CEPC

Jets, samples and Wednesday working meeting

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CEPCSW update

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- https://code.ihep.ac.cn/cepc/CEPCSW/-/merge_requests/248
- Reduce rec momory.
- Decouple the geometry service.
- Need to re-organize the script order.
- (Not merged yet.) Under discussion.

> Store EcalBar geometry meta data into root file.
>
> 1. root file size +~ 10KB
> 2. simulation mem usage: 3.10GB -> 3.80 GB
> 3. CyberPFA mem usage: -> 1.6GB

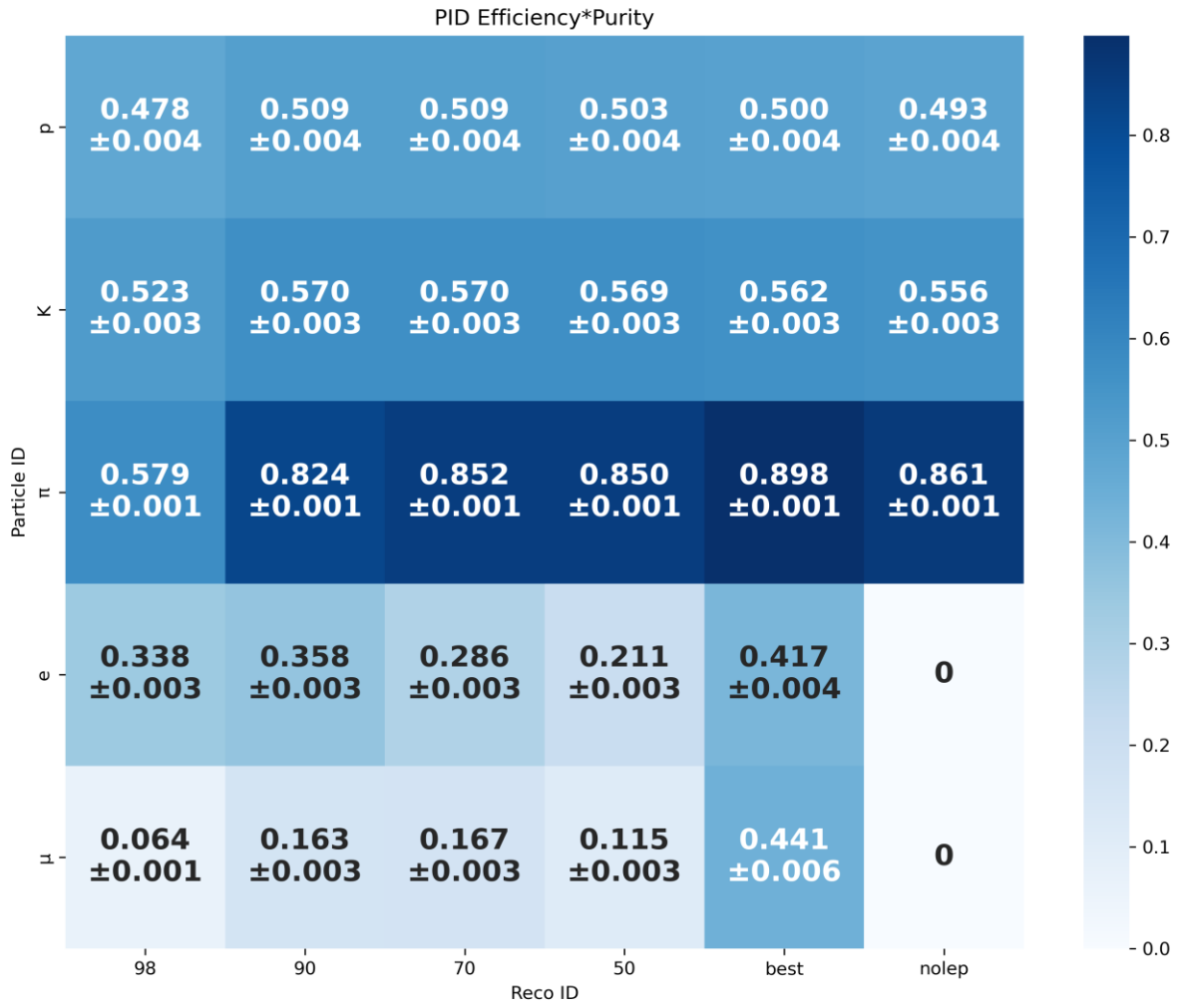
Using Geliang’s XGBoost PID on Hbb jet:

