

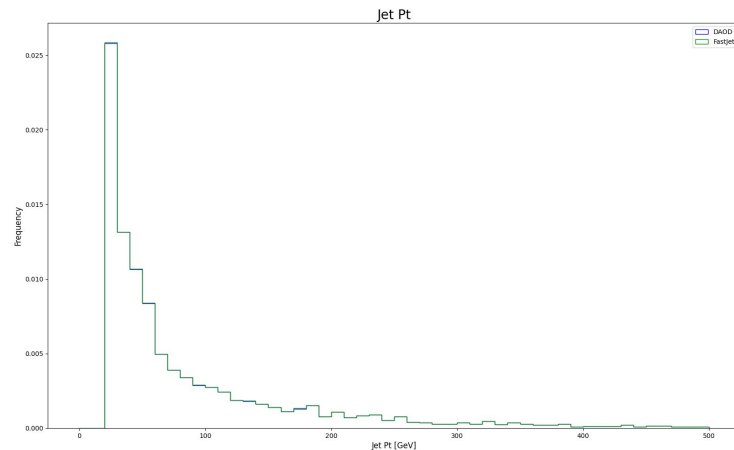
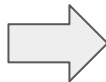
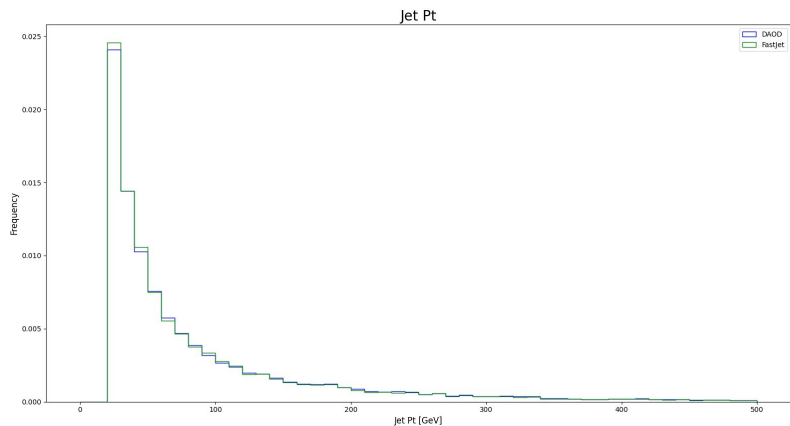
# Z+bb update

2 October 2023

# Slim jet issued solved

- Only **prompt leptons** are dressed
- Dressed leptons are then removed from event record
- 2463/2468 jets now match

[source](#)

