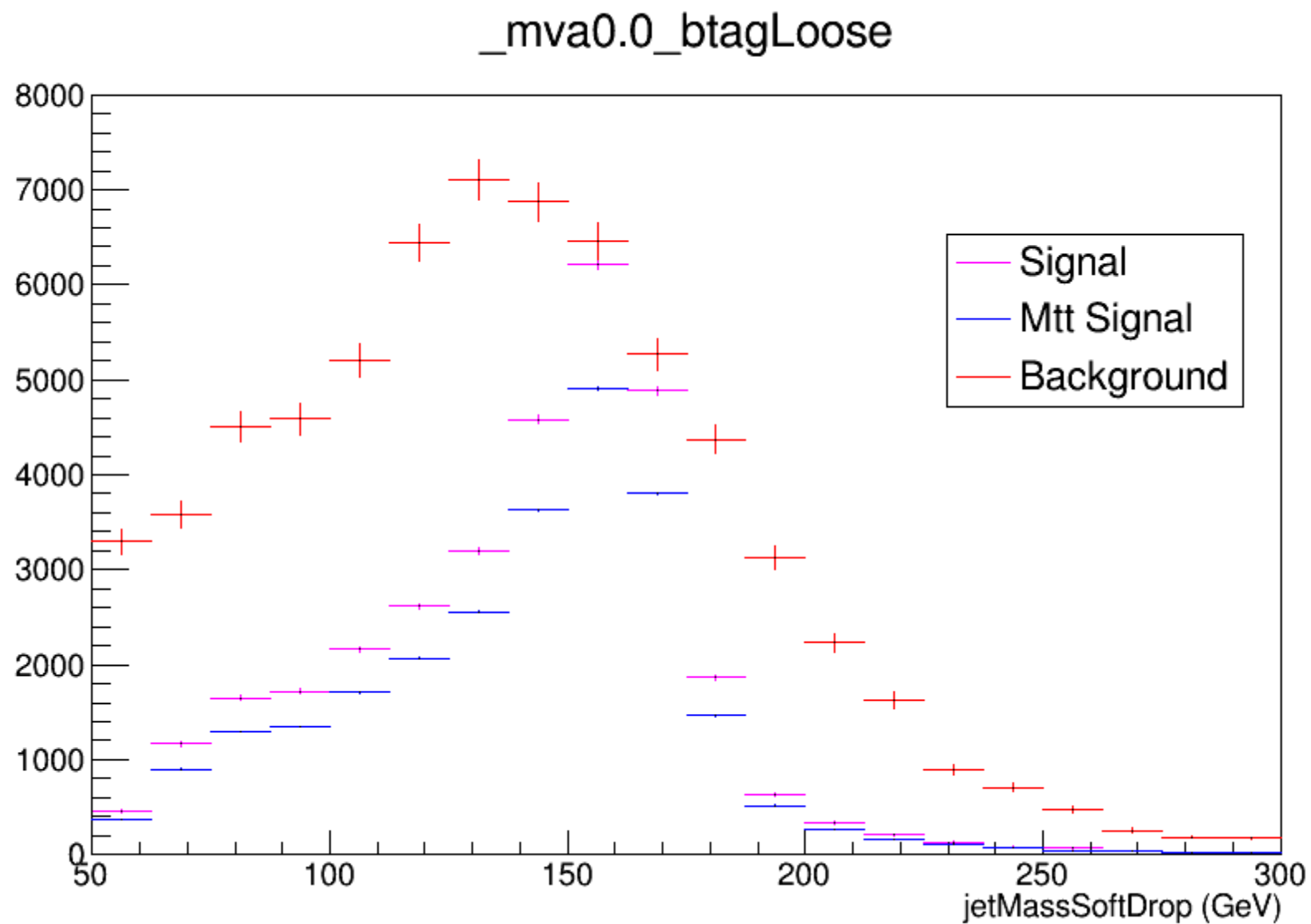
Signal Over Background



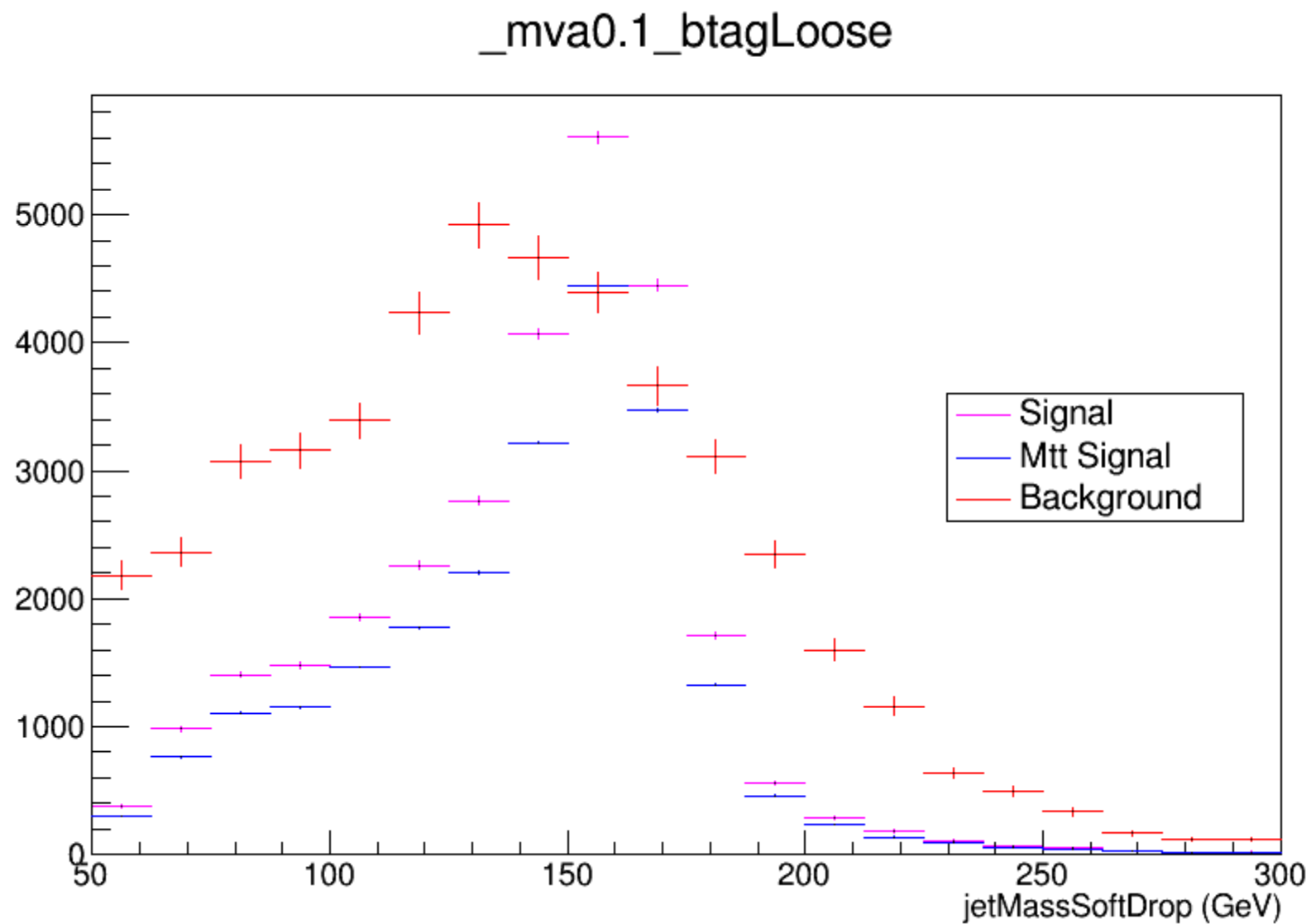
Signal Mtt over Background



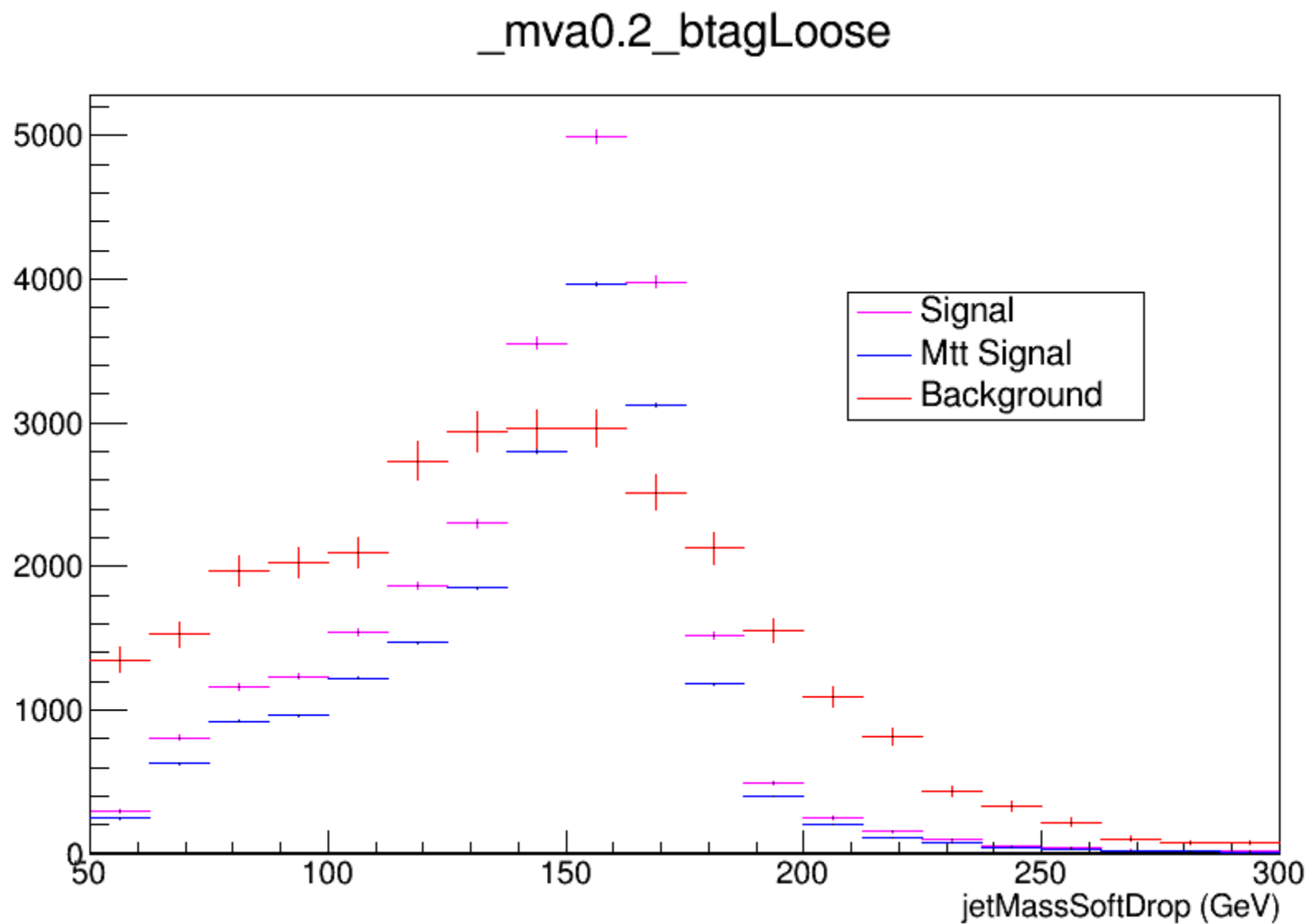