/hpcfs/cepc/higgsgpu/zhangkl/datasets0506/33*bb.root

20000 jets

-> Dominant in Hqq environment

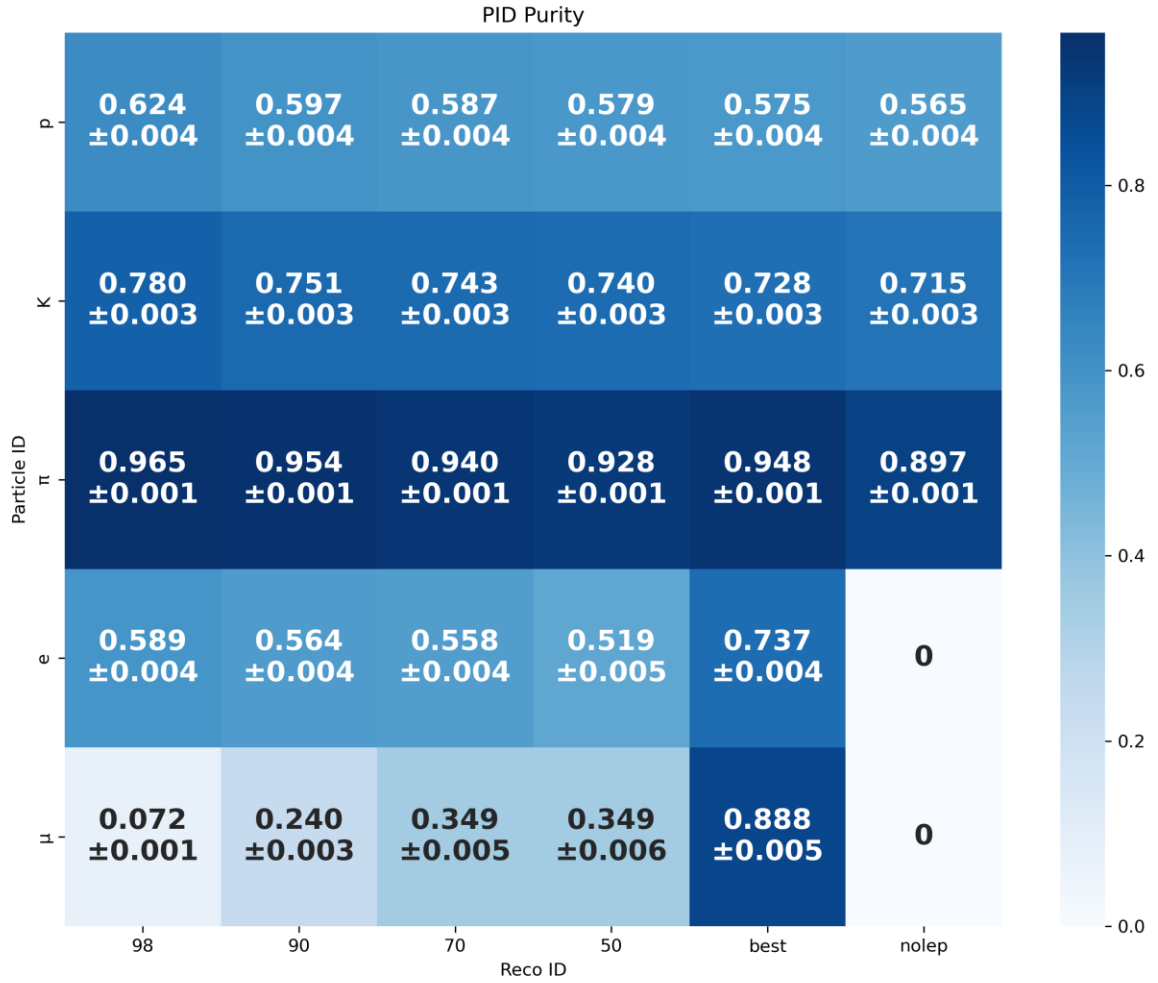
Eff*Purity with uncertainty



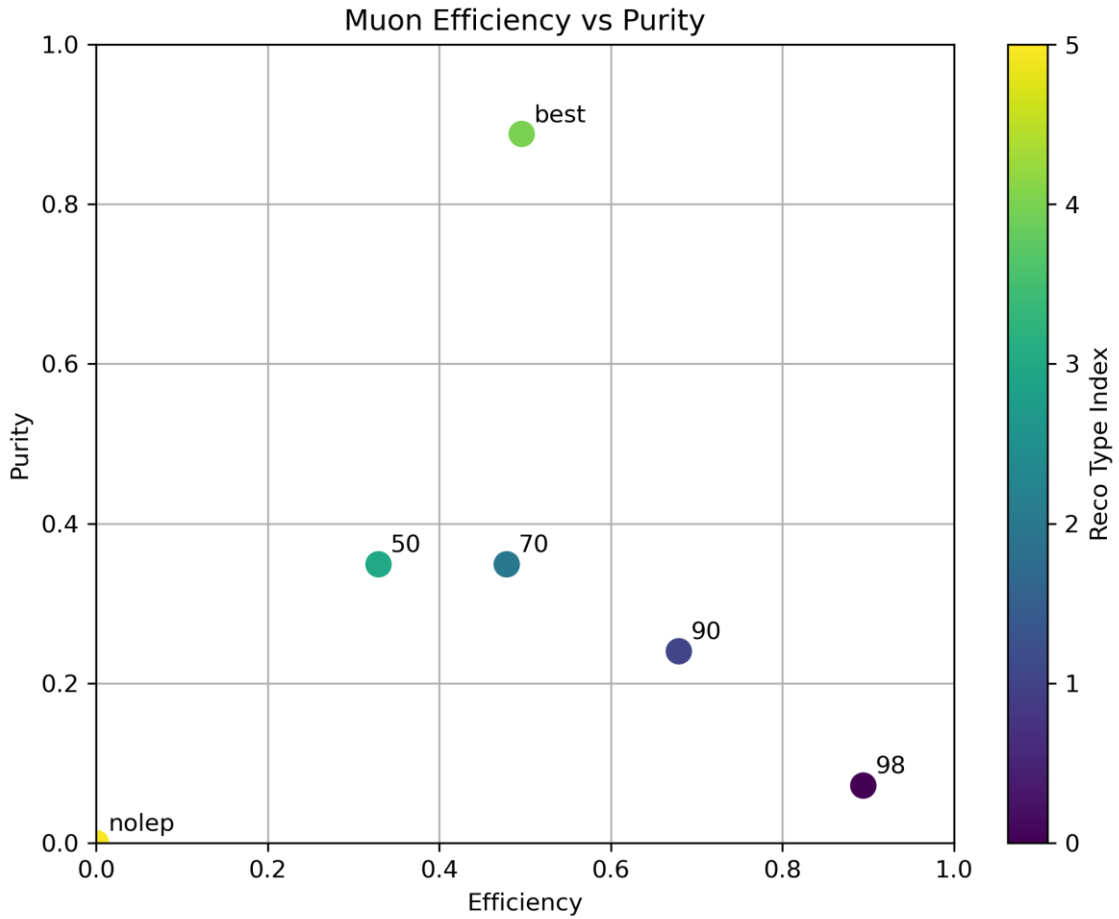
Last week, the large uncertainty due to the entries scaled to event level. (O(1)). Now fixed. ~O(20000)

High eff*purity found in “best” WP, which requires the maximum likelihood among 5 categories.

