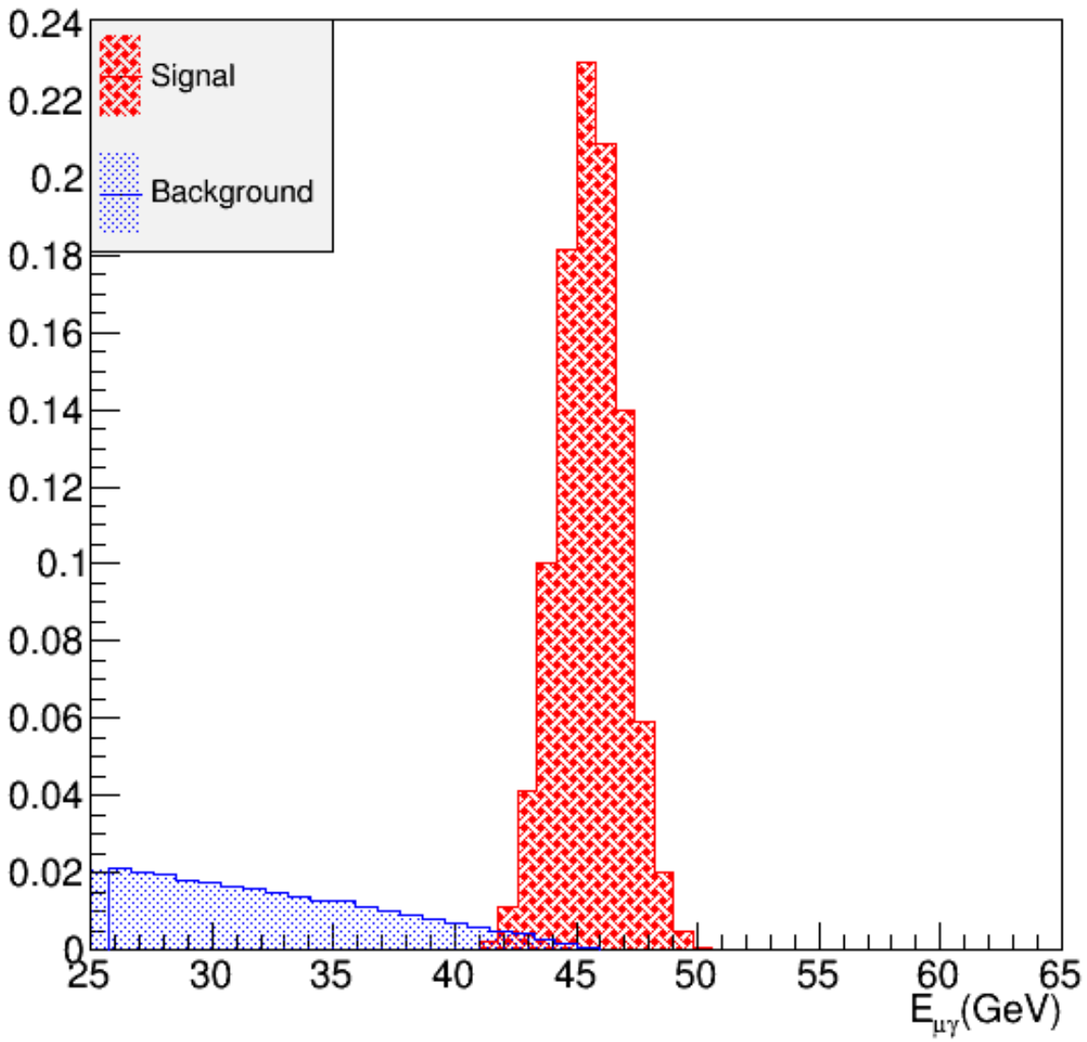
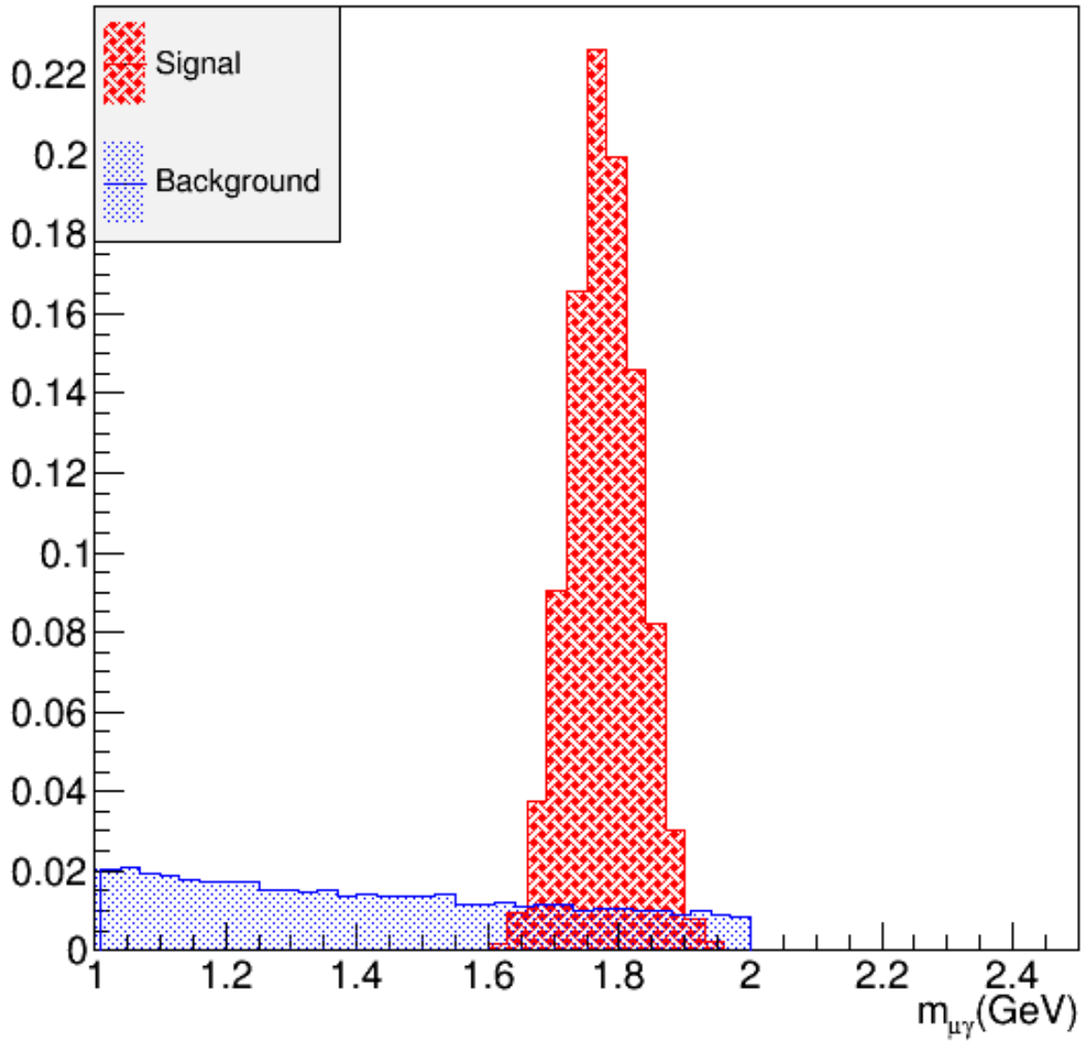
Charged lepton flavor violation

