Weekly Report

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ITk

- Developing IHEP ATLAS ITk Production Management Page

- Workflow management √

- Task assignment √

- Inventory check √

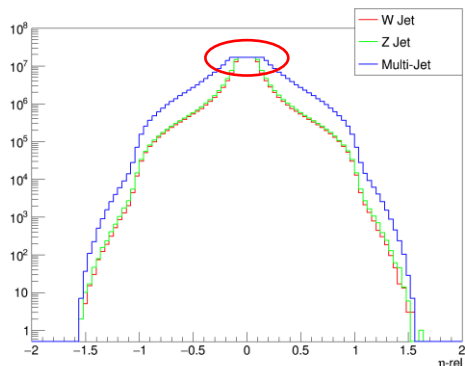- Will use MySQL to store data in the future with Shuiting's help (now I just write data to a .pkl file)
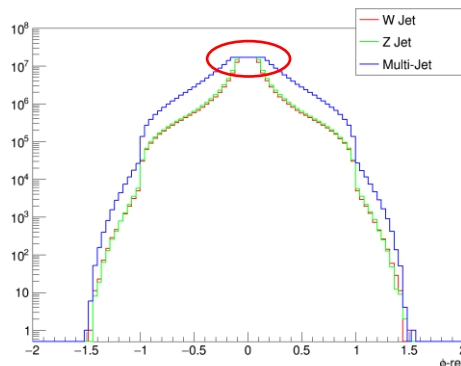
- …

Constituent based W/Z boson tagging

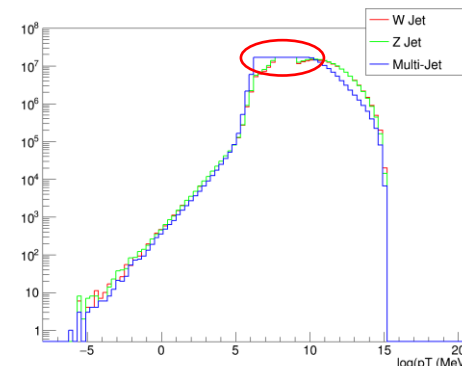- Distributions of the seven constituent-level quantities used as inputs to tagger

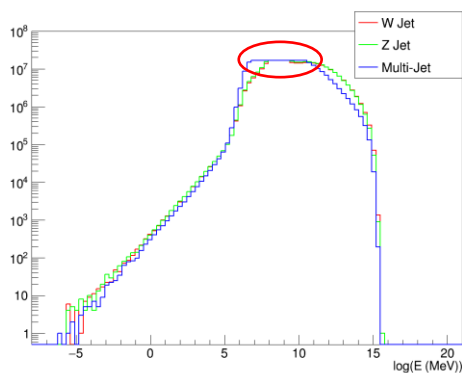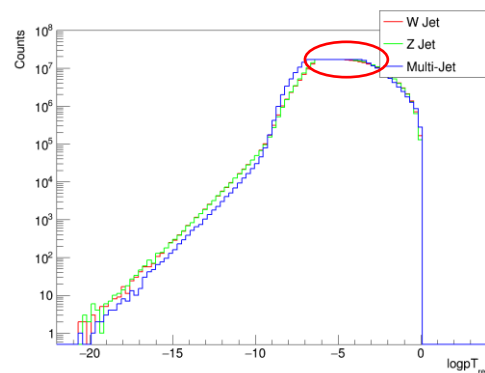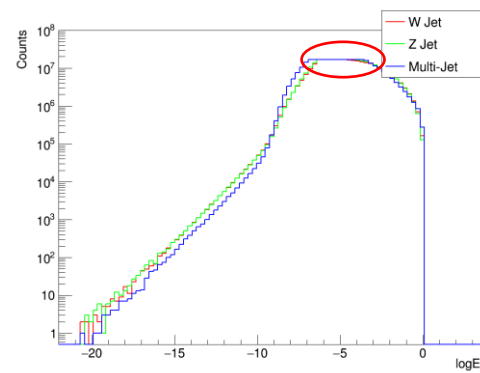Asked by people: flat-topped distribution, why?
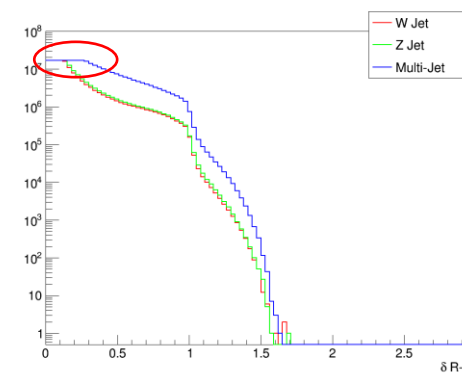

