PrimeTagSvc

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https://code.ihep.ac.cn/zhangkl/PrimeTagSvc
Now you can git pull from lxlogin.

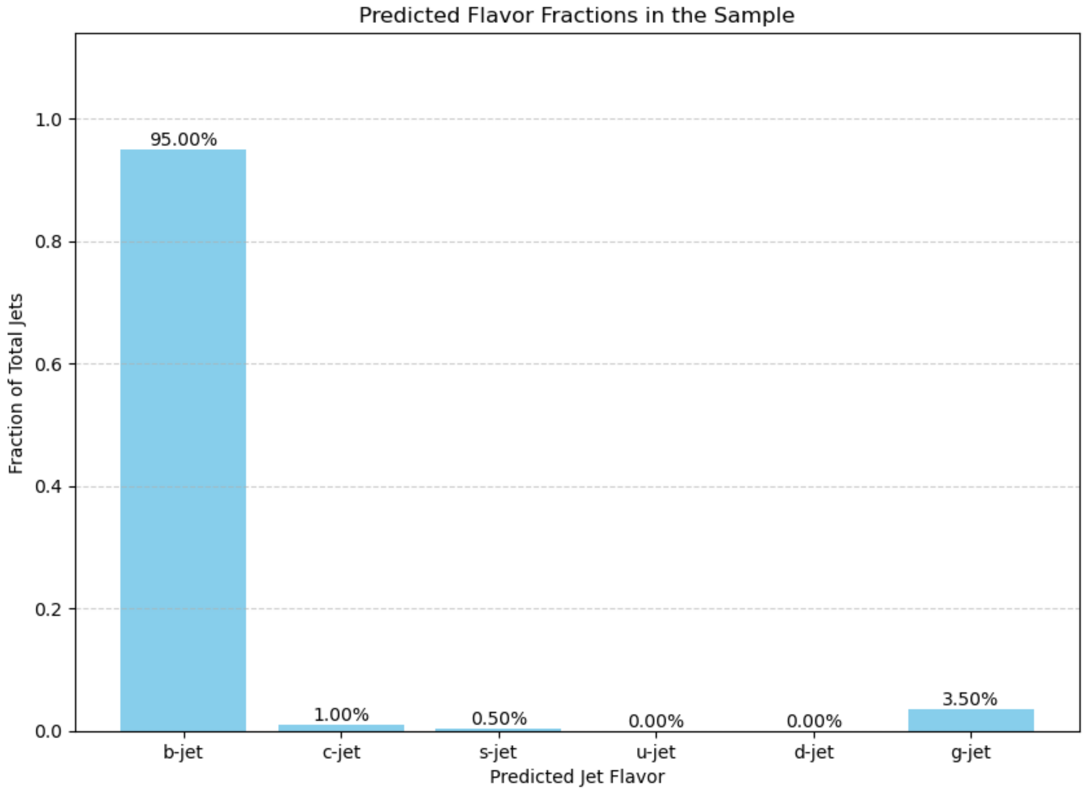
Application on Zqq

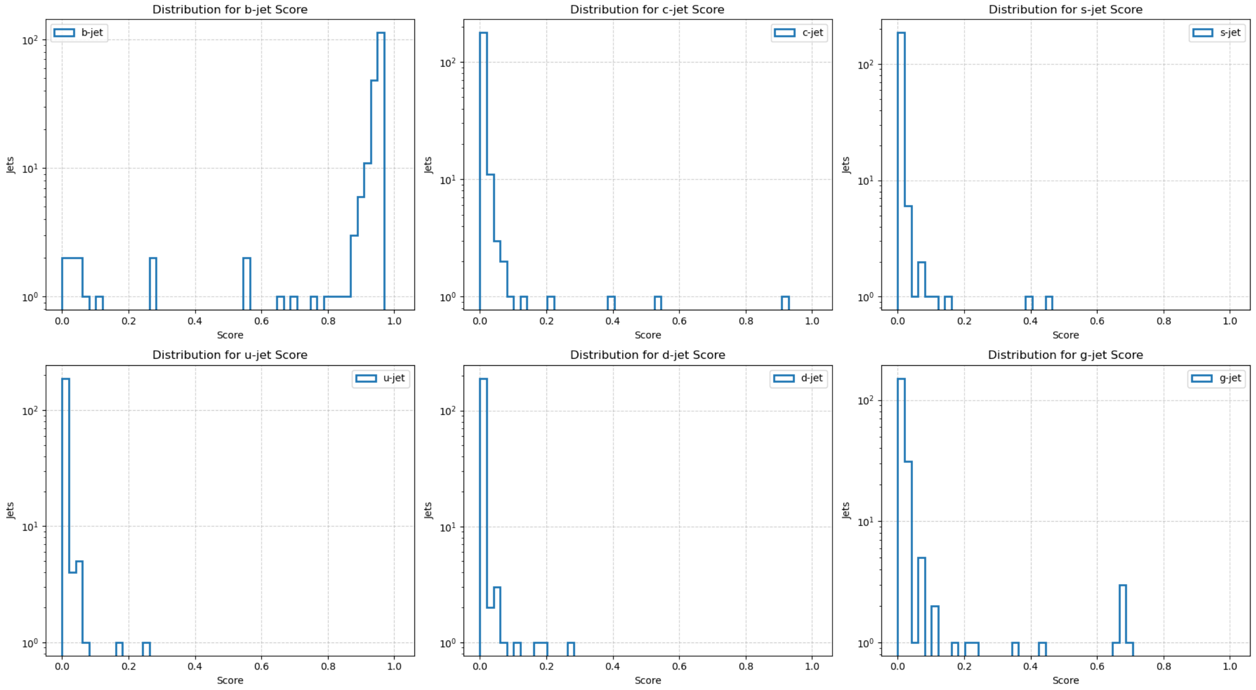
Output of JetDumpAlg;

```
============================================================
          Jet Summary Report
============================================================
Total Events Processed: 100
Total Jets Processed  : 200
------------------------------------------------------------
Jet Flavor Fractions (M6-level):
  - b-jets (b+b_bar) : 190 / 200 (95.00%)
  - c-jets (c+c_bar) : 2 / 200 (1.00%)
  - light-jets       : 8 / 200 (4.00%)
Detailed b-jet Counts (M11-level):
  - b quark jets     : 88 / 200 (44.00%)
  - b_bar quark jets : 102 / 200 (51.00%)
------------------------------------------------------------
Event Pair Fractions (for 2-jet events):
  - bb events: 93 / 100 (93.00%)
  - cc events: 0 / 100 (0.00%)
  - ss events: 0 / 100 (0.00%)
  - gg events: 3 / 100 (3.00%)
    - b + b          : 7 (7.53% of bb)
    - b_bar + b_bar  : 13 (13.98% of bb)
    - b + b_bar      : 73 (78.49% of bb)
============================================================
```

Category/Scores

To repeat this plot, try score_ana.py.