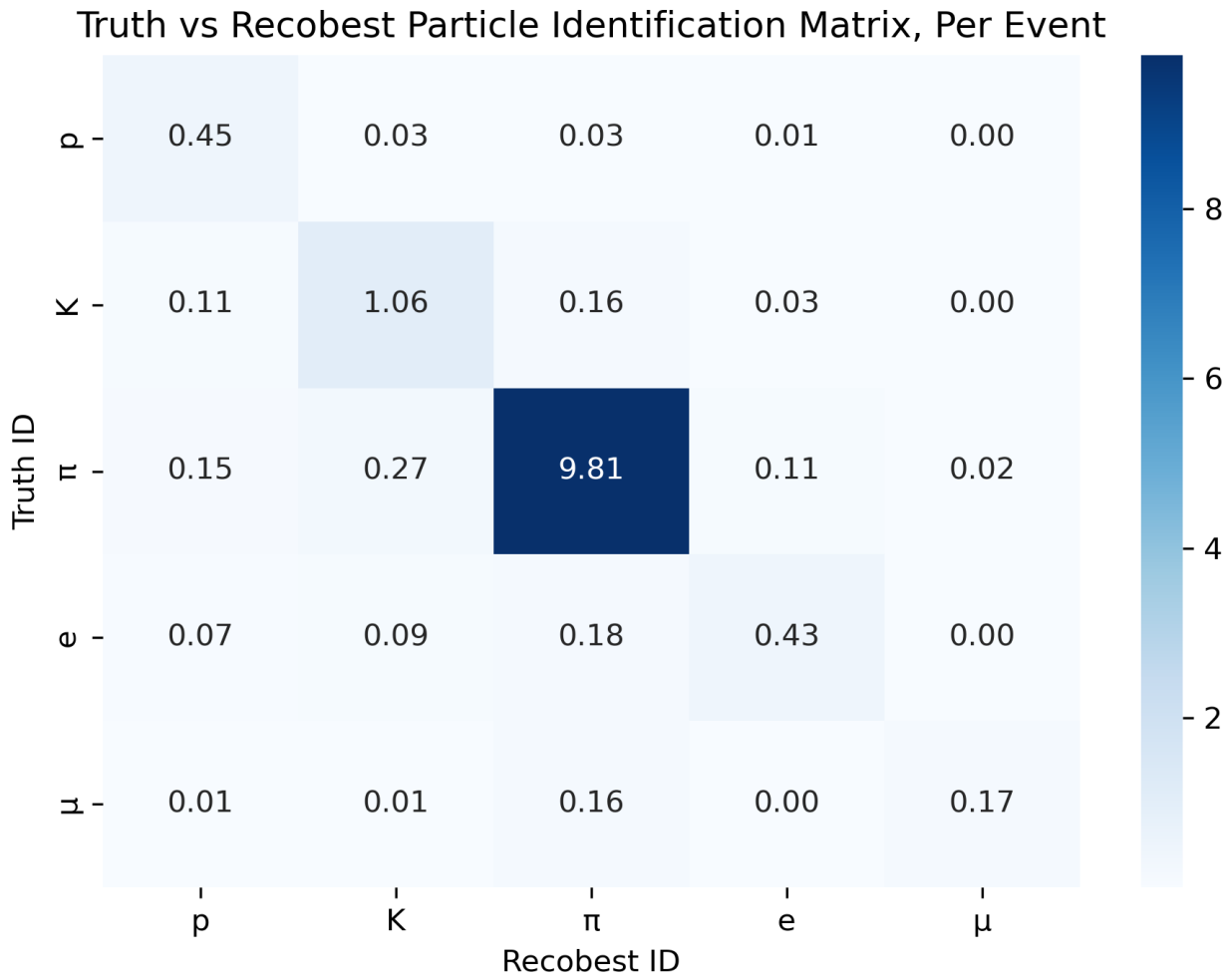
In this way, ~50Eff% and high Purity for e and muon. Even for those low energy leptons which lacks information.



