

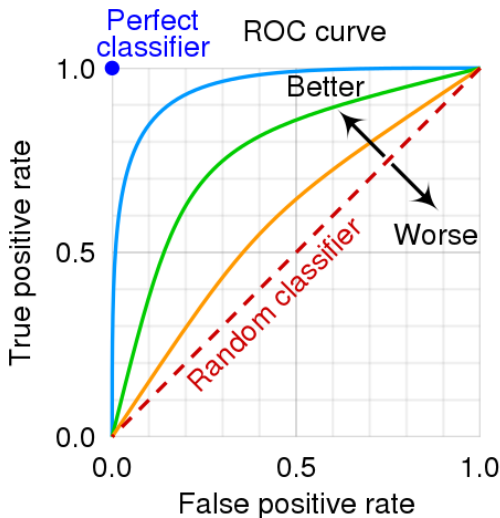
Vertex Tagging: Sanity Check

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NMSU Update
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Receiver Operating Characteristic (ROC) Curve

- ROC curves typically feature true positive rate on the Y axis, and false positive rate on the X axis. This means that the top left corner of the plot is the “ideal” point - a false positive rate of zero, and a true positive rate of one. This is not very realistic, but it does mean that a larger area under the curve (AUC) is usually better.



Confusion Matrix

- Confusion matrix evaluate the accuracy of a classification.
- By definition a confusion matrix C is such that C_{ij} is equal to the number of observations known to be in group i and predicted to be in group j .
- Thus in binary classification, the count of true negatives is C_{00} , false negatives is C_{10} , true positives is C_{11} and false positives is C_{01} .

		True Class	
		Positive	Negative
Predicted Class	Positive	TP	FP
	Negative	FN	TN

■ Labels;

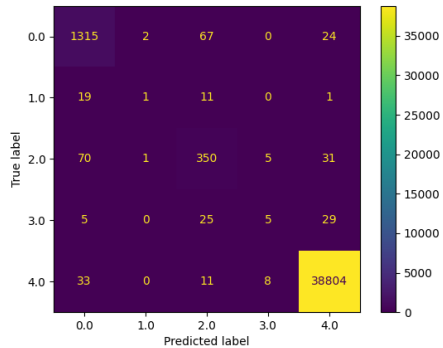
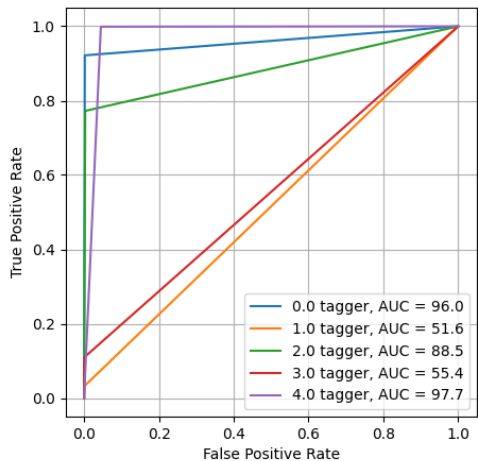
position	label	int

-800. < z < -500.	collimator	0
-500. < z < -305.	air1	1
-305. < z < -295.	target	2
-295. < z < 0.	air2	3
0. < z < 300.	beam dump	4

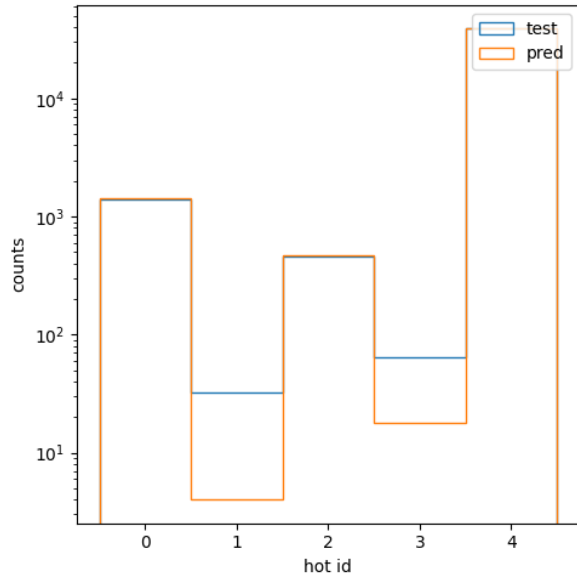
■ Hot encoding;

