

HCALIN - DeScoping studies on JES/JER

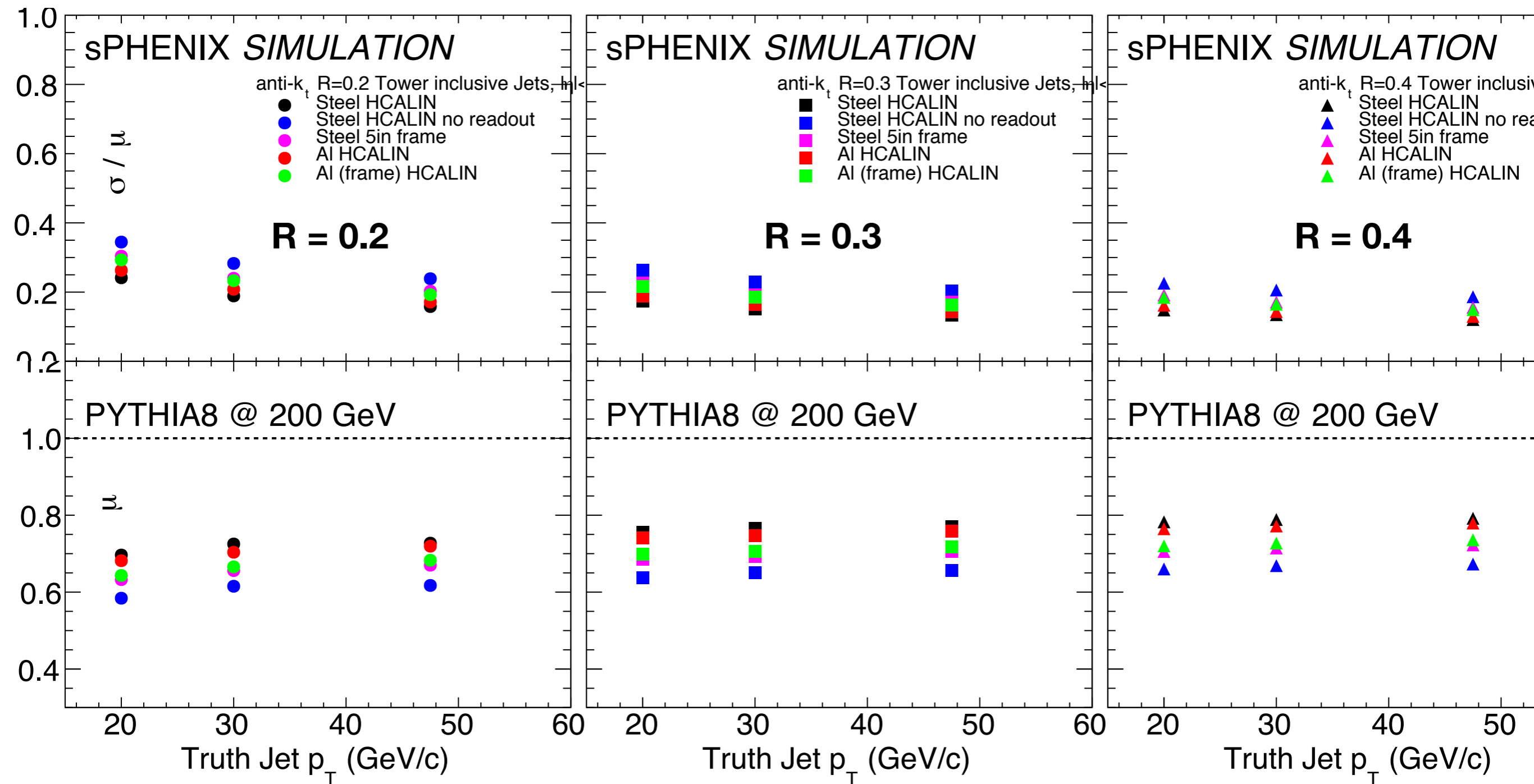
Studies on the Jet Flavor and detector level corrections