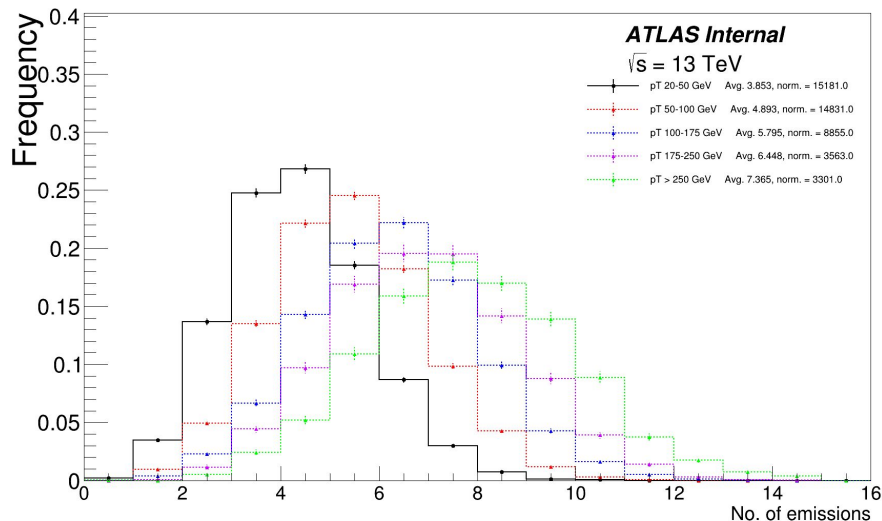


No. of emissions vs.  
Track WP and jet PT

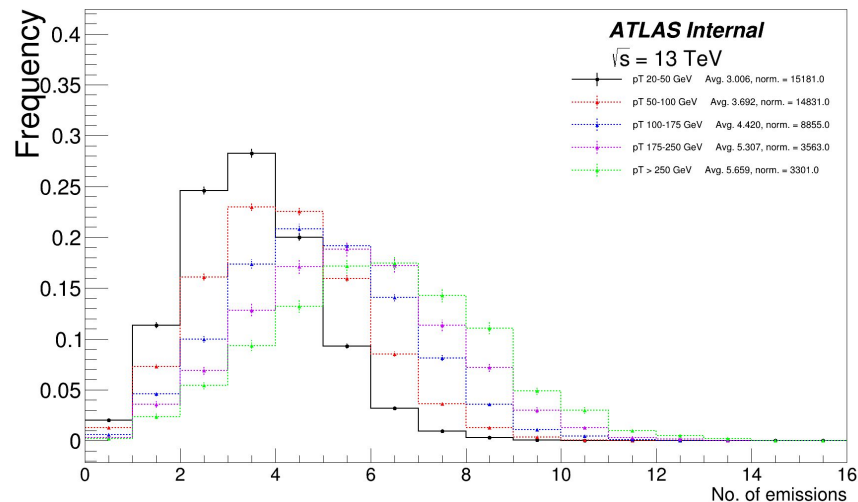
# No. of emissions vs. pT

trk pT > 0.5 GeV, Track selection WP TightPrimary,  
Vertex Association WP Tight

Truth



Reco

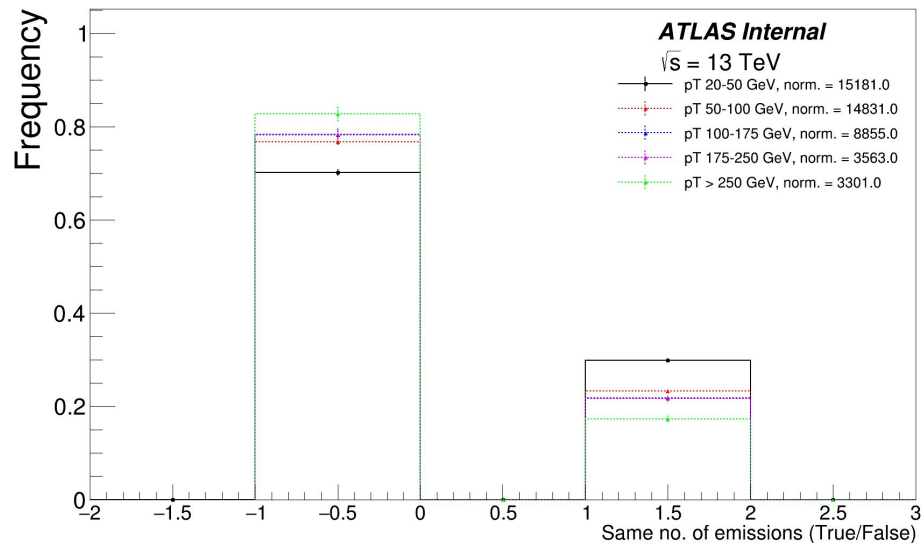


As jet pT increases, so does the number of emissions

# No. of emissions vs. pT

trk pT > 0.5 GeV, Track selection WP TightPrimary,  
Vertex Association WP Tight

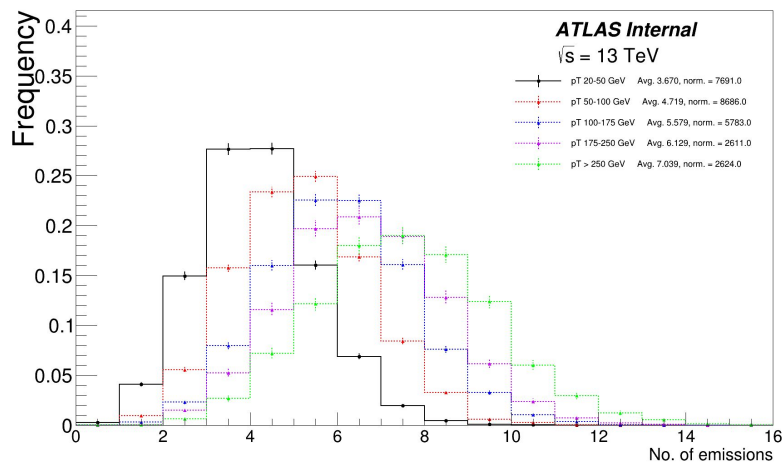
