UNFOLDING THE JET MASS IN Z + JETS EVENTS

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- A Measurement of normalized double differential jet production cross section in Z + Jet events :

$$\frac{1}{\frac{d\sigma}{dp_T}}\frac{d^2\sigma}{dp_T dm}(\frac{1}{GeV})$$

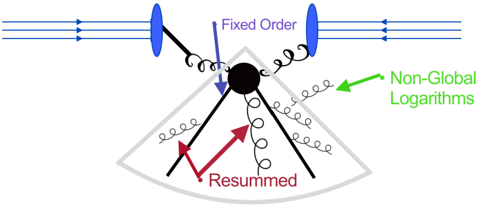
- We perform 2D unfolding:

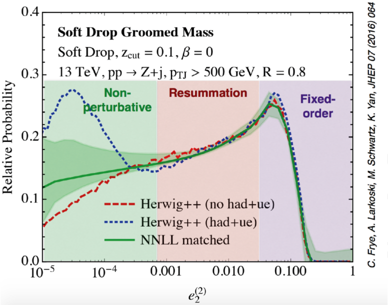
$$(p_T, [m_u||m_g])$$

- We compare the ungroomed and groomed jet masses (9 combinations of the soft-drop parameters)
- Today we show a preview of our preliminary results for 2017 data
- Plan to publish this summer with 2016/2017/2018 or some subset of that data

Motivation

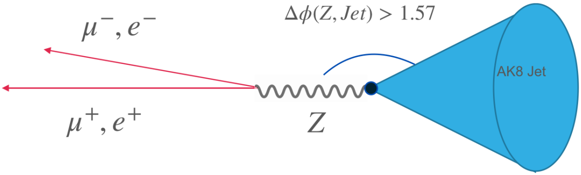
Jet Mass : A simple observable for testing QCD





- Understand evolution of the "jet" function in perturbative QCD
- Improve modeling of jets in Monte Carlo generators

Event Selection



Summary

- At least 1 Anti-Kt $R = 0.8$ Jet, $P_T > 200 GeV$, $|\eta| < 2.5$, $dR(Jet, Lepton) > 0.8$
- 2 opposite sign, same flavor leptons, $|\eta| < 2.4$
- Sum of the 2 leptons gives the Z candidate, $P_T > 90 GeV$, $d\phi(Z, Jet) > 1.57$

Event Selection

Muons

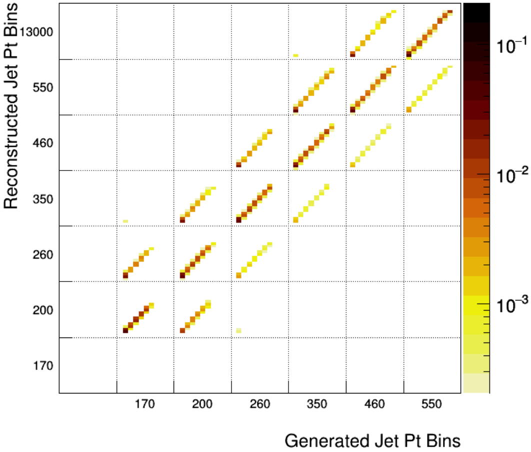
- ISO : PF relative Isolation $0.4 < 0.25$
- ID : Medium cut based ID
- Trigger : IsoMu27 $(P_T > 29GeV)$

Electrons

- ISO : None
- ID : Medium cut based ID
- Trigger : $Ele35_WPTight_GsfORPhoton200$ $(P_T > 37GeV)$

Response Matrix

Normalized by Reconstructed (Y axis) P_T bin



Tables and Figures

- Use `tabular` for basic tables — see Table 1, for example.
- You can upload a figure (JPEG, PNG or PDF) using the files menu.
- To include it in your document, use the `includegraphics` command (see the comment below in the source code).

Item	Quantity
Widgets	42
Gadgets	13

Table: An example table.

Readable Mathematics

Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n} \sum_i^n X_i$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

The End

Extra Stuff

Something I wanted to keep in backup because I thought it was cool.