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for the Jet TG
Oct 3rd 2017

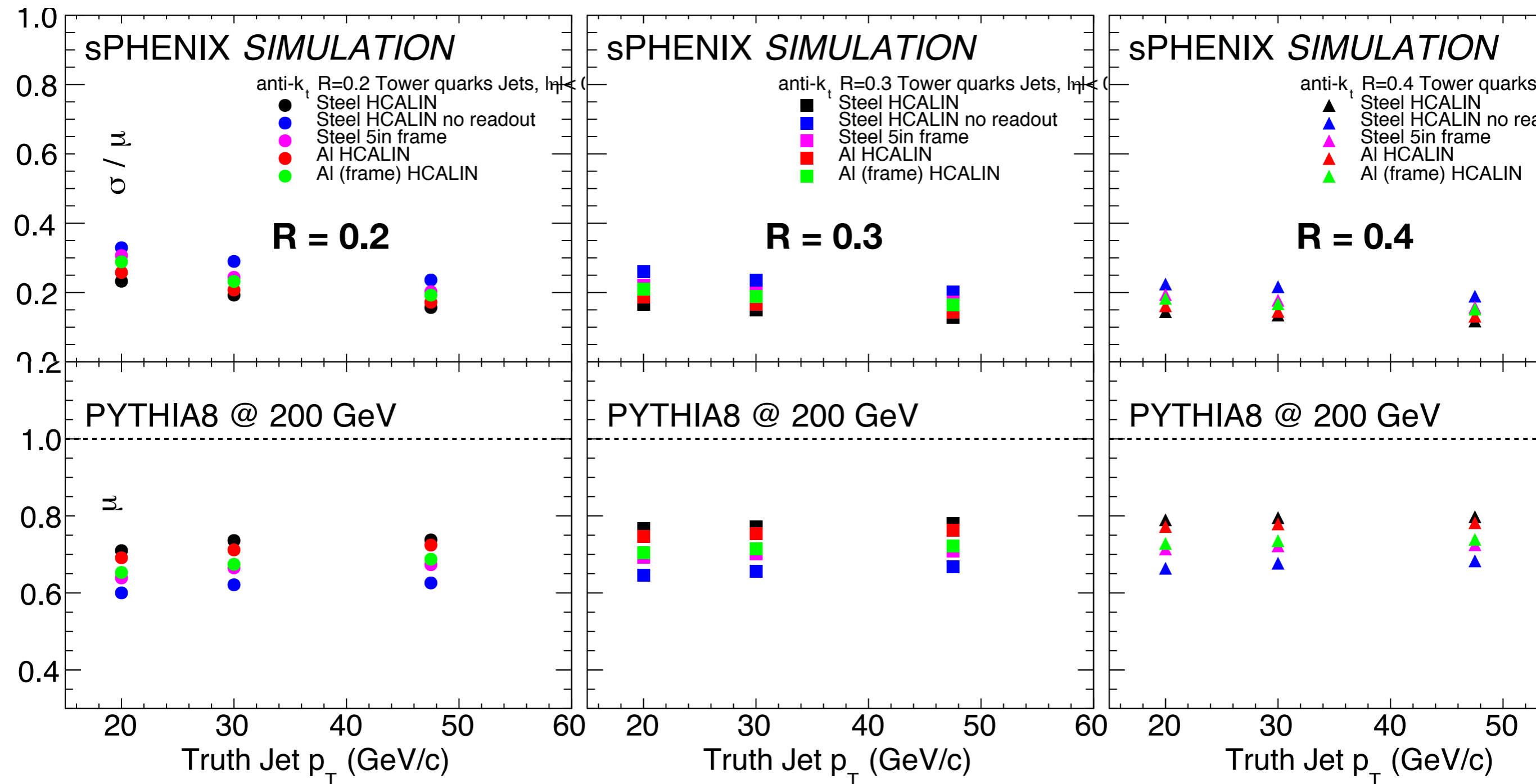
Inclusive Jets

- 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



