

# Vertex Tagging: Sanity Check

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NMSU Update  
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# ROC Curve and Confusion Matrix

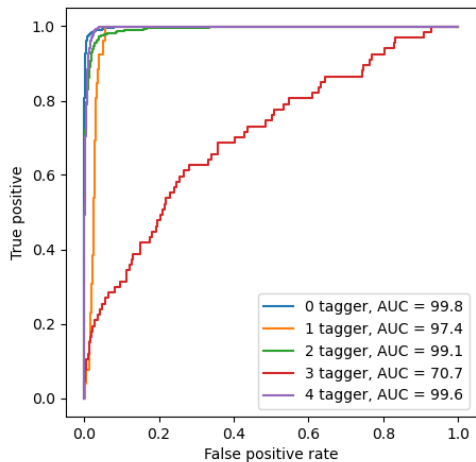


Figure 1: ROC curve for the tagging task.

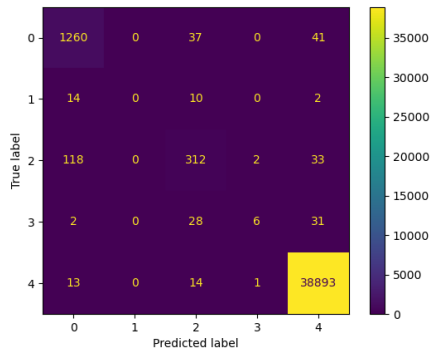


Figure 2: Confusion matrix for the tagging task.

# Loss

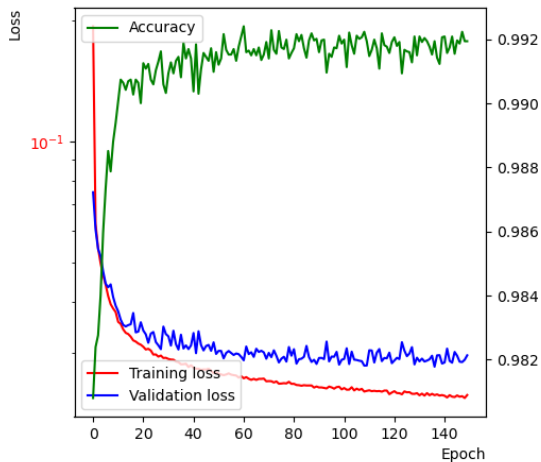


Figure 3: Loss for tagging task.

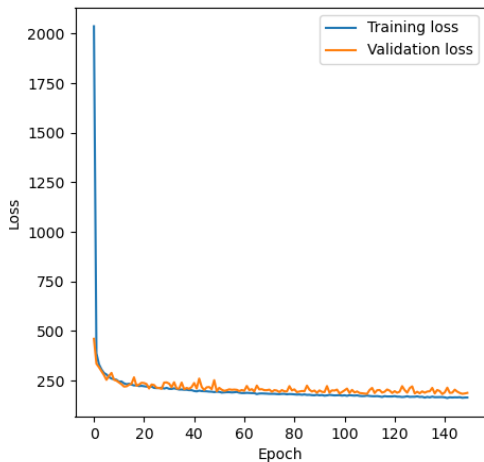


Figure 4: Loss for the regression task.

# Tagging Task

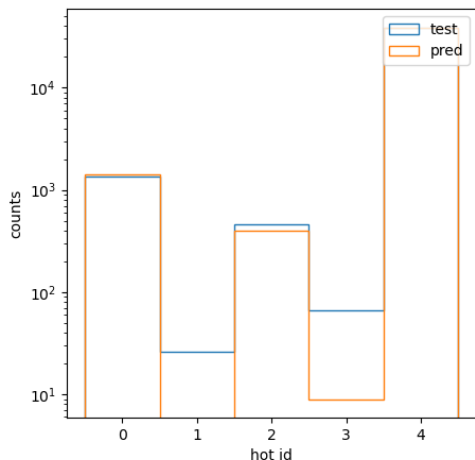


Figure 5: Predicted and test hot id.

- Classification layer almost predict bins except for bin with `hot_id = 1, 3`, with Accuracy for the test set: 0.9931

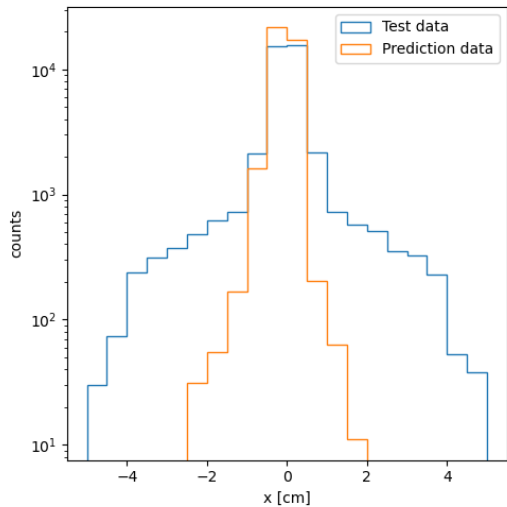


Figure 6: Predicted and test  $x$ .