Expected Yields vs JetMassSoftDrop (double fill)



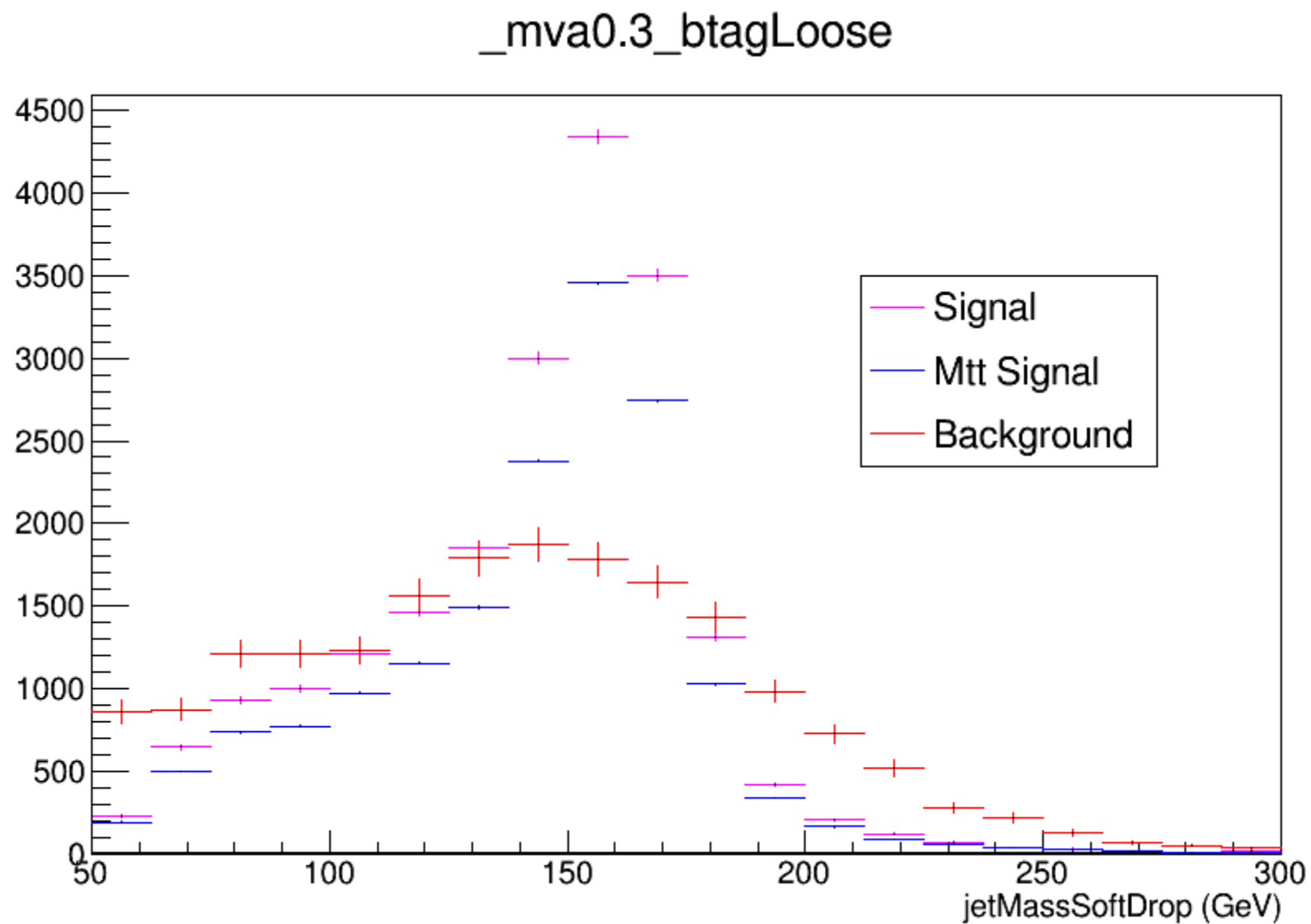
Expected Yields vs JetMassSoftDrop (double fill)