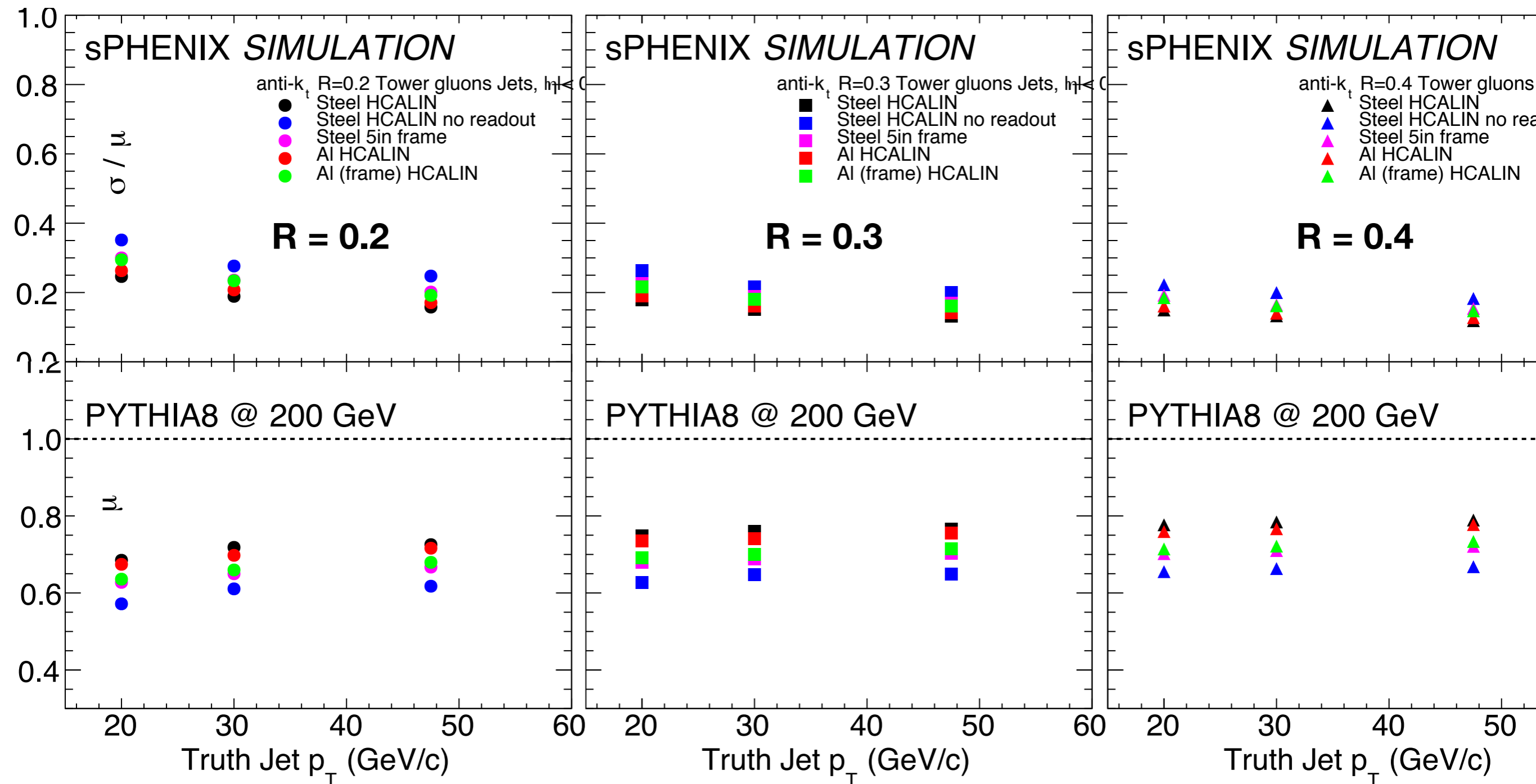
Quark Jets

- 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



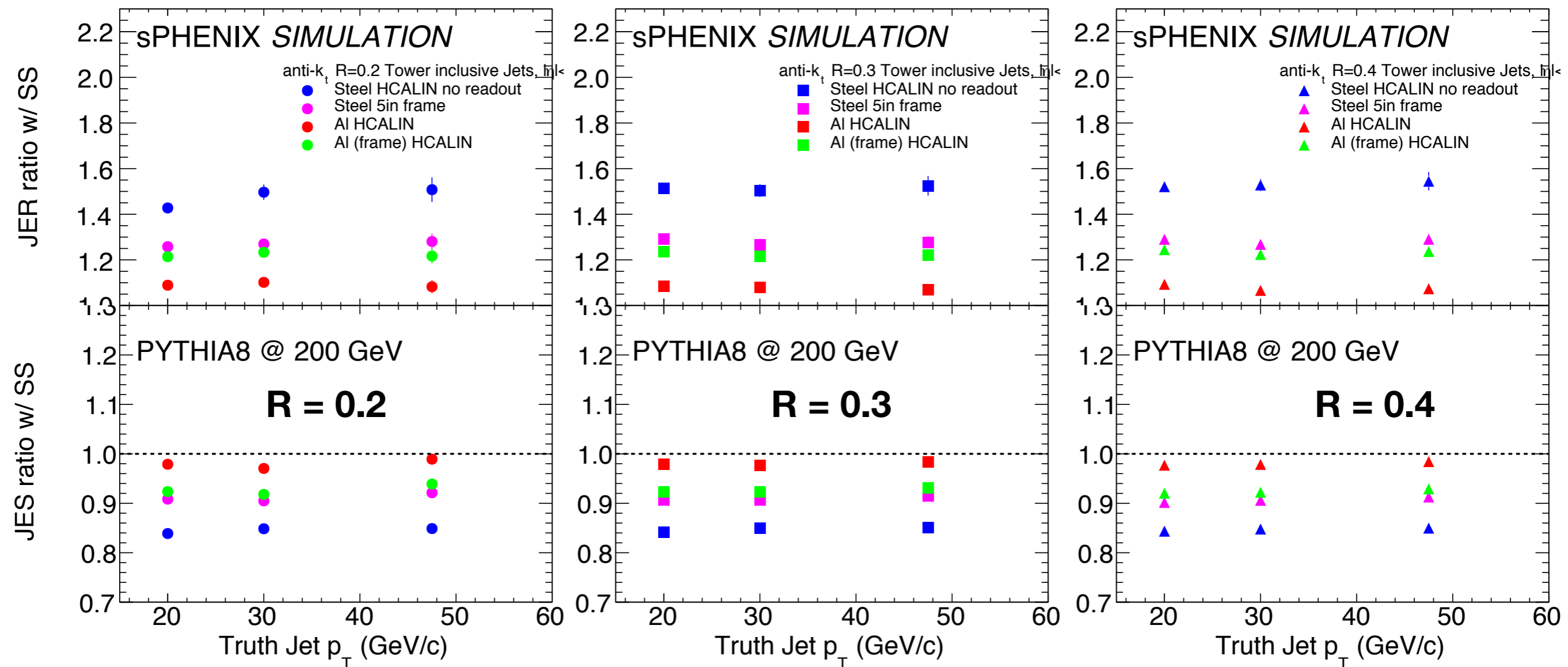
Gluon Jets

