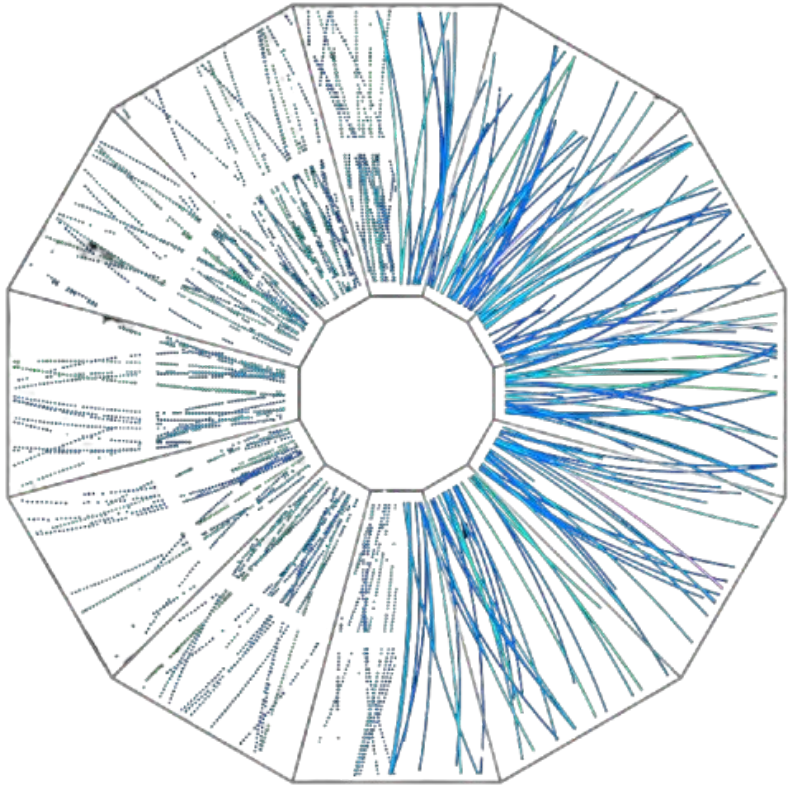
Jet Performance Plots



Dener De Souza Lemos (BNL)

Jets and HF Working Group Meeting

ePIC

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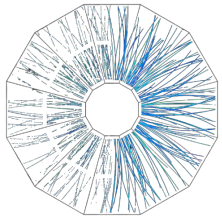
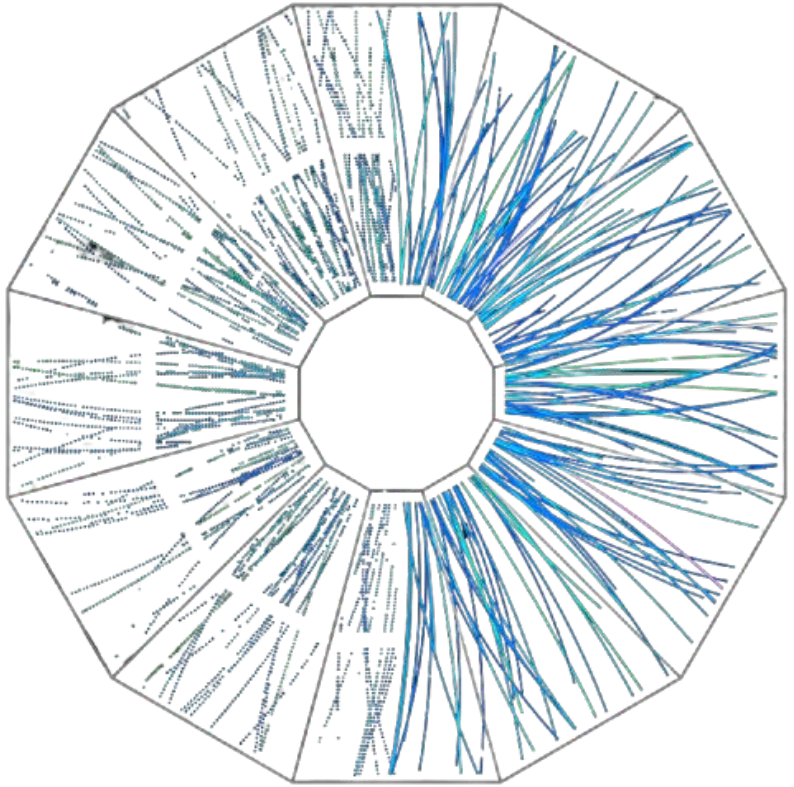


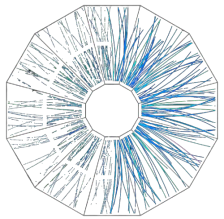
Simulation Details

- Energy: 10x100
- Geometry: **25.10**
- ep: official production (NCDIS)
  - PYTHIA8.306
    - **q^2 min = 1 and q^2 min = 10**
- eAu: official production (DIS)
  - BeAGLE103
    - **$1 < q^2 < 10$ and $10 < q^2 < 100$**

