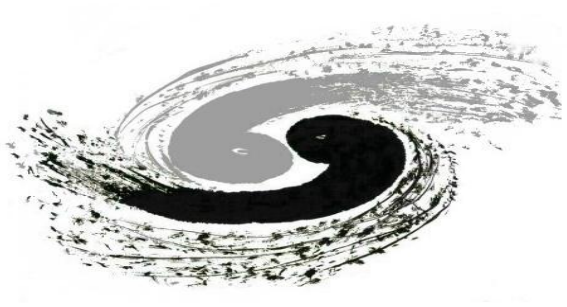


CEPC

Kaili Zhang

zhangkl@ihep.ac.cn

ECM		Z process	H process	Path	CEPCSW Release	EvtNumber	Sim+Digi+Trk	Rec	Status	Note:
240		mm	bb	/cefs/higgs/zhangkl/Production/25035/E240_mmHbb	25.3.5	500k	D	D	D	D=Done
240		mm	cc	/cefs/higgs/zhangkl/Production/25035/E240_mmHcc	25.3.5	500k	D	D	D	
240		mm	tautau	/cefs/higgs/zhangkl/Production/25035/E240_mmHe3e3	25.3.5	500k	D	D	D	
240		mm	ww(fullhad	/cefs/higgs/zhangkl/Production/25035/E240_mmHww	25.3.5	500k	D	D	D	
240		mm	zz(fullhad)	/cefs/higgs/zhangkl/Production/25035/E240_mmHzz	25.3.5	500k	D	D	D	
240		mm	gg	/cefs/higgs/zhangkl/Production/25035/E240_mmHgg	25.3.5	500k	D	D	D	some broken files
91.2		bb		/cefs/higgs/zhangkl/Production/25035/E91.2_eebb	25.3.6	100k	D			Muon hit information available after 25.3.6.
91.2		cc		/cefs/higgs/zhangkl/Production/25035/E91.2_eecc	25.3.6	100k	D			
91.2		dd		/cefs/higgs/zhangkl/Production/25035/E91.2_eedd	25.3.6	100k	D			
91.2		uu		/cefs/higgs/zhangkl/Production/25035/E91.2_eeuu	25.3.6	100k	D			
91.2		ss		/cefs/higgs/zhangkl/Production/25036/E91.2_eess	25.3.6	100k	D			
240		ee	inclusive	/cefs/higgs/zhangkl/Production/25036/E240_eeHX	25.3.6	1M	D	D		
240		mm	inclusive	/cefs/higgs/zhangkl/Production/25036/E240_mmHX	25.3.6	1M	D	D		
240		qq	inclusive	/cefs/higgs/zhangkl/Production/25036/E240_qqHX	25.3.6	3M	D	D		
240		vv	inclusive	/cefs/higgs/zhangkl/Production/25036/E240_vvHX	25.3.6	1M	D			
240		tautau	inclusive	/cefs/higgs/zhangkl/Production/25036/E240_tautauHX	25.3.6	1M	D	D		
240	4f	43 final states each 2(		/cefs/higgs/zhangkl/Production/25036/4fermions						
240	2f	ee		/cefs/higgs/zhangkl/Production/25036/E240_e1e1	25.3.6	100k	D			
		mm		/cefs/higgs/zhangkl/Production/25036/E240_e2e2	25.3.6	100k	D			
		tautau		/cefs/higgs/zhangkl/Production/25036/E240_e3e3	25.3.6	100k	D			
		qq		/cefs/higgs/zhangkl/Production/25036/E240_qq	25.3.6	500k	D			
341	ttbar	semi-lep			25.3.6	100k				@liyeyan
342.75	ttbar	semi-lep			25.3.6	600k				
344	ttbar	semi-lep			25.3.6	200k				
346	ttbar	semi-lep			25.3.6	100k				
91.2		bb		/cefs/higgs/zhangkl/Production/25036/E91.2_eebb	25.3.6	2M	D	D		
91.2		dd		/cefs/higgs/zhangkl/Production/25036/E91.2_eedd	25.3.6	2M	D			
91.2		uu		/cefs/higgs/zhangkl/Production/25036/E91.2_eeuu	25.3.6	2M	D			
240	smuon									@xuai, done by Shiyi.
80		ee->bb(withoutISR)		/cefs/higgs/zhangkl/Production/25036/E80_eebb_woisr	25.3.6	100k	D	D		
120		ee->bb(withoutISR)		/cefs/higgs/zhangkl/Production/25036/E120_eebb_woisr	25.3.6	100k	D	D		
160		ee->bb(withoutISR)		/cefs/higgs/zhangkl/Production/25036/E160_eebb_woisr	25.3.6	100k	D	D		
200		ee->bb(withoutISR)		/cefs/higgs/zhangkl/Production/25036/E200_eebb_woisr	25.3.6	100k	D	D		
240		ee->bb(withoutISR)		/cefs/higgs/zhangkl/Production/25036/E240_eebb_woisr	25.3.6	500k	D	D		
240	H124.8	mm	inclusive			15k	D			
	H124.95	mm	inclusive			15k	D			
	H125.05	mm	inclusive			15k	D			
	H125.02	mm	inclusive			15k	D			

Higgs Group Jobs Status

- In the long run, ~20% 4gb simulation jobs need to be resubmitted with higher memory like 6GB.

```
78185 jobs; 0 completed, 0 removed, 74272 idle, 1163 running, 2750 held, 0 suspended
```

- For 4gb simulation, max speed ~9000 cores.
- For 6gb reconstruction, max speed ~1000 cores.