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



Ratios of JES/JER w/ original Steel HCALIN

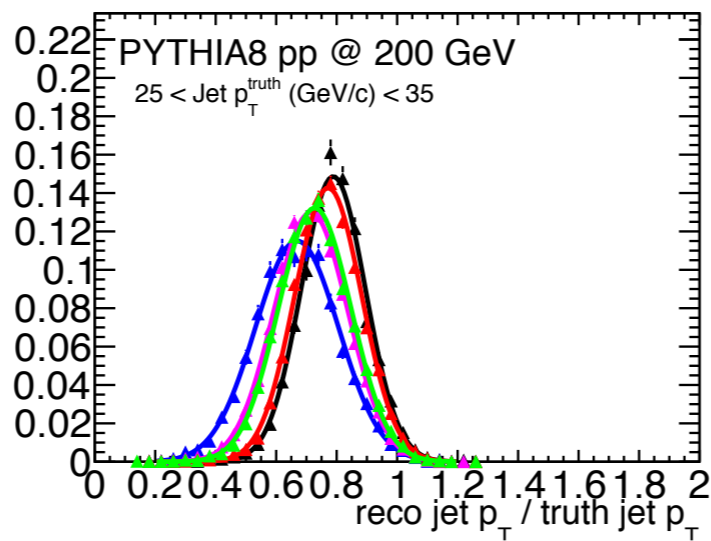
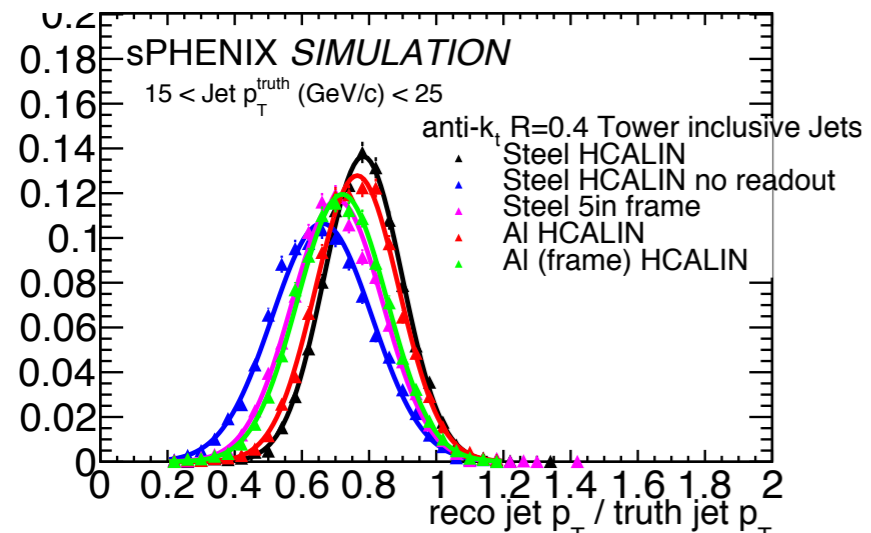
