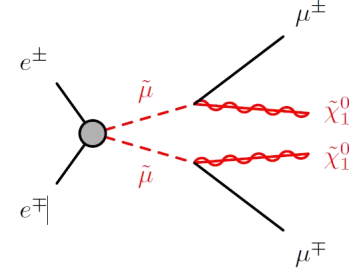# CEPC RefTDR
smuon search

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Introduction

➢ **Target: search for smuon pair production on CEPC, considering smuon decay to μ and LSP.**

➢ **Status:**

    ➢ signal MC production of $\sqrt{s}$=240 GeV[done]

    ➢ reco-truth comparison of signal with (smuon mass,LSP mass)[GeV]=(115,110/70/20)

    ➢ check Mμμ distributions of signal and comparison with previous results

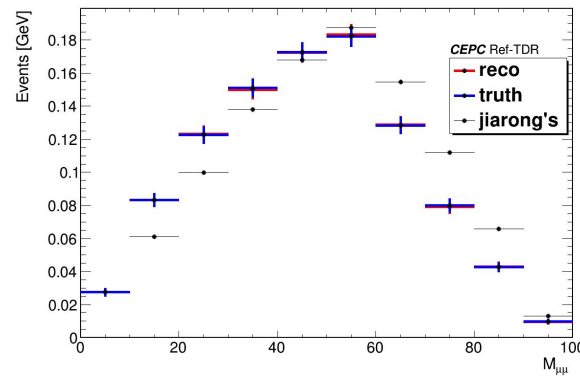➢ **Next step: check kinematic distributions of signal and SM background to decide search strategy**
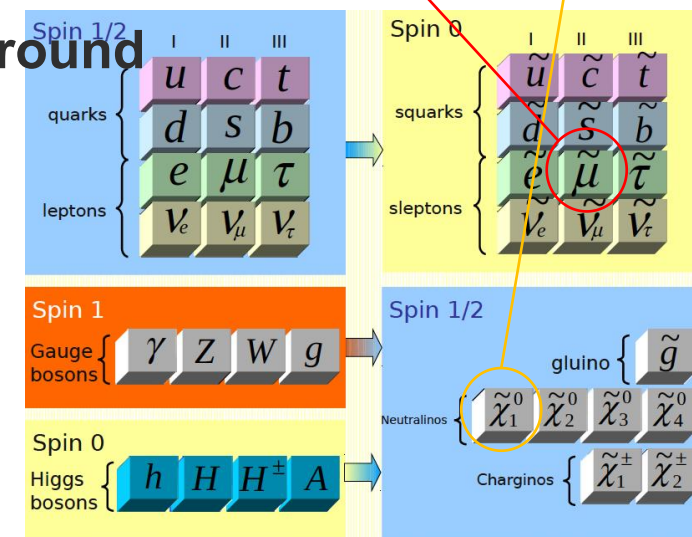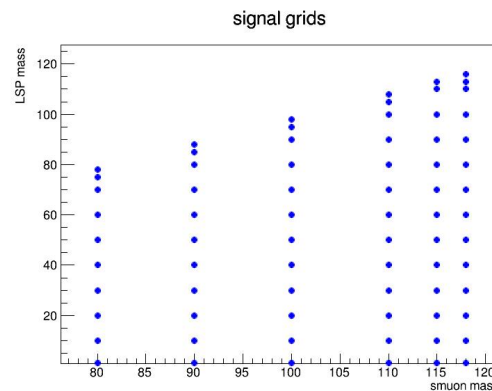
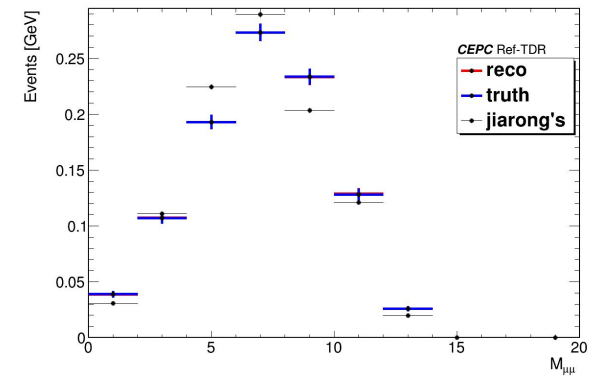# M$_{\mu\mu}$ distribution check ==without== endcap information

