

HCALIN - DeScoping studies on JES/JER

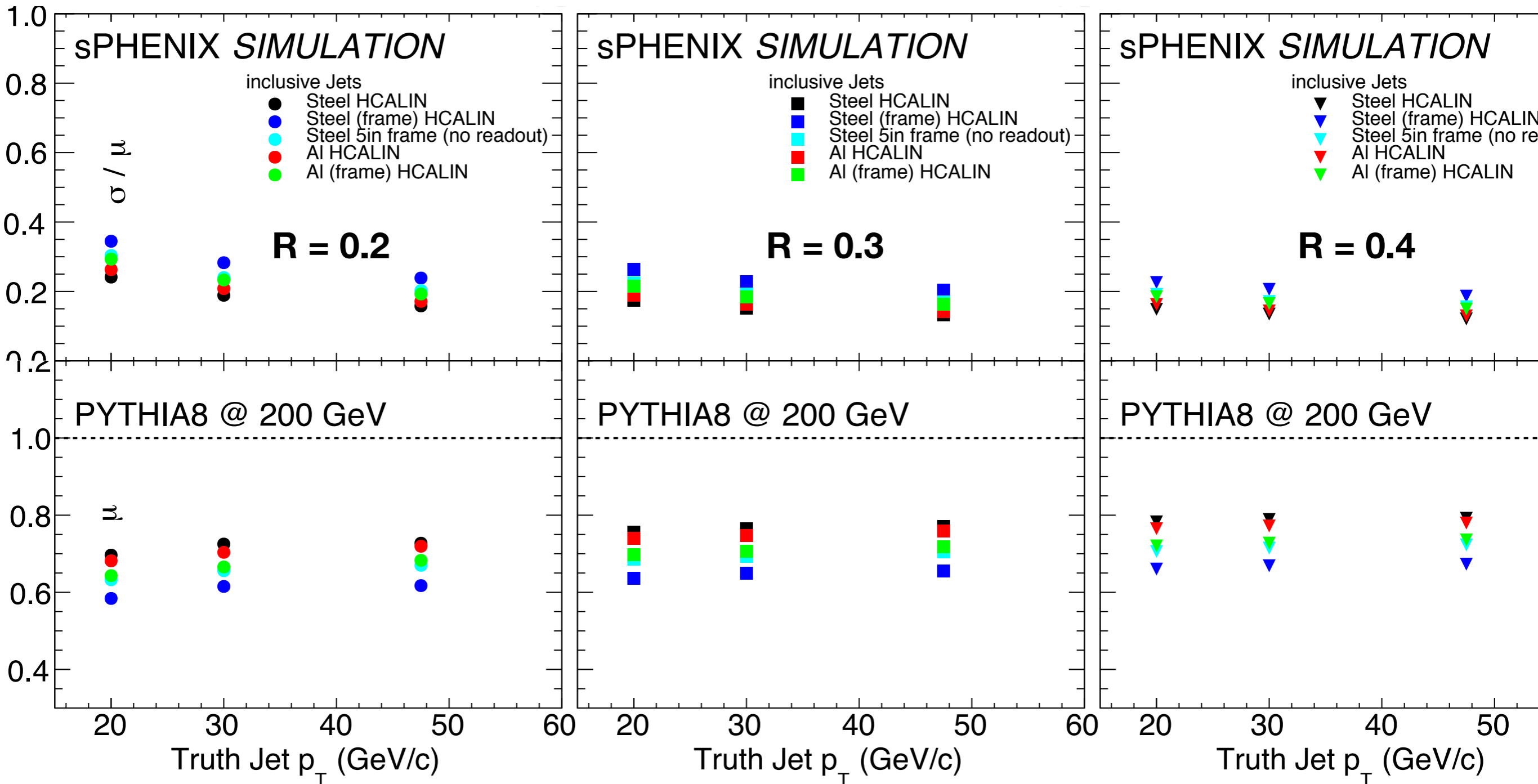
Studies on the Jet Flavor and detector level corrections

