Regression analysis to determine ν p_z in $W \rightarrow \ell\nu$ decay

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Inputs

Lepton p_T, η, Φ
MET magnitude and Φ

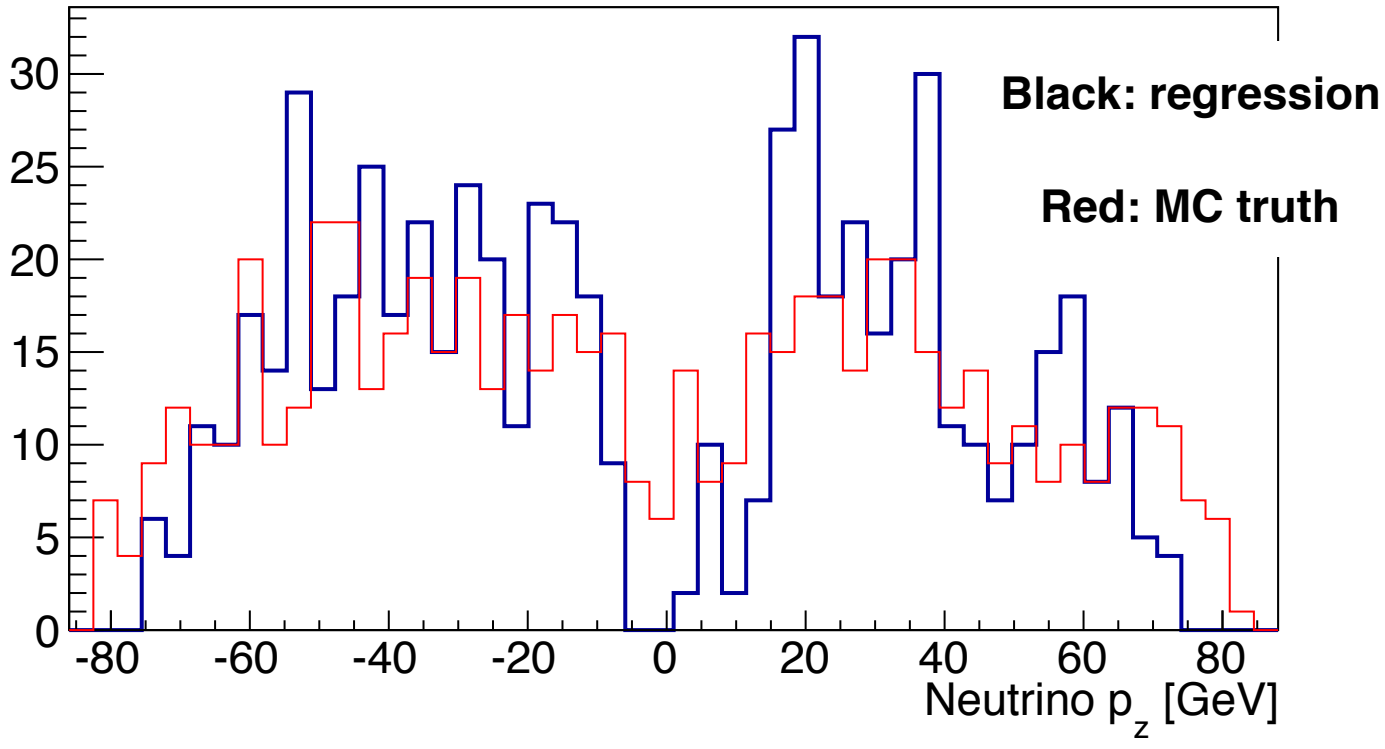
Leading jet p_T, η
Second jet p_T, η

Since our final state has two jets in addition to the leptonically decaying W boson