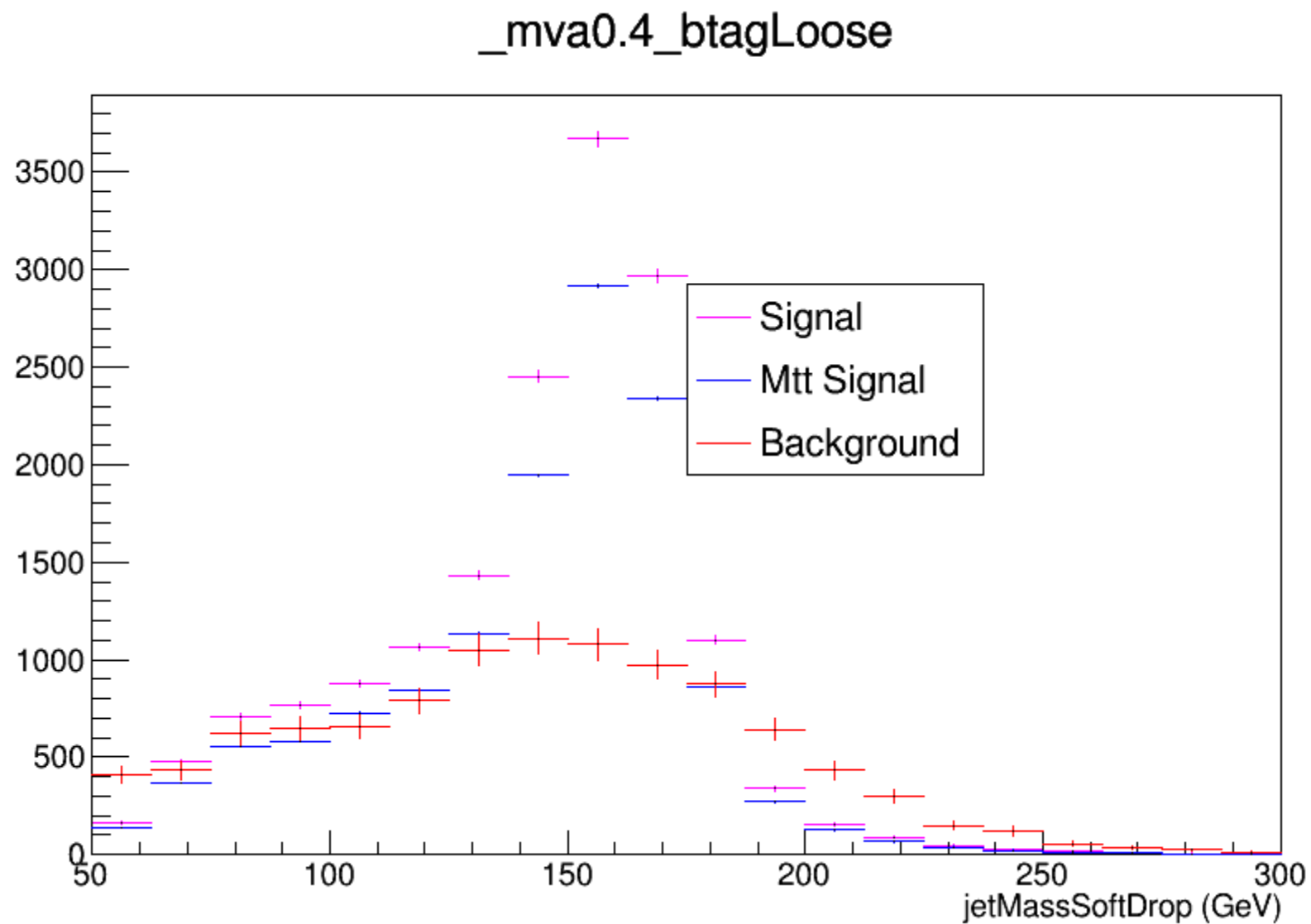
Expected Yields vs JetMassSoftDrop (double fill)



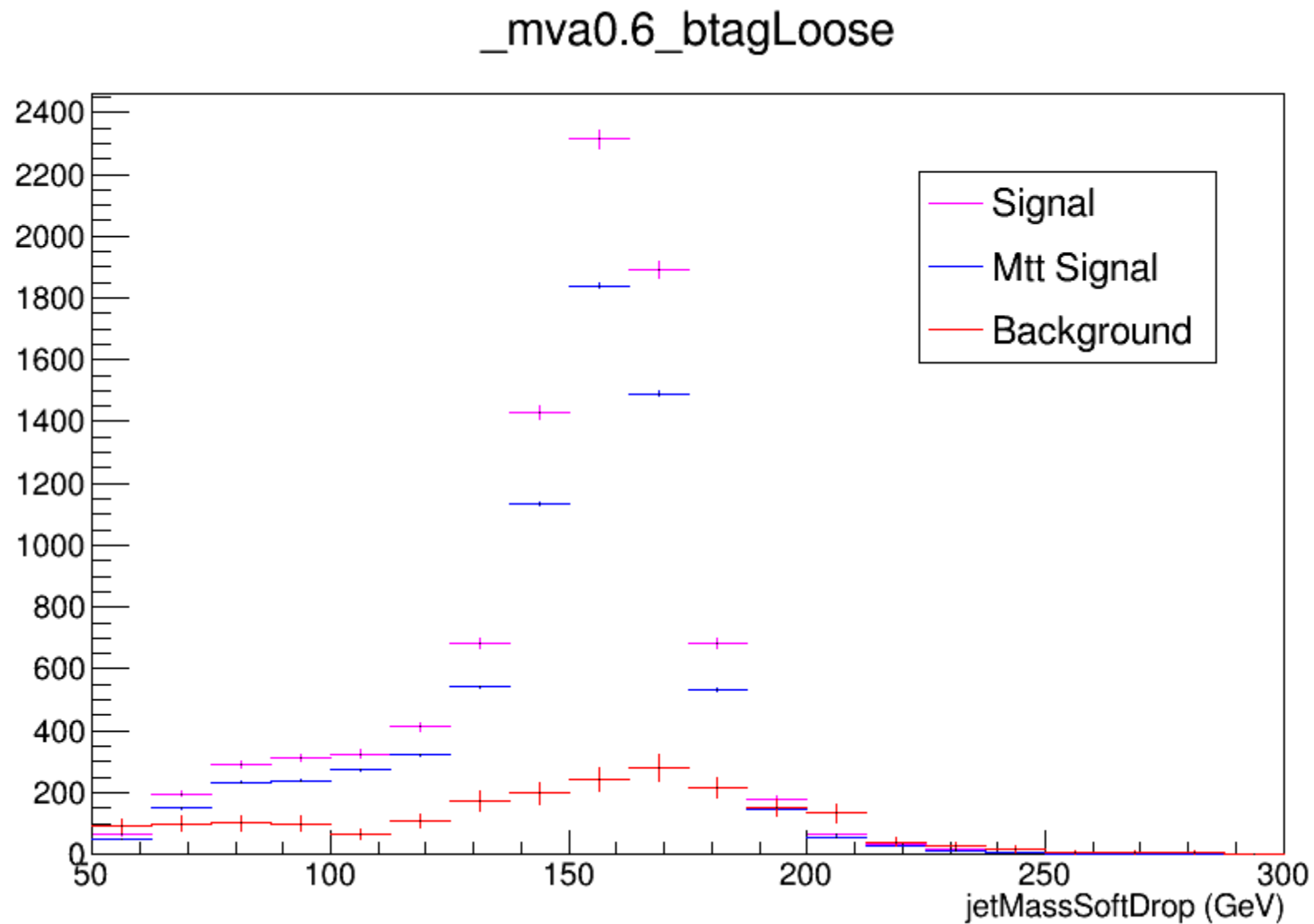
Expected Yields vs JetMassSoftDrop (double fill)