- Takes longer time than expected for sample production.

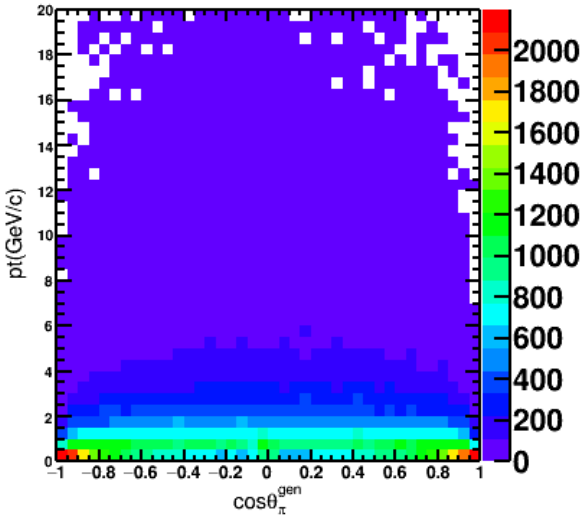
```
JOBID           OWNER           SUBMITTED       RUN_TIME        ST PRI SIZE CMD
10862153.0      zhangkl         03/19 17:20     0+00:00:00      H  0   5119.9 sub_E240_4f_sze_l0e_00018.sh
10862431.0      zhangkl         03/19 17:20     0+00:00:00      H  0   5119.9 sub_E240_4f_sze_l0e_00096.sh
10864715.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00911.sh
10864727.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00915.sh
10864731.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00917.sh
10864740.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00920.sh
10864796.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00942.sh
10864801.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00944.sh
10864818.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00950.sh
10864825.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00953.sh
10864838.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00958.sh
10864860.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5119.9 sub_E240_4f_sze_l0e_00966.sh
10864874.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00971.sh
10864890.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00977.sh
10864929.0      zhangkl         03/19 17:25     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_00991.sh
10864976.0      zhangkl         03/19 17:26     0+00:00:00      H  0   5120.0 sub_E240_4f_sze_l0e_01008.sh
```

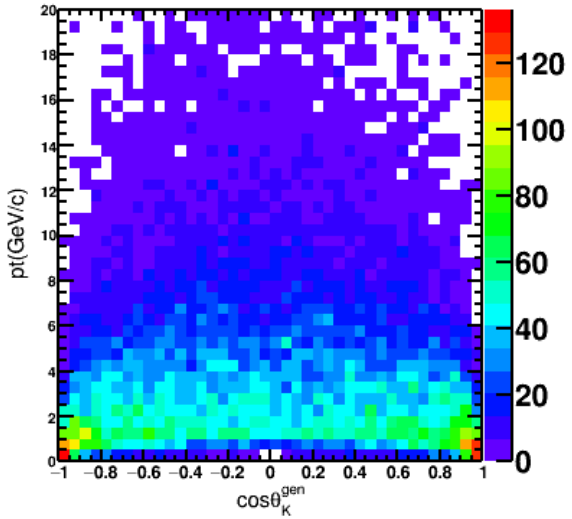
PID

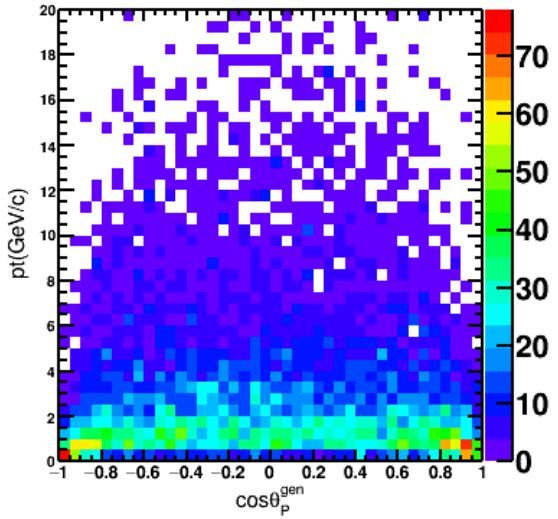
@Haoyue Xu, Kaili Zhang

- Using Geliang's package
- Truth match method using `CompleteTracksParticleAssociation`
- Ensure each tracks match with one MCParticle. (Calo match not available yet)
  - Validate with old DR/DE, consistent.
  - e, mu, k, pi, p pid information stored for JOI.