Low pT jets more often  
have the same number of  
emissions between truth  
and reco



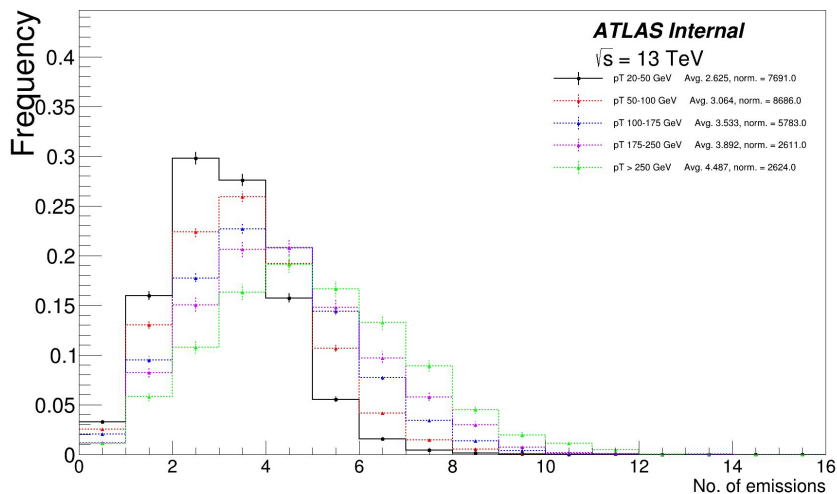
# No. of emissions vs. pT

trk pT > 0.9 GeV, Track selection WP TightPrimary,  
selection B criteria, Vertex Association WP Tight

Truth



Reco

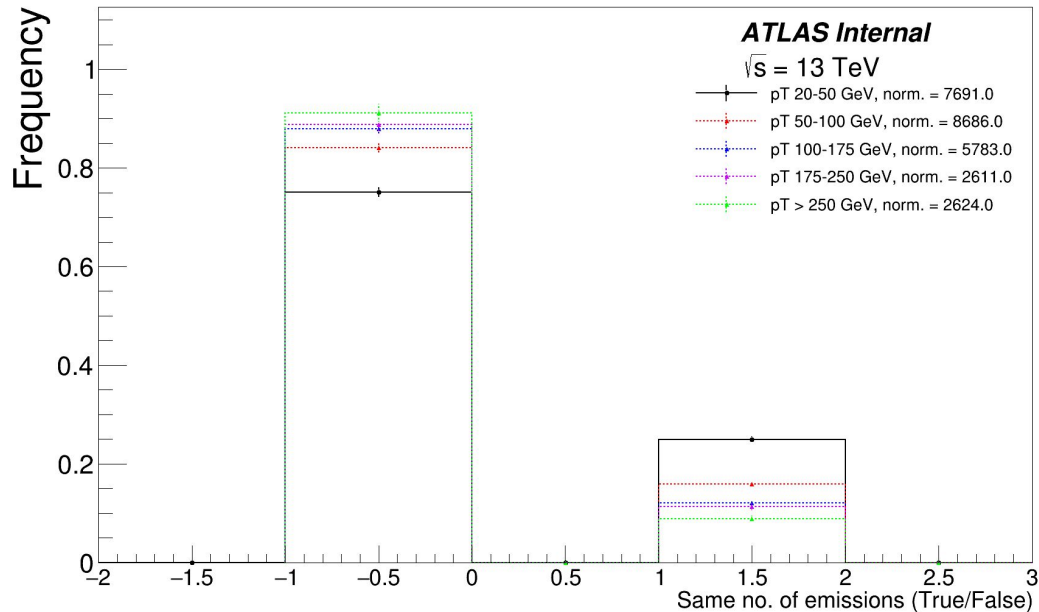


Same emission vs. pT trend also at tighter WP

# No. of emissions vs. pT

trk pT > 0.9 GeV, Track selection WP TightPrimary,  
selection B criteria, Vertex Association WP Tight