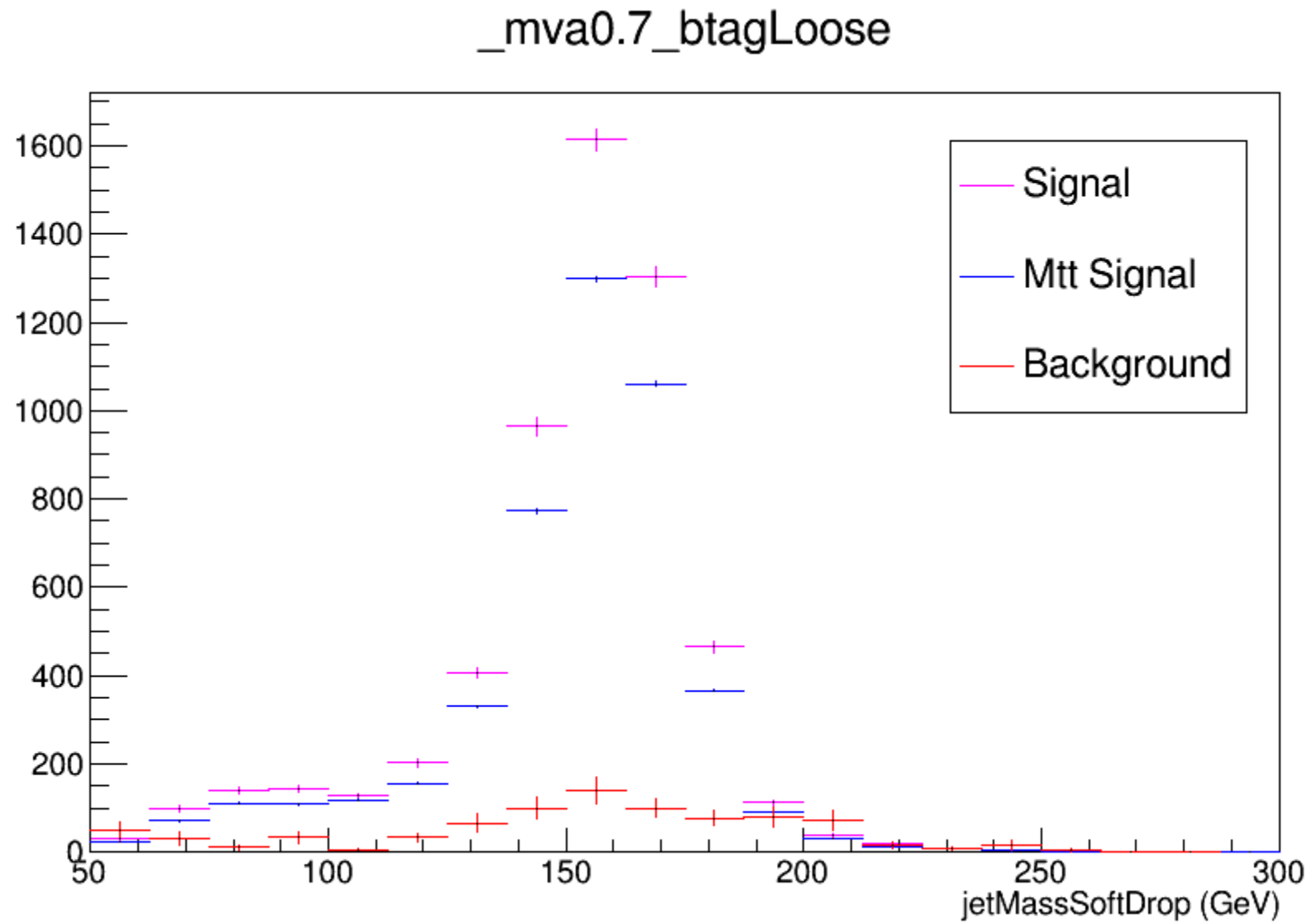
Expected Yields vs JetMassSoftDrop (double fill)



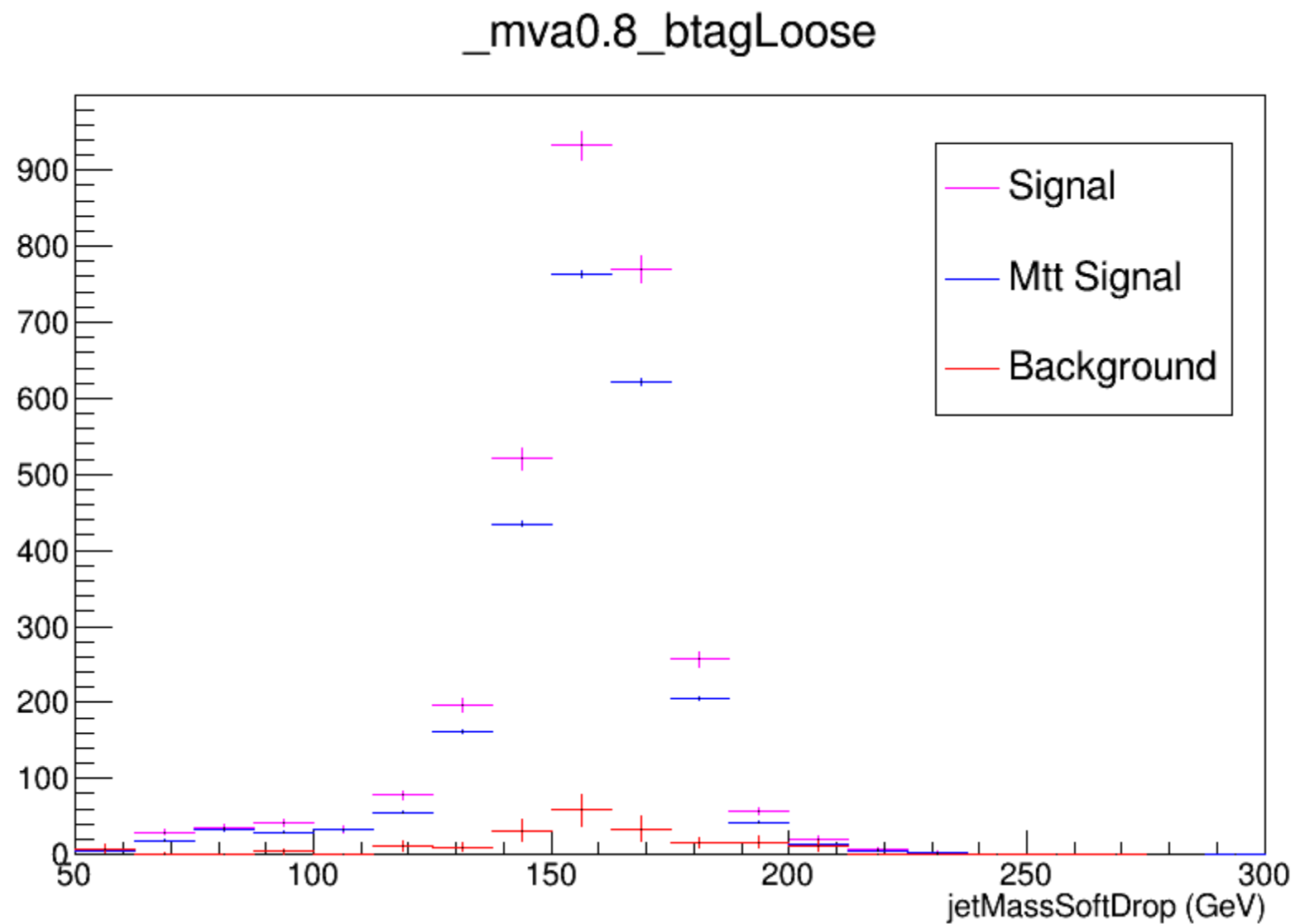
Expected Yields vs JetMassSoftDrop (double fill)