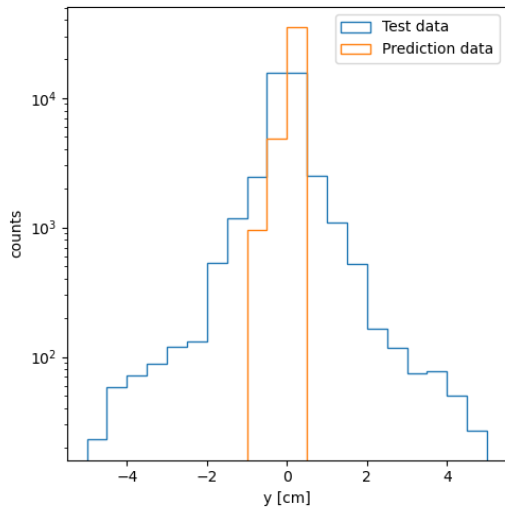


Figure 7: Predicted and test  $y$ .

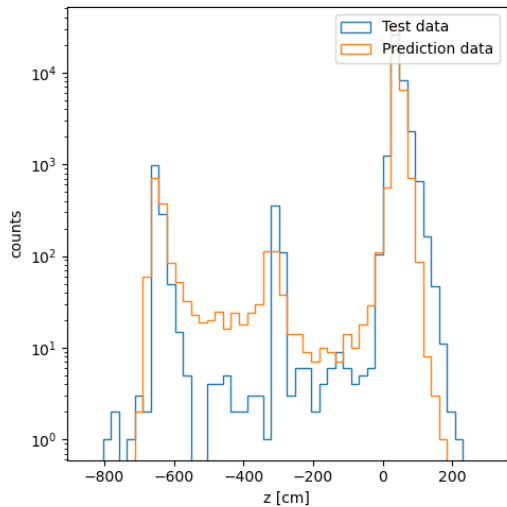


Figure 8: Predicted and test  $z$ .

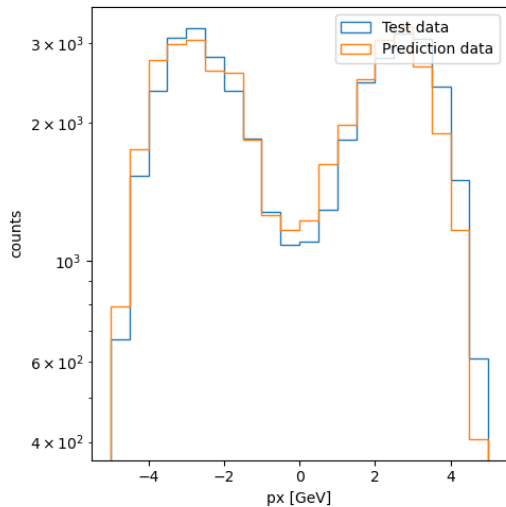


Figure 9: Predicted and test  $p_x$ .

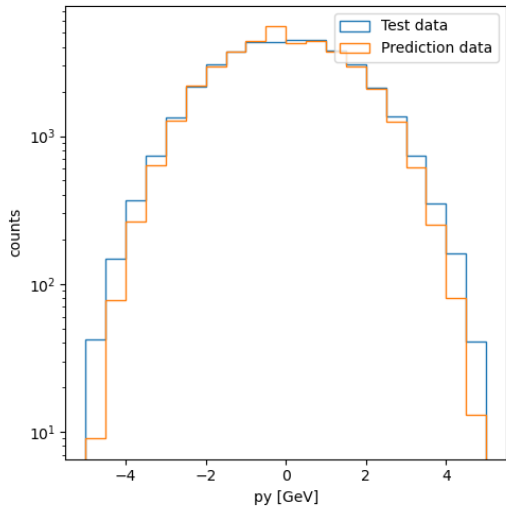


Figure 10: Predicted and test  $p_y$ .