Raghav Kunnawalkam Elayavalli
(Rutgers University)

for the Jet TG
Oct 3rd 2017

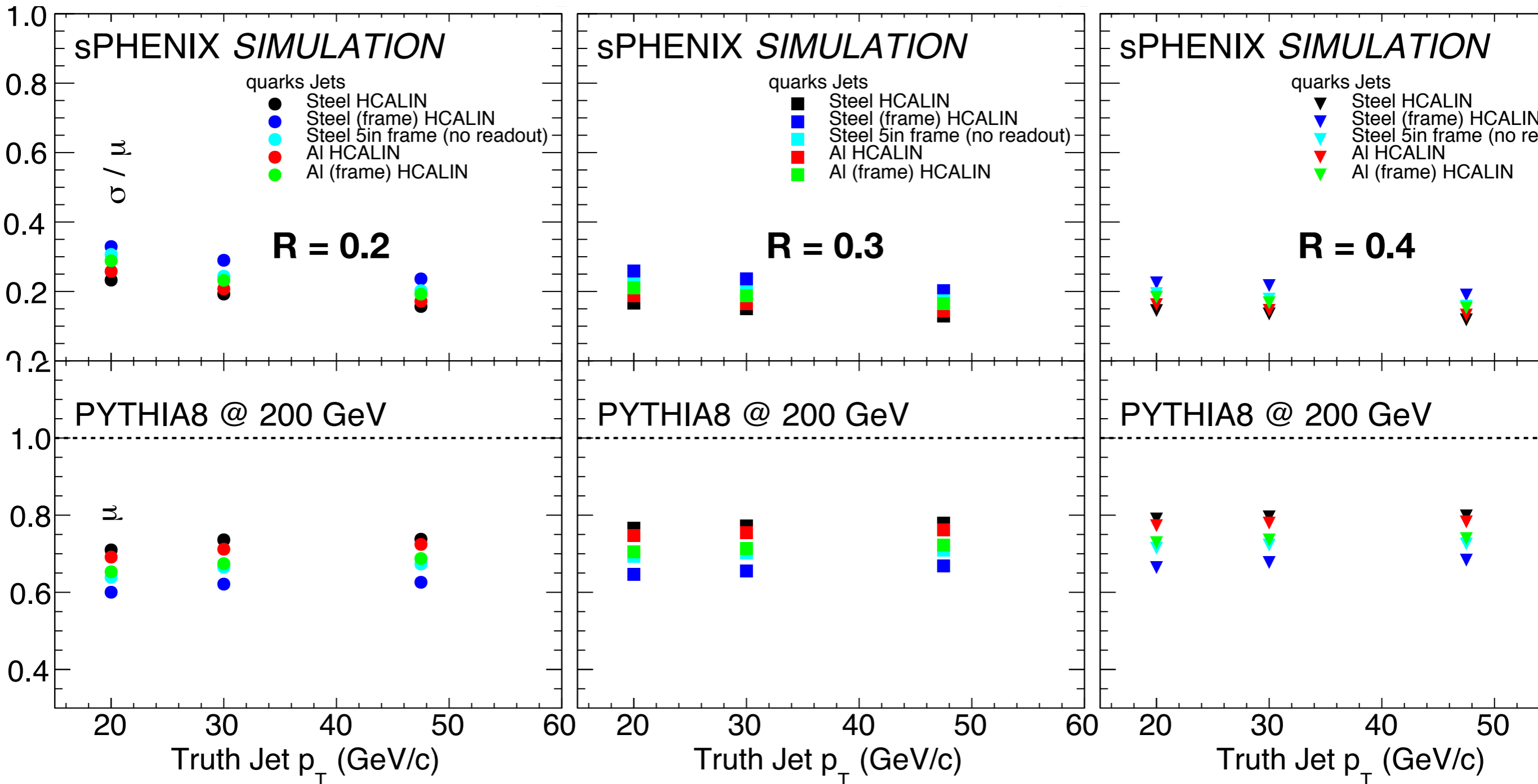
Inclusive Jets

- Raw detector response - R = 0.2 (left), 0.3 (center) and 0.4(right)
- Steel 5in frame very similar to Al frame. Steel HCALIN w/o readout the worst