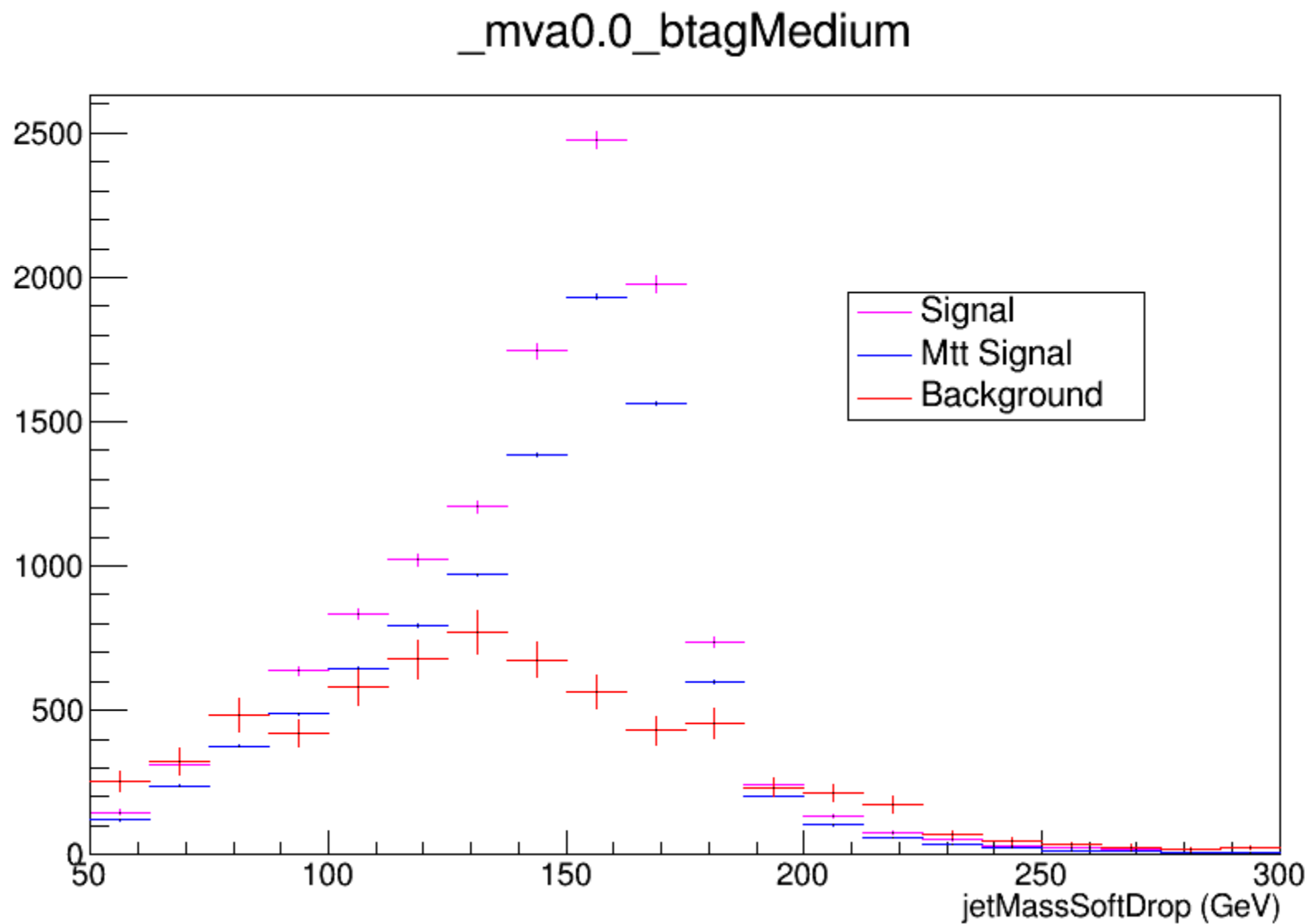
Expected Yields vs JetMassSoftDrop (double fill)