	collimator	air1	target	air2	beam dump

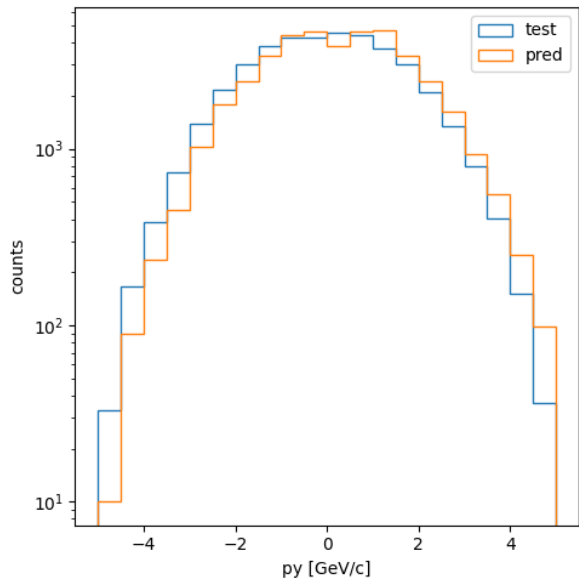
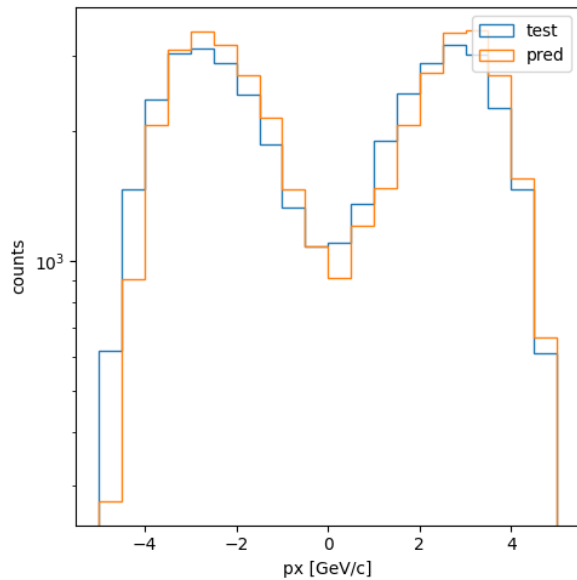
collimator	1	0	0	0	0
air1	0	1	0	0	0
target	0	0	1	0	0
air2	0	0	0	1	0
beam dump	0	0	0	0	1

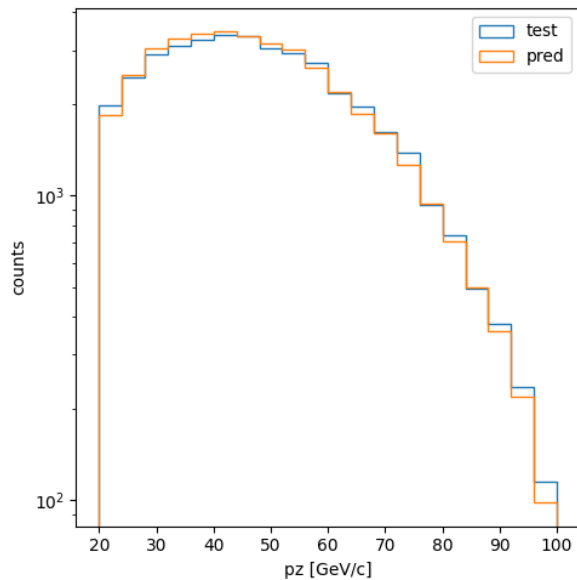


Tagging Task

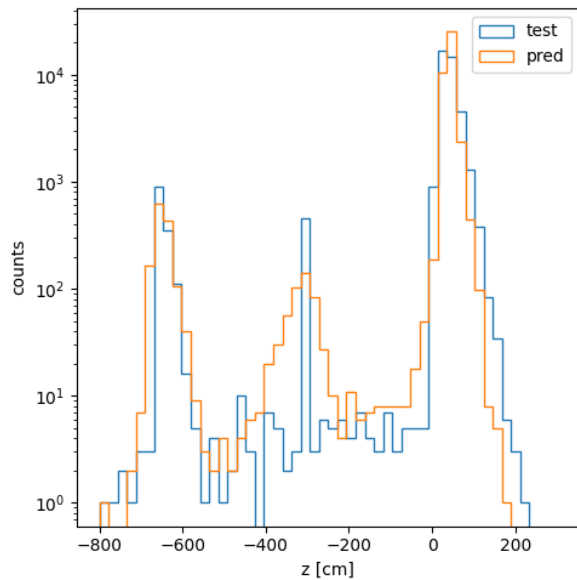


- Classification layer almost predict bins except for bin with `hot_id = 1, 3`, with classification score = 0.9907





■ v_{px} , v_{py} , v_{pz} has a good prediction.



■ With Tagging we can increase the vtz prediction.