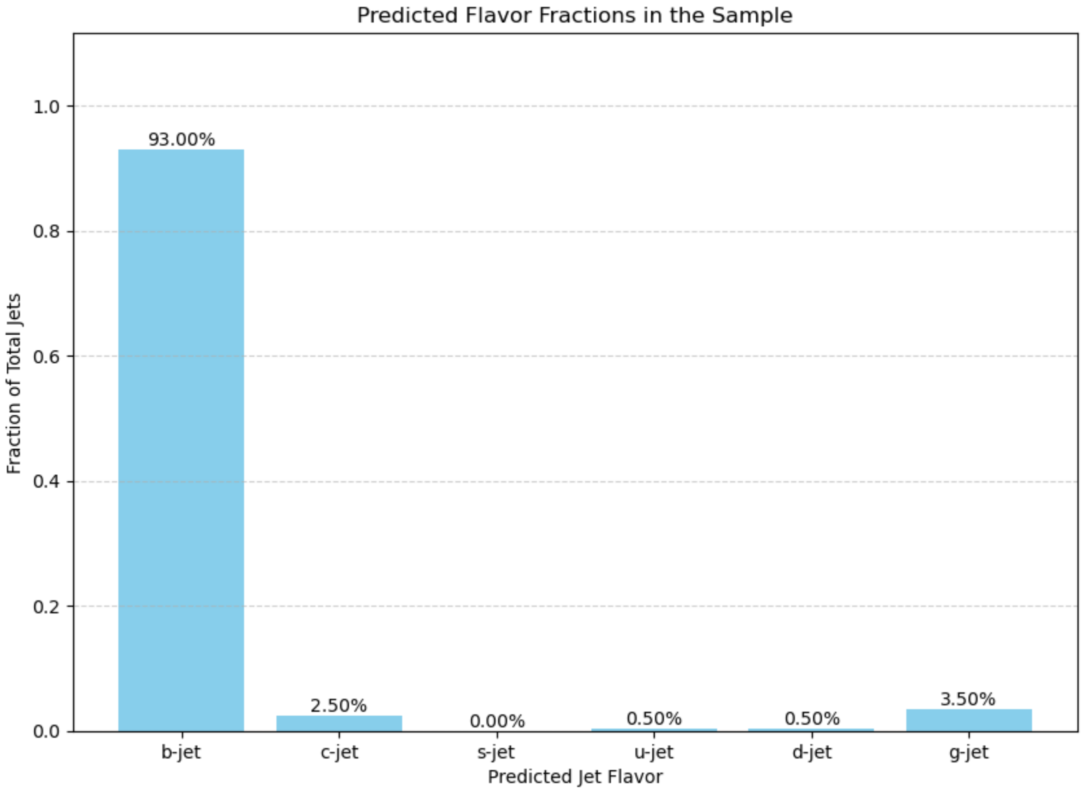


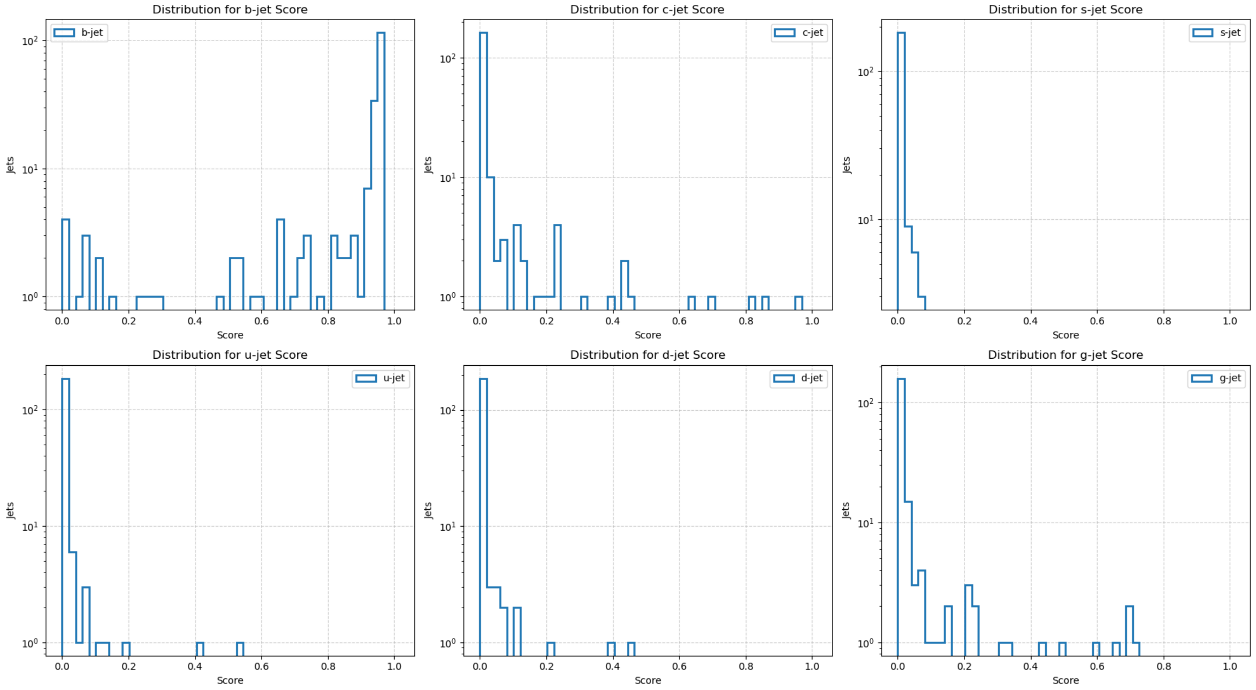


Application on Hqq

```
==============================================================
                      Jet Summary Report
==============================================================
Total Events Processed: 100
Total Jets Processed  : 200
--------------------------------------------------------------
Jet Flavor Fractions (M6-level):
  - b-jets (b+b_bar) : 186 / 200 (93.00%)
  - c-jets (c+c_bar) : 5 / 200 (2.50%)
  - light-jets       : 9 / 200 (4.50%)
Detailed b-jet Counts (M11-level):
  - b quark jets     : 93 / 200 (46.50%)
  - b_bar quark jets : 92 / 200 (46.00%)
--------------------------------------------------------------