Top Panels: Ratio of the jet energy resolution for different scenario with steel HCALIN



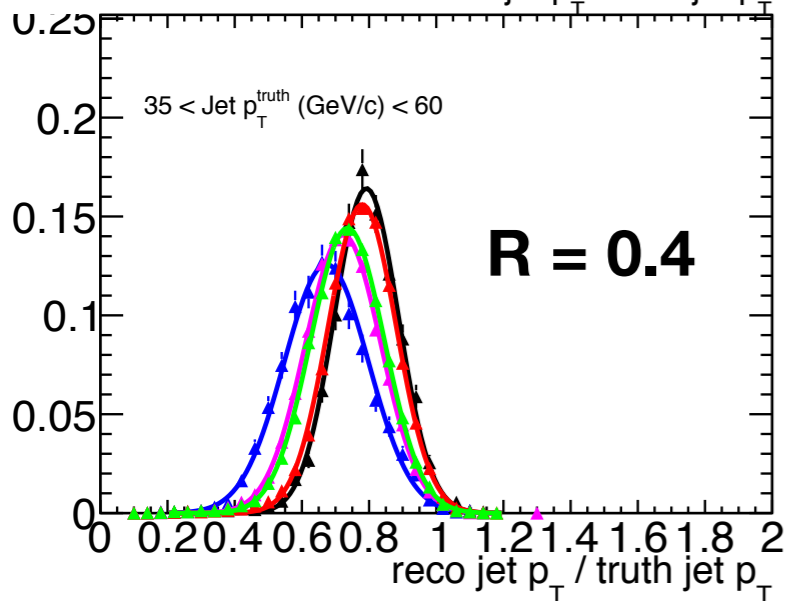
Bottom Panels: Ratio of the jet Energy scale for different scenario with steel HCALIN