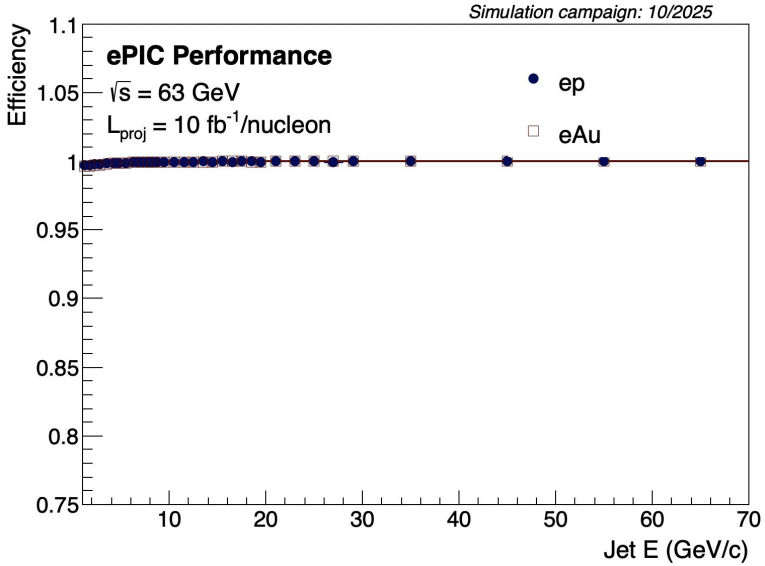
- Jet reconstruction
  - Charged jets:
    - ReconstructedChargedJets
    - GeneratedChargedJets
    - electron removed
  - anti-k_T
    - R = 1.0 (default at the jet trees)
  - Jet Tree maker:
    - https://github.com/denerslemos/CHJetTrees

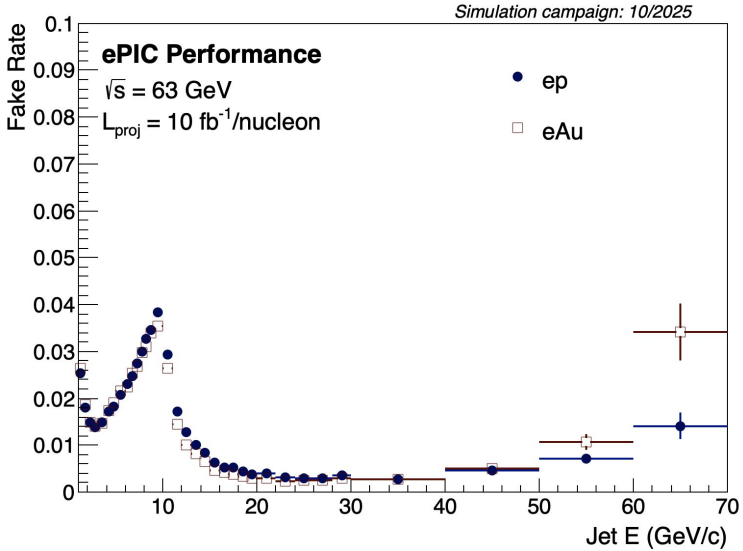
Efficiency and Fake Rate





Efficiency and Fake rate





$|\eta| < 3$

$p_{T,min} > 1$ GeV

$$\epsilon = \frac{N_{\text{matched}}}{N_{\text{generated}}}$$

$$f = \frac{N_{\text{unmatched}}}{N_{\text{reconstructed}}}$$

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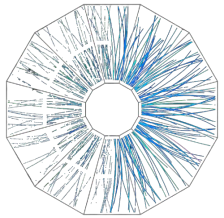
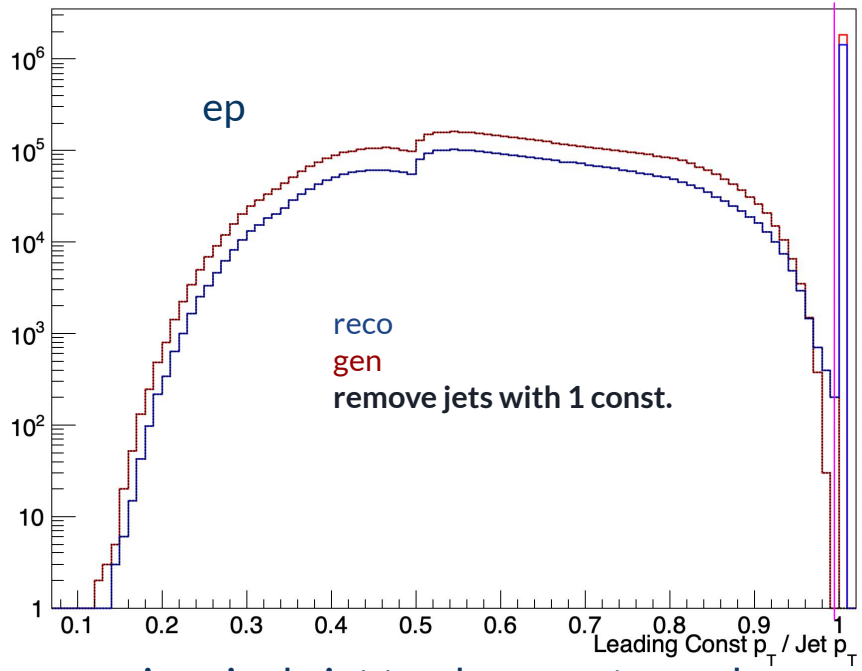
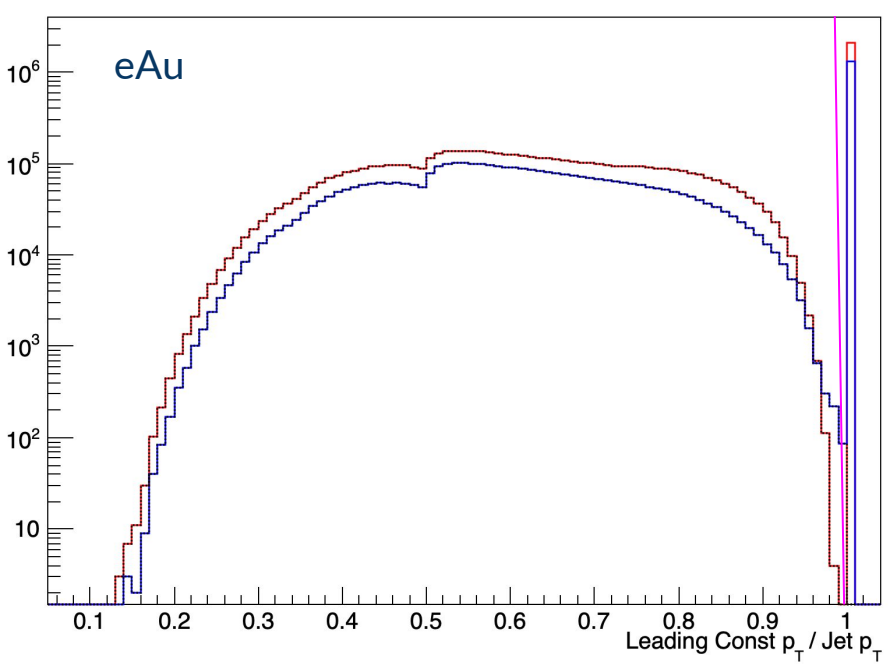