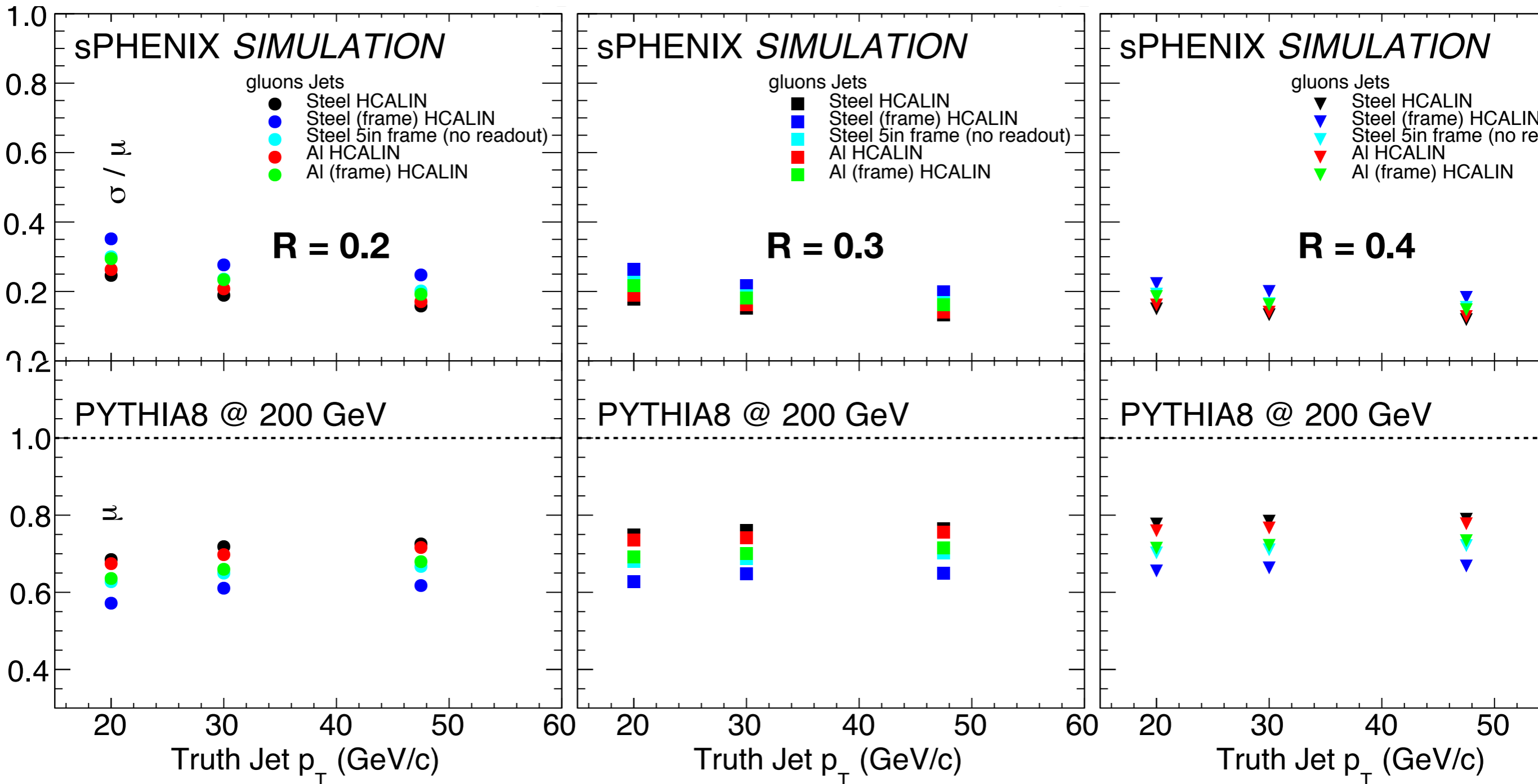
Quark Jets

- Jets selected as Quark jets if $\Delta R(\text{Jet}, \text{initial parton}) < \text{Jet } R$
- high $p_T (> 40 \text{ GeV})$ similar to Inclusive Jets



