Input variables

Constituent-based

DeParT and ParT

Constituent Interaction Variables
$\log \Delta = \log \sqrt{(\eta^a - \eta^b)^2 + (\phi^a - \phi^b)^2}$
$\log k_T = \log (\min (p_T^a, p_T^b)\Delta)$
$z = \min (p_T^a, p_T^b)/(p_T^a + p_T^b)$
$\log m^2 = \log (p^{\mu,a} + p^{\mu,b})^2$

Constituent Variables
$\Delta\eta = \eta - \eta^{\text{jet}}$
$\Delta\phi = \phi - \phi^{\text{jet}}$
$\Delta R = \sqrt{\Delta\eta^2 + \Delta\phi^2}$
$\log p_T$
$\log E$
$\log \frac{p_T}{p_T^{\text{jet}}}$
$\log \frac{E}{E^{\text{jet}}}$
m

Forward

$\log \Delta_{x,y}^{HGTD}$

ΔPhi^{HGTD}

*flat distribution not understood

Highlevel variables

FC Network
Highway Network

EMFrac + Jet pT
Jet width
TrackWidthPt1000
NumChargedPFOWidthPt1000
chf

Forward

+ jet_HGTD_n

FC Network

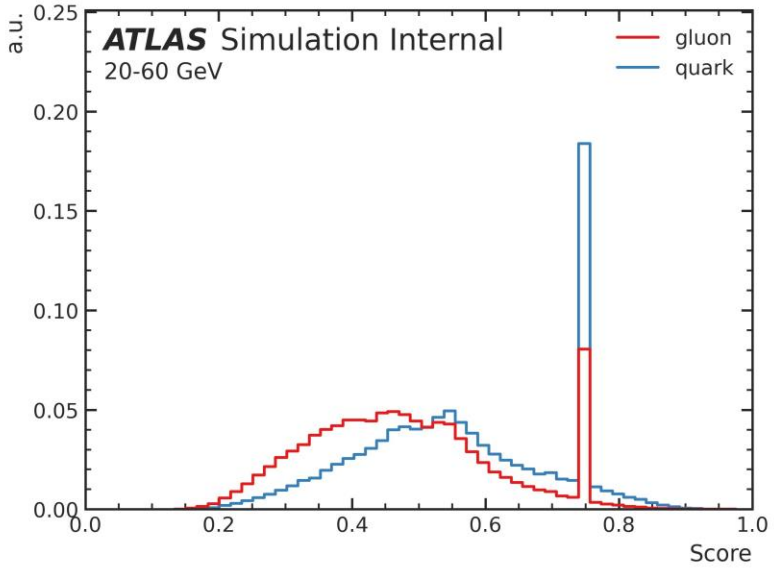
$N_{\text{PF0}} = \sum_{\text{PFO}\in\text{jet}}$

