

Qualification Task of MOHAMMED EL ALLAM Checkpoint report from local supervisor

Title: Optimisation of isolation WPs in Run3

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Introduction

In this presentation, I worked on subsection 8.3, "Studies on jet modelling uncertainty: Powheg+Pythia vs. Powheg+Herwig vs. Sherpa," from the documentation: [here](#)

- $Z \rightarrow \mu^+ \mu^-$
- Run 2 and Run 3

Monte Carlo samples description

- MC23,MC20.
- DAOD_MUON1 format.
- DSID: 700789,513108.
- Package:[fastMuonChecker](#)
- Generator:Pythia 8,Sherpa 2.2.14.

Run2

Distributions for the dimuon mass in Run2

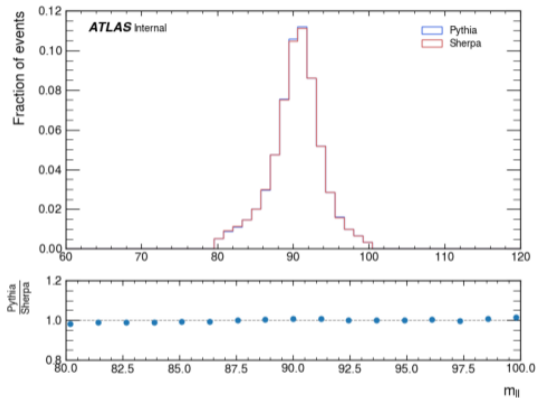


Figure: Original plot

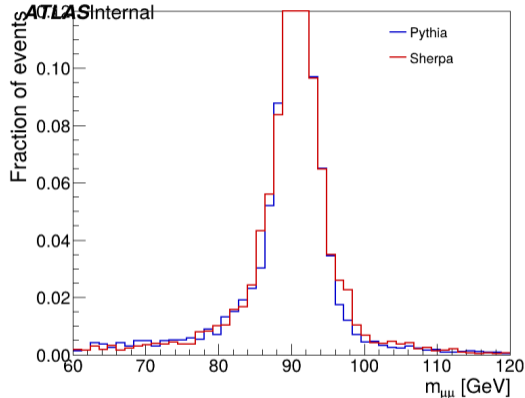


Figure: Reproduced plot

Distributions for muon transverse momentum in Run2