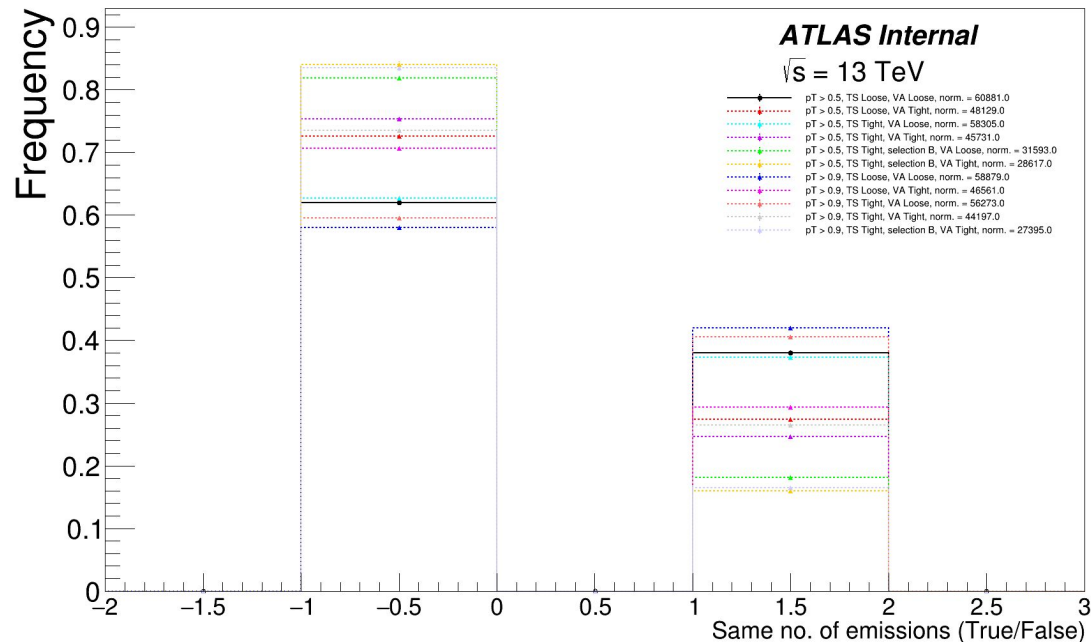
Low pT jets more often  
have the same number of  
emissions between truth  
and reco



# Which WP is optimal?

Inclusive in Jet pT

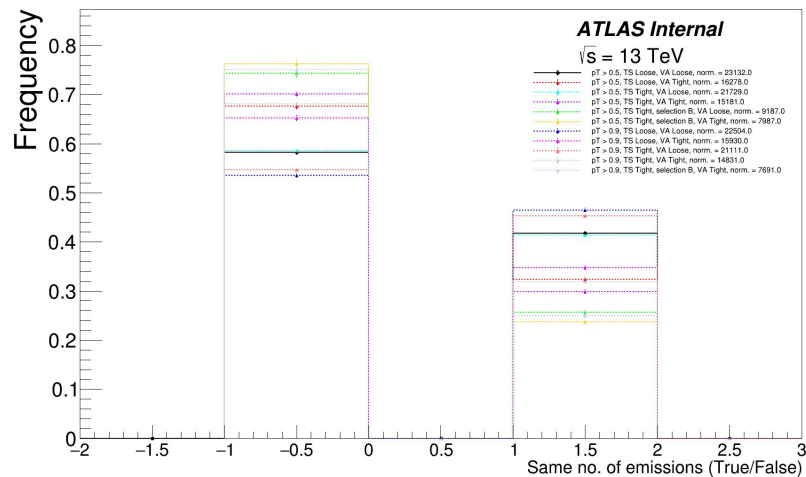
trk pT cut > 0.9, track selection WP  
Loose, Vertex Association WP Loose