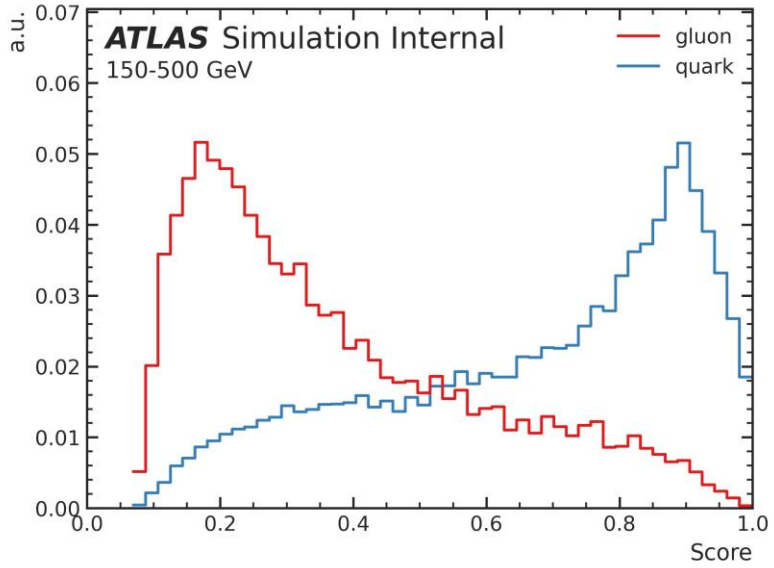
+ Jet pT

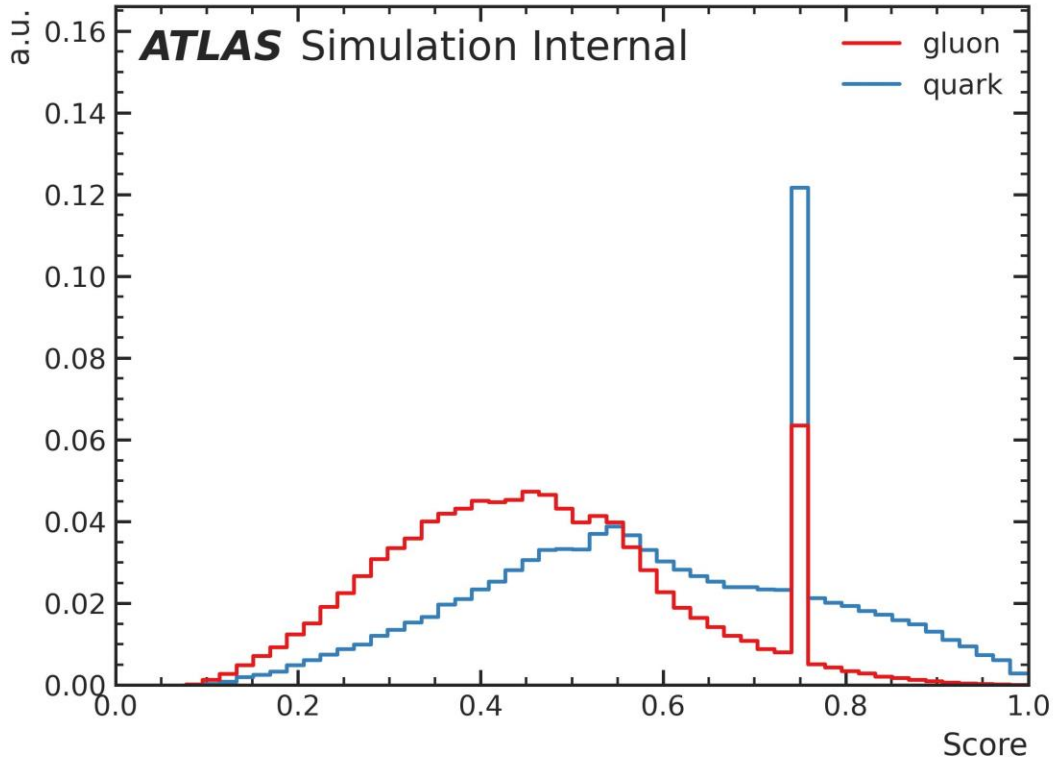
$C1^{\beta=0.2} = \frac{\sum_{i,j\in jet}^{i\neq j} p_{T,i} p_{T,j} (\Delta R_{i,j})^{\beta=0.2}}{(\sum_{i,j\in jet} p_T^{PFO})^2}$

$w^{PFO} = \frac{\sum_{\text{PFO}\in\text{jet}} p_T^{PFO} \cdot \Delta R_{PFO,jet}}{\sum_{\text{PFO}\in\text{jet}} p_T^{PFO}}$