- 3 signal point with (smuon mass,LSP mass)[GeV]=(115,20), (115,70), (115,110)

- Preselection: final state contain two μ with opposite-sign and with energy>0.5 GeV.

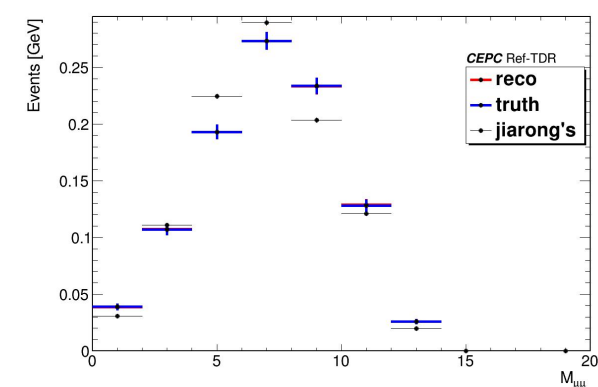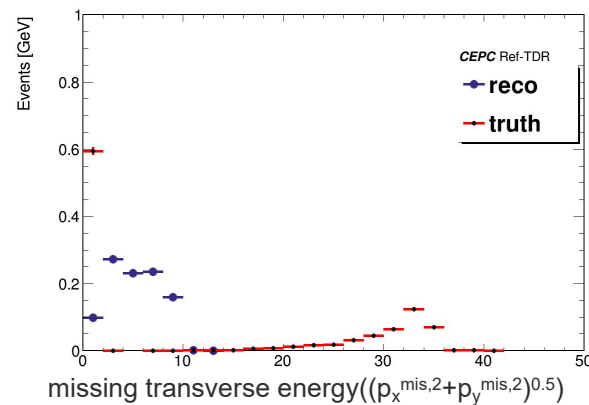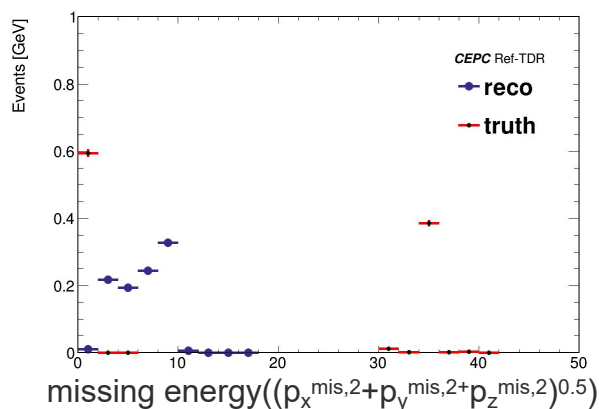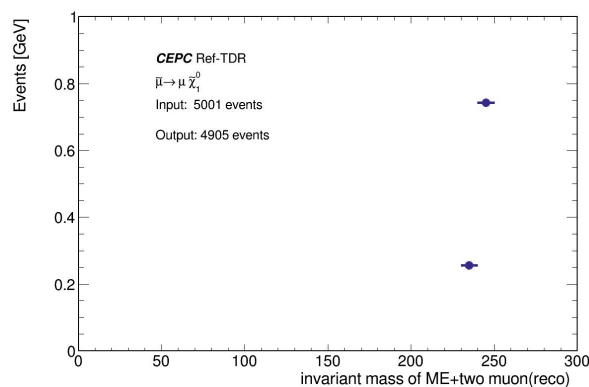- Compare with jiarong's previous results.
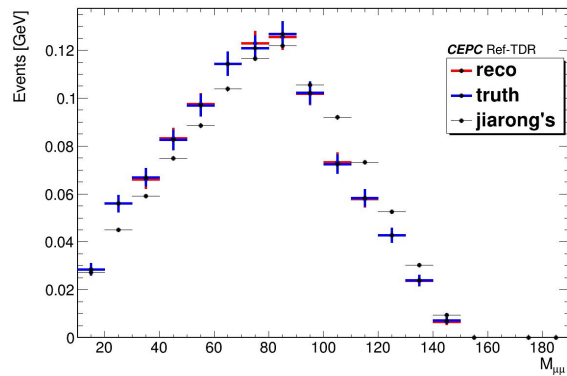
(115,20)