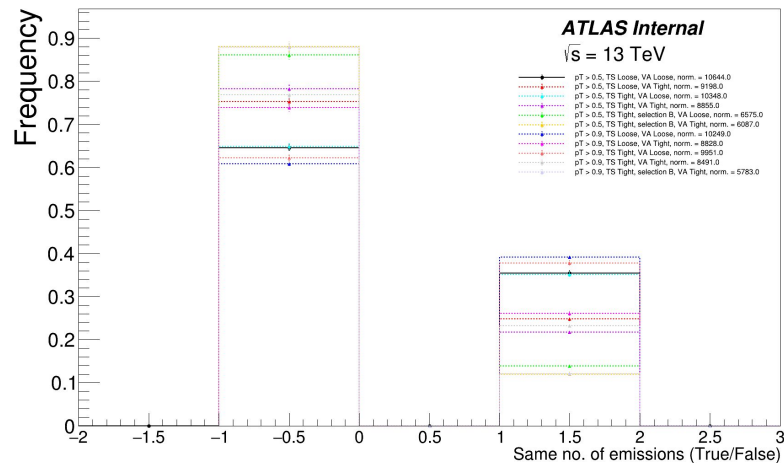
# Which WP is optimal?

Jet pT  
20-50 GeV

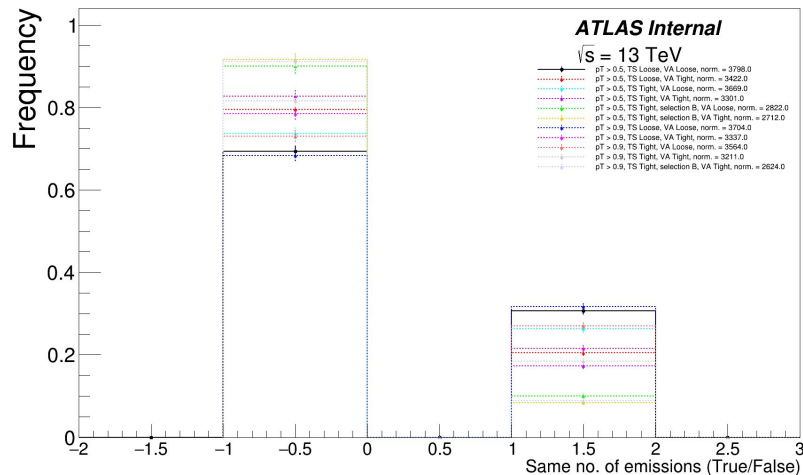


WP is optimal across  
entire pT spectrum

Jet pT  
100-175  
GeV



Jet pT >  
250 GeV





# Unfolding difficulties & track selection criteria

- Variable number of emissions in jets between truth and reco levels make unfolding challenging
- Tighter track selections help to reduce extra reco emissions caused by fake/pileup tracks

Table 3: Track-selection criteria for the different working points used in the track-counting luminosity measurement, applied in addition to the basic TightPrimary selection of Ref. [16]. Selection A was used for the baseline track-counting luminosity measurement.

Criterion	Selection A	Selection B	Selection C
$p_T$ [GeV]	$> 0.9$	$> 0.9$	$> 0.9$
$ \eta $	$< 1.0$	$< 2.5$	$< 1.0$
$N_{\text{hits}}^{\text{Si}}$	$\geq 9$	$\geq 9$ if $ \eta  < 1.65$ else $\geq 11$	$\geq 10$
$N_{\text{holes}}^{\text{Pix}}$	$\leq 1$	$= 0$	$\leq 1$
$ d_0 /\sigma_{d_0}$	$< 7$	$< 7$	$< 7$

- Opt for Selection B

[arXiv:2212.09379](https://arxiv.org/abs/2212.09379)

limited to consistency checks during some vdM scan periods with isolated bunches and low instantaneous luminosity, and luminosity measurement in heavy-ion collisions.