Low level. Strange pick. Without HGTD variables

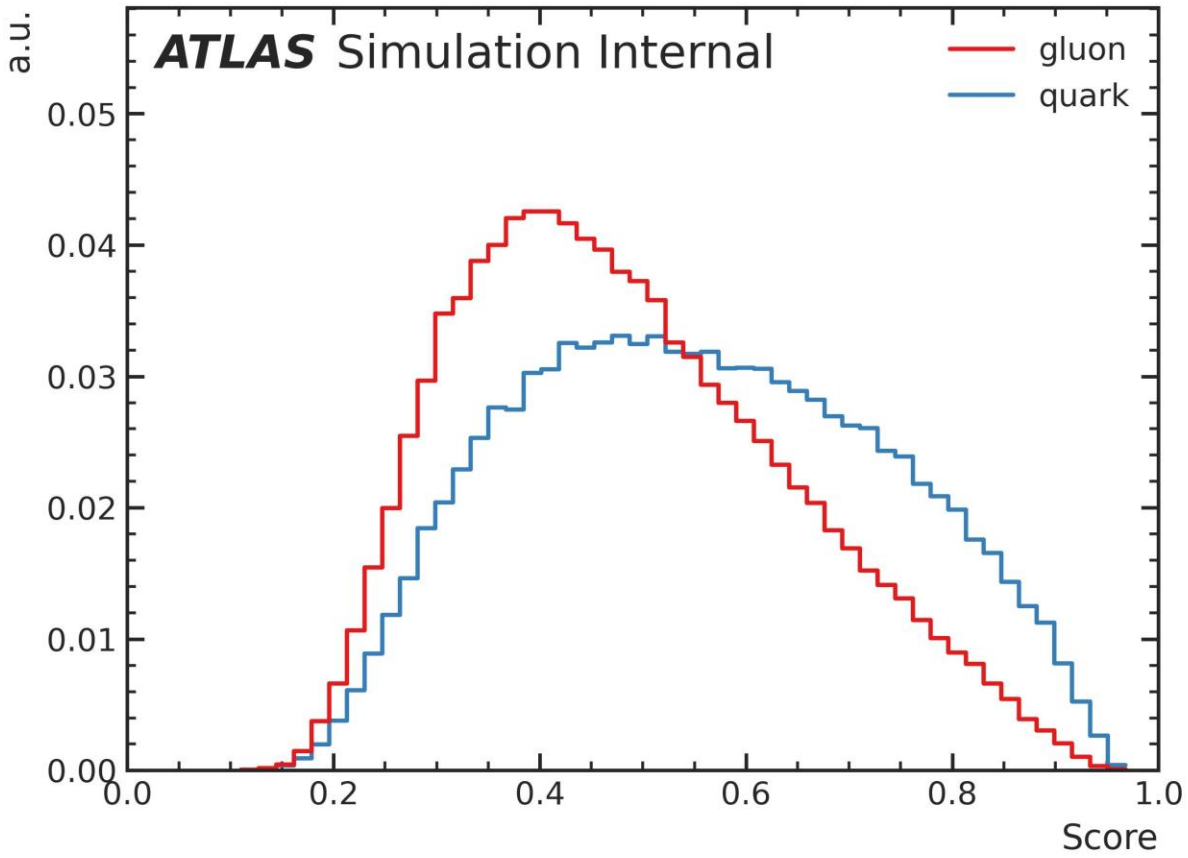




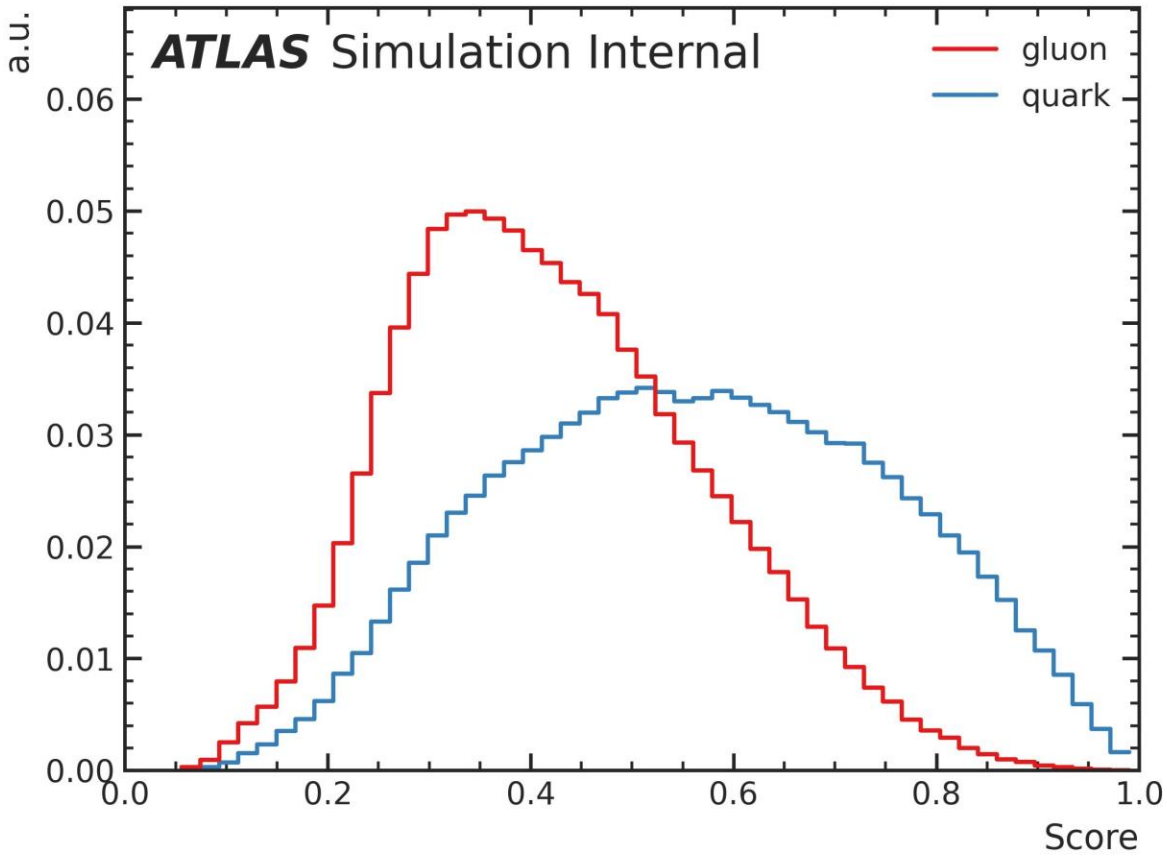


NTrack cut: 1 < ntracks < 30

Part HGTD

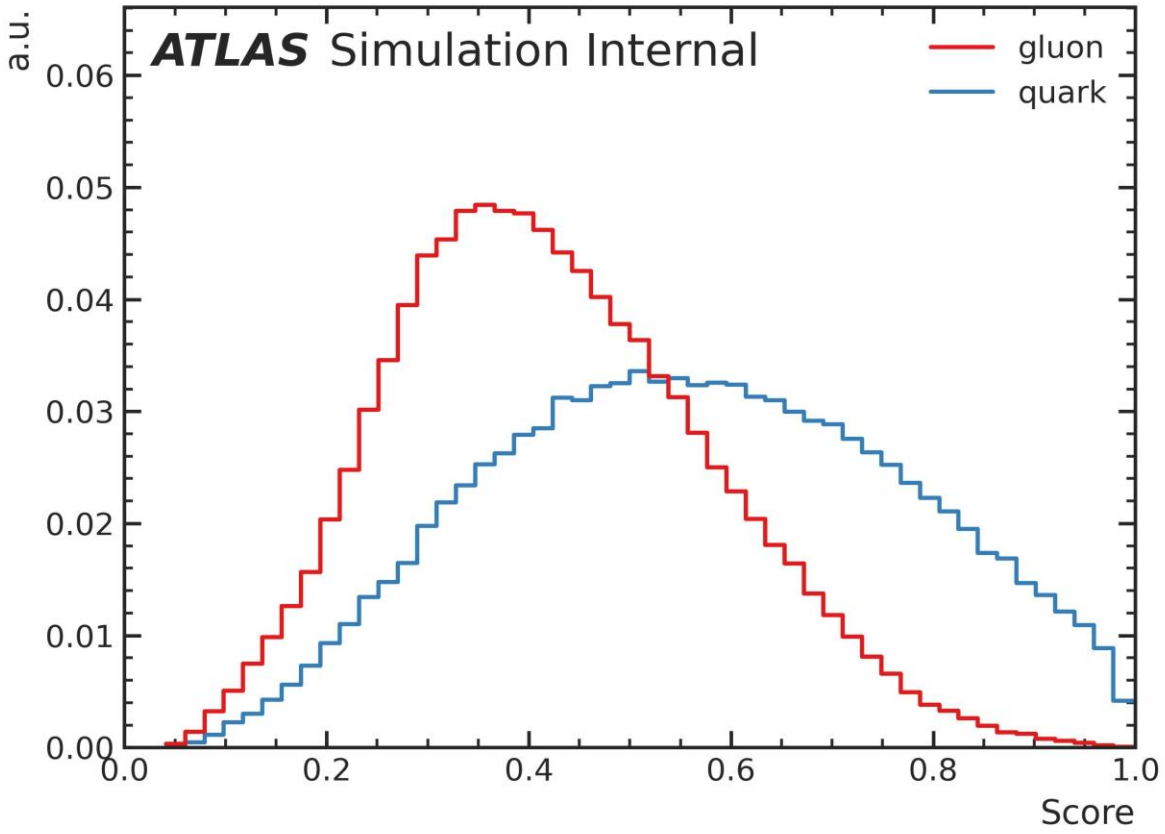