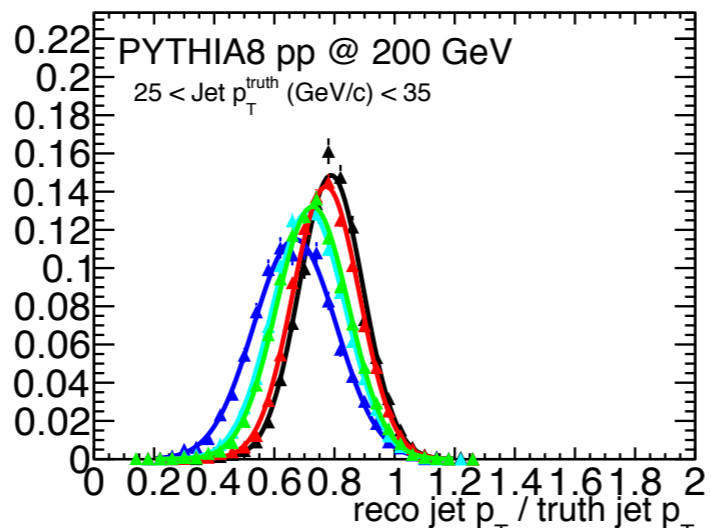
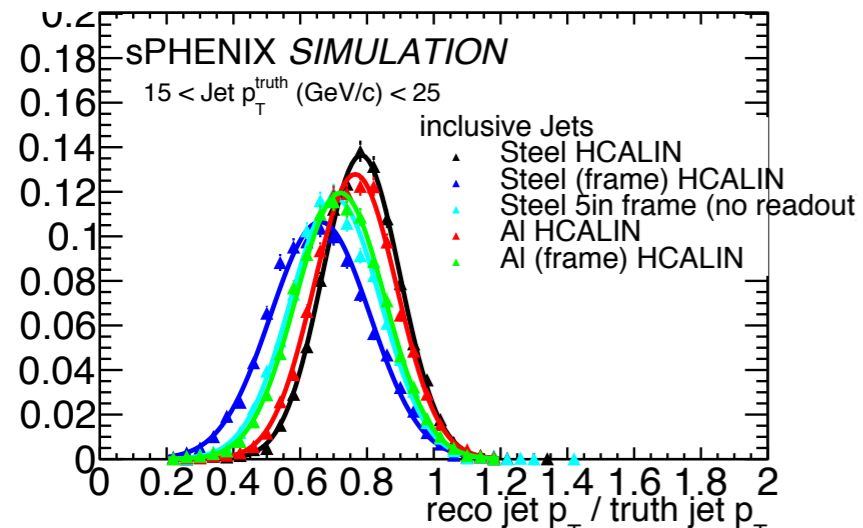
Gluon Jets

- Similar selection criteria for gluon jets
- Mostly gluons at low p_T .

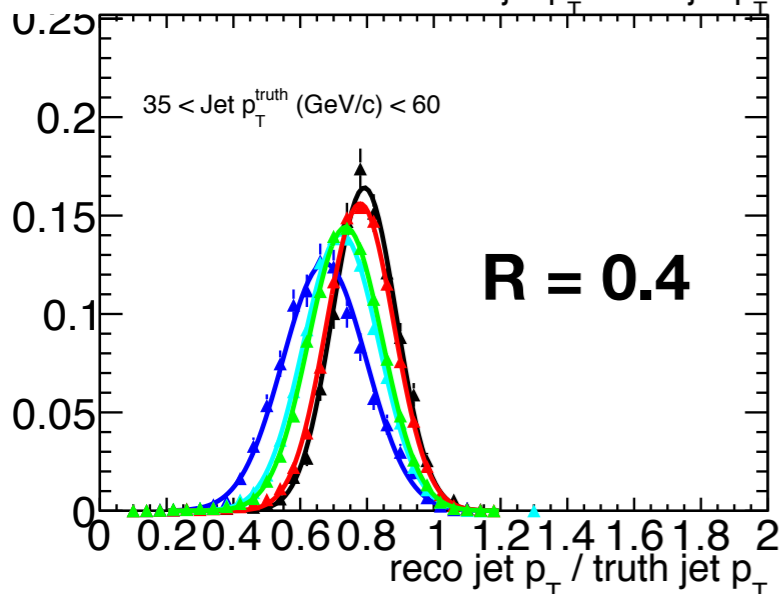


Rudimentary Jet Energy correction (JEC) for a single ETA bin ($|\eta| < 0.6$)