(115,70)

(115,110)

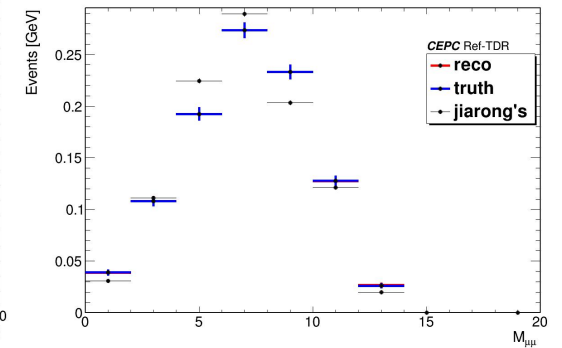- Conclusion: a shift in Mμμ distribution comparing with jiarong's result.

M$_{\mu\mu}$ distribution check ==without== endcap information

- ■ (smuon mass,LSP mass)[GeV]=(115,110)

- ■ Preselection: final state contain two μ with opposite-sign and with energy>0.5 GeV.

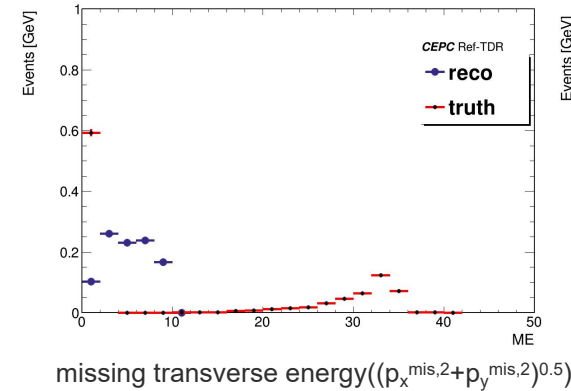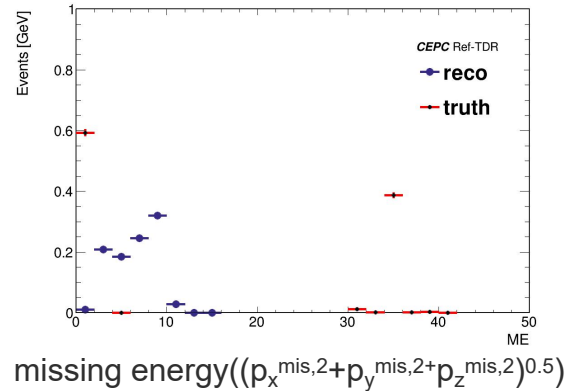