Event Pair Fractions (for 2-jet events):
  - bb events: 88 / 100 (88.00%)
  - cc events: 0 / 100 (0.00%)
  - ss events: 0 / 100 (0.00%)
  - gg events: 2 / 100 (2.00%)
    - b + b          : 7 (7.95% of bb)
    - b_bar + b_bar  : 7 (7.95% of bb)
    - b + b_bar      : 73 (82.95% of bb)
==============================================================
```

Category/Scores



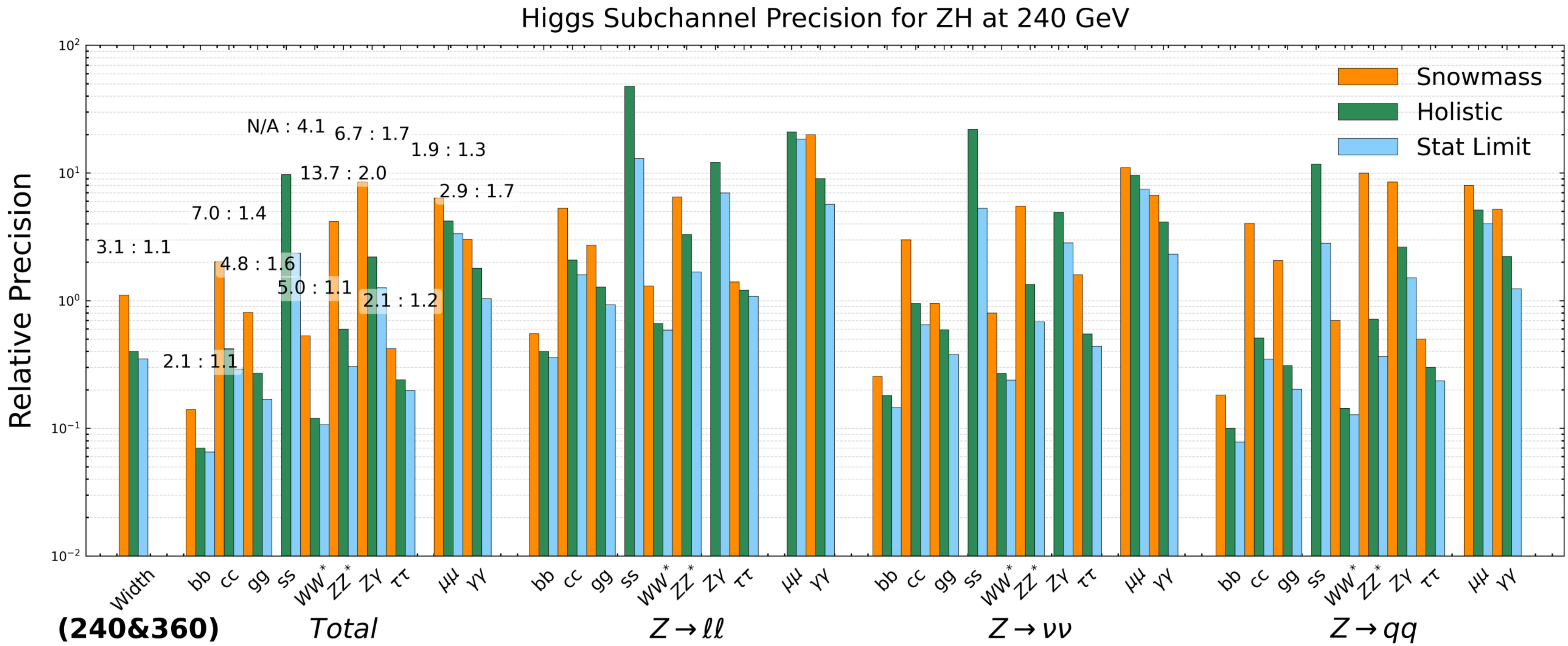


Reason

- Charge type:
  - Int (in ntuple)-> double(bug code) -> float(in onnx), change double to int.
- All values type kept until last time going to float;
  - range check for all variables

Multihead

Improved by:
Full channel covered;
Multihead sensitivity;
(rough) bkg estimation.