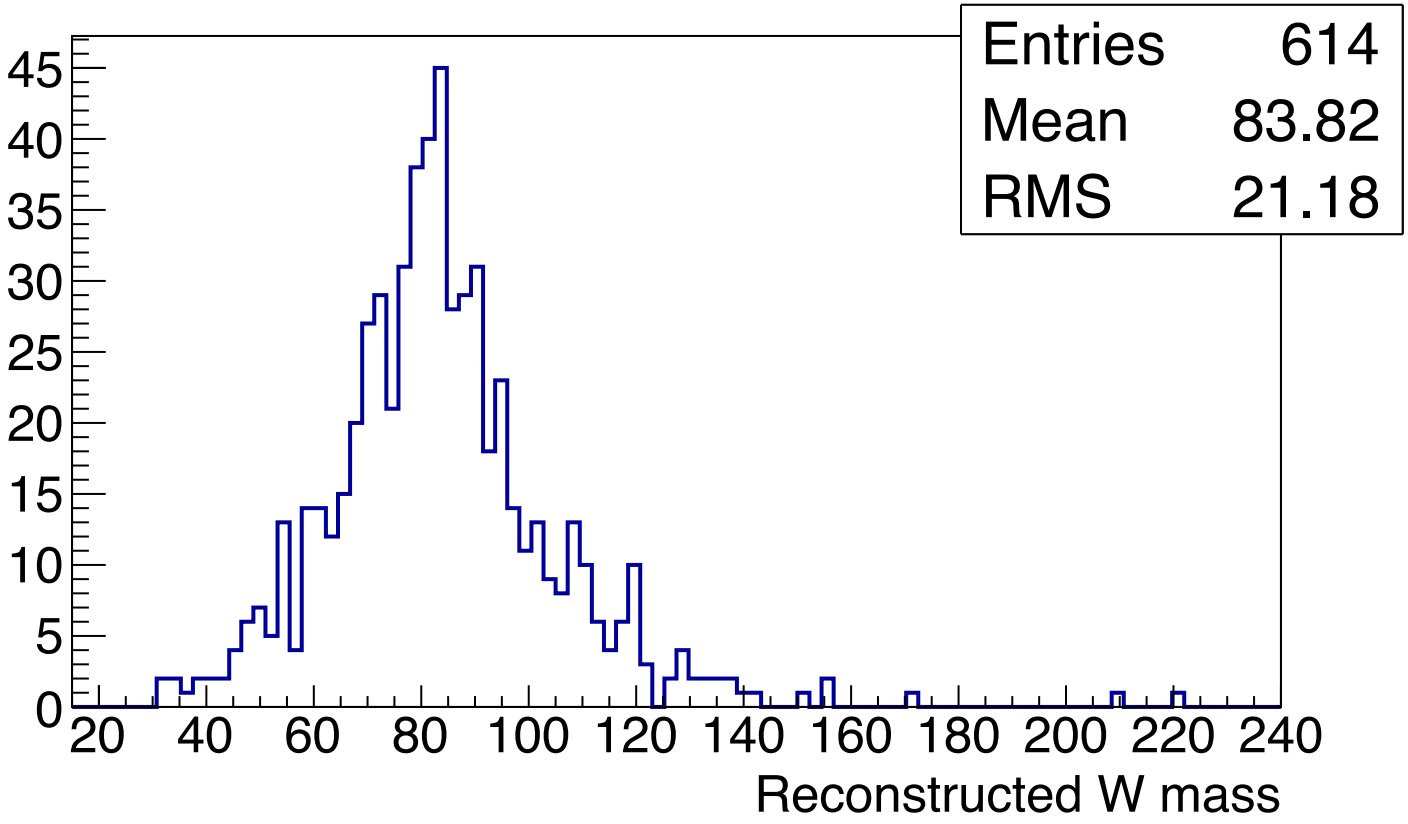
Target: generated neutrino p_z
Discriminant: Boosted Decision Tree

