

Updates: March 6

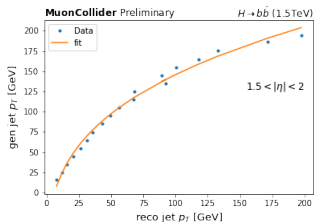
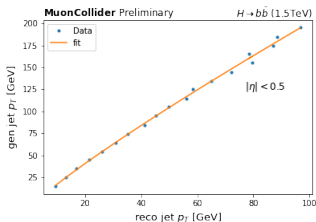
- Jet momentum correction applied.
- Working on jet reconstruction efficiency and resolution.

Jet momentum correction

To recover lost energy due to tight threshold of 2MeV in ECal.

1. Found a reco match in $\Delta R < 0.5$ for each gen jet.
2. The gen jets are divided into 5 η regions $[0, 2.5]$ and 19 p_T bins in $[20, 200]$ GeV.
3. For each interval, mean and std deviation of gen jet p_T calculated.
4. Distribution of mean gen p_T vs mean reco p_T fitted using `scipy.curve_fit()`

Jet momentum correction

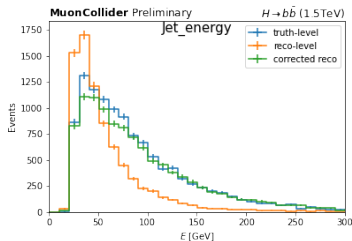
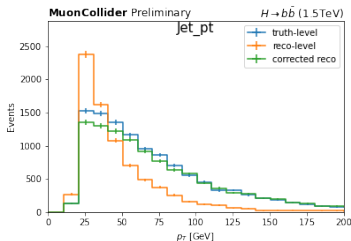


Derive scale factors using the fitted function for each reco jet and apply to each component of jet 4-momentum:

$$sf = \frac{p_T^{\text{corrected}}}{p_T^{\text{reco}}}$$

Jets after correction

Jet p_t and E distributions at generator level and reconstruction level, before and after correction.



- Working on reconstruction efficiency and resolution plots.

Acceptance Efficiency

$$\epsilon = \frac{\#events(p_T^j > p_T^{cut} \& |\cos\theta_j| < |\cos\theta_{cut}|)}{\#events(p_T^j > p_T^{cut})}$$

where each event has $N_j \geq 2$

p_T^{cut}	$ \cos\theta_{cut} $	$\epsilon(\text{truth-level})$	$\epsilon(\text{corrected reco w/o BIB})$
20	-	8069/8069 (100%)	6686/8069 (83%)
20	0.8	3622/8069 (45%)	3260/8069 (40%)
20	0.85	4272/8069 (53%)	3816/8069 (47%)
20	0.9	5125/8069 (64%)	4530/8069 (56%)