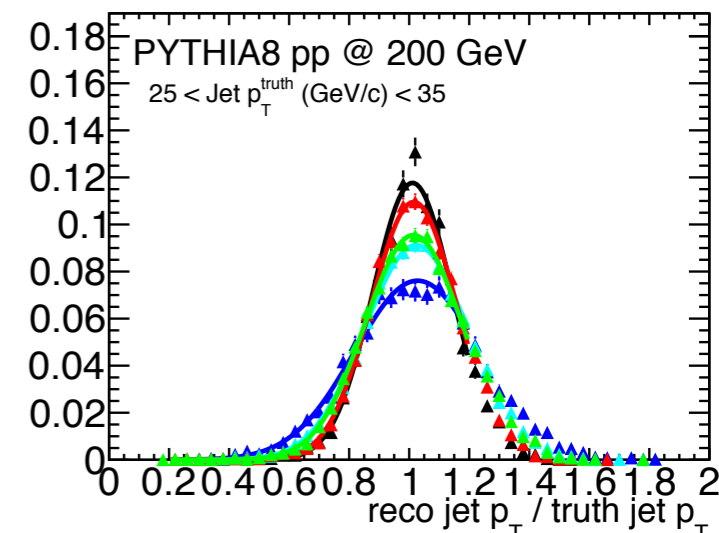
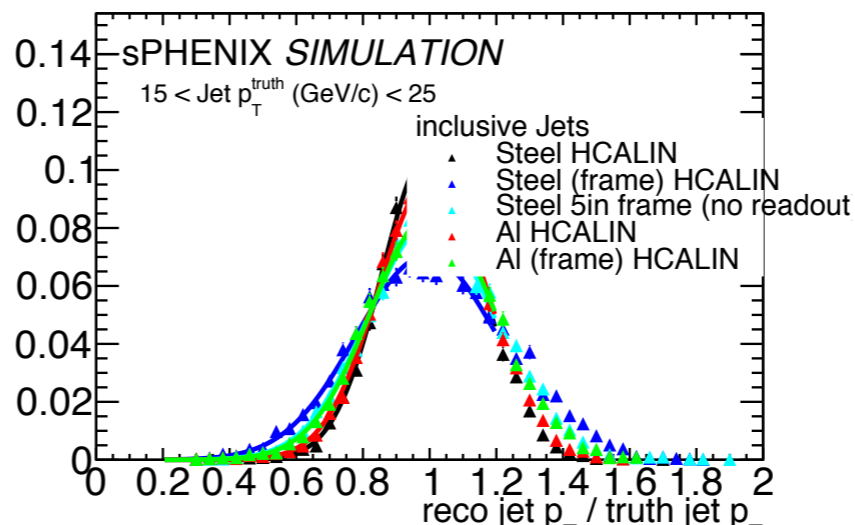
JEC - Detector level correction