DePart HGTD

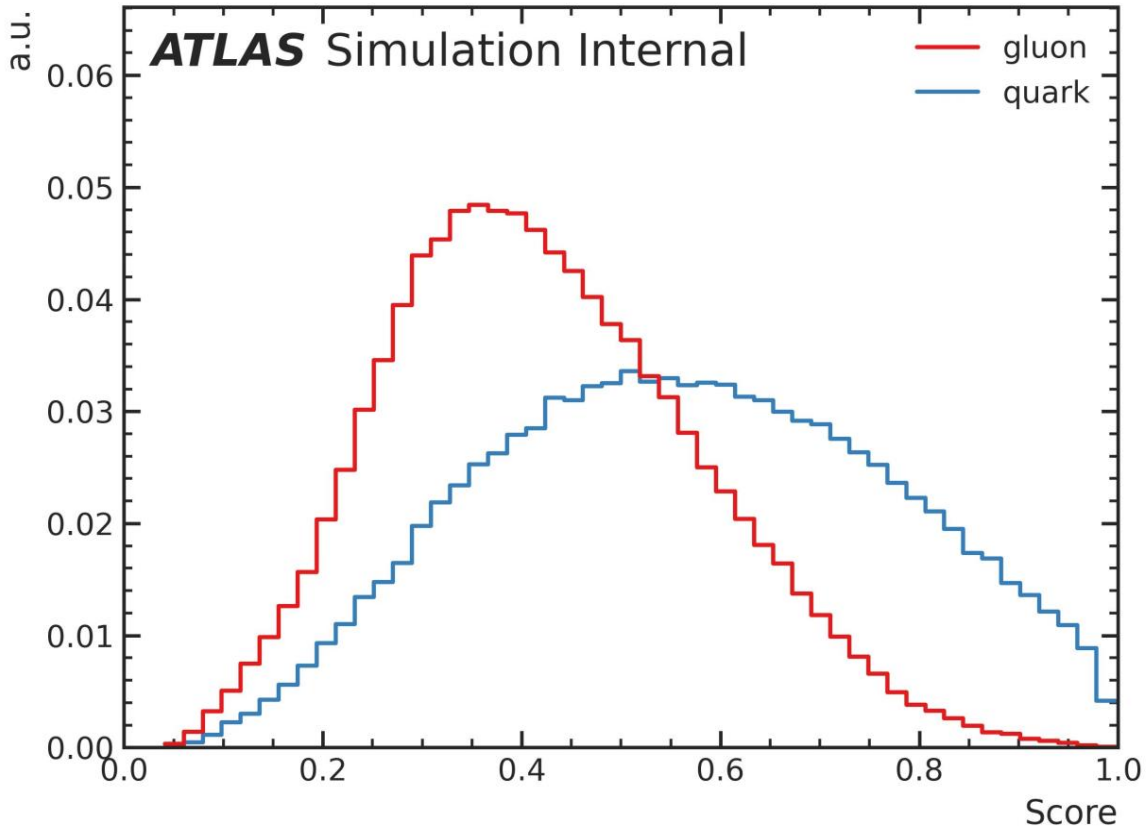


NTrack cut: 1 < ntracks < 30

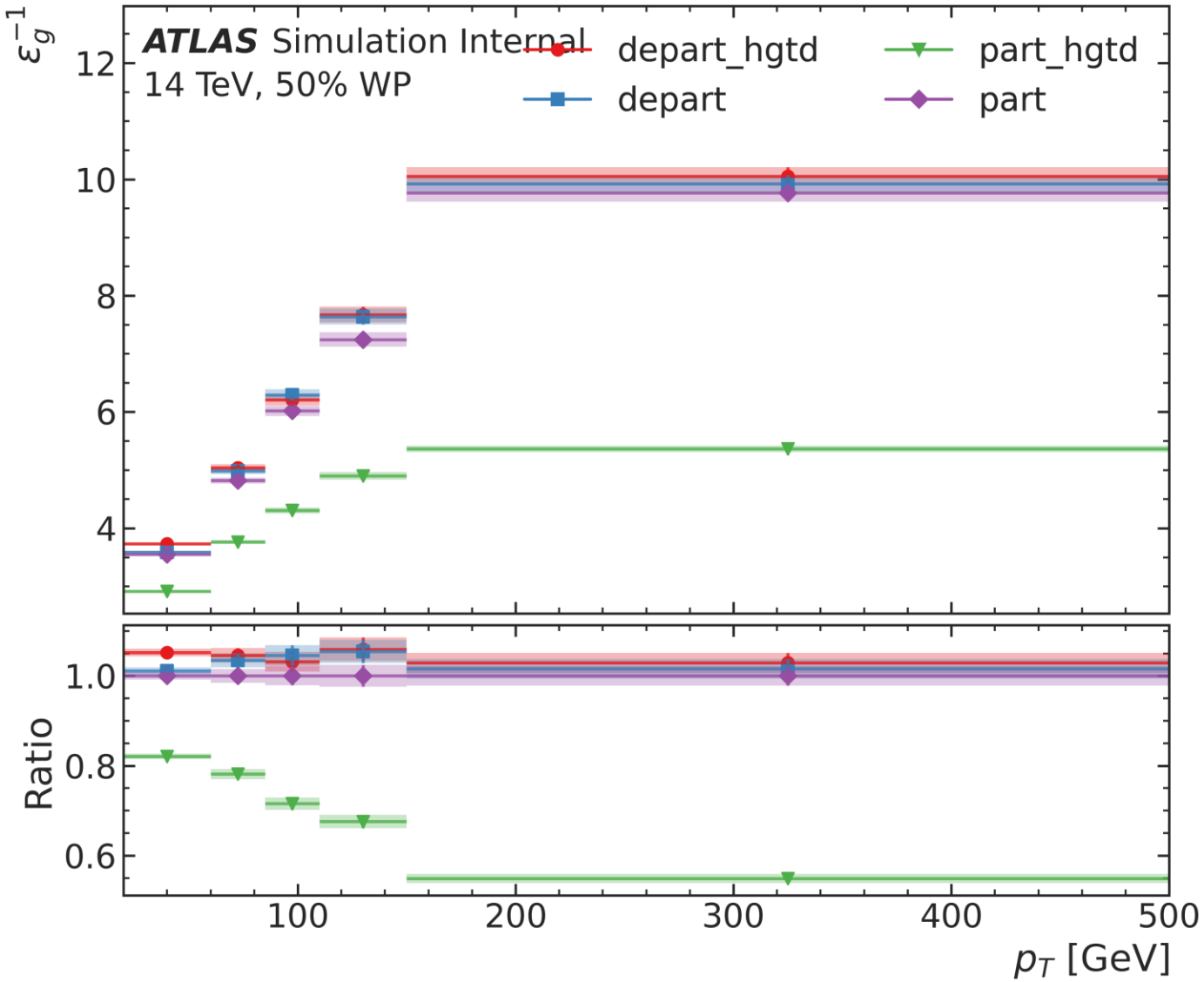
Part



DePart



Gluon rejection



Summary

- Reproduce part_hgtd score and check I didn't do something wrong
- Remove Delta_Phi^HGTD
  - Reason of not big improvement?
  - Maybe need more stats. These studies were done with 950.000 jets

- 5M Derivation and ntuple almost ready
  - Not all of them finished ok but I think I have enough stats now
    - Central region -> 8.5M
    - Forward region -> Still need to run

- An update on atlas meeting (upgrade) will be presented the 12th of September