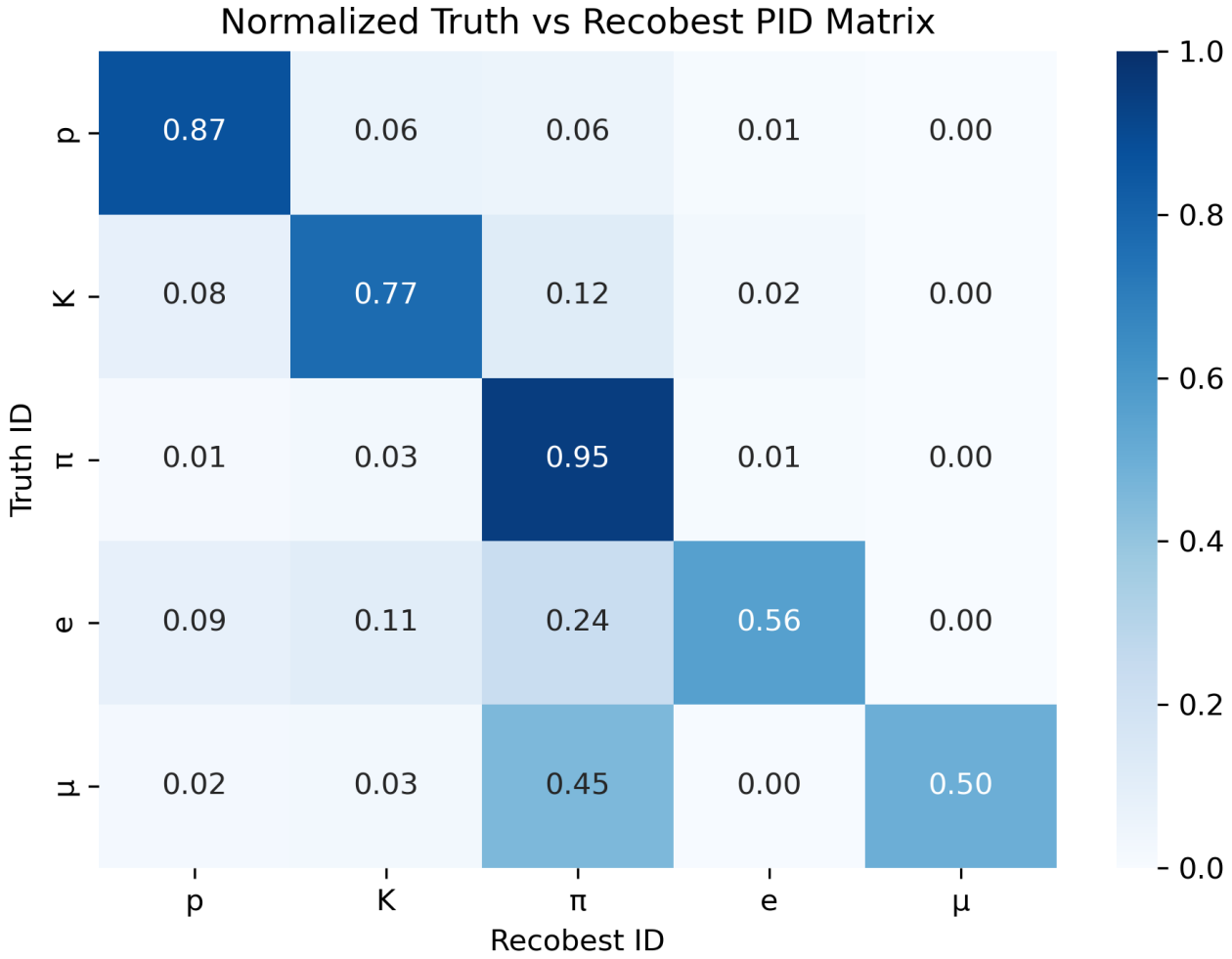
Maximum likelihood: best WP.



Confusion matrix, scale by one event.



Confusion matrix, scale by category



Clear separation between p/k/pi to e/mu.