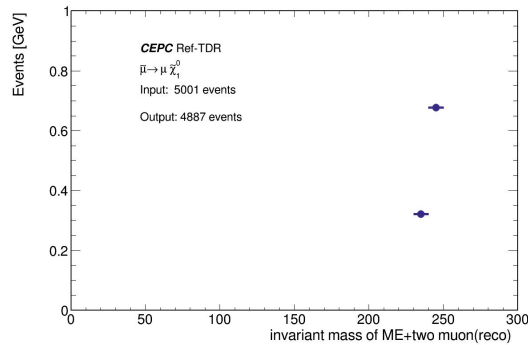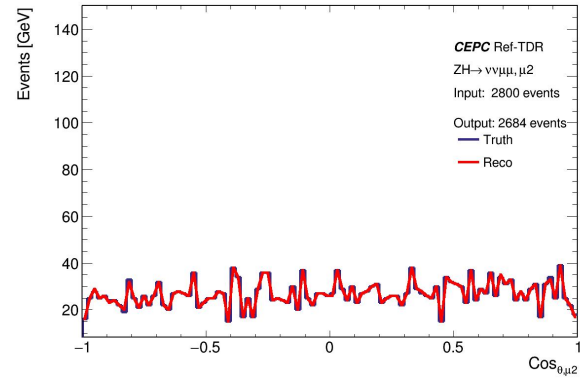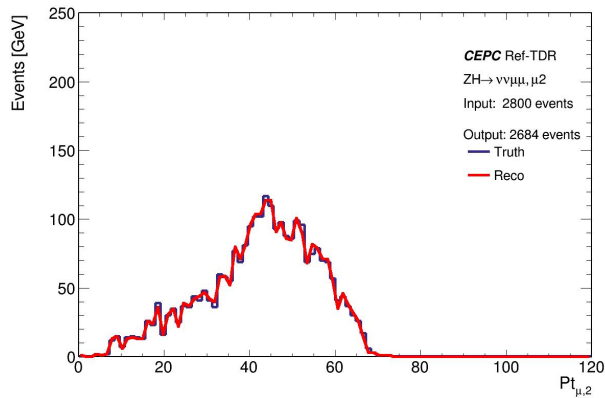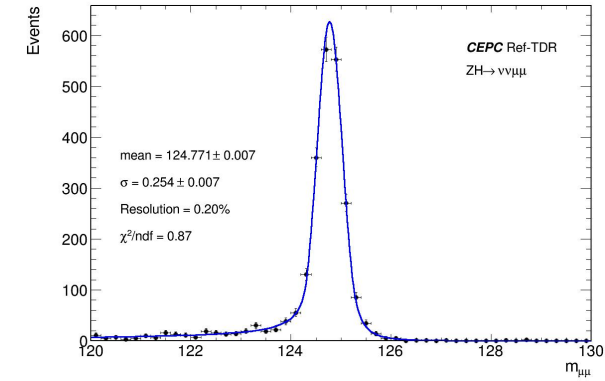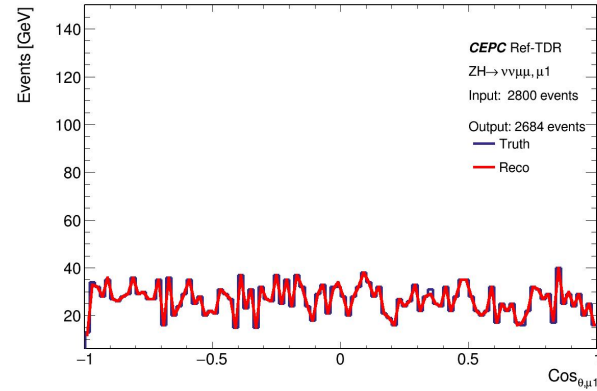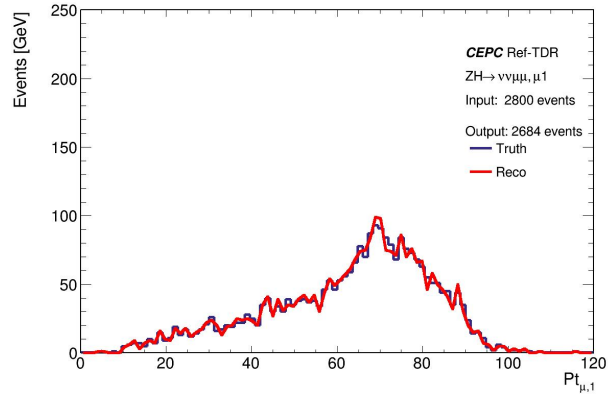# M$_{\mu\mu}$ distribution check <mark>with</mark> endcap information

- (smuon mass,LSP mass)[GeV]=(115,110)

- Preselection: final state contain two μ with opposite-sign and with energy>0.5 GeV.