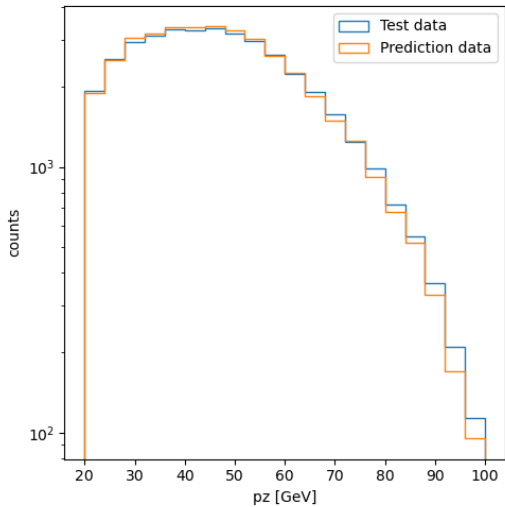


Figure 11: Predicted and test  $p_z$ .

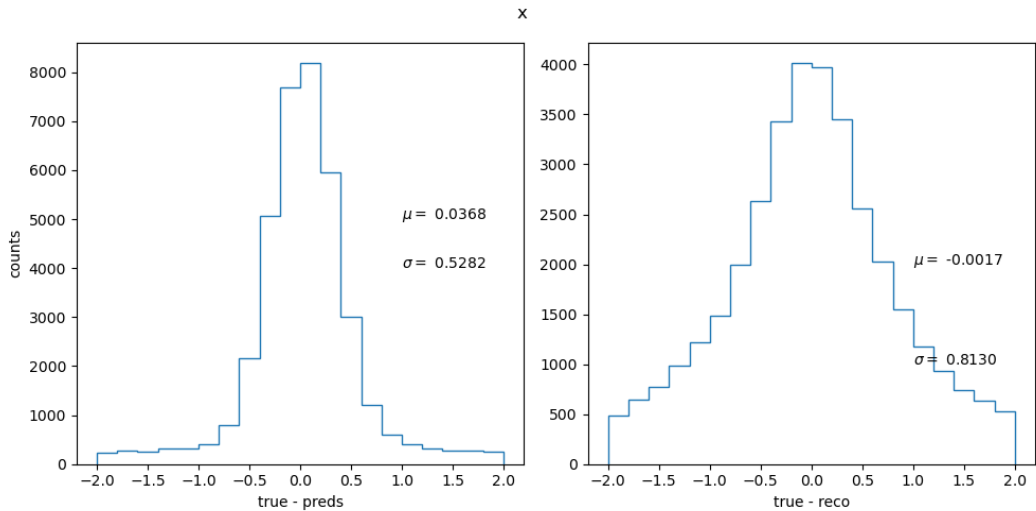


Figure 12:  $x$  resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)



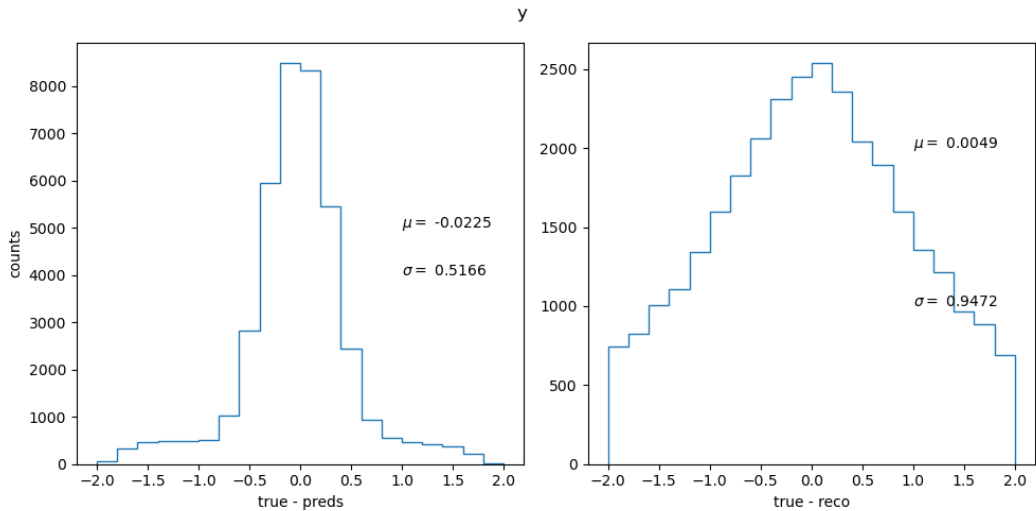


Figure 13:  $y$  resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)