$\Delta\eta$

$\Delta\phi$

$\ln p_{\mathrm{T}}$

$\ln E$

$\ln \dfrac{p_{\mathrm{T}}}{\Sigma_{\mathrm{jet}}\, p_{\mathrm{T}}}$

$\ln \dfrac{E}{\Sigma_{\mathrm{jet}}\, E}$

ΔR

Constituent based W/Z boson tagging

- jet requirements

We thought it might be because of those cut

| Jet requirements	W jet requirements	Z jet requirements
Jet $\lvert\eta\rvert < 2.0$ Jet $p_{\mathrm{T,truth}} > 200$ GeV Number of constituents ≥ 2 Jet mass > 40 GeV	dR(truth jet, MC truth W) < 0.75 Ungroomed truth jet mass > 50 GeV Number ghost associated b-hadrons == 1 Truth jet $\sqrt{d_{12}} > 55.25\times\exp(-2.34 \times 10^{-3} \times$ Jet $p_{\mathrm{T,truth}})$	dR(truth jet, MC truth Z) < 0.75 Ungroomed truth jet mass > 50 GeV Truth jet $\sqrt{d_{12}} > 55.25\times\exp(-2.34 \times 10^{-3} \times$ Jet $p_{\mathrm{T,truth}})$

Constituent based W/Z boson tagging

- Distributions of the seven constituent-level quantities used as inputs to tagger

no cut (without any selection), but still…
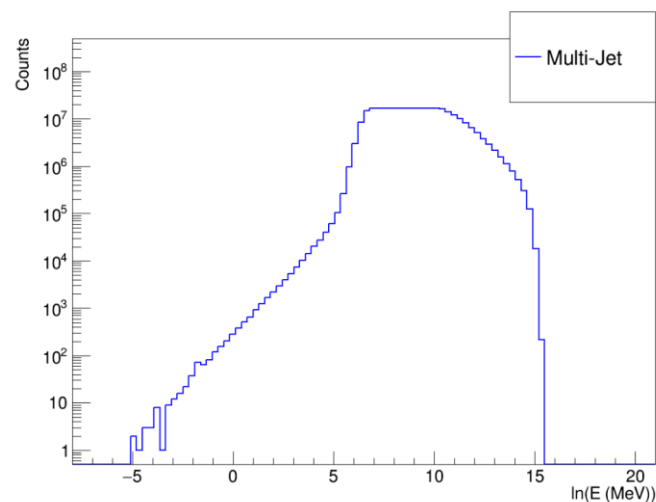
W, Z mixed (can't separate W,Z when no cut applied)