M6 Multihead

Eff based

CEPC $H \rightarrow$ all, 125 GeV

True \ Predicted	*bb*	*cc*	*ss*	*uu*	*dd*	*gg*
bb	0.973	0.013	0.000	0.000	0.000	0.013
cc	0.010	0.934	0.019	0.005	0.004	0.029
ss	0.001	0.008	0.806	0.050	0.058	0.077
uu	0.001	0.004	0.085	0.502	0.293	0.115
dd	0.001	0.005	0.095	0.370	0.415	0.116
gg	0.027	0.038	0.080	0.089	0.059	0.707

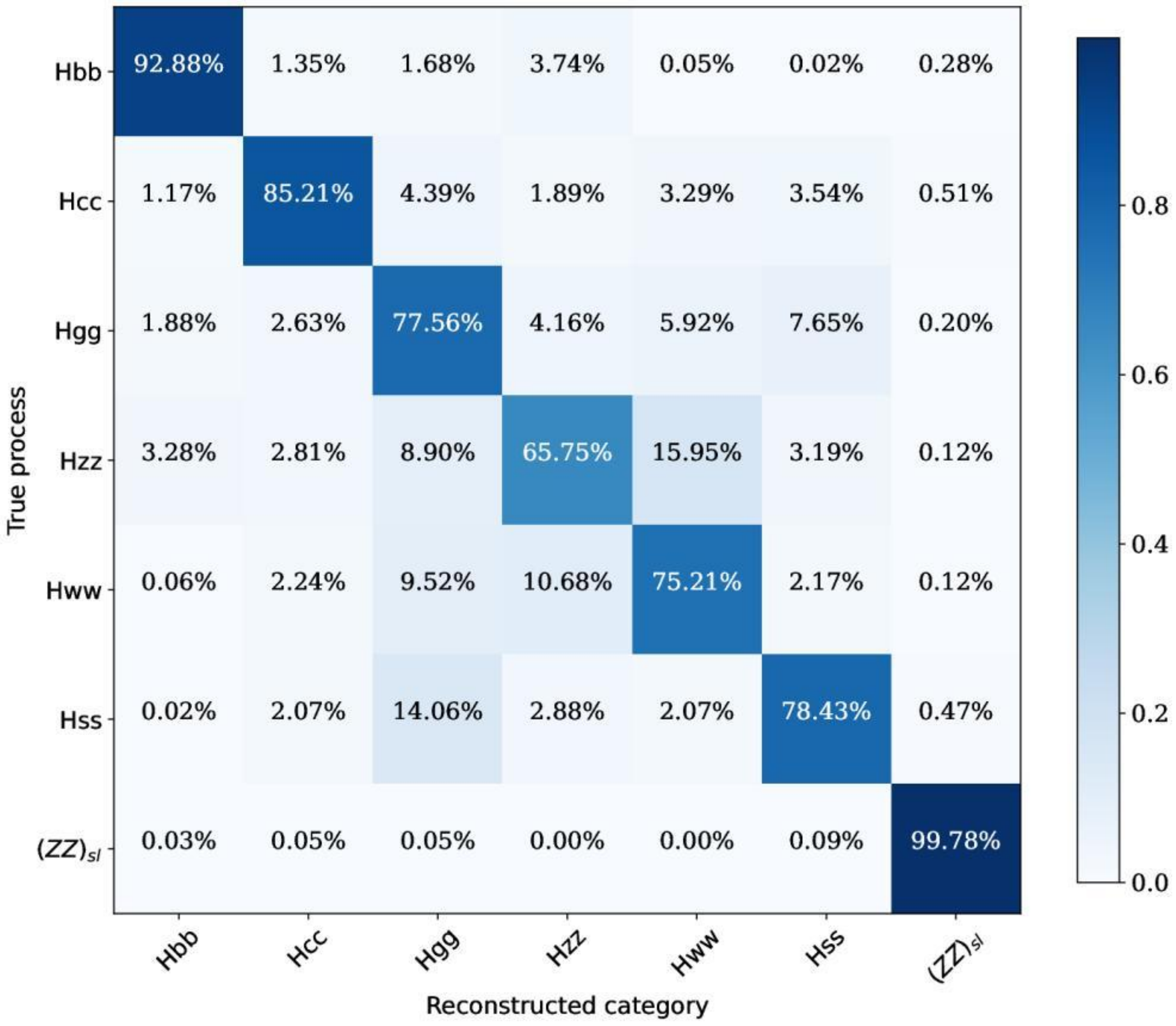