z

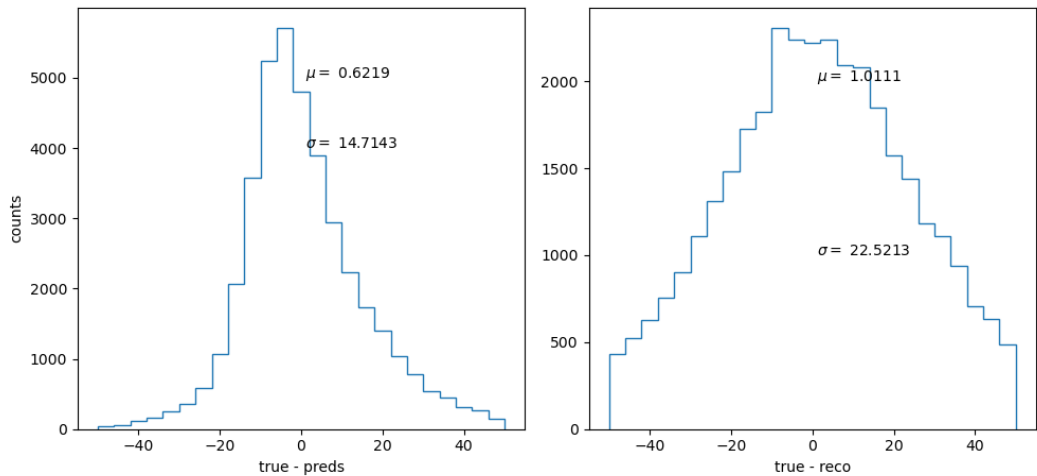


Figure 14:  $z$  resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)

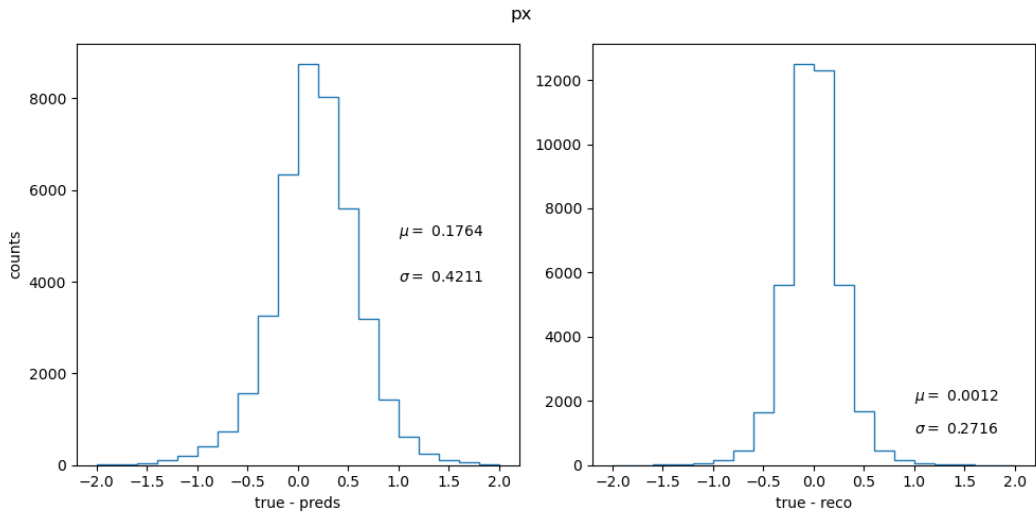


Figure 15:  $px$  resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)

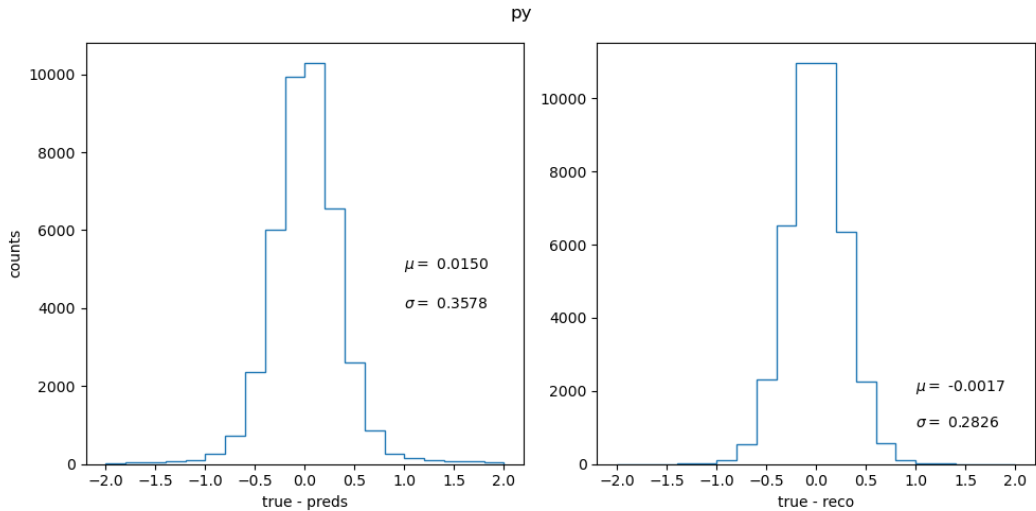


Figure 16: *py* resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)