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

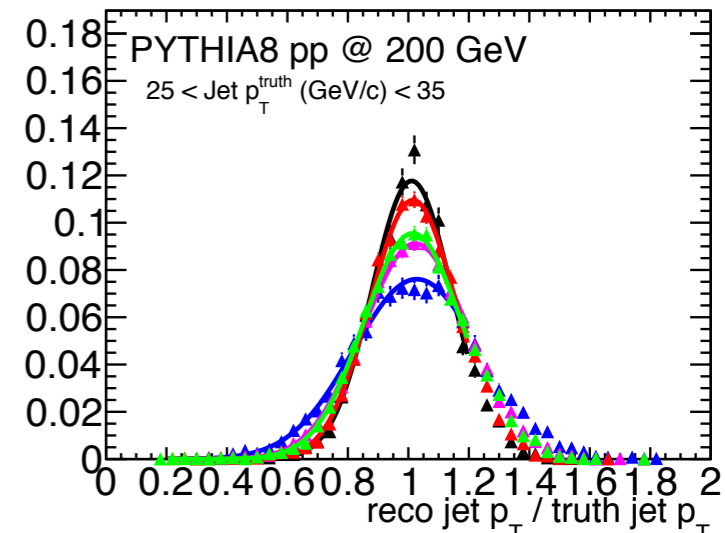
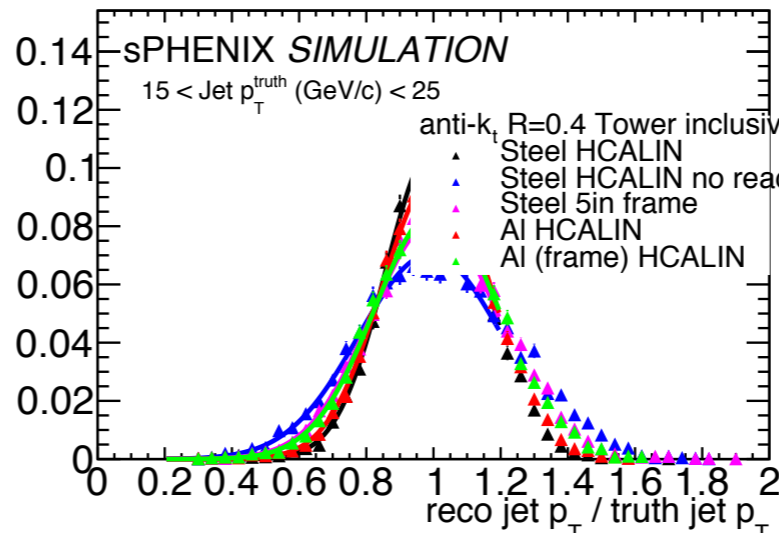
JEC - Detector level correction