Output: ν p_Z

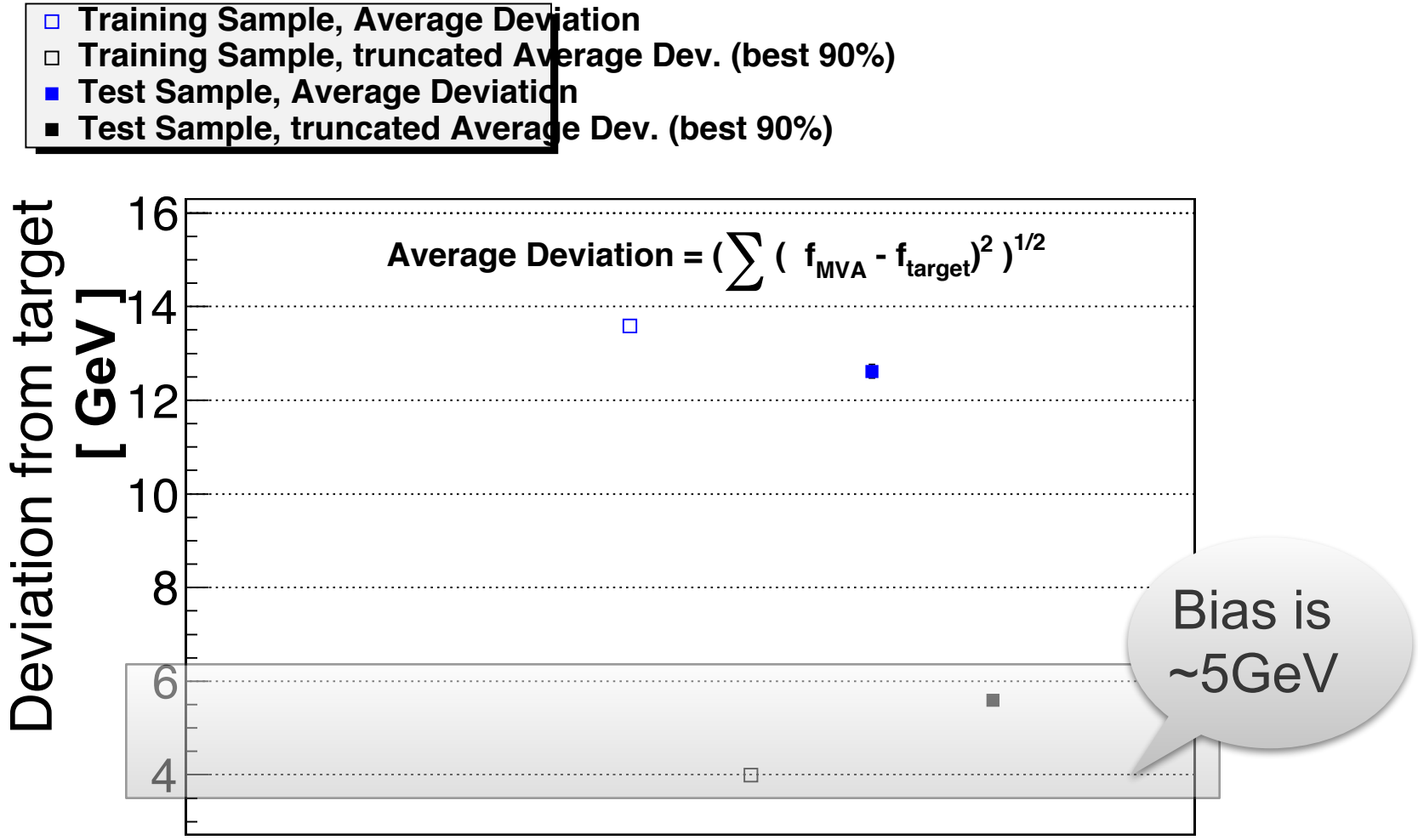
Tested and validated on H(500)→WW→lνjj sample



Reconstructed W mass using ν p_Z from regression



How accurate is our prediction ?



Reasonable given the resolution

Code and regression kernel

https://github.com/kalanand/NeutrinoPzRegression

Drop me a line if you have questions

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