PID in Jet

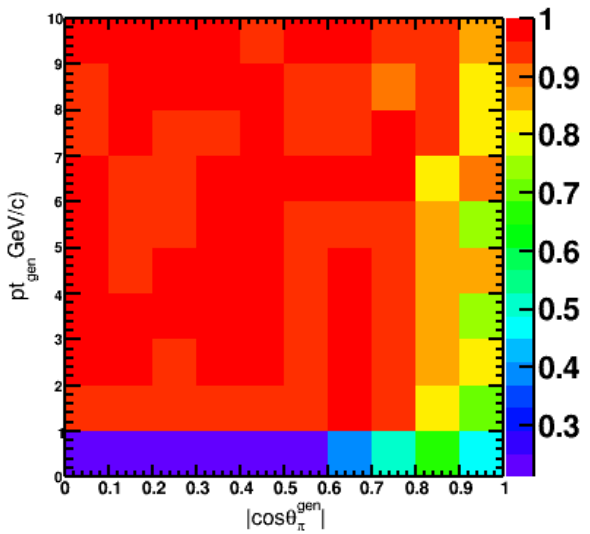


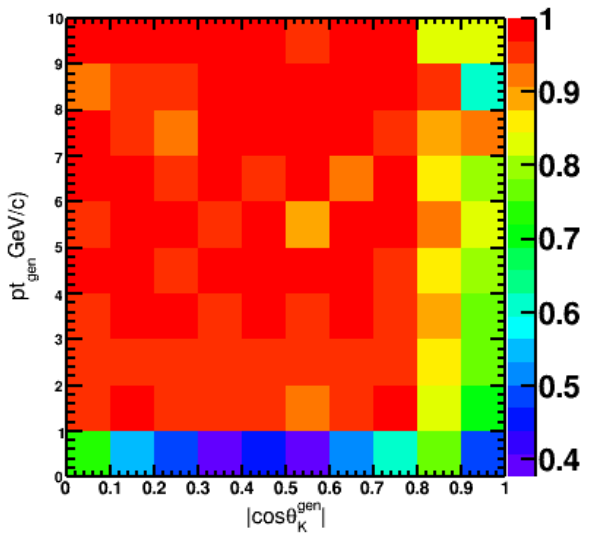


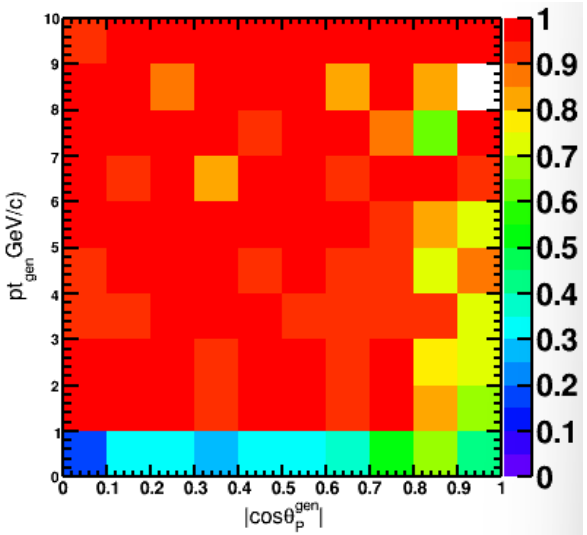


Phase space;

Track efficacy;
(With TOF&&TPC)