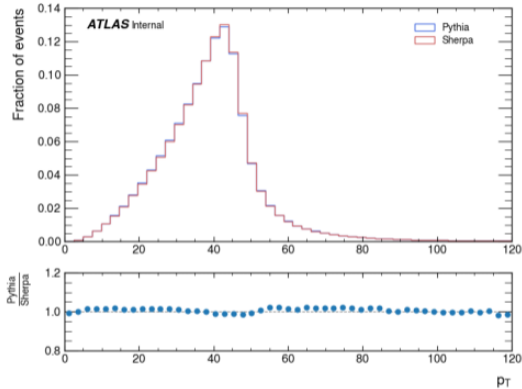


Figure: Original plot

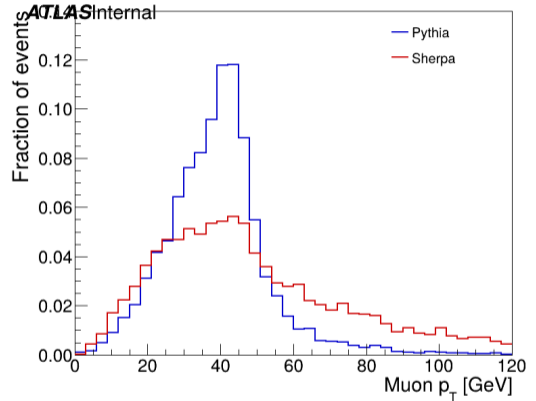


Figure: Reproduced plot

Distributions for muon pseudorapidity in Run2

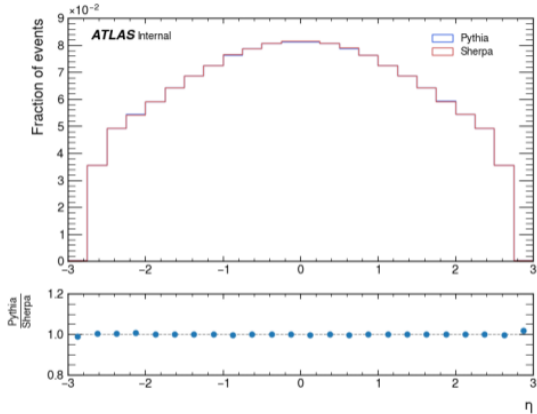


Figure: Original plot

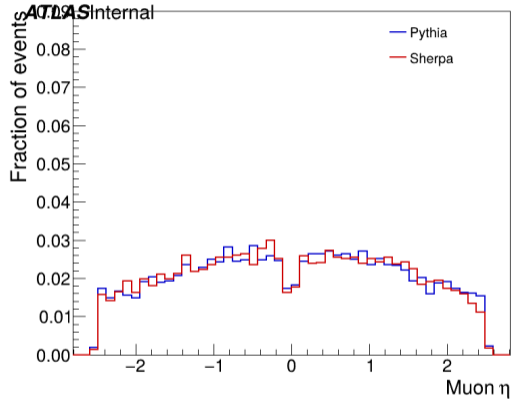


Figure: Reproduced plot

Distributions for angular distance between a muon and its closest jet in Run2

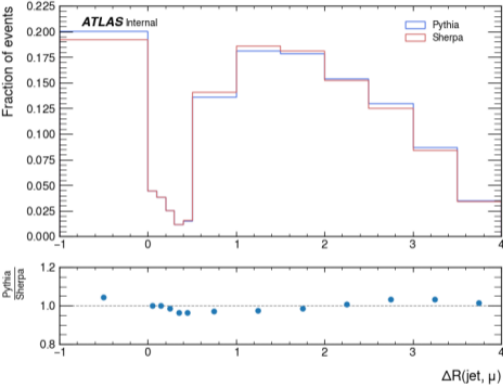


Figure: Original plot

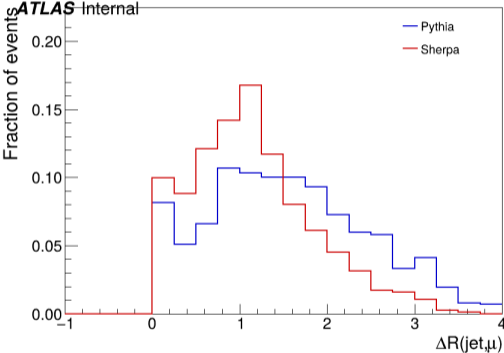


Figure: Reproduced plot

Run3

Distributions for the dimuon mass in Run3

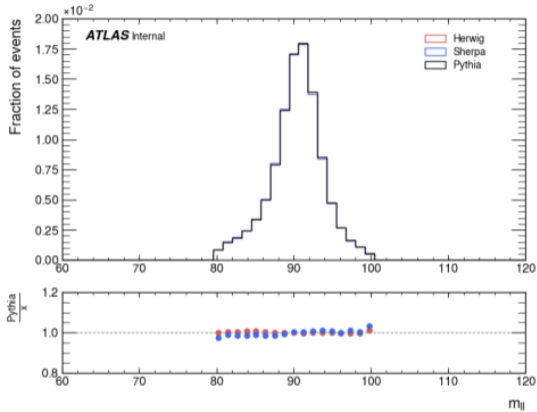


Figure: Original plot

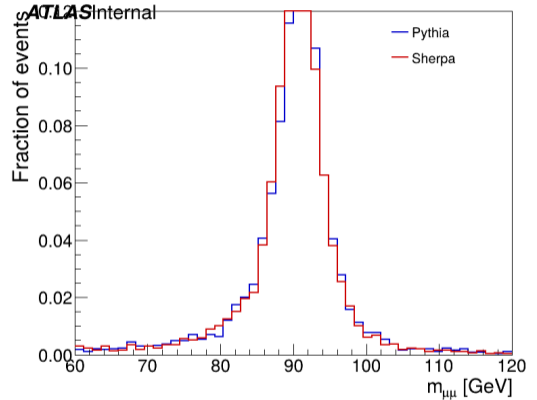


Figure: Reproduced plot

Distributions for muon transverse momentum in Run3