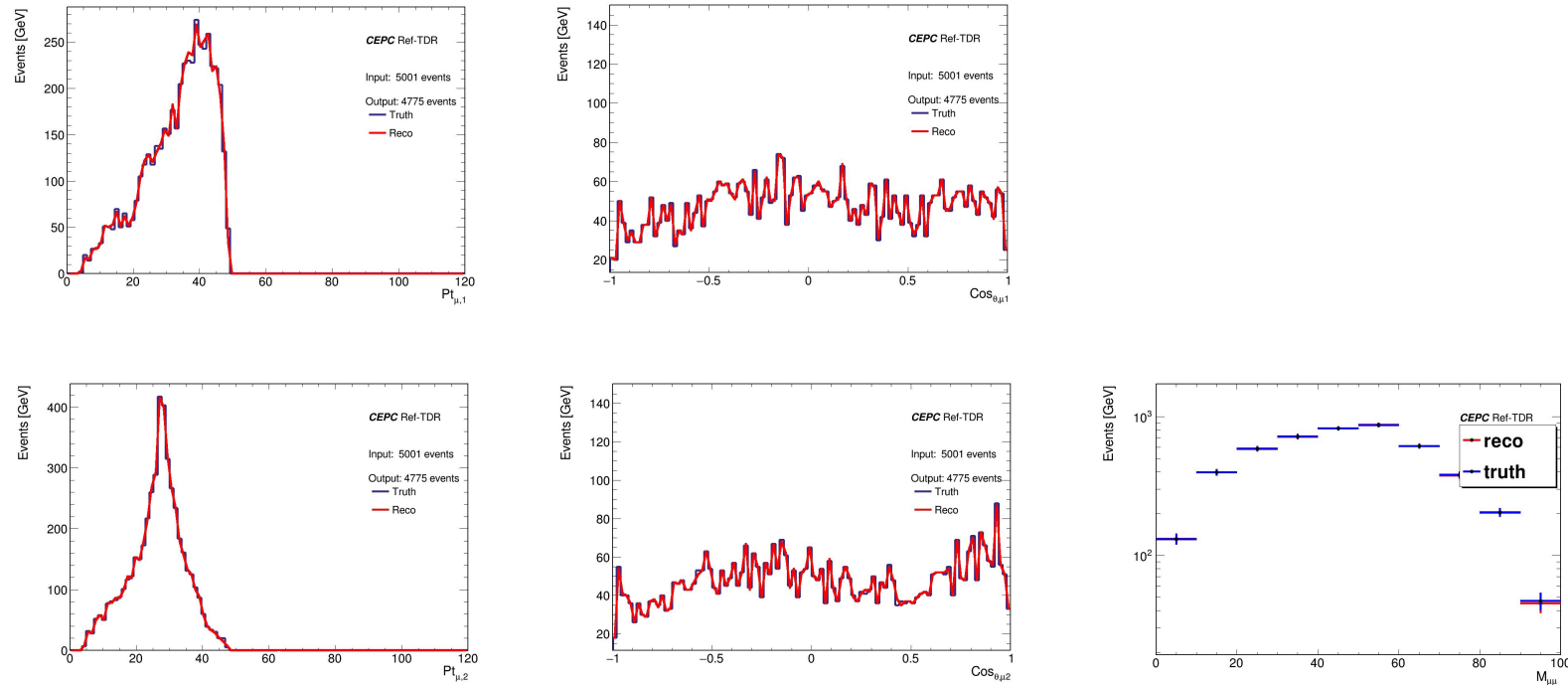missing energy$((p_x^{mis,2}+p_y^{mis,2}+p_z^{mis,2})^{0.5})$