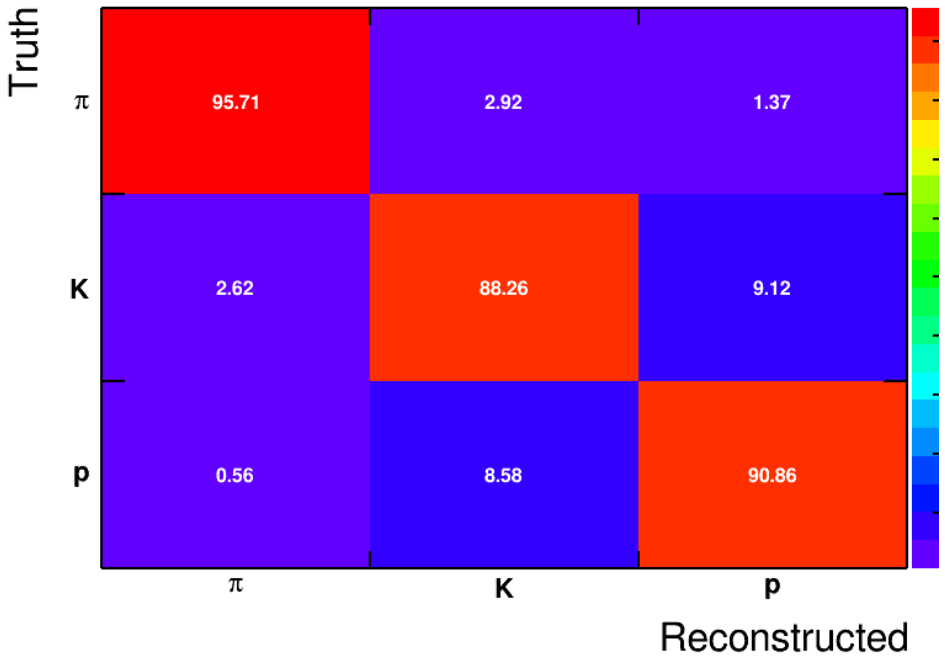




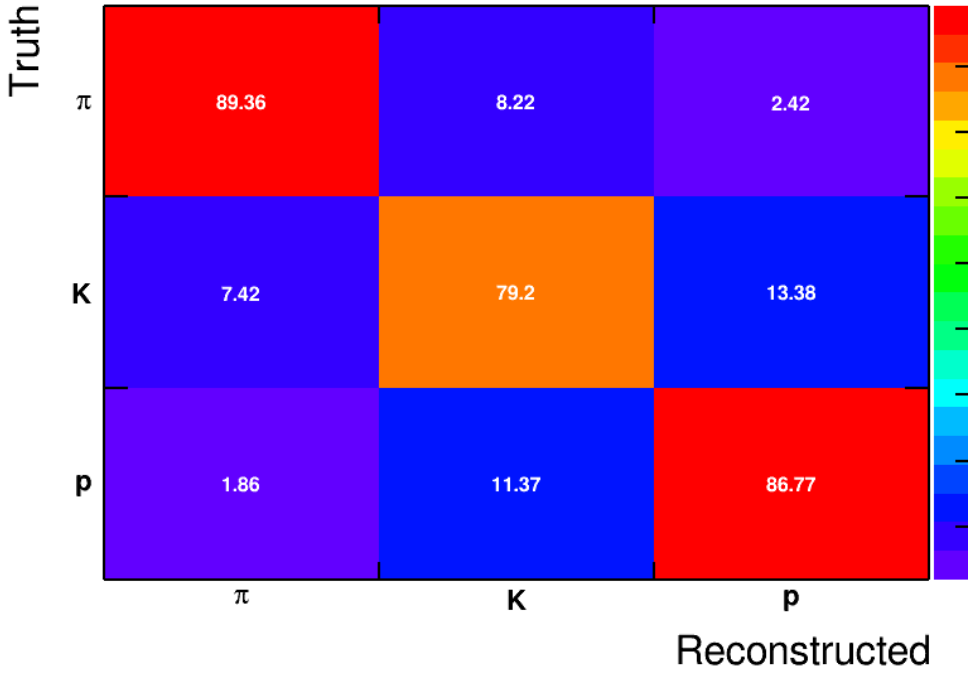
PID in Jet

	π	K	p
eff(pt>1GeV and |cosθ|<0.85)	95.7%	88.3%	90.9%
$purity$(pt>1GeV and |cosθ|<0.85)	99.2%	86.2%	69.4%
eff(pt>1GeV and 0.99>|$cos\theta$|>0.85)	89.4%	79.2%	86.8%
$purity$(pt>1GeV and 0.99>|$cos\theta$|>0.85)	96.8%	75.7%	57.5%