Total energy of signal muon and photon



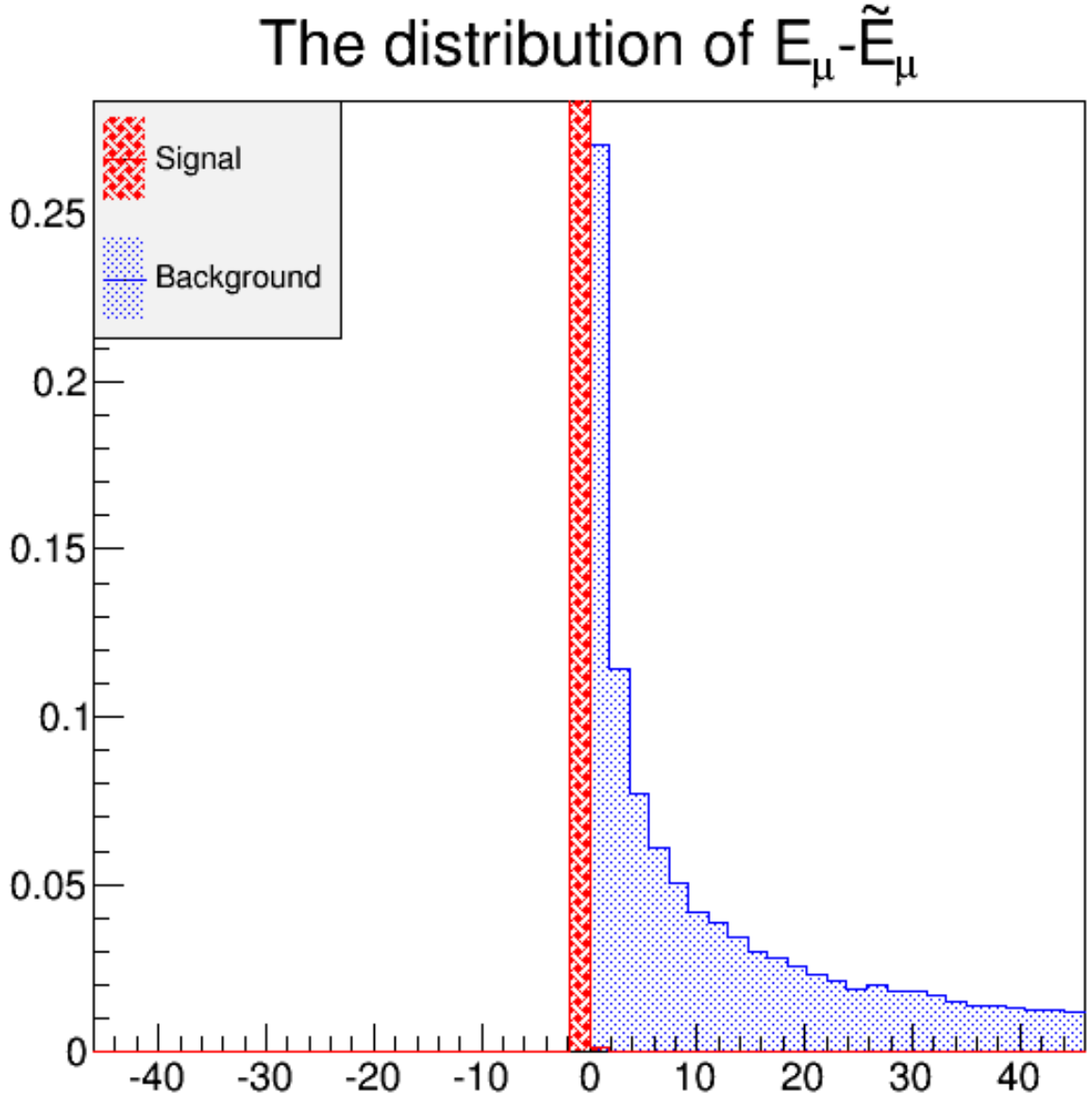
Invariant mass of signal muon and photon