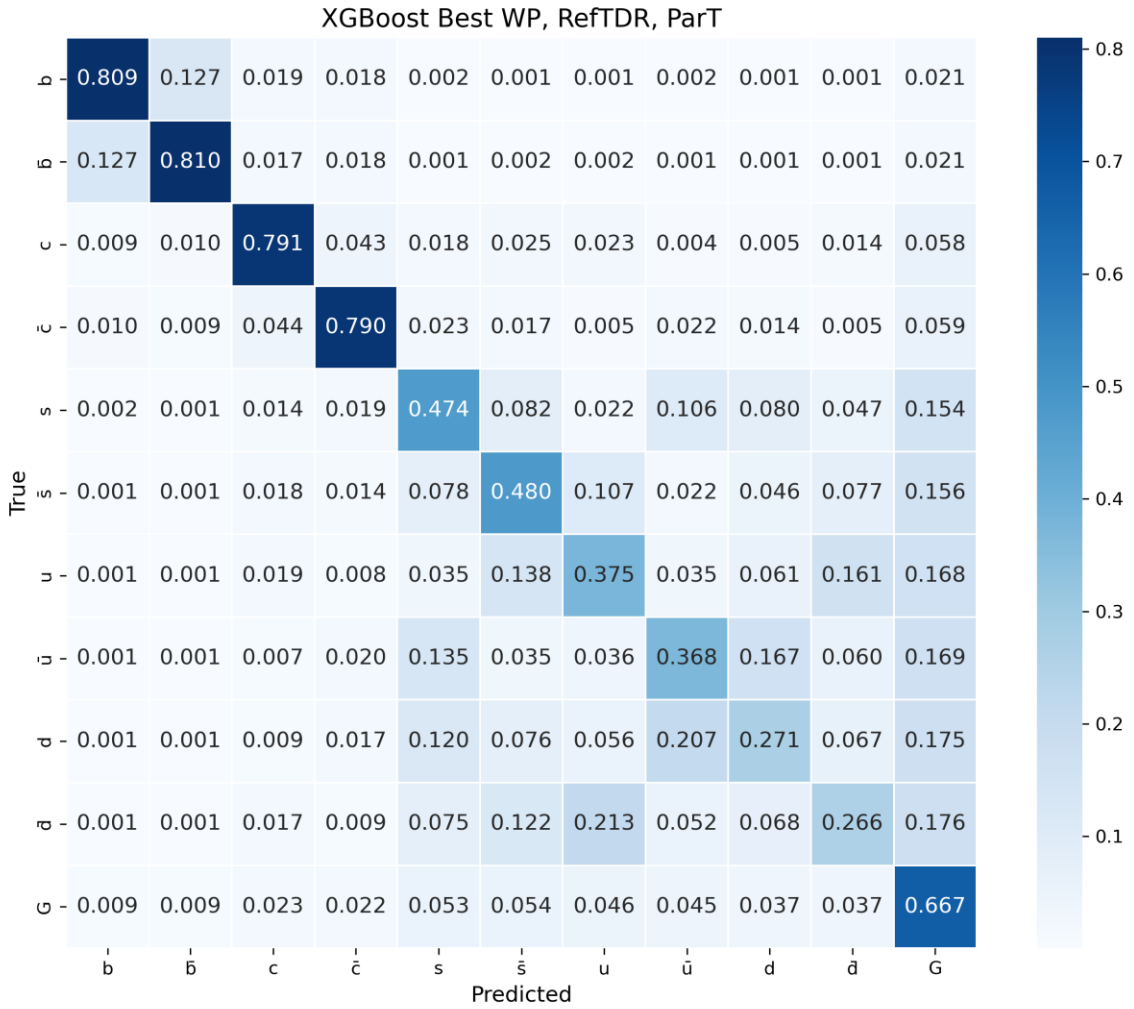
Clear sepraration between e/muon

Very low contamination ratio for pion->muon, even for low energy.

Muon eff ~50% and ~50% failed to Pion.

JOI Application

Use 1M sample training. Not application.