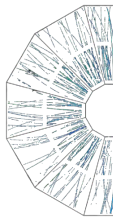
Single track removal

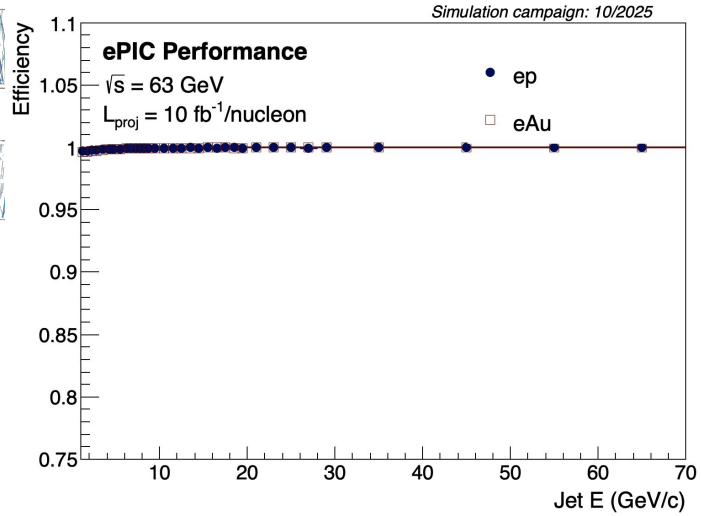
$q^2 > 10\ GeV^2$



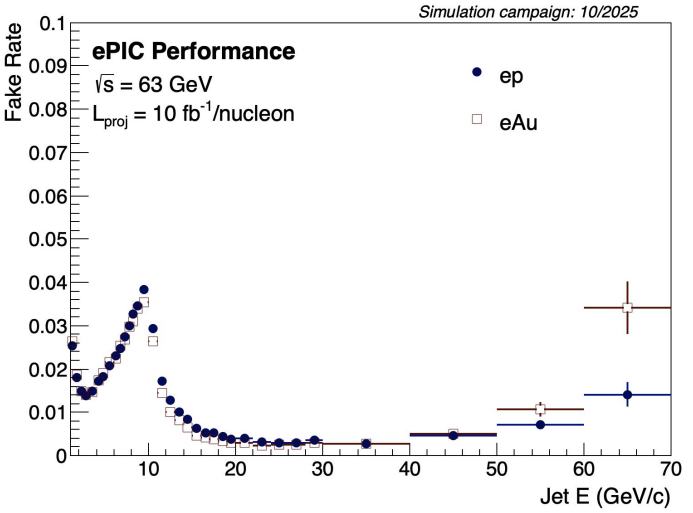


removing single jet track seems to work well, no need of arbitrary cut



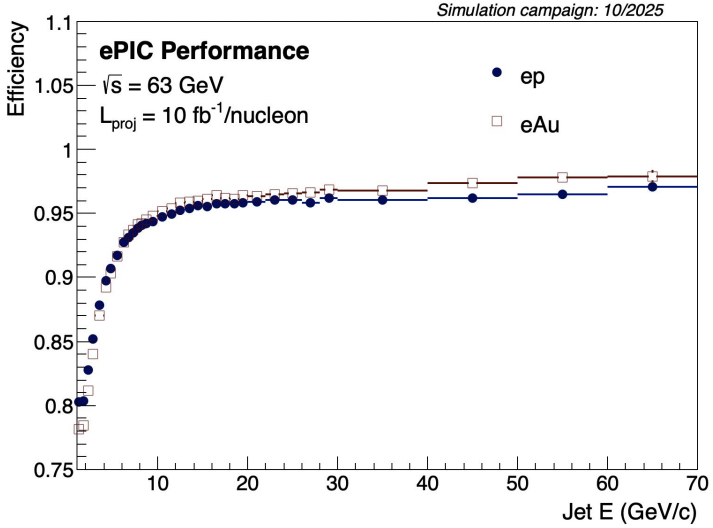


No single track removal

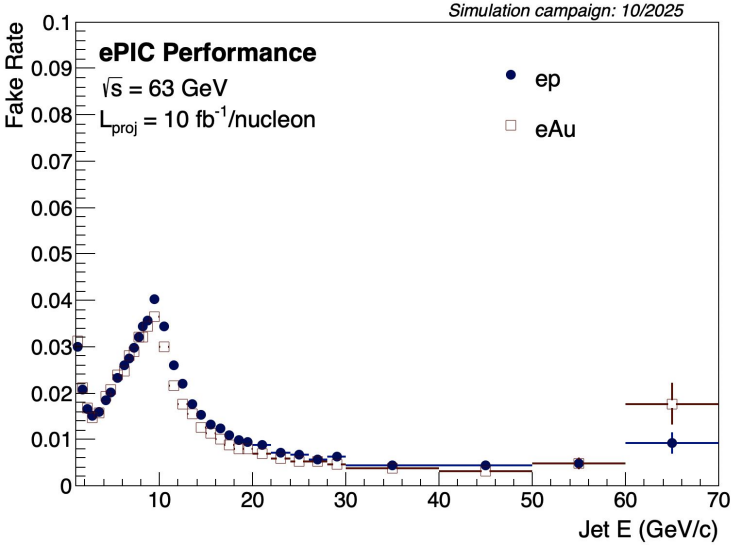


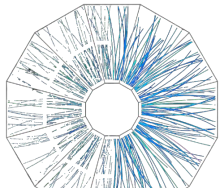
$|\eta| < 3$

$p_{T,min} > 1$ GeV



With single track removal

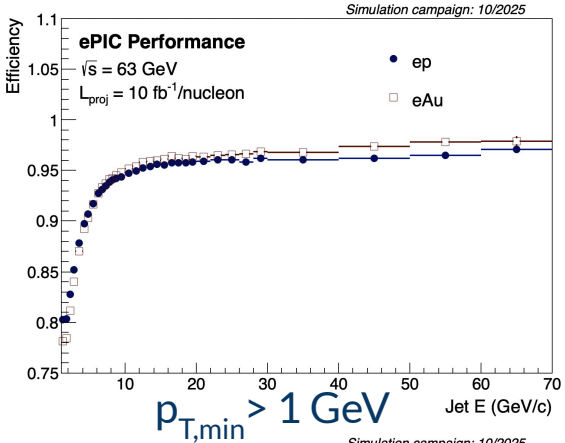




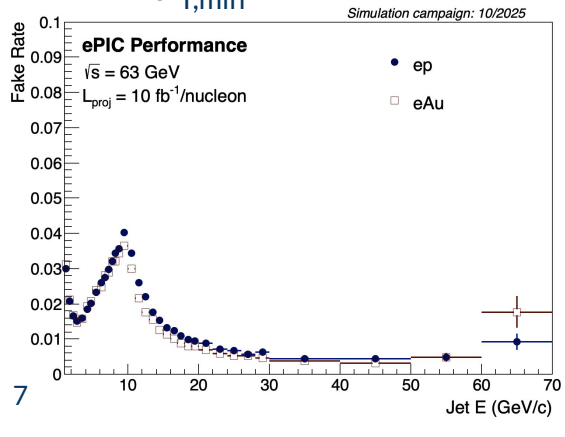