missing transverse energy$((p_x^{mis,2}+p_y^{mis,2})^{0.5})$

- Next: check the distributions

Backup

Validation: M$_{\mu\mu}$ distribution of ZHμμ sample
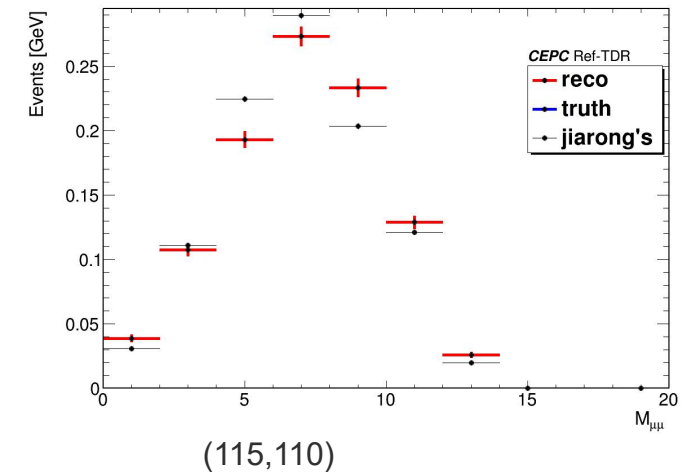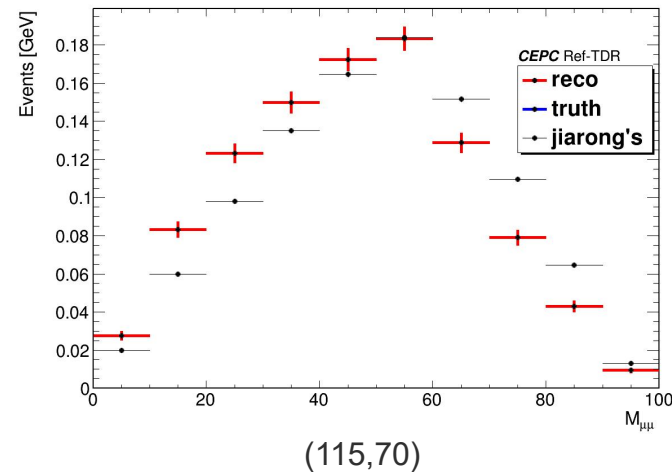
reco-truth comparison (115,70) signal

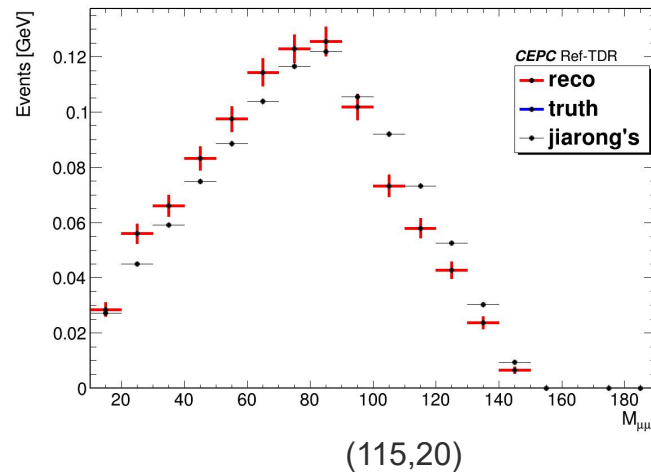■ Selection: ΔR(truth,reco) of CyberPFO < 0.1

■ Conclusion: reco-truth match well.

M_{μμ} distribution check(buggy in analysis codes)

- 3 signal point with (smuon mass,LSP mass)[GeV]=(115,20), (115,70), (115,110)

- Preselection: final state contain two μ with opposite-sign and with energy>0.5 GeV.

- Compare with jiarong's previous results.

(115,20)   (115,70)   (115,110)

- Conclusion: Mμμ distributions look good as jiarong's result.