Purity Based

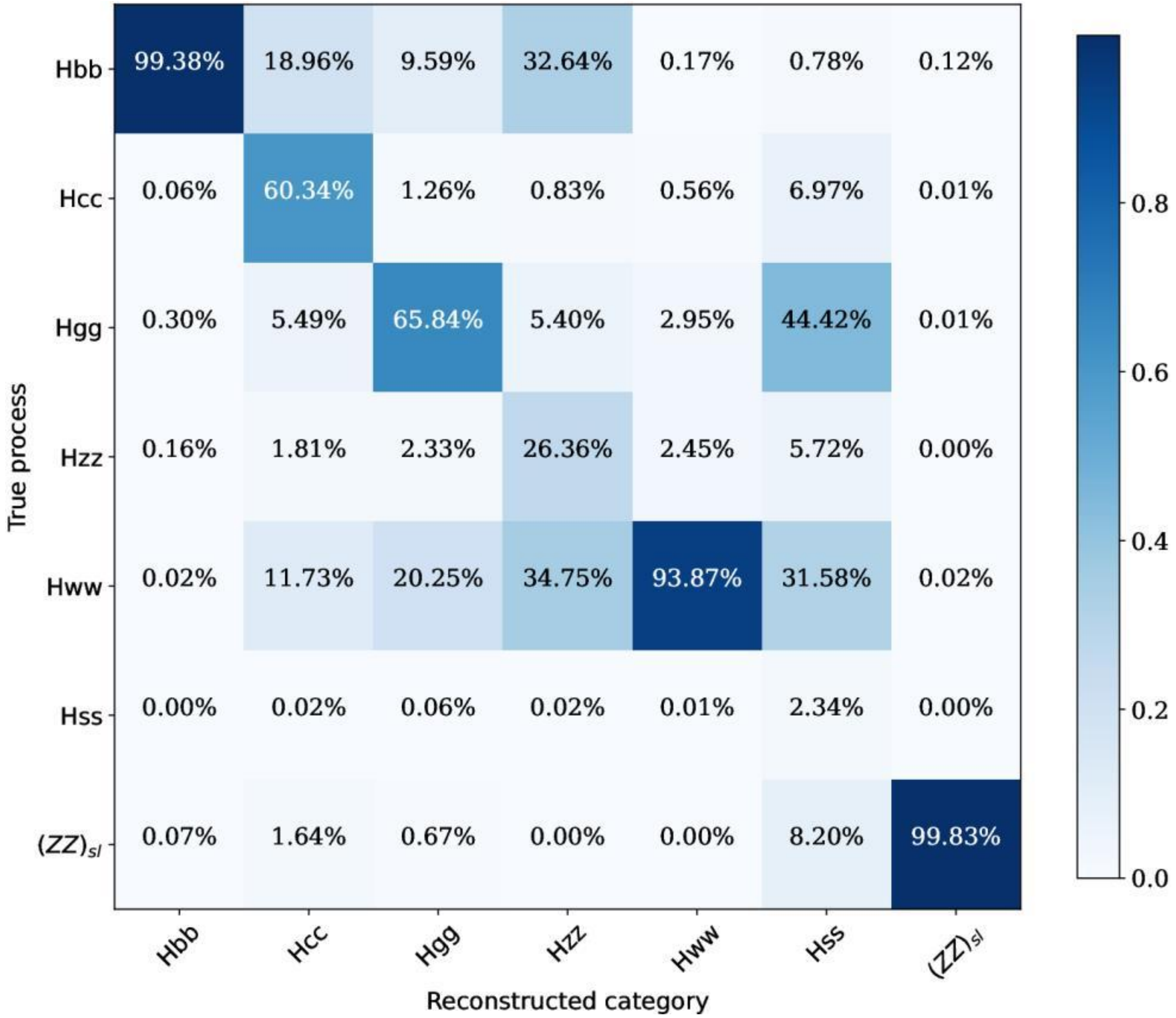
CEPC $H \rightarrow$ all, 125 GeV

True \ Predicted	*bb*	*cc*	*ss*	*uu*	*dd*	*gg*
bb	0.962	0.013	0.000	0.000	0.000	0.012
cc	0.010	0.932	0.017	0.005	0.004	0.027
ss	0.001	0.008	0.743	0.049	0.070	0.073
uu	0.001	0.004	0.079	0.494	0.353	0.109
dd	0.001	0.004	0.087	0.364	0.501	0.109
gg	0.026	0.038	0.074	0.088	0.071	0.670