Barrel



Endcap



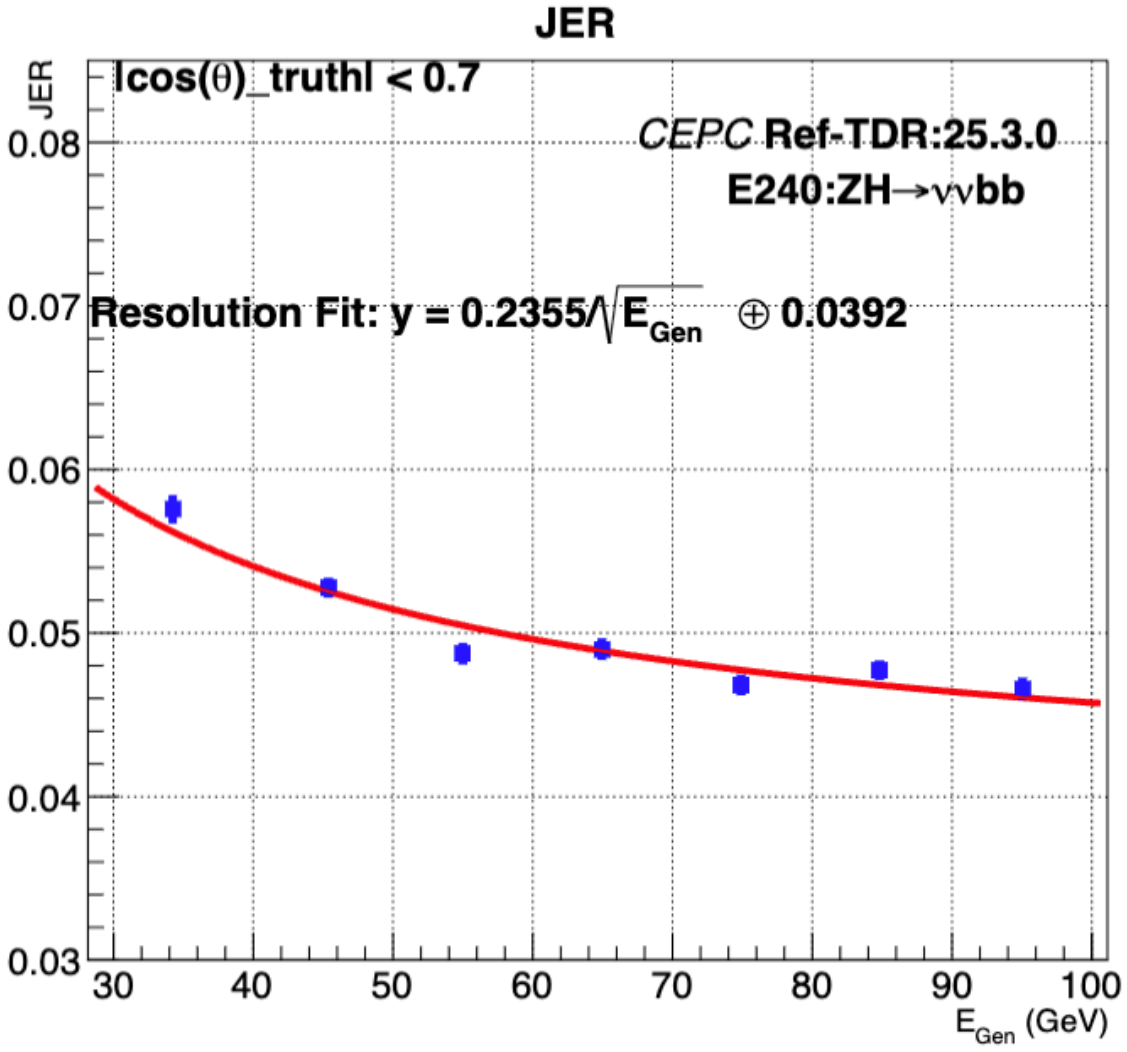
backup

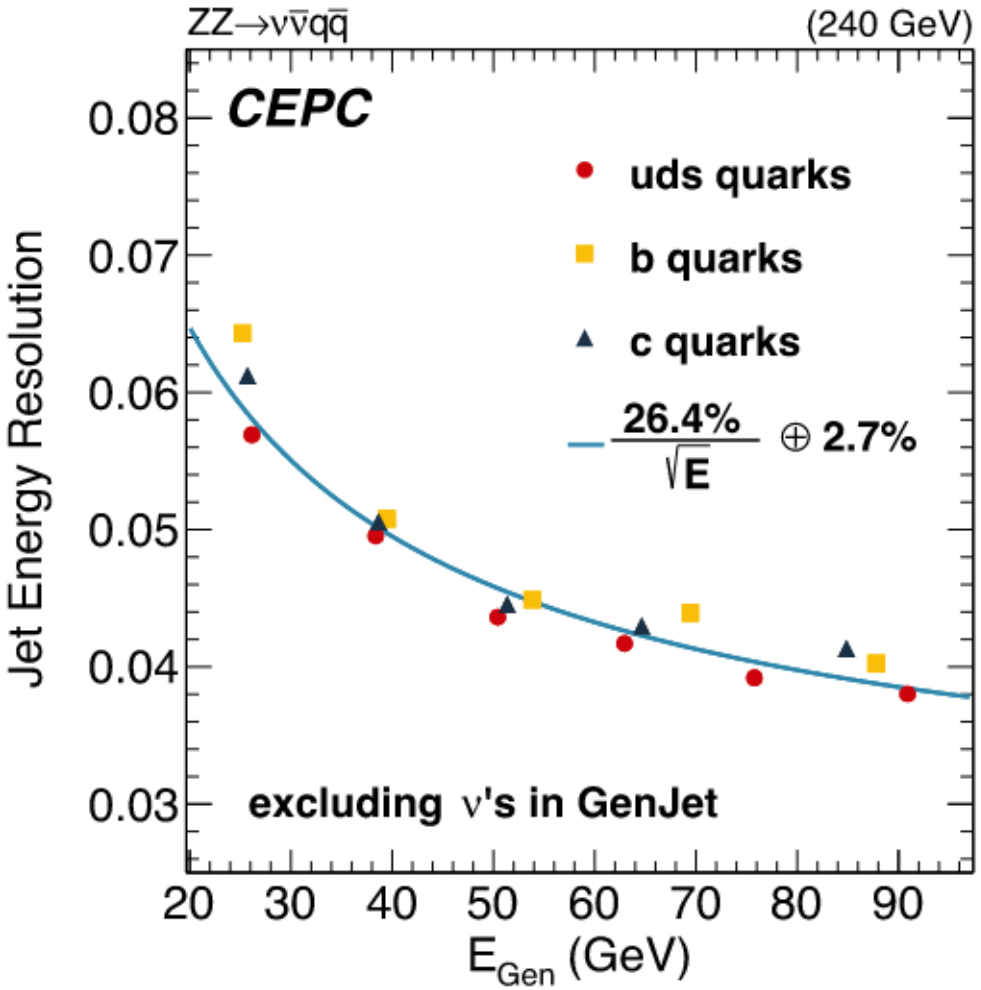
JER

Last Report shows the boundary region for jet1/2 leading unexpected behavior from jet clustering. Fit with 2 pattern:
Despite the ZZ/ZH, b/uds quark difference,
TDR has better energy related term and worse constant term.

@Yingqi

→ TDR JER curve flatter.





PID status

- Currently, TOF/TPC pid available
- Muon hit info, lepton ID (Ecal over P, Hcal over P, Rhad) under testing, plan to in use this week.
- One unified service package for ID.

PID in Jets

Tdr25.3.6; ZH->vvbb; stats: 100w events, 200w b jets.