Jet min p_T dependency

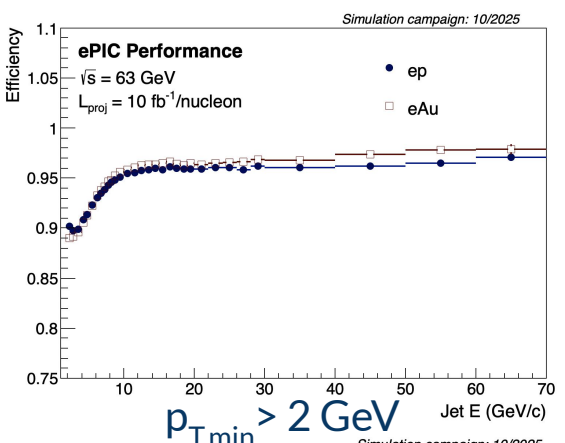
With single track removal

$|\eta| < 3$

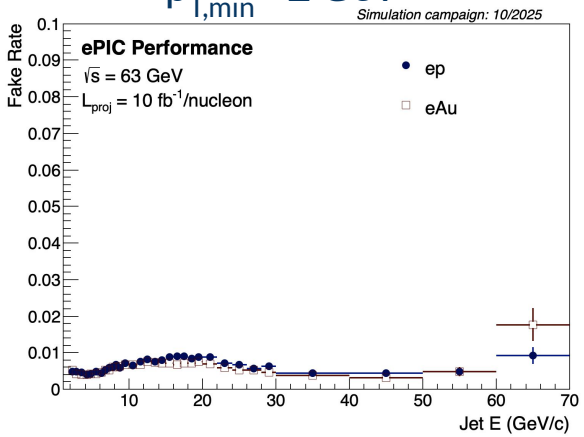


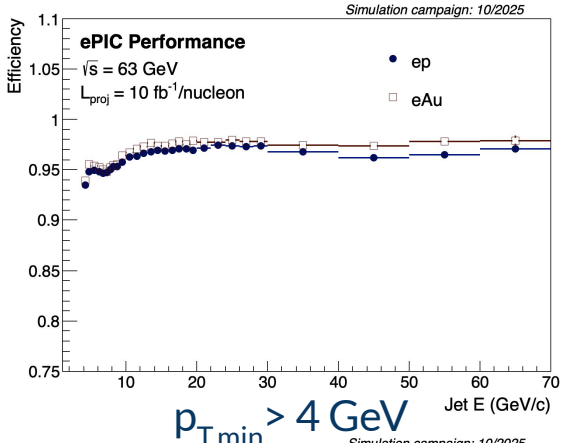
$p_{T,min} > 1$ GeV



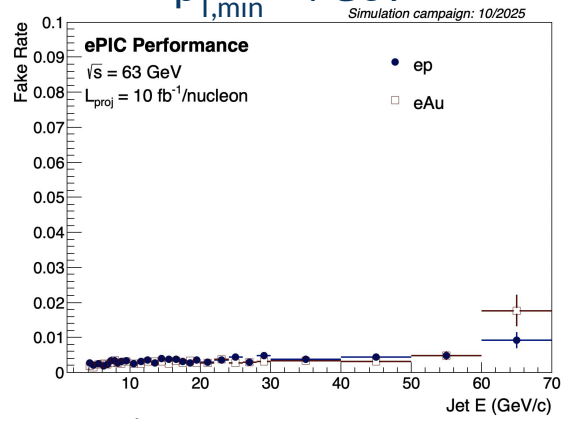


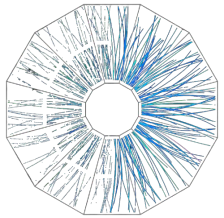
$p_{T,min} > 2$ GeV





$p_{T,min} > 4$ GeV

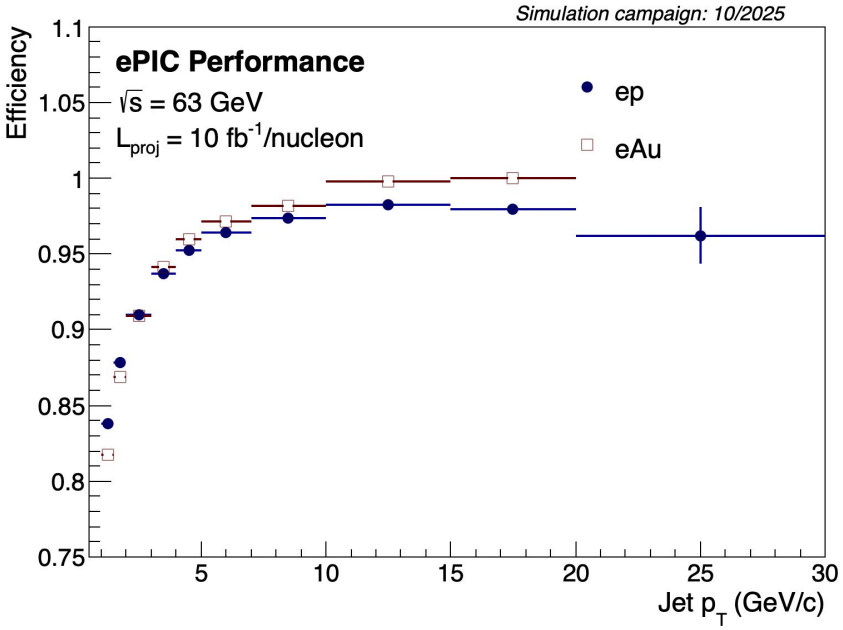


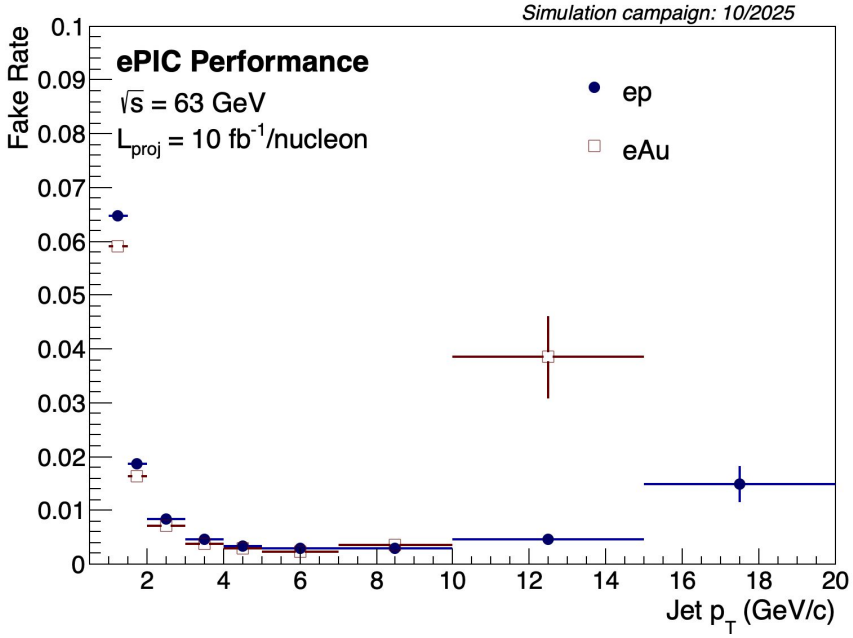


Jet p_T dependency

With single track removal

$|\eta| < 3$





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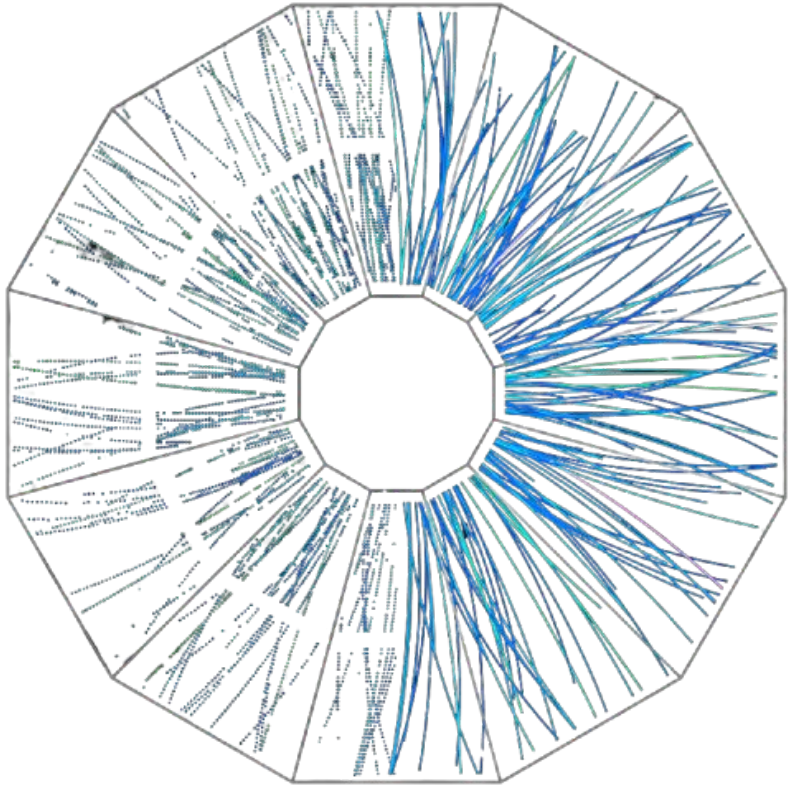