By Xiaotian

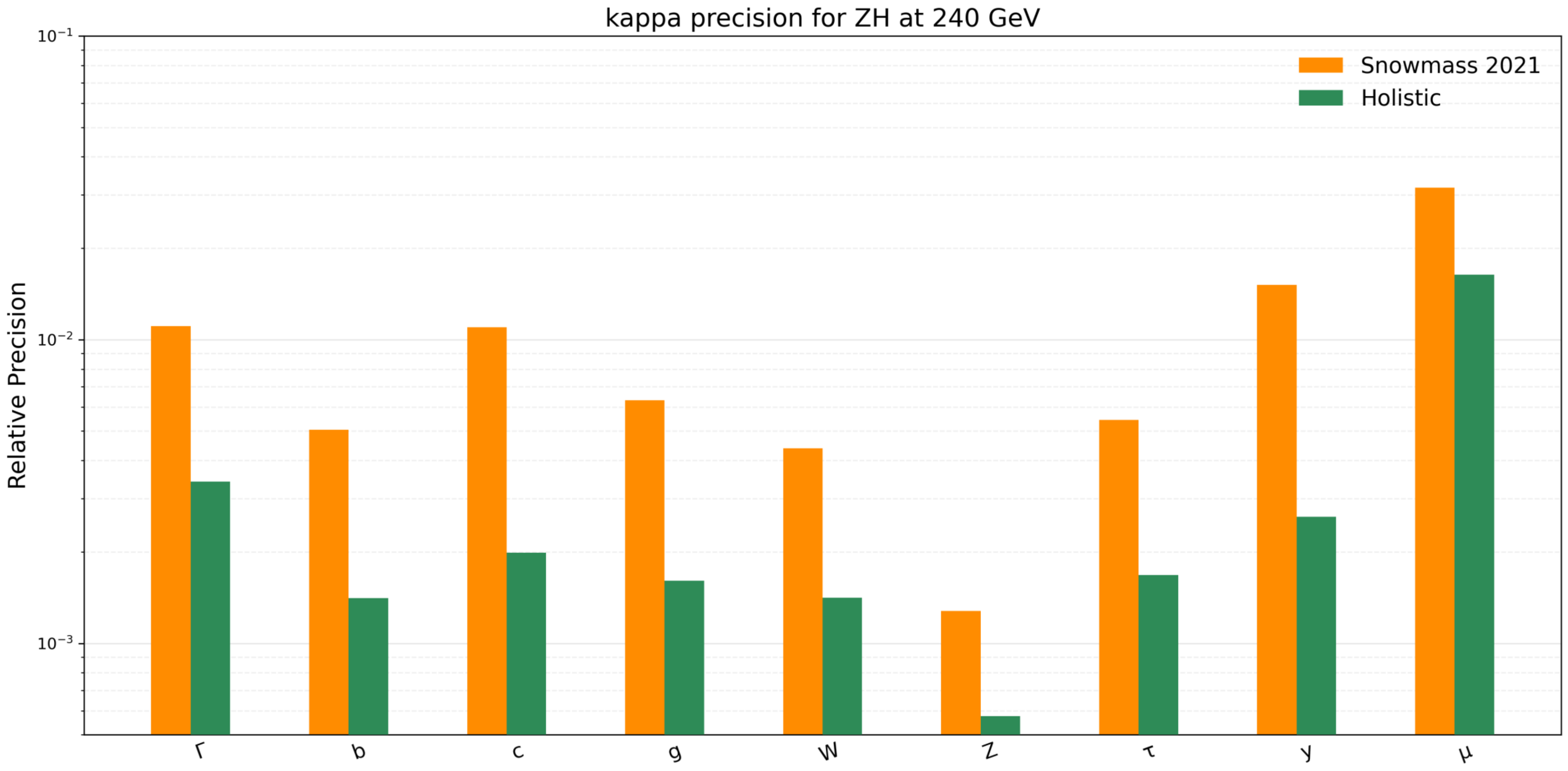
Consistent performance expected.