@Haoyue Xu, Kaili Zhang

Tracks per jet						
Endcap:	e	mu	pi	k	p	Tot
Init	0.05	0.03	1.46	0.21	0.07	1.81
Tpc	0.03	0.02	0.83	0.14	0.05	1.07
Tof	0.02	0.02	0.58	0.11	0.03	0.76
Pt>1	0.01	0.02	0.34	0.09	0.02	0.49
Barrel:	e	mu	pi	k	p	Tot
Init:	0.33	0.19	9.83	1.33	0.42	12.10
Tpc	0.23	0.18	8.26	1.21	0.40	10.29
Tof	0.18	0.17	5.65	0.97	0.33	7.31
Pt>1	0.17	0.16	4.96	0.93	0.31	6.53

In average, for one b jet, initially it has 14 tracks: 11.19 Pion, 1.5 Kaon, 0.49 Proton. 0.38 electron and 0.22 muon.
For those 7 “good” tracks, it has 5.30 Pion, 0.96 Kaon, 0.33Proton, 0.18 electron and 0.18 muon.

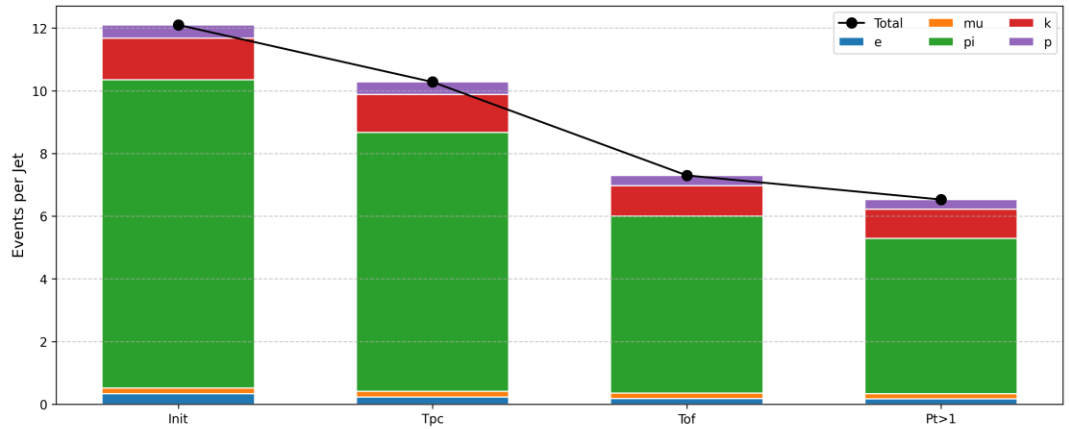
Charged track ratio

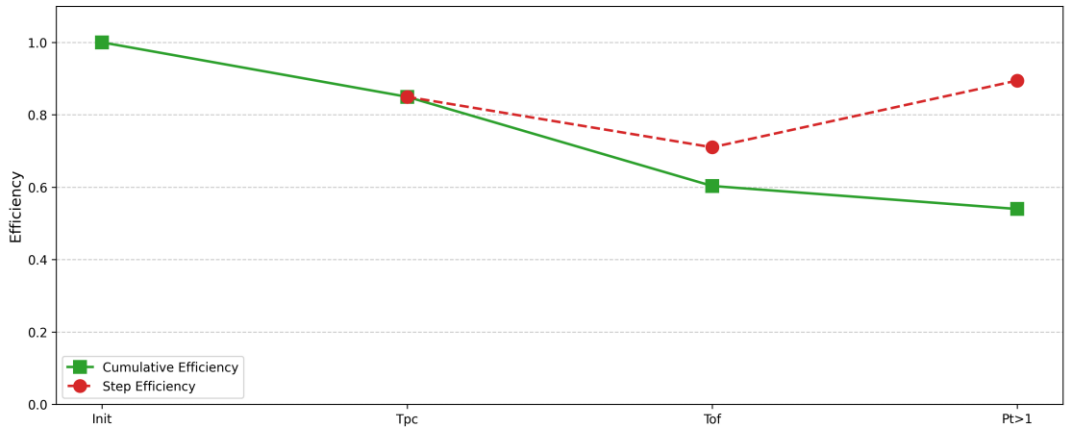
per jet						
Endcap:	e	mu	pi	k	p	Tot
Init	2.49%	1.70%	80.73%	11.50%	3.58%	100%
Tpc	2.41%	2.23%	77.40%	13.45%	4.51%	100%
Tof	2.39%	2.73%	76.27%	14.07%	4.54%	100%
Pt>1	3.07%	3.63%	70.46%	17.71%	5.13%	100%
Barrel:	e	mu	pi	k	p	Tot
Init:	2.72%	1.59%	81.23%	10.96%	3.50%	100%
Tpc	2.26%	1.79%	80.29%	11.76%	3.90%	100%
Tof	2.47%	2.30%	77.37%	13.29%	4.57%	100%
Pt>1	2.63%	2.48%	75.91%	14.21%	4.77%	100%