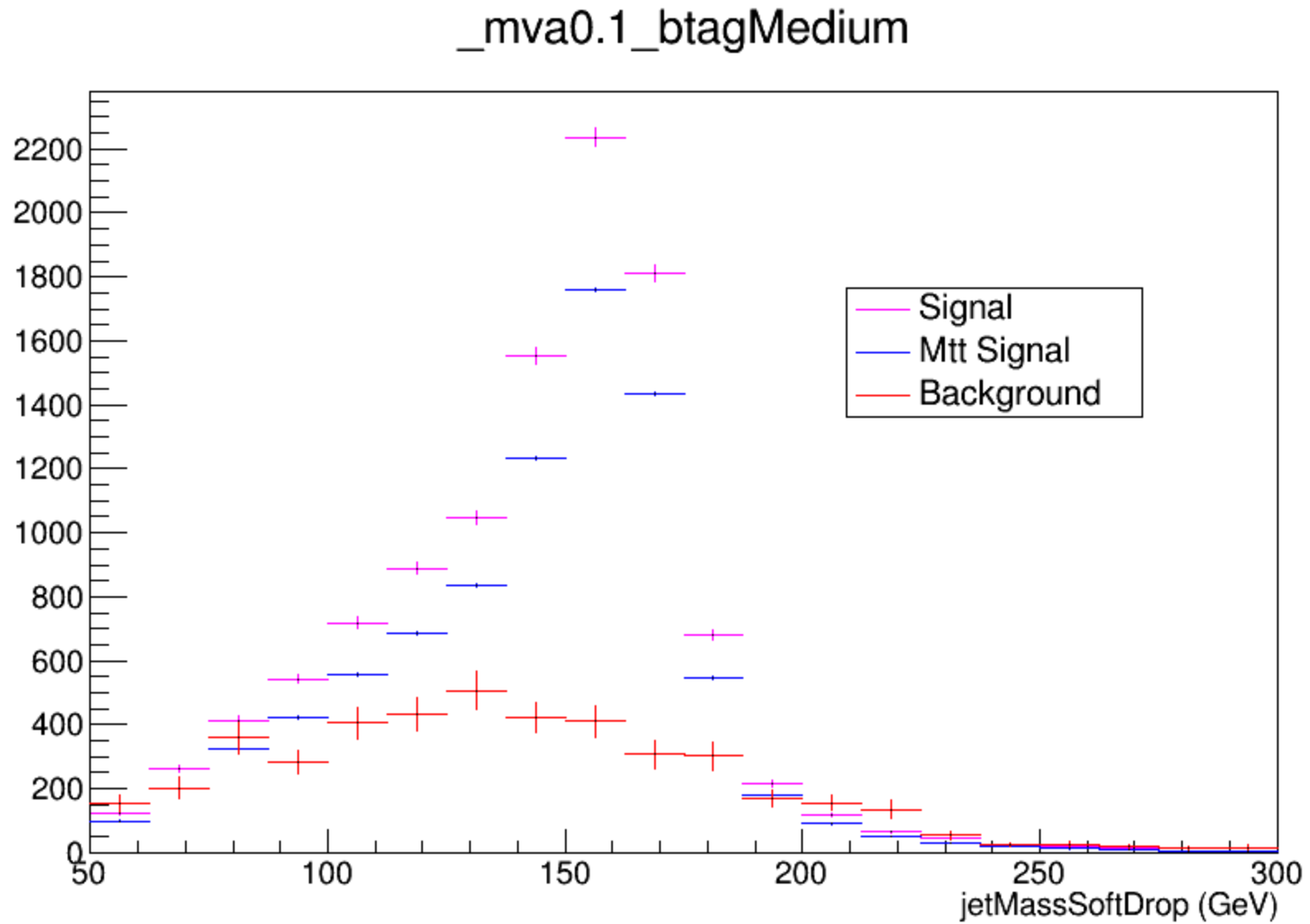
Expected Yields vs JetMassSoftDrop (double fill)



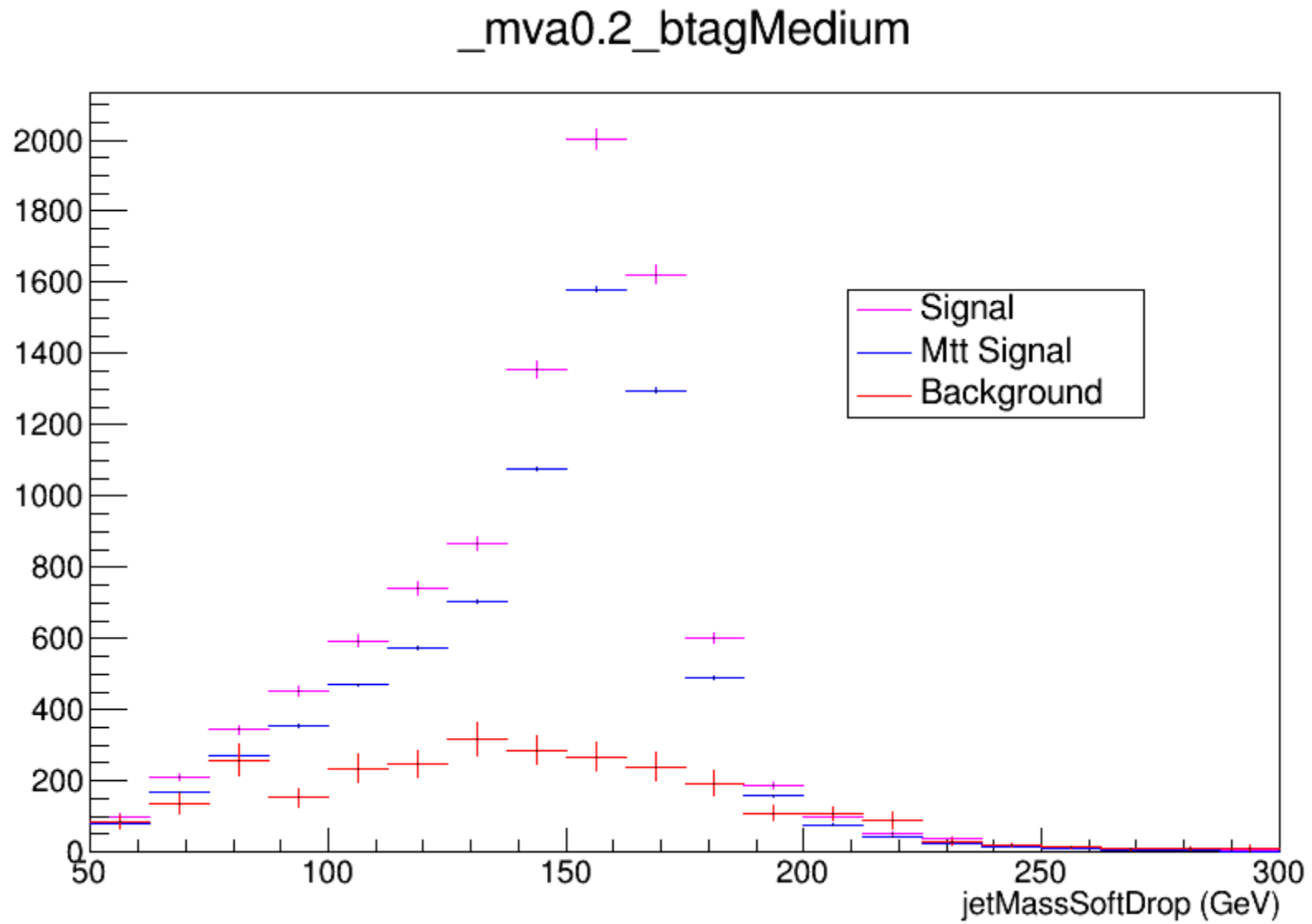
Expected Yields vs JetMassSoftDrop (double fill)