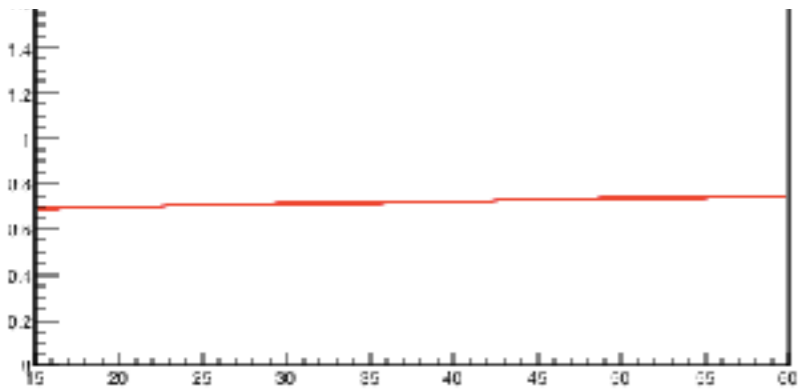
Raw response



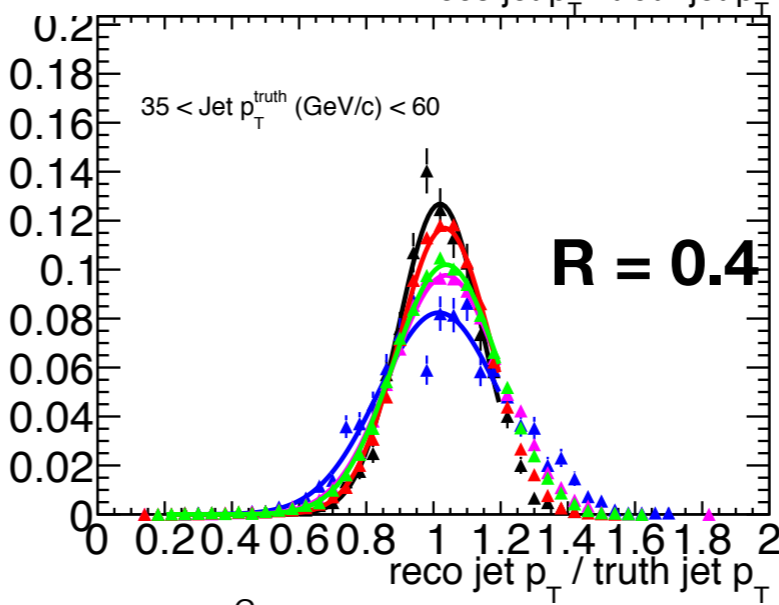
w/ JEC Applied



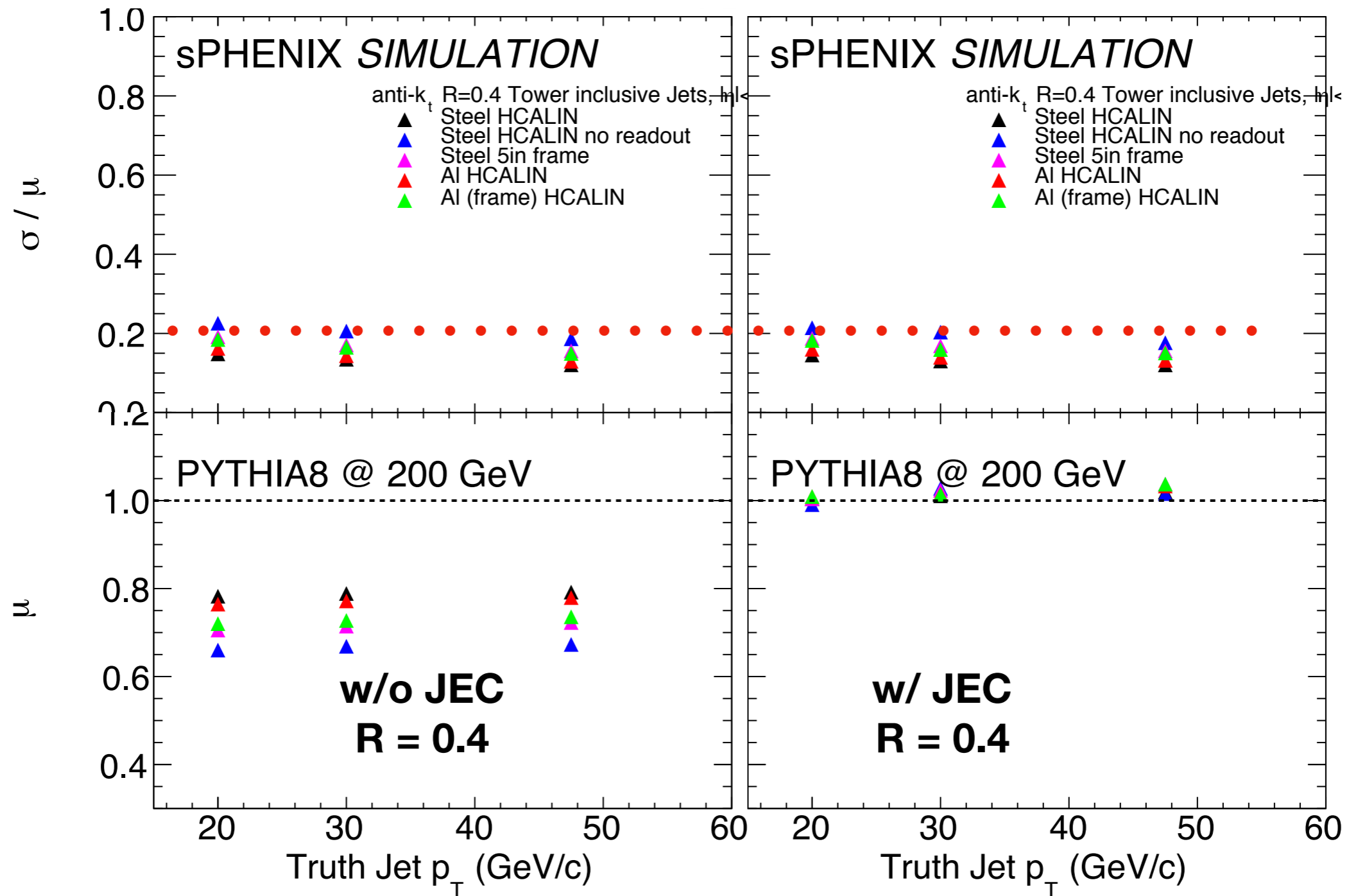
JEC : $\text{Exp}([0] + [1] \cdot p_T)$
Derived for individual scenario
and for each jet radii