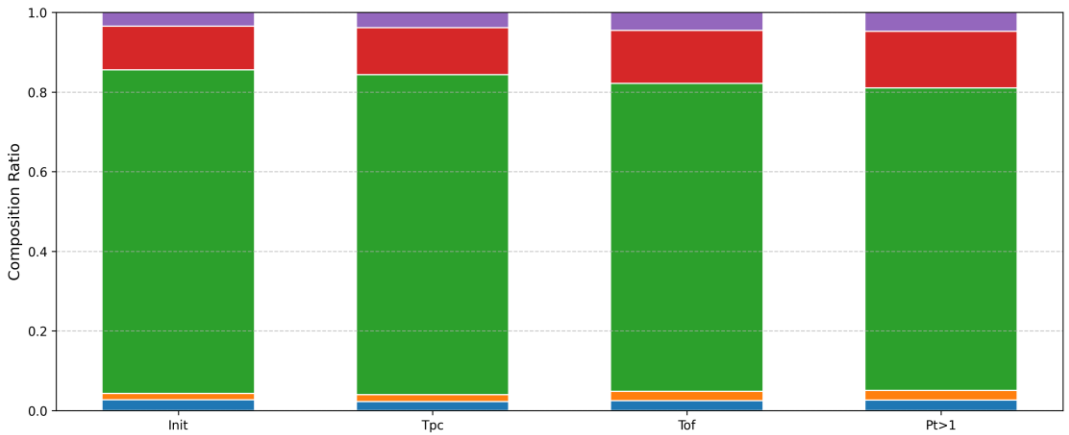
Charged track eff

per jet						
Endcap:	e	mu	pi	k	p	Tot
Init	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Tpc	57.12%	77.79%	56.73%	69.24%	74.49%	59.17%
Tof	40.17%	67.42%	39.56%	51.26%	52.99%	41.88%
Pt>1	32.95%	57.28%	23.35%	41.20%	38.26%	26.75%
Barrel:	e	mu	pi	k	p	
Init:	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Tpc	70.59%	95.91%	84.00%	91.19%	94.73%	84.99%
Tof	54.66%	87.60%	57.52%	73.24%	78.93%	60.39%
Pt>1	52.10%	84.28%	50.41%	69.94%	73.67%	53.95%