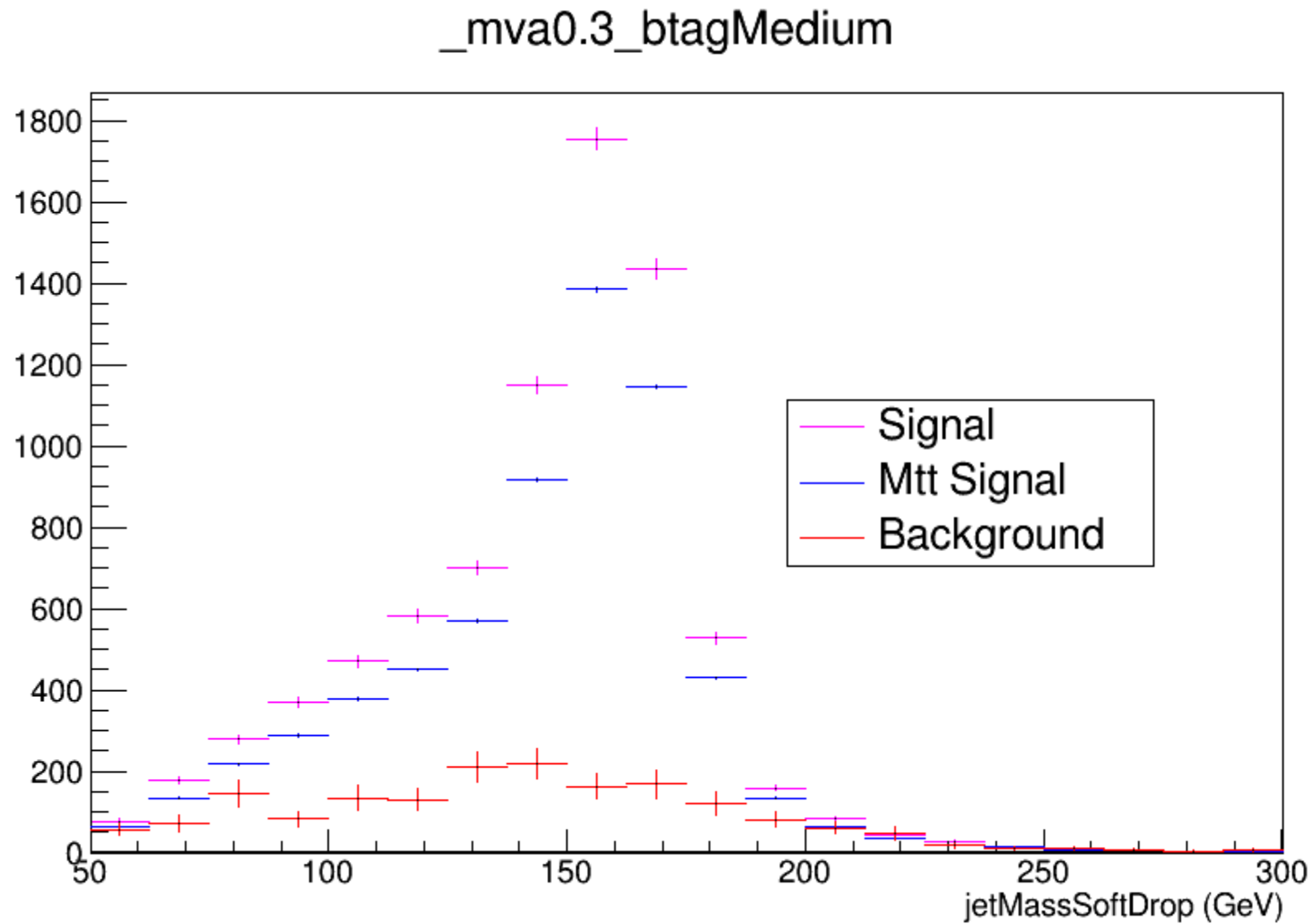
Expected Yields vs JetMassSoftDrop (double fill)



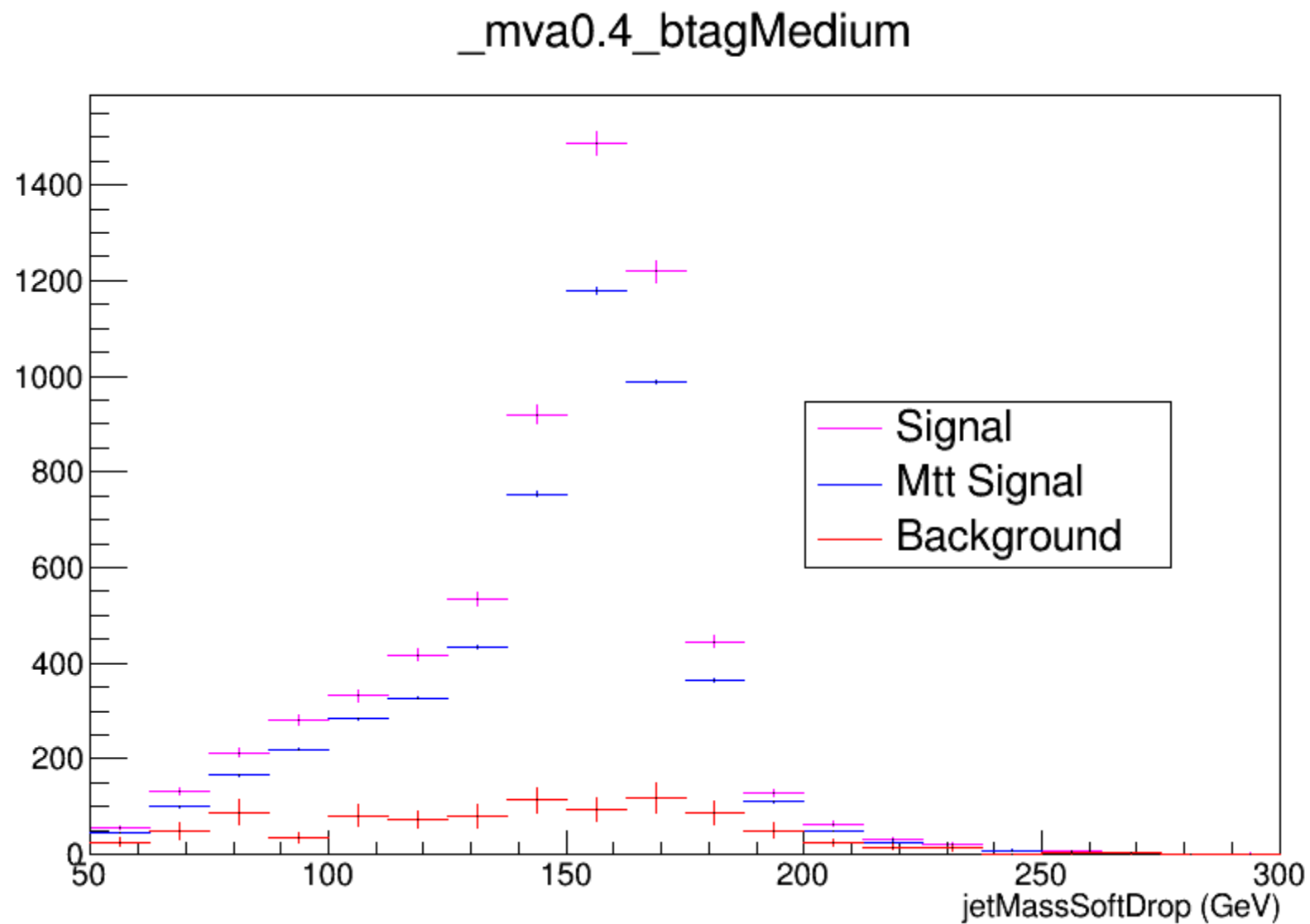
Expected Yields vs JetMassSoftDrop (double fill)