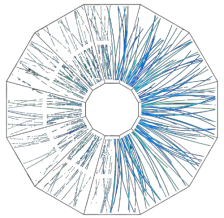
Jets with different radius





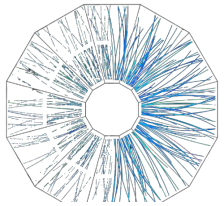
Jet reconstruction information

- Code:

  https://github.com/denerslemos/CHJetsReCluster

  - R between 0.1 and 1 in 0.1 steps
  - Same official selections
  - RecoJets: ReconstructedChargedParticles
  - GenJets: GeneratedParticles
    - Remove neutral particles
  - Same tree structure
- Advantages:
  - Remove the electron before the clustering
  - Apply NHit bkg cut before clustering

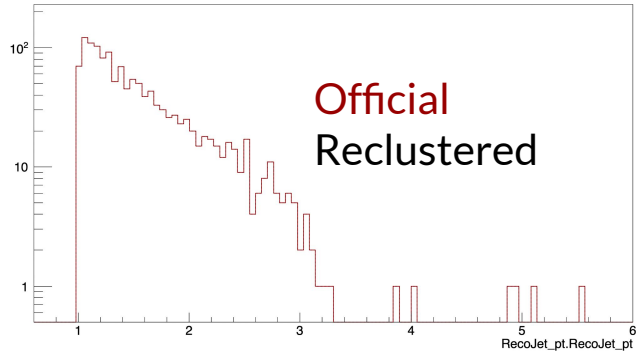
Parameter	Name	Value
Jet algorithm	m_jetAlgo	anti-kT
Jet recombination Scheme	m_recombScheme	E-scheme
Jet resolution parameter	m_rJet	1
Min. constituent pT	m_minCstPt	0.2 GeV/c
Max. constituent pT	m_maxCstPt	100 GeV/c
Min. jet pT	m_minJetPt	1 GeV/c
Area type	m_areaType	active
Max ghost rapidity	m_ghostMaxRap	3.5
No. of repeated ghost	m_numGhostRepeat	1
Area per ghost	m_ghostArea	0.001

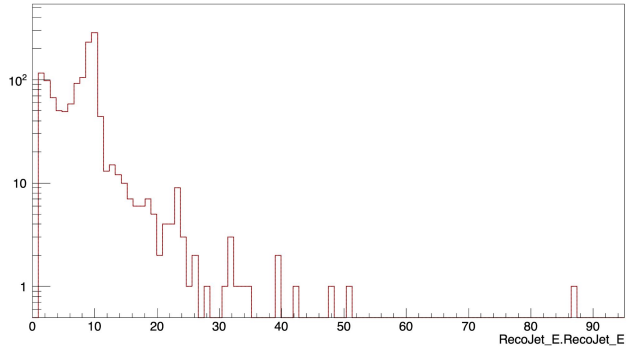


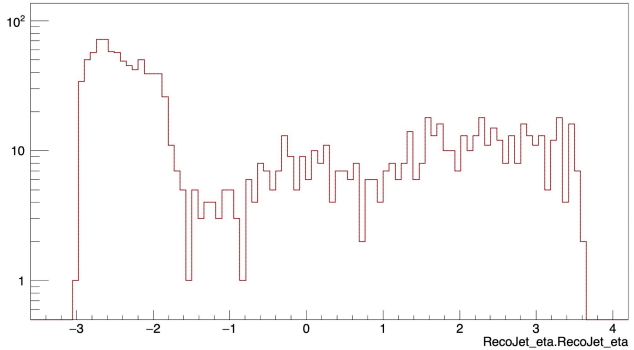
Comparison to official jet branch (I)