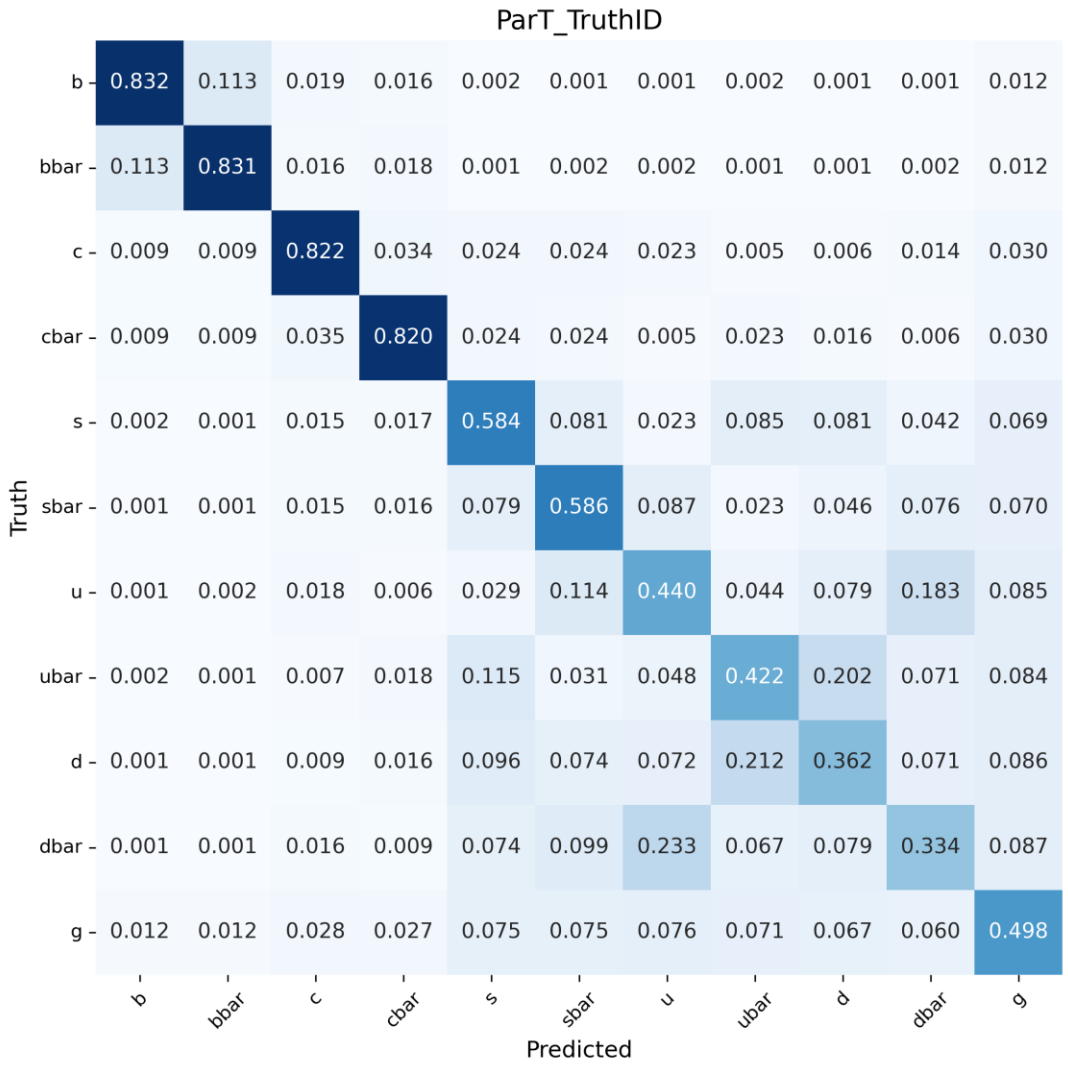


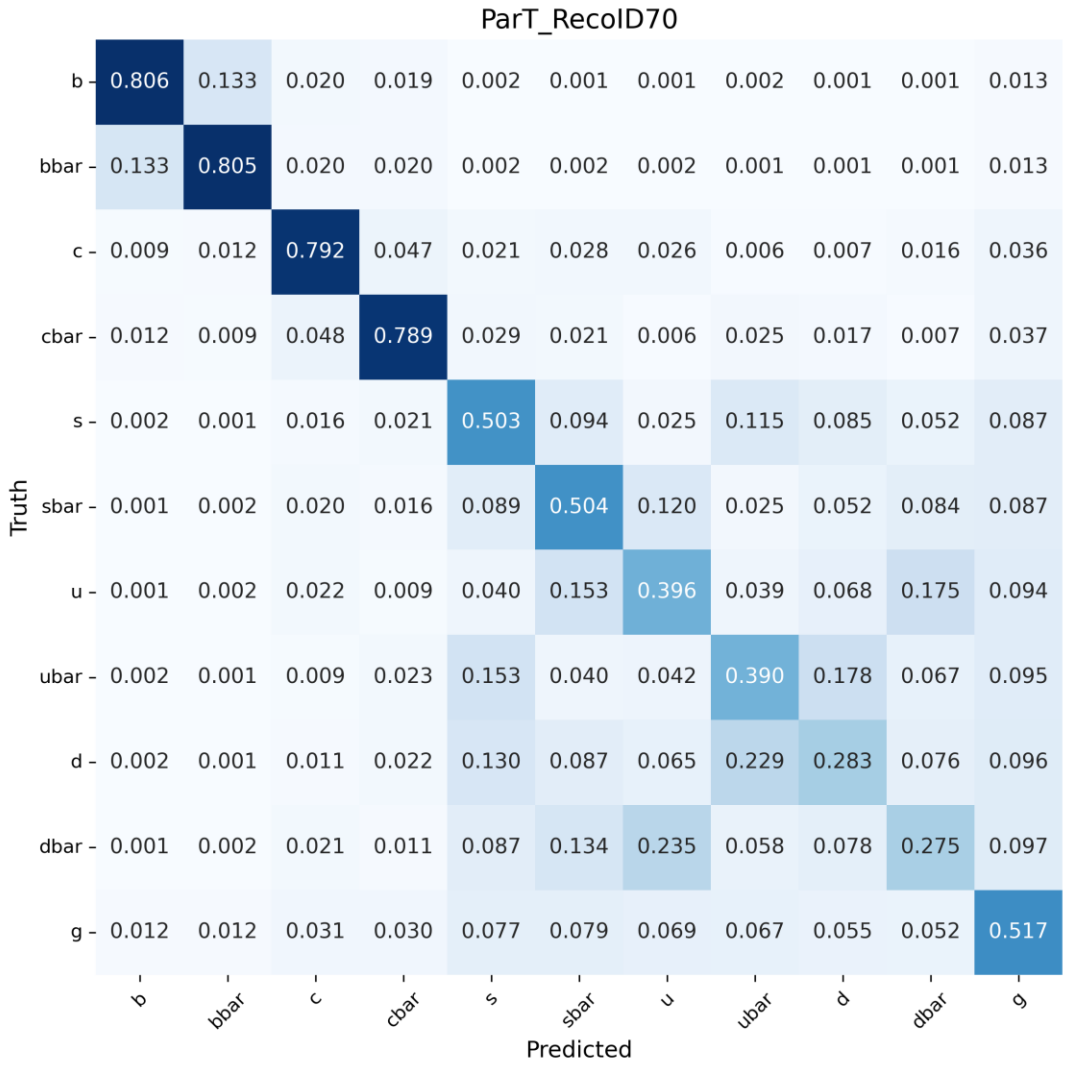
XGBest: 0.5545.

Slightly better than Reco70.

Past:	
Truth:	0.5936
Reco70:	0.5510
Nolep:	0.5494
Reco98:	0.5153
NoID:	0.4825

XG_Best gets lower s eff but higher gluon eff compared to Reco70.
However, the PID improvement leads to small impact on JOI.





To dos

- Further study the JOI Impact parameters. (VTX, PID)
- Test applications on Zqq, E360, cases like 4j.
- Write universal package to use. (Under construction)