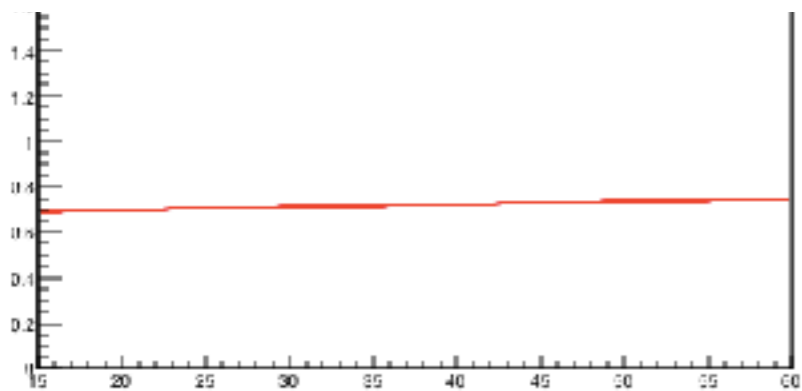
Raw response



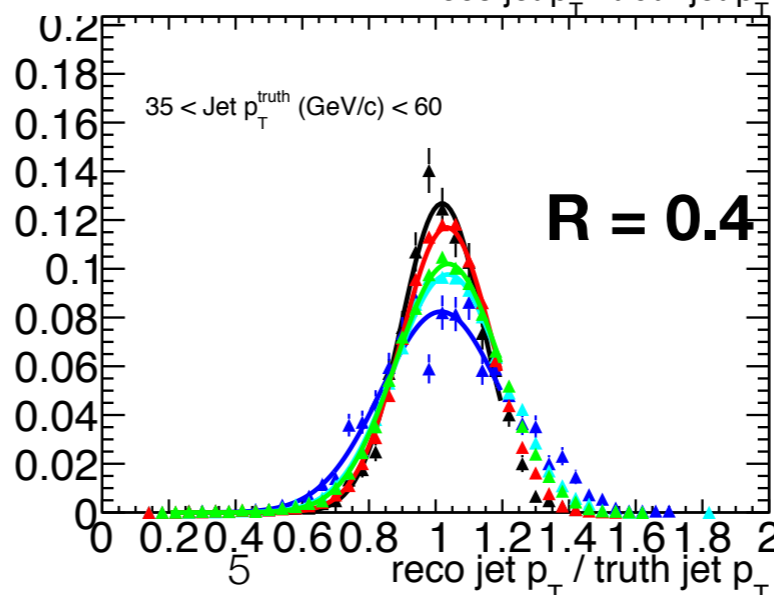
w/ JEC Applied



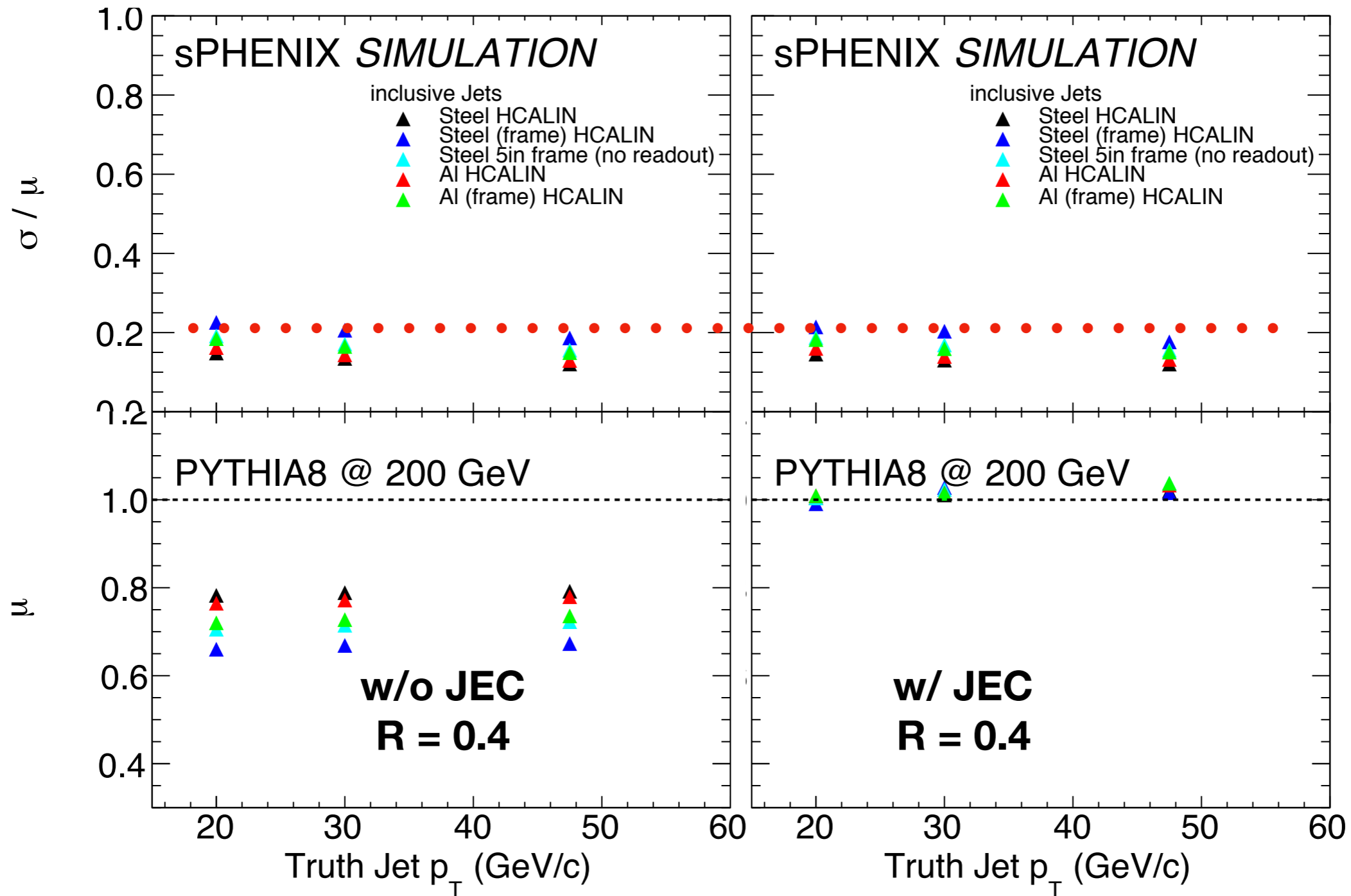
JEC : $\text{Exp}([0] + [1]*p_T)$
Derived for individual scenario
and for each jet radii