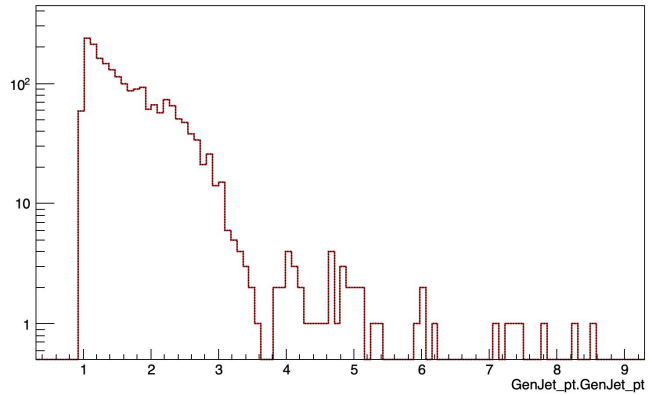
Only 1k events

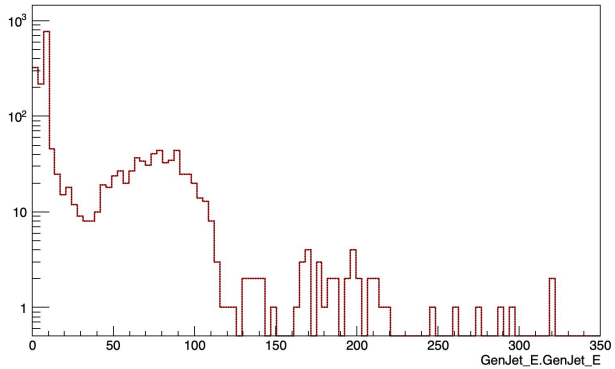
Official
Reclustered

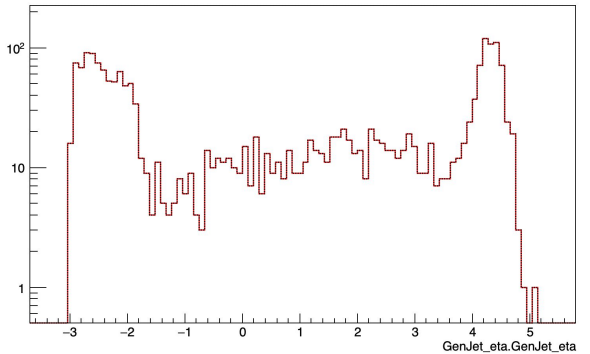












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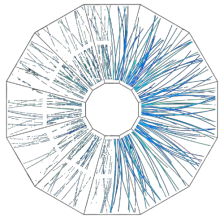
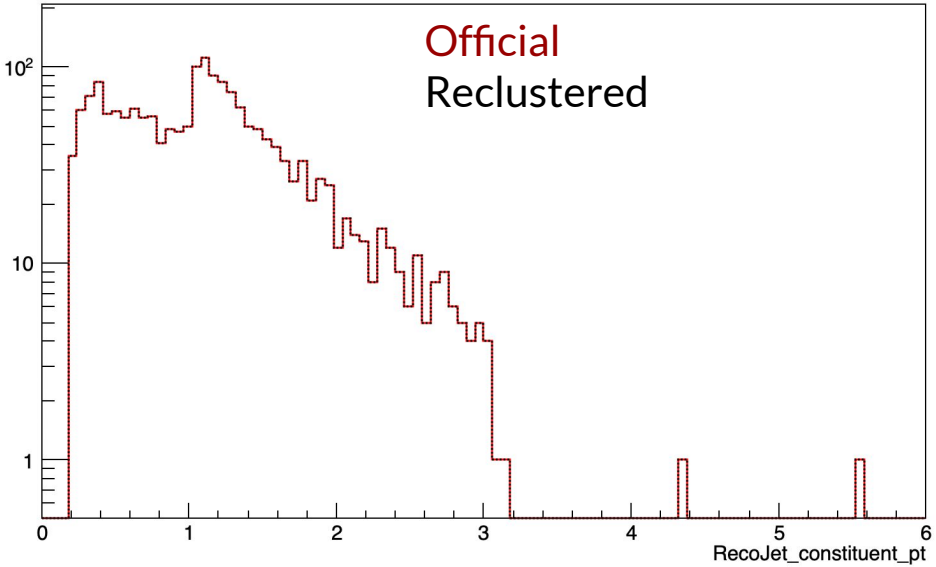
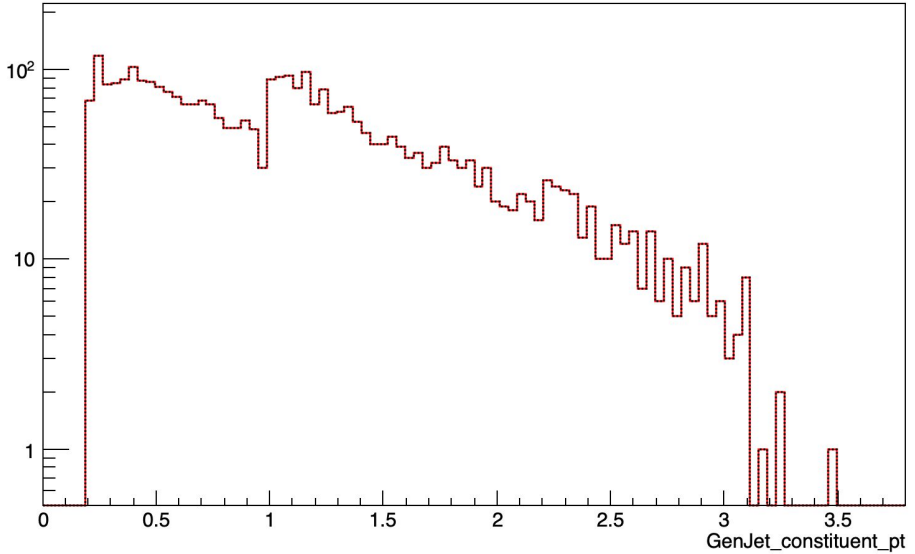


Comparison to official jet branch (II)