ln E
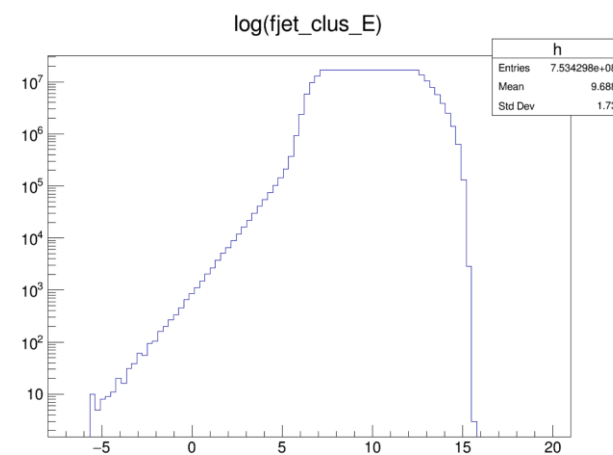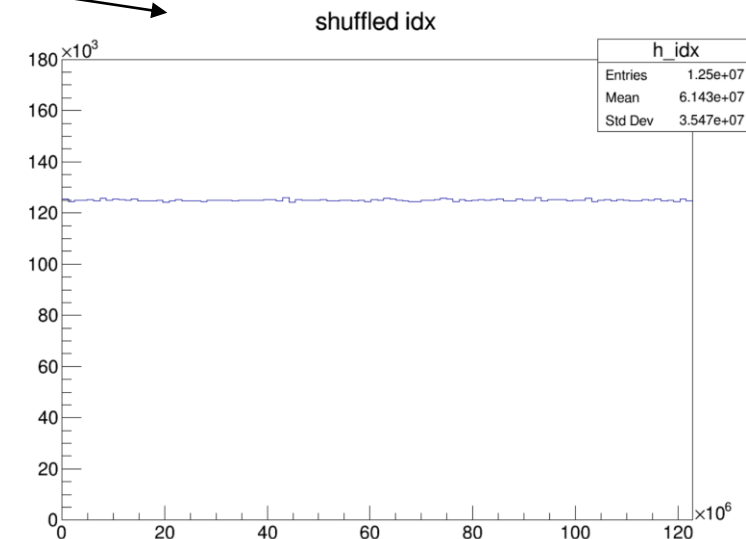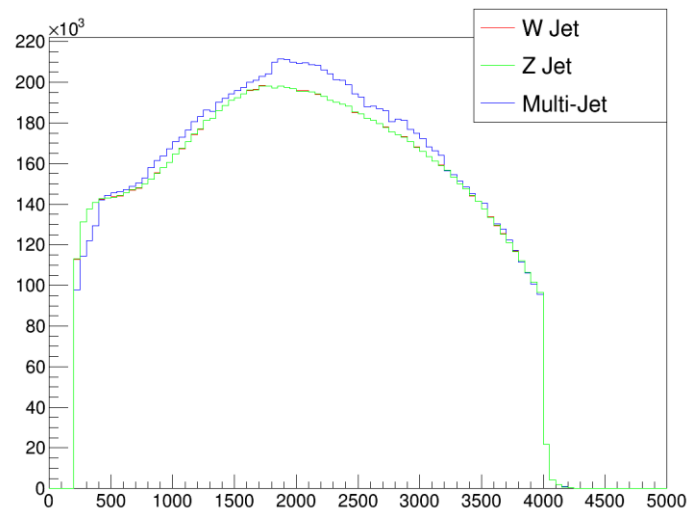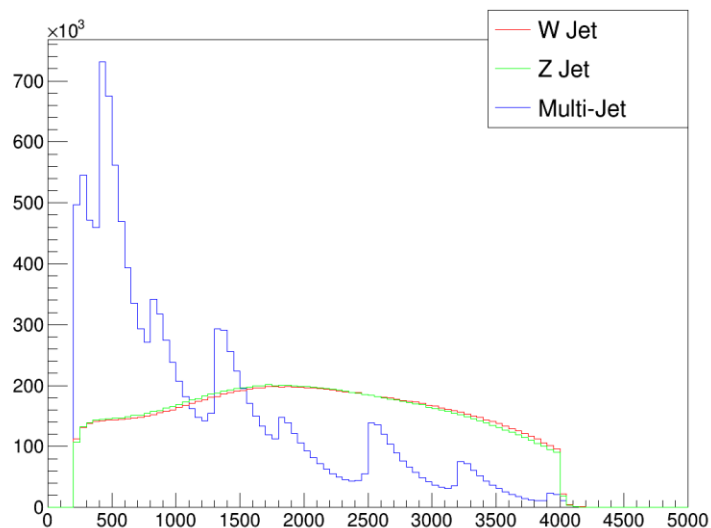

ln E

at least, not our problem

- Problem found

NOT **Result of biased sampling ?**

- Weights gained by using all sig(13M+) & bkg (1.2B+) events, then do the sampling to get 1:1 sig/bkg ratio (12.5M: 12.5M) and apply weights*sf as training weights.
- Won't affect the result much, but need to be improved.

Will try to do reweighting first and then do the sampling

Constituent based W/Z boson tagging

- Will try Z tagging and W vs Z classification this week

- Will try ParticleTransformer this week