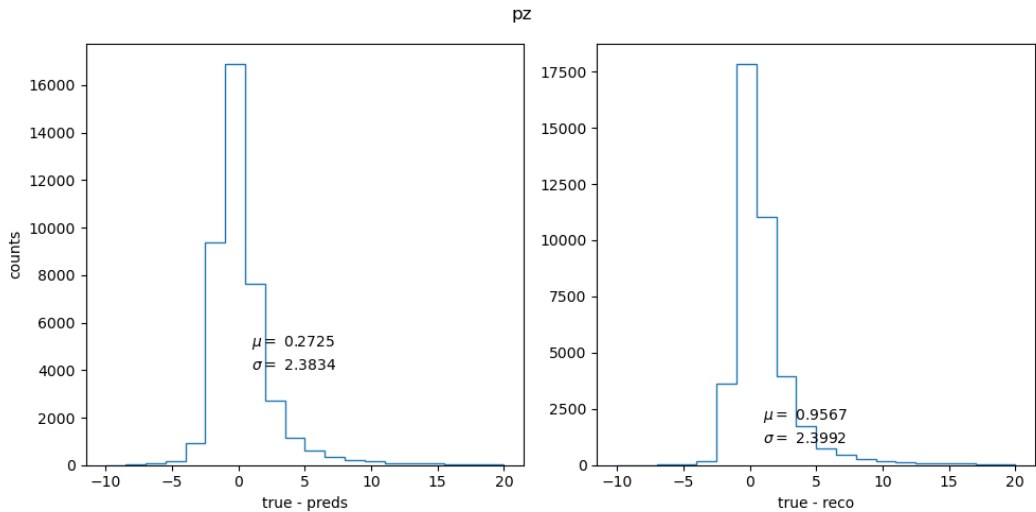


Figure 17:  $p_z$  resolution. (right) Test data – ML prediction. (left) Test data – Reco. data (Legacy method)

# Asymmetry Check

Used GetAsymmetry() function in TH1D in ROOT

$$\text{Asymmetry} = \frac{\text{true} - \text{pred}}{\text{true} + \text{pred}}$$

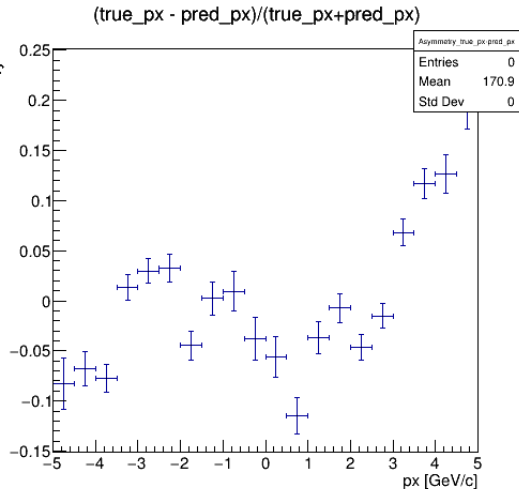


Figure 18: Asymmetry in  $p_x$ .

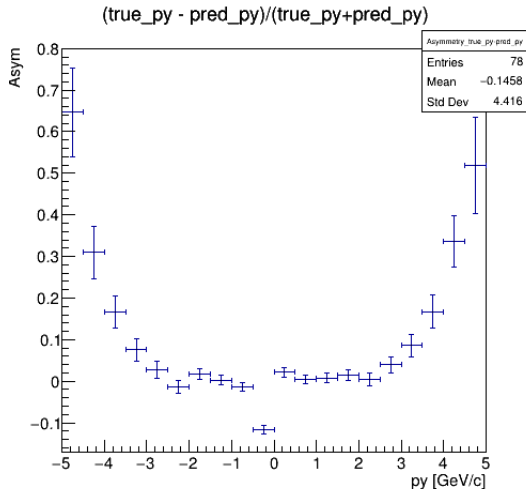


Figure 19: Asymmetry in  $p_y$ .