Only 1k events





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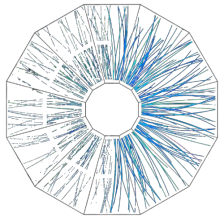


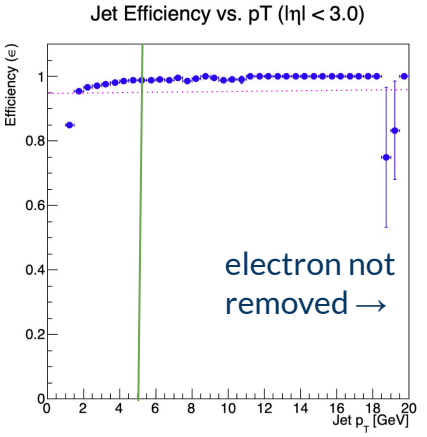
TODO's

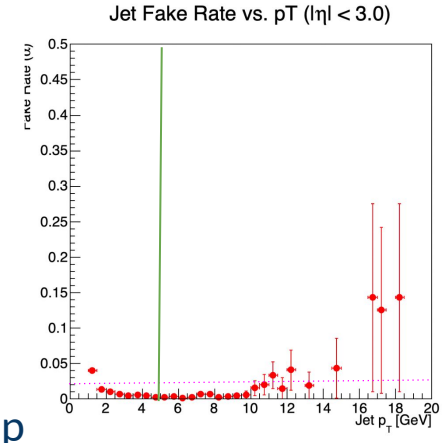
- Work with fits
- Produce plots using ePIC official style
- Work on physics results
  - R_{eAu} for different jet R
    - Comparison with official jet tree ongoing
    - Need condor to speed the process


شكراً جزيلاً
ngiyabonga
рахмат
danke
謝謝
teşekkür ederim
Баярлалаа
mersi
kia ora
barka
welalin
tack
spas
mahalo
tapadh leat
спасибо
faafetai lava
vinaka
спасибі
blagodaram
dank je
misaotra
matondo
paldies
grazzi
thank you
gracias
хвала
kiitos
dankie
nandri
nanni
dhanyavad
mauruuru
köszönöm
asante
manana
obrigada
tenki
murakoze
bedankt
bayarlalaa
gràçie
hvala
enkosi
dankon
aciū
akun
djiere dieuf
tau
mochchakkeram
mamnun
дякую
dziękuję
chnorakaloutioun
gratias ago
gràcies
sulpáy
taiku
go raibh maith agat
chokrane
sobodi
dėkuji
obrigado
sagolun
sukriya
kop khun krap
arigatô
takk
dakujem
trugarez
mèsi
didi madloba
ありがとう
najis tuke
tanemirt
grazie
terima kasih
rahmet
kam sah hamnida
rahmat
shukriya
merce
мерси
diolch
dhanyavadagalu
ευχαριστώ
xièxie
merci
তোমাকে ধন্যবাদ
감사합니다

Effect of electron removal

1/10 of stats





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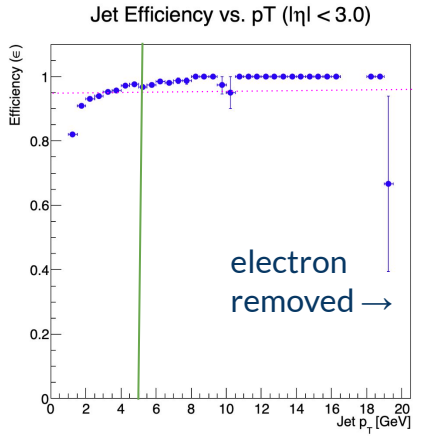

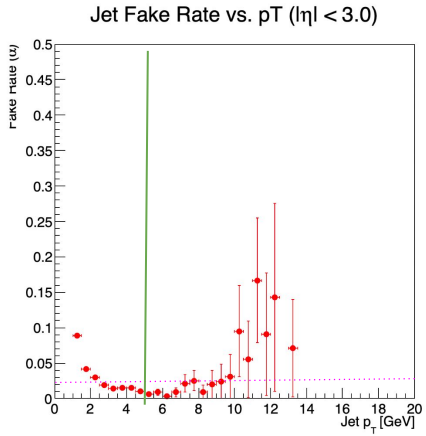

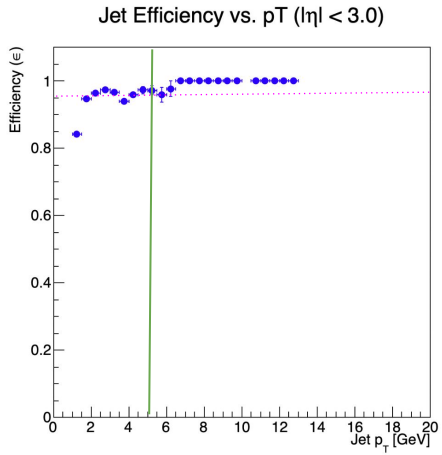

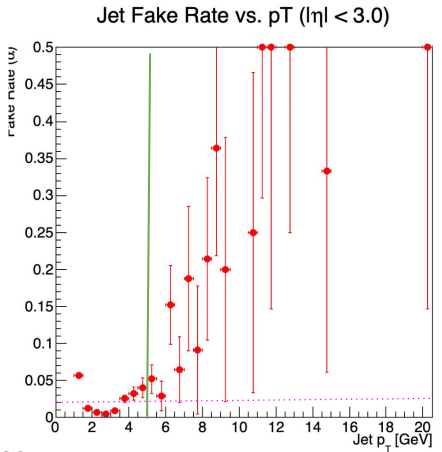

eAu