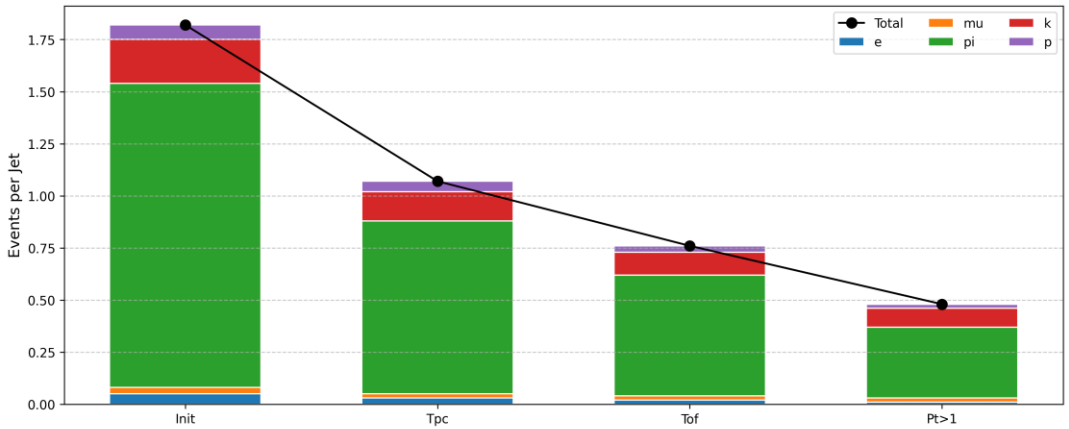
Particle Analysis - Barrel

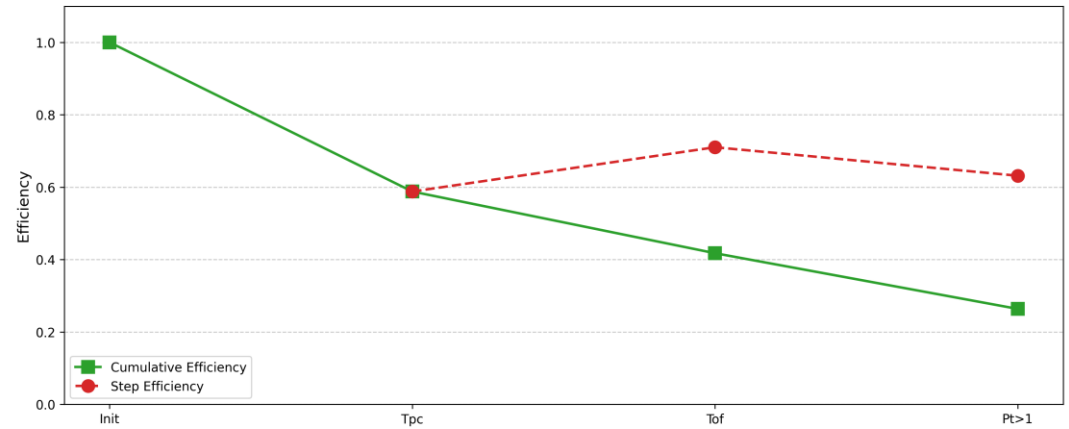


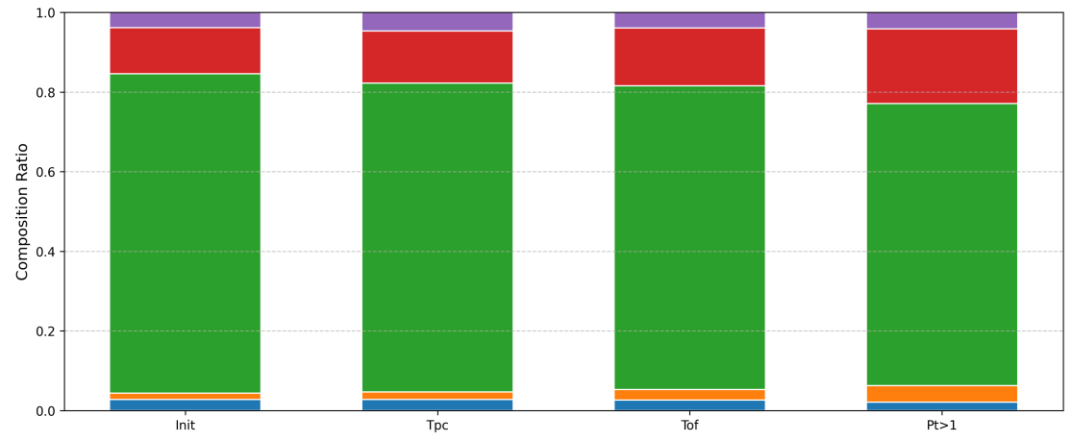




Particle Analysis - Endcap



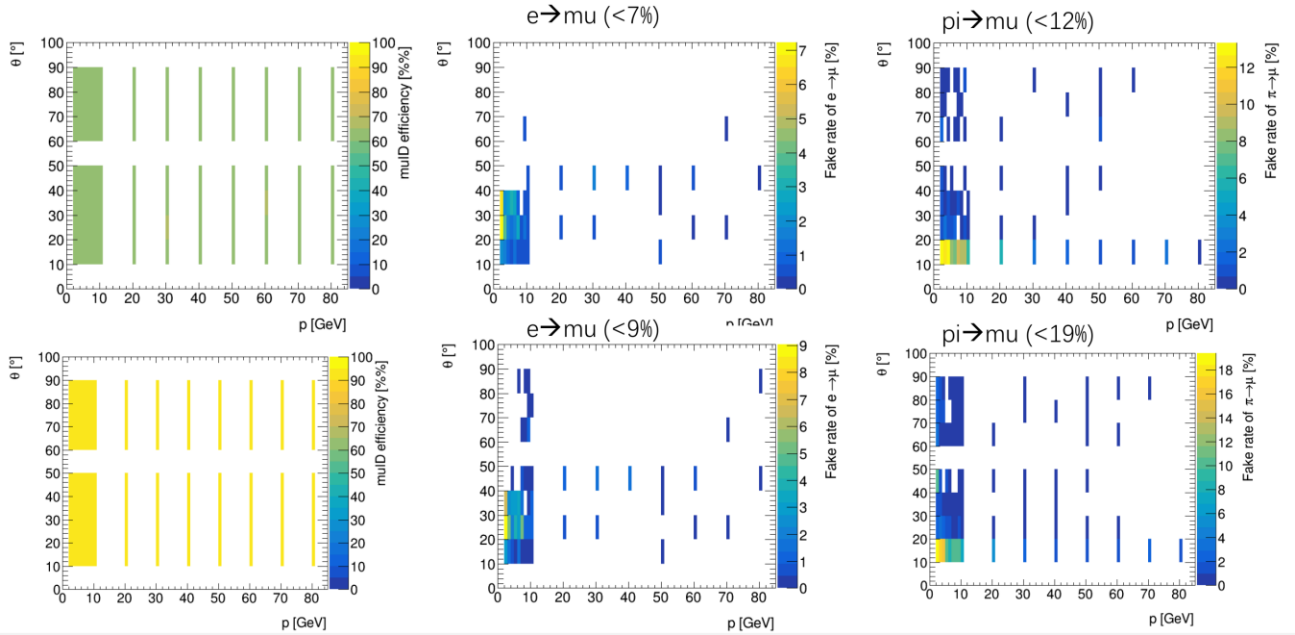




Roughly: lepton PID in jet

@Xia Ligang, Last Friday;

muID: 60%WP (top) and 90% WP (bottom)



In jet, charged tracks P ~<10GeV.

From charged track ratio, for one good track in jet,

N_Pion: N_Muon: 30:1. (2.48%:75.91%. For raw track, 50:1)

Pion to muon mistarget ratio, assuming 10%

Reco PID Pio purity < 1/(30*10%+1) = 25%

One good to use lepton ID require purity > 90% -> Mistarget ratio <1%.

purity > 99% -> Mistarget ratio <0.1%.

@Geliang, Muon chamber information also inefficient in low pt region.

Difficult to tag lepton in jet.

Lepton yield in jet; Impact?