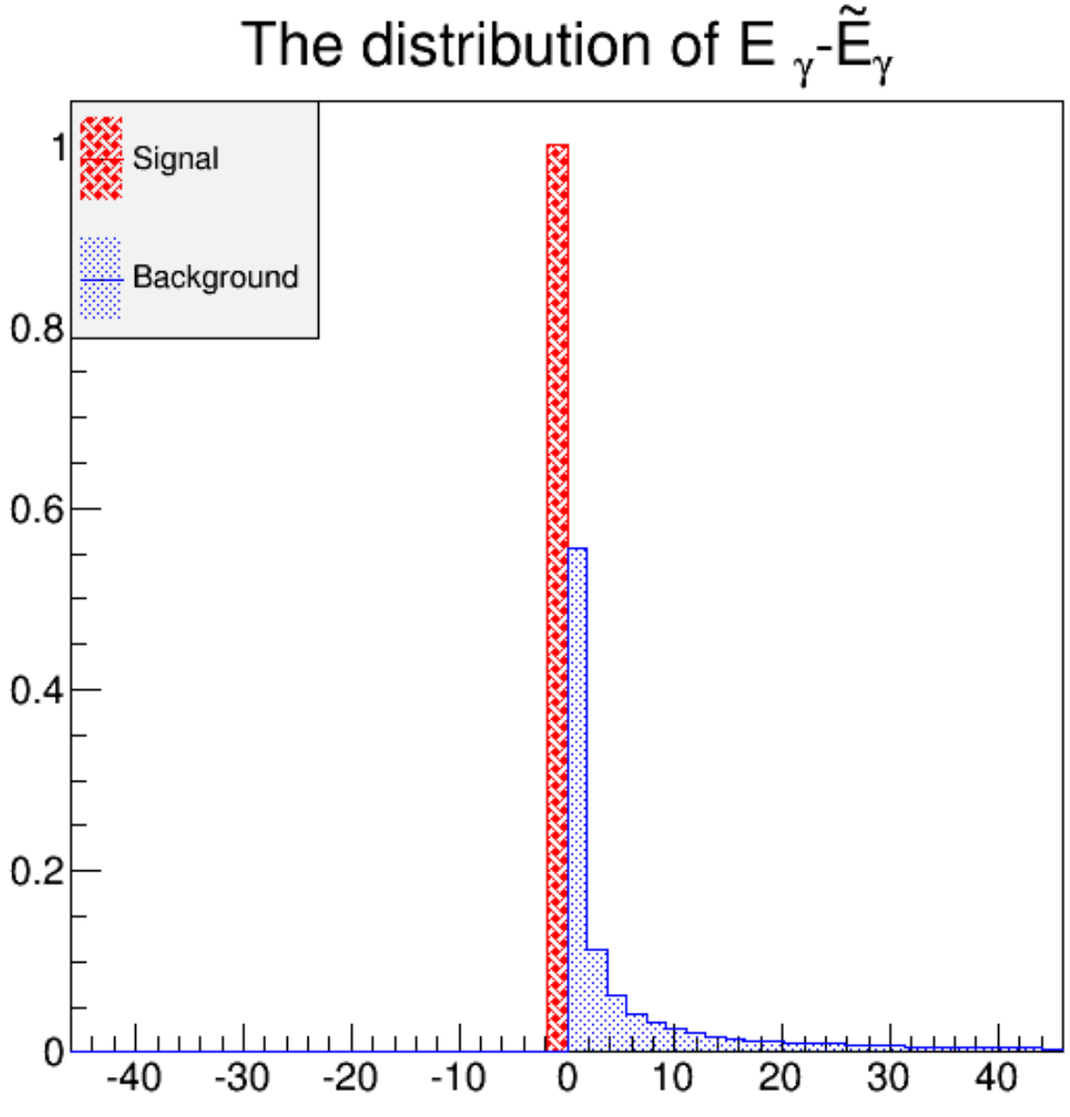


In the decay process $\tau \to \mu\gamma$, $\tilde{E}_\mu$ and $\tilde{E}_\gamma$ are represent as