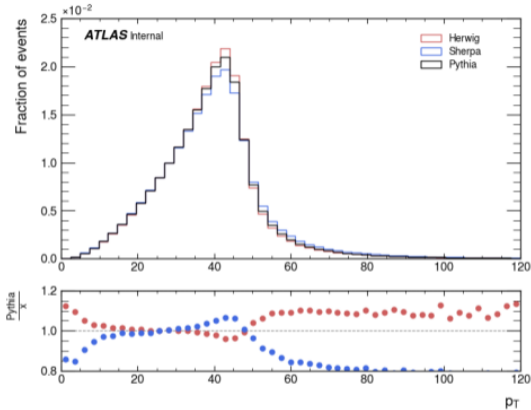


Figure: Original plot

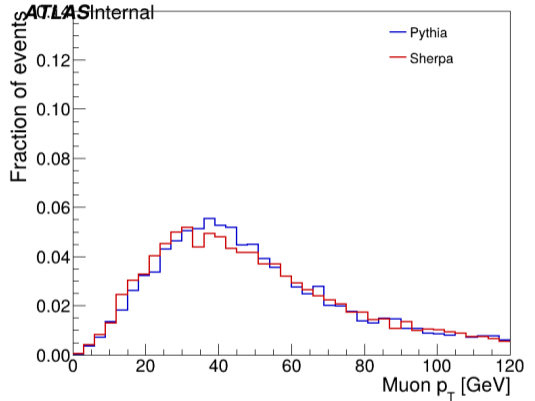


Figure: Reproduced plot

Distributions for muon pseudorapidity in Run3

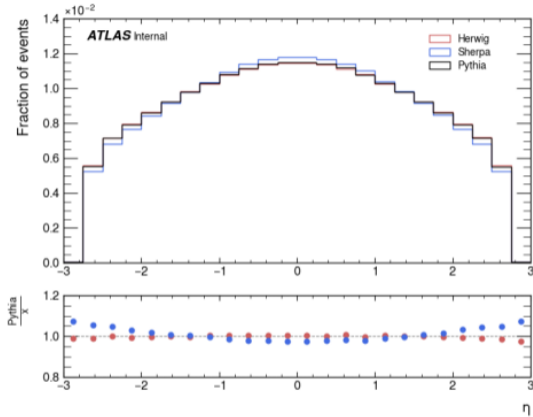


Figure: Original plot

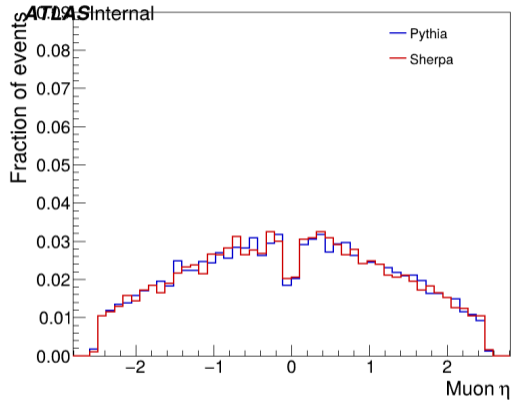


Figure: Reproduced plot

Distributions for angular distance between a muon and its closest jet in Run3

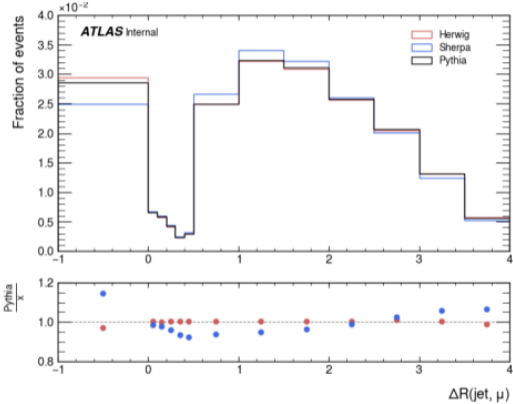


Figure: Original plot

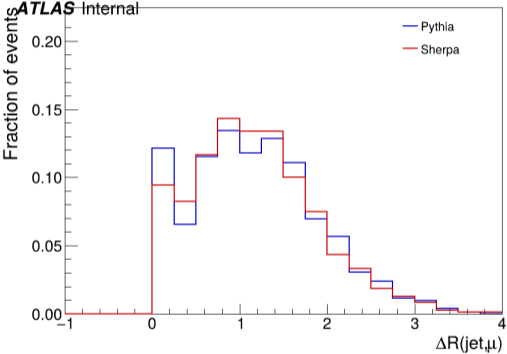


Figure: Reproduced plot

Conclusion

- The MC data was successfully processed and the main distributions were reproduced.
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- Some limitations were encountered during the analysis.
- Next step: advanced studies.

Thank You