Uncorrected jet p_T

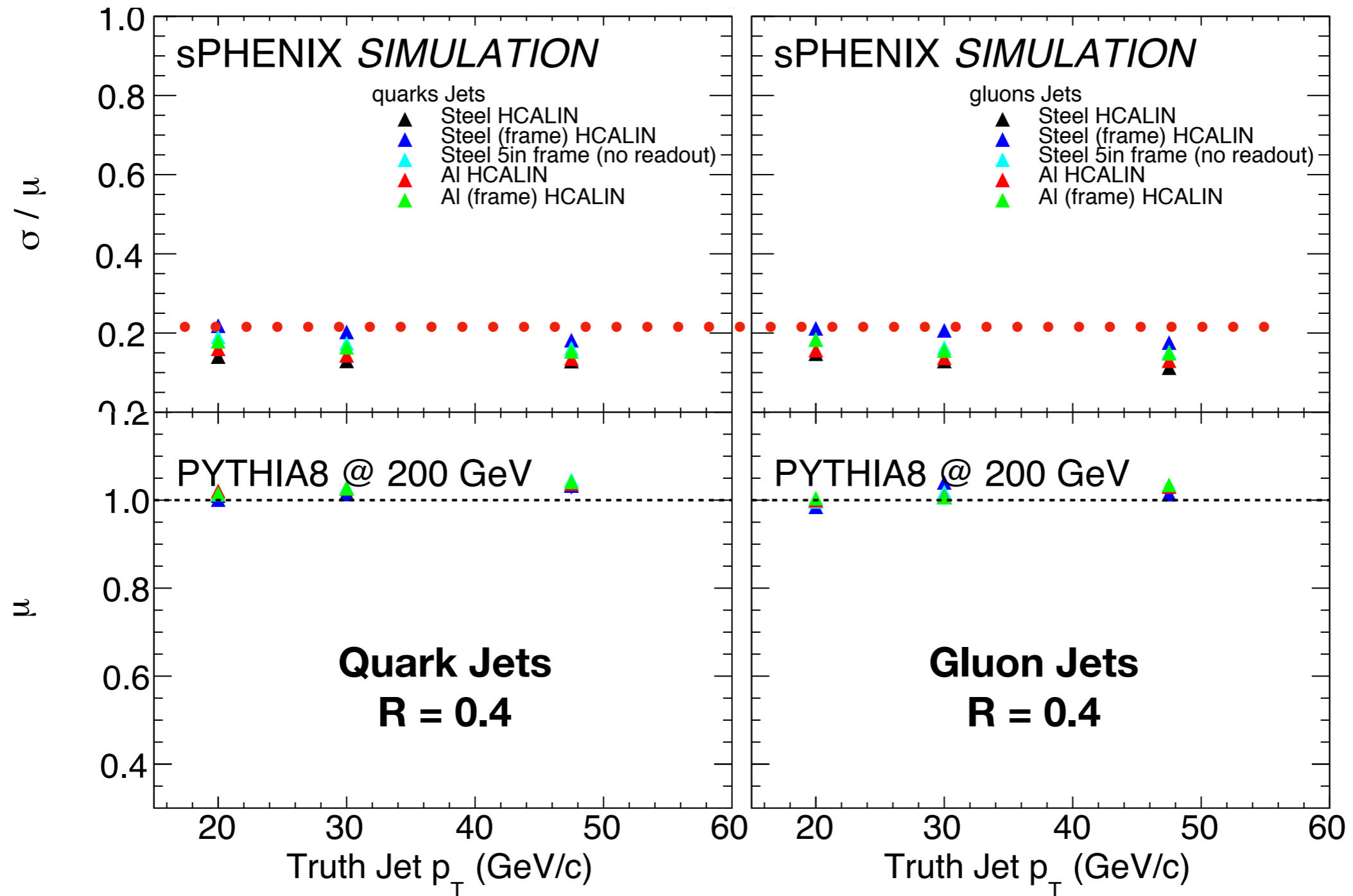


Applying JEC (Simple Fits)



- JER still worse after applying JEC
- 20% in the resolution leads to large uncertainties during unfolding

Quarks vs Gluons w/ JEC



- Quark and Gluon suffer similar losses in the resolution after correcting for detector response

backup