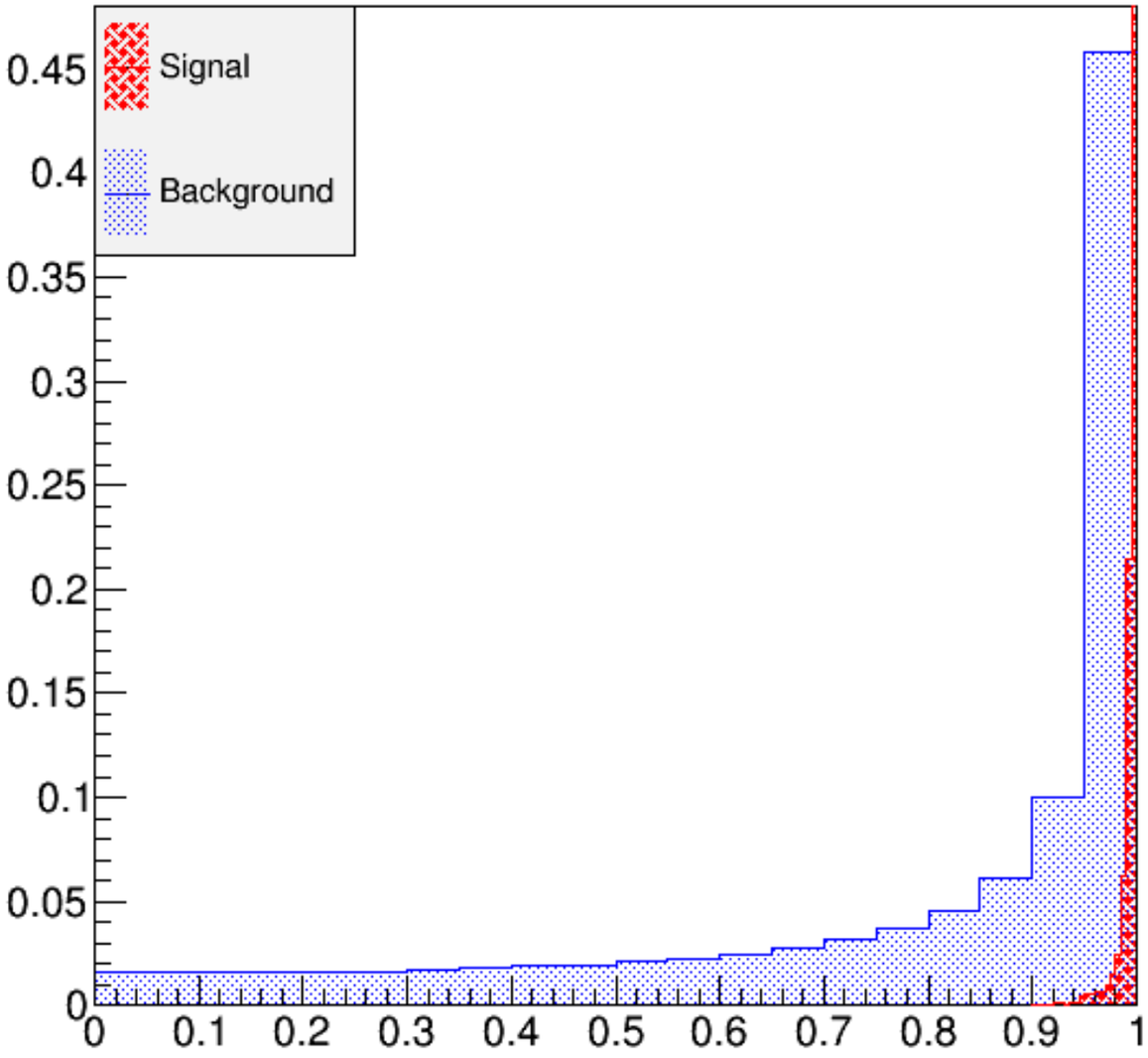
$$\tilde{E}_\mu = \frac{M_\tau^2 + M_\mu^2}{2(E_{\mu\gamma} - P_{\mu\gamma}\cos\tilde{\theta}_{\tau\mu})}$$

$$\tilde{E}_\gamma = \frac{M_\tau^2 - M_\mu^2}{2(E_{\mu\gamma} - P_{\mu\gamma}\cos\tilde{\theta}_{\tau\gamma})}$$