Uncorrected jet pT

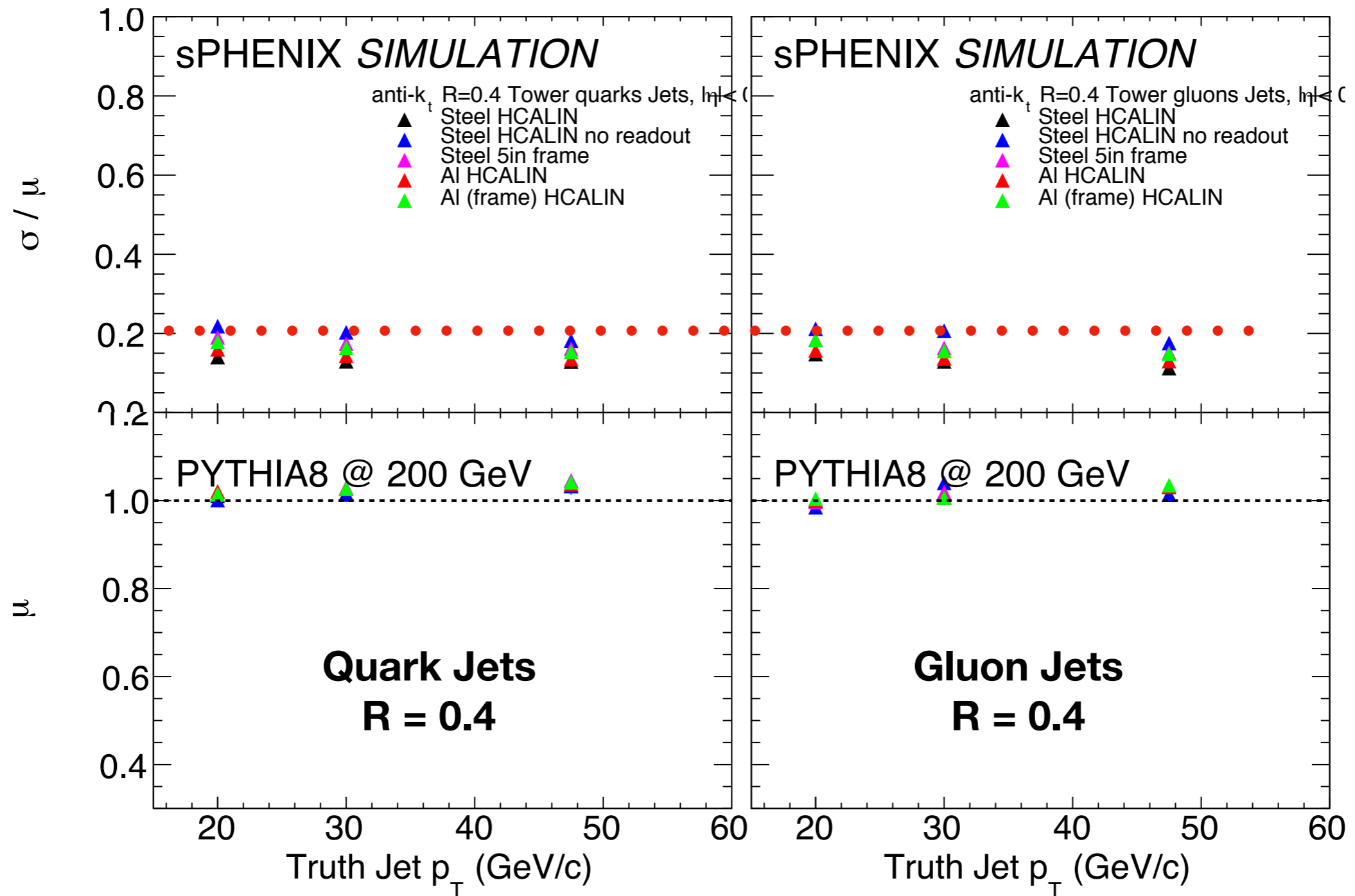


Applying JEC (Simple Fits)



- 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

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