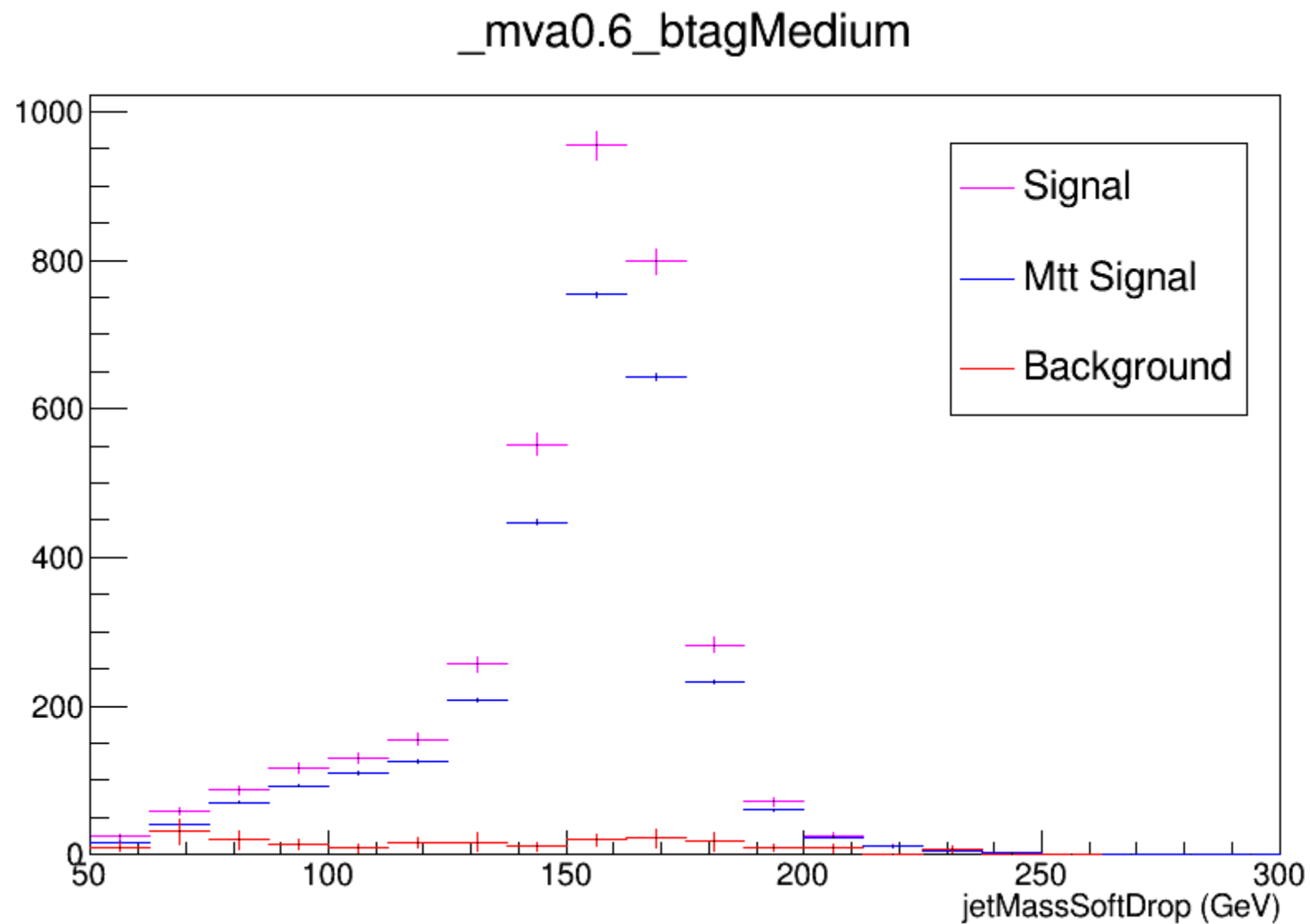
Expected Yields vs JetMassSoftDrop (double fill)



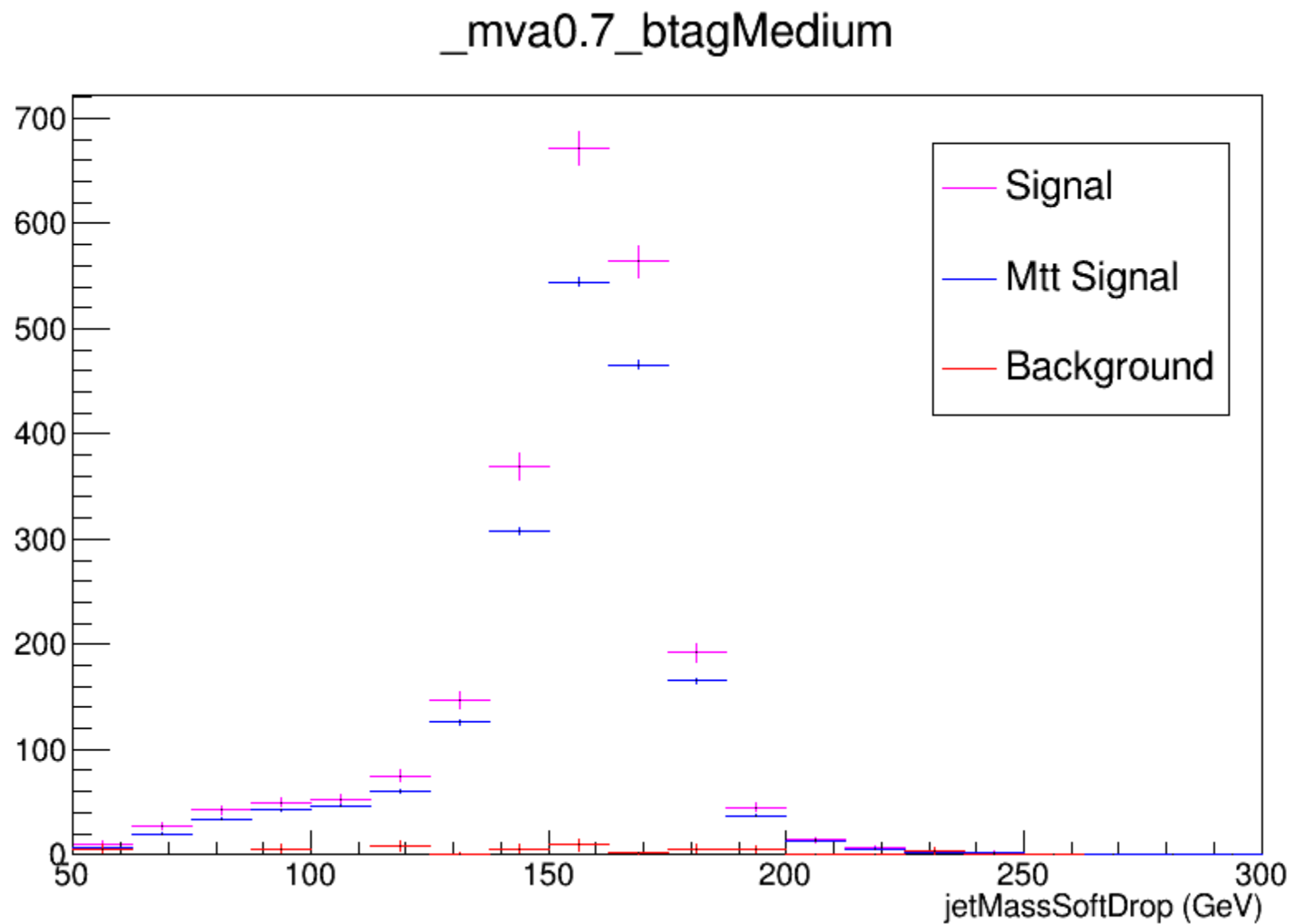
Expected Yields vs JetMassSoftDrop (double fill)



Expected Yields vs JetMassSoftDrop (double fill)



Expected Yields vs JetMassSoftDrop (double fill)



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