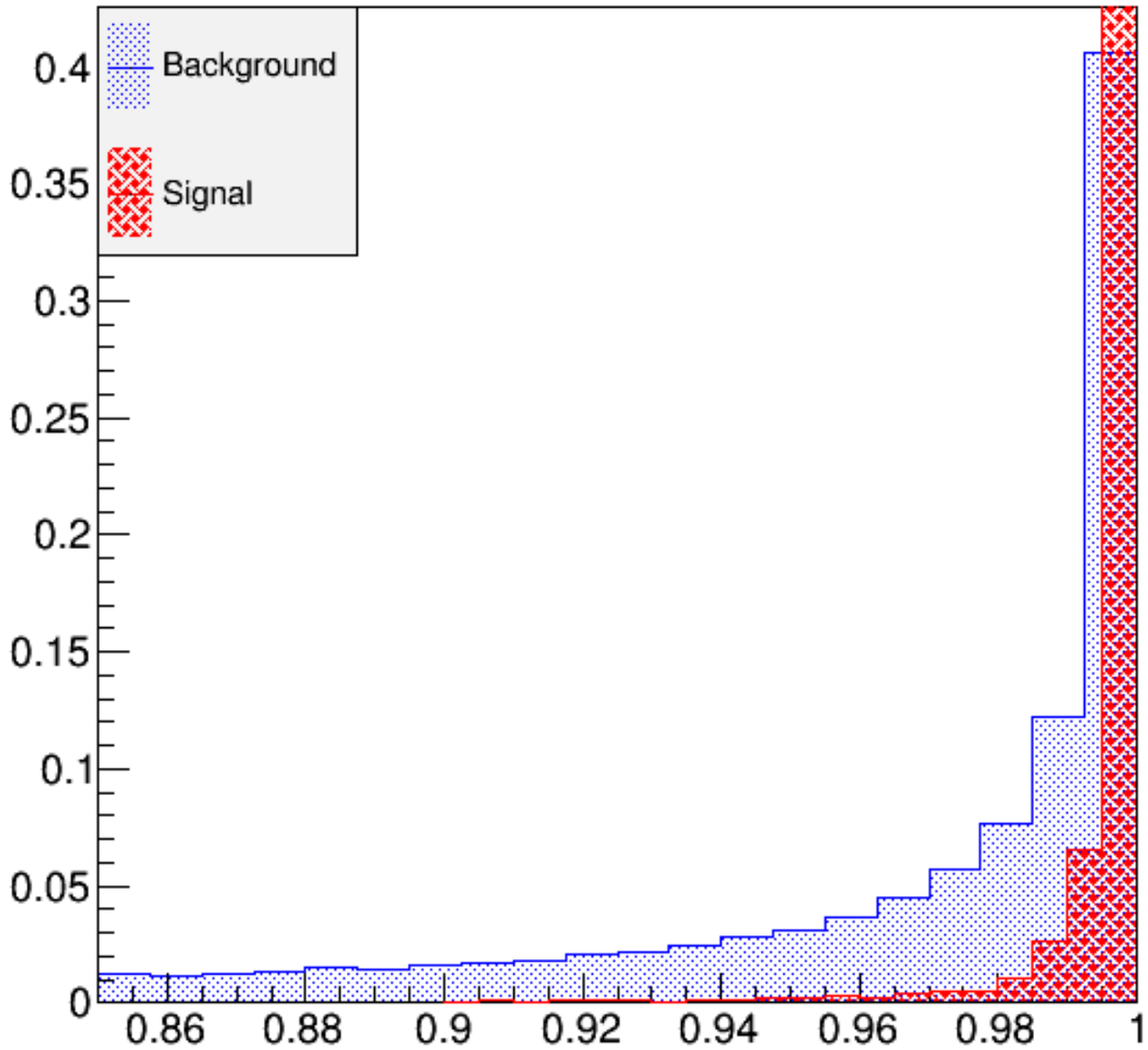


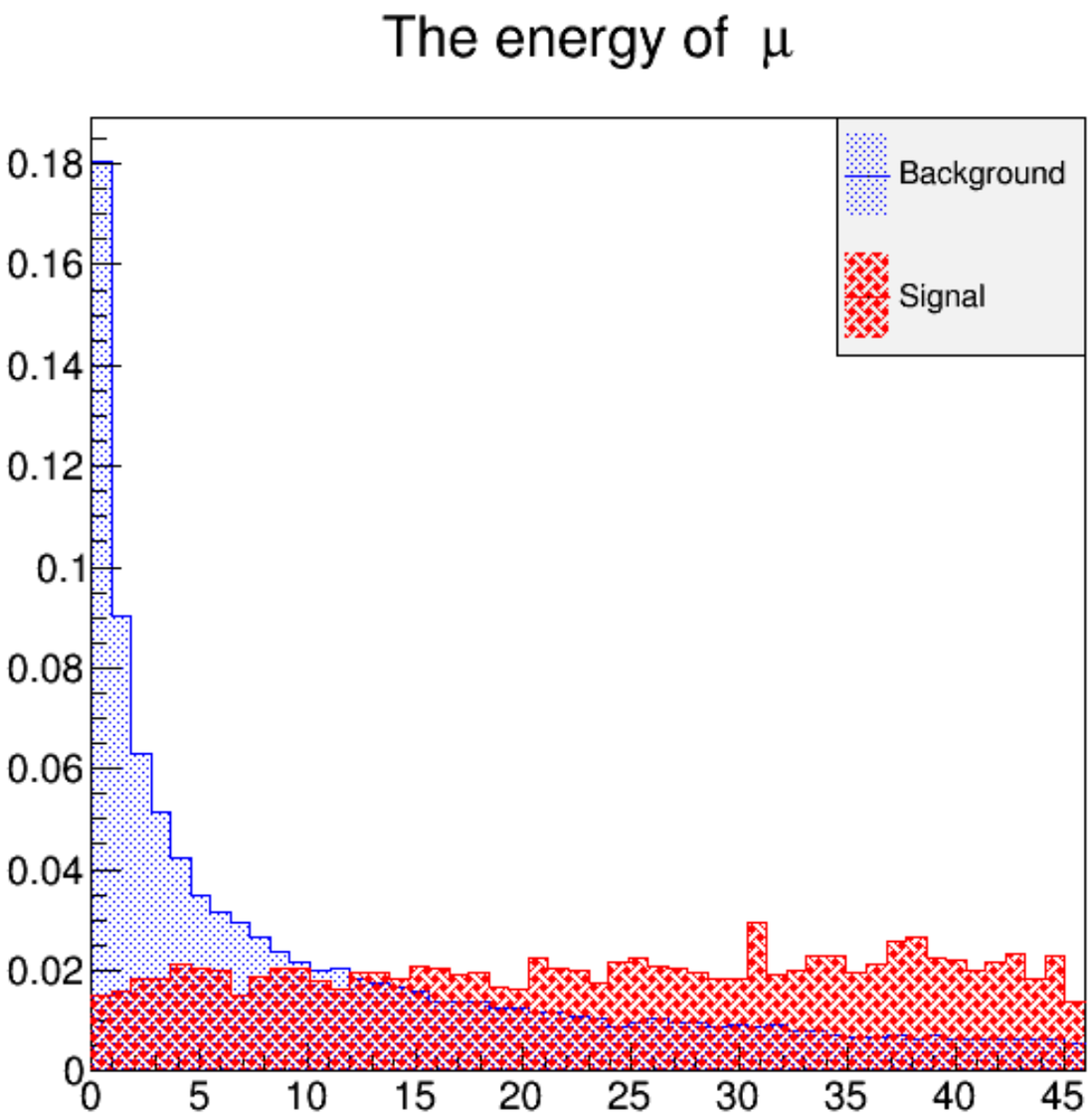


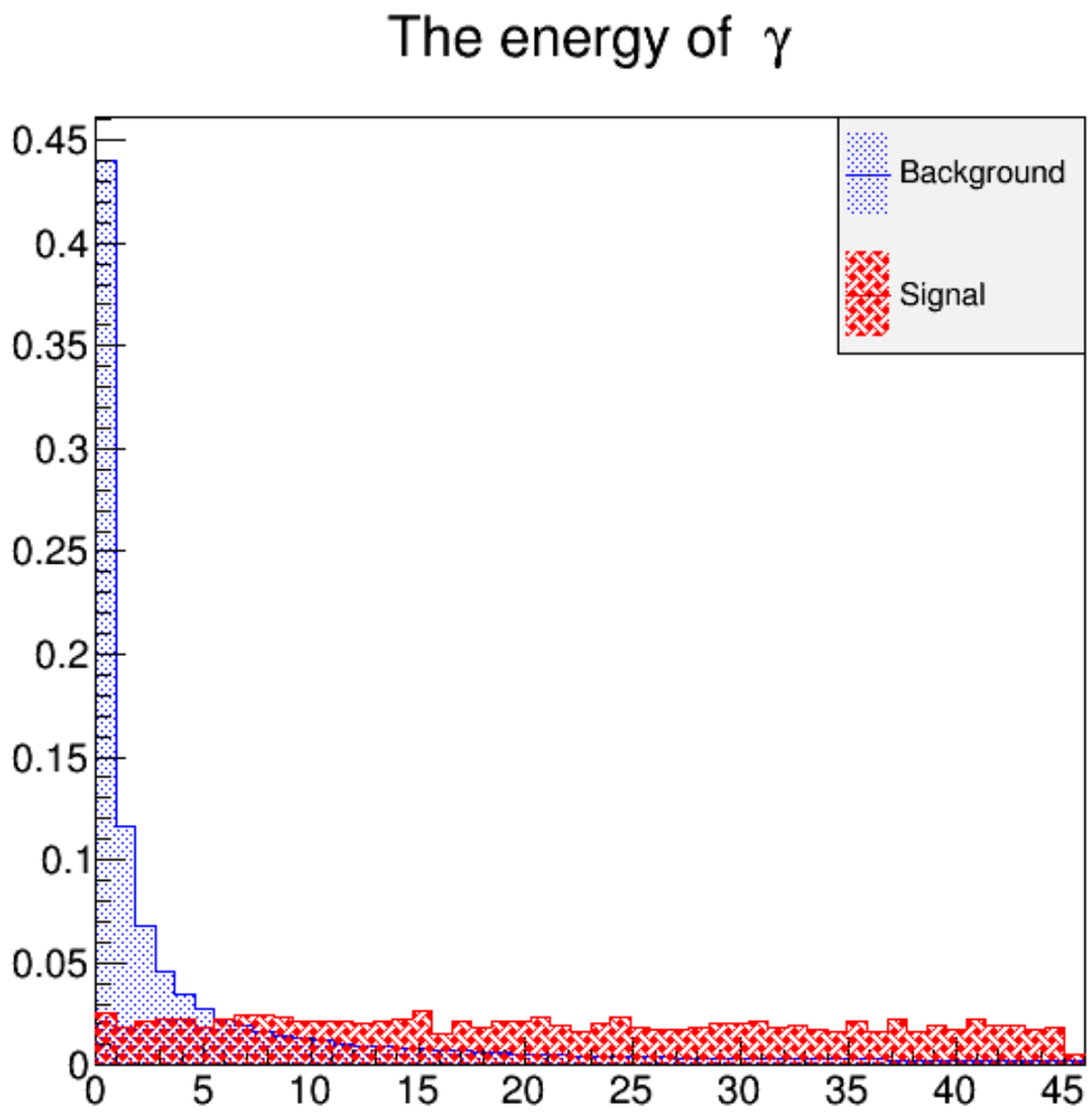
Angular distribution between μγ

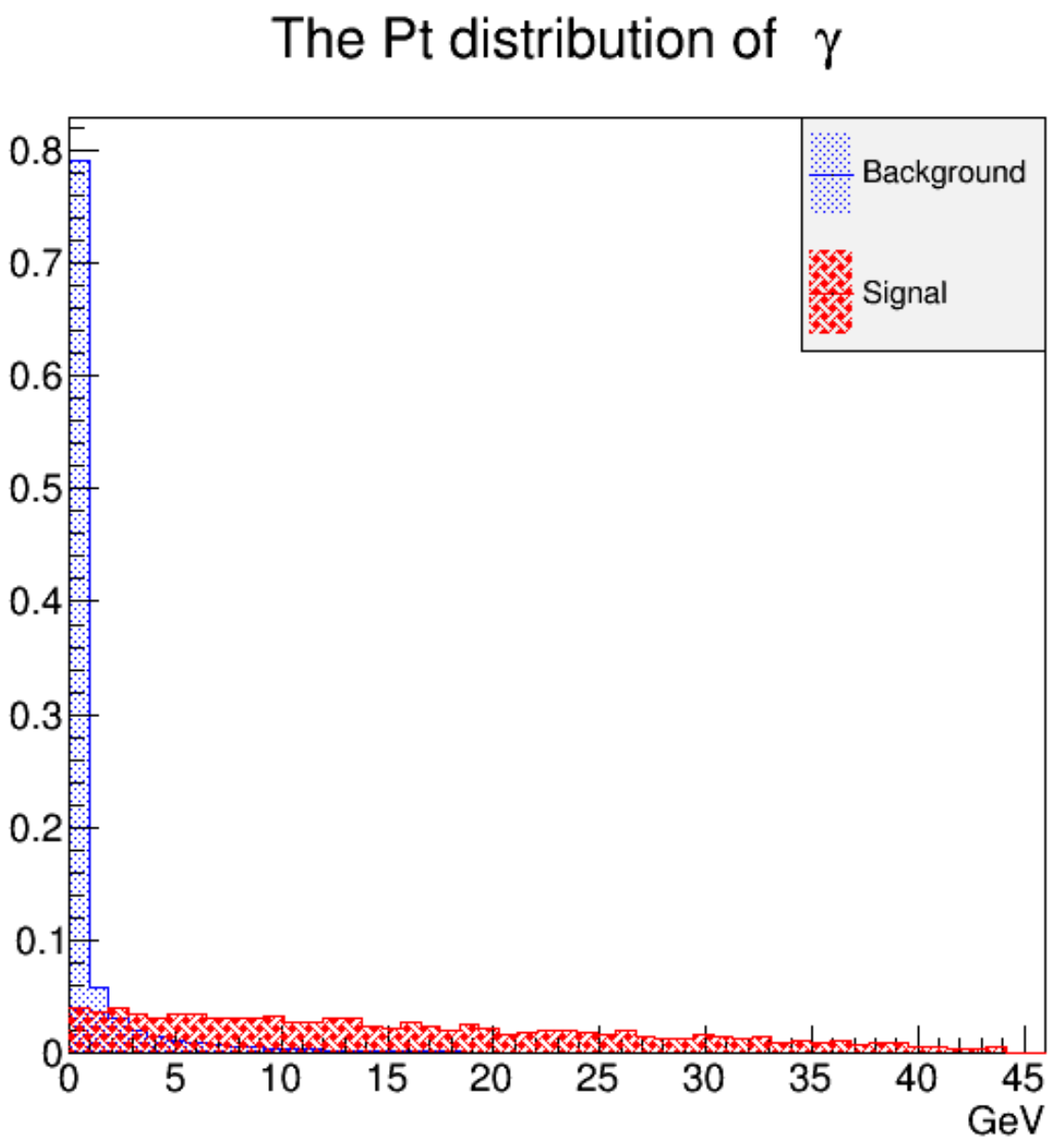


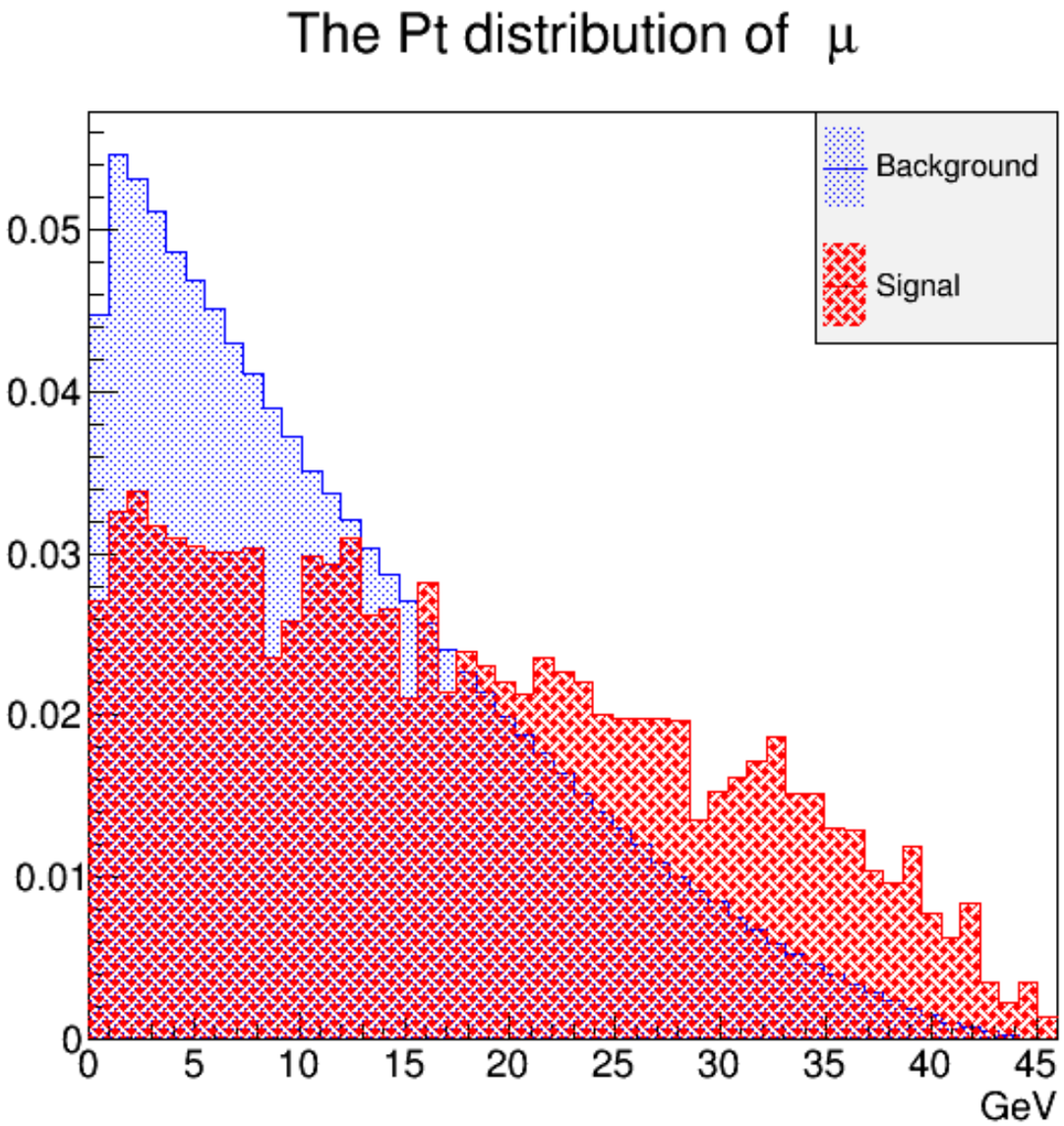
Angular distribution between $\mu\gamma$




The energy of μ
Background
Signal
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30
35
40
45


The energy of γ
Background
Signal
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
5
10
15
20
25
30
35
40
45





For the Pt of photon, the cut condition could be chosen as

$$P_t > 2 \text{ GeV}$$

But few backgrounds(5%) are removed as above cut condition have beed used.

Table 1: The $\mu\gamma$ cut flow

	Bkg	$\sqrt{S+B}/S(\%)$
total generated	4052000000	63655.32
$N_{\mu^+} \geq 1$	355264891	18848.47
42.6 GeV $< E_{\mu\gamma} <$48.6 GeV	654982	809.30
1.6 GeV $< M_{\mu\gamma} <$2 GeV	15170	123.57
$cos_{\mu\gamma} > 0.94$	8864	94.68
$\lvert E'_{\mu^+} - E_{\mu^+} \rvert < 3$ GeV	5006	71.46
$\lvert E'_{\gamma} - E_{\gamma} \rvert < 3$ GeV	3375	58.09
$E_{\mu} > 3$ GeV	2990	54.68
$E_{\gamma} > 3$ GeV	2143	46.29

* The signal events number based this background is about 100.