

Status Report

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Nam Jong Woo

Action Item

- Dimuon plots
 - $p_T > 25\text{GeV}$, $|\eta| < 2.4$
 - Dimuon p_T , eta, invariant mass
 - Include Ratio plot (data/DY)
 - M60to120
 - Log scale
- Calculate $Z \rightarrow \mu \mu$ Cross Section
 - $\sigma = \frac{N}{A\epsilon L}$
 - $N = 350665 \times (1 - 0.03)$ (exclude γ^* 3%)
 - $L = 569.017 \text{ pb}^{-1}$
 - A, ϵ
 - Error propagation

Acceptance

- Fraction of muon events with

- $p_T^{gen} > 25 \text{ GeV}, |\eta^{gen}| < 2.4$

- $60 < m_{inv}^{gen} < 120 \text{ GeV}$

$$\rightarrow N_{gen}^{acc} = 14,326,358 \rightarrow 3,267,666$$

- Total number of muon events in the same mass range.

$$\rightarrow N_{gen}^{tot} = 19,119,769 \rightarrow 9,101,413$$

(Total MC events: 28,827,486)

$$\therefore A = \frac{N_{gen}^{acc}}{N_{gen}^{tot}} = 0.749 \rightarrow 0.359$$

Efficiency

- Fraction of selected events with

- $60 < m_{inv}^{reco} < 120 GeV$

$$\rightarrow N_{reco}^{sel} = \cancel{2,504,640} \rightarrow 2,803,342$$

- Divided by $N_{gen}^{acc} = 3,267,666$

$$\therefore \epsilon = \frac{N_{reco}^{sel}}{N_{gen}^{acc}} = \cancel{0.175} \rightarrow 0.858$$

Cross Section

- $\sigma = \frac{N}{A\epsilon L}$
 - $N = 350,665 \times (1 - 0.03)$ (exclude γ^* 3%)
 - $L = 569.017 \text{ pb}^{-1}$
 - $A = 0.359$
 - $\epsilon = 0.858$
 - $A \times \epsilon = 0.308$
- $\therefore \sigma(Z \rightarrow \mu\mu) = 1936.062 \text{ pb}$
 - reference: $\sigma(\text{Theory}) = 1868 \text{ pb}$
 $\sigma(\text{data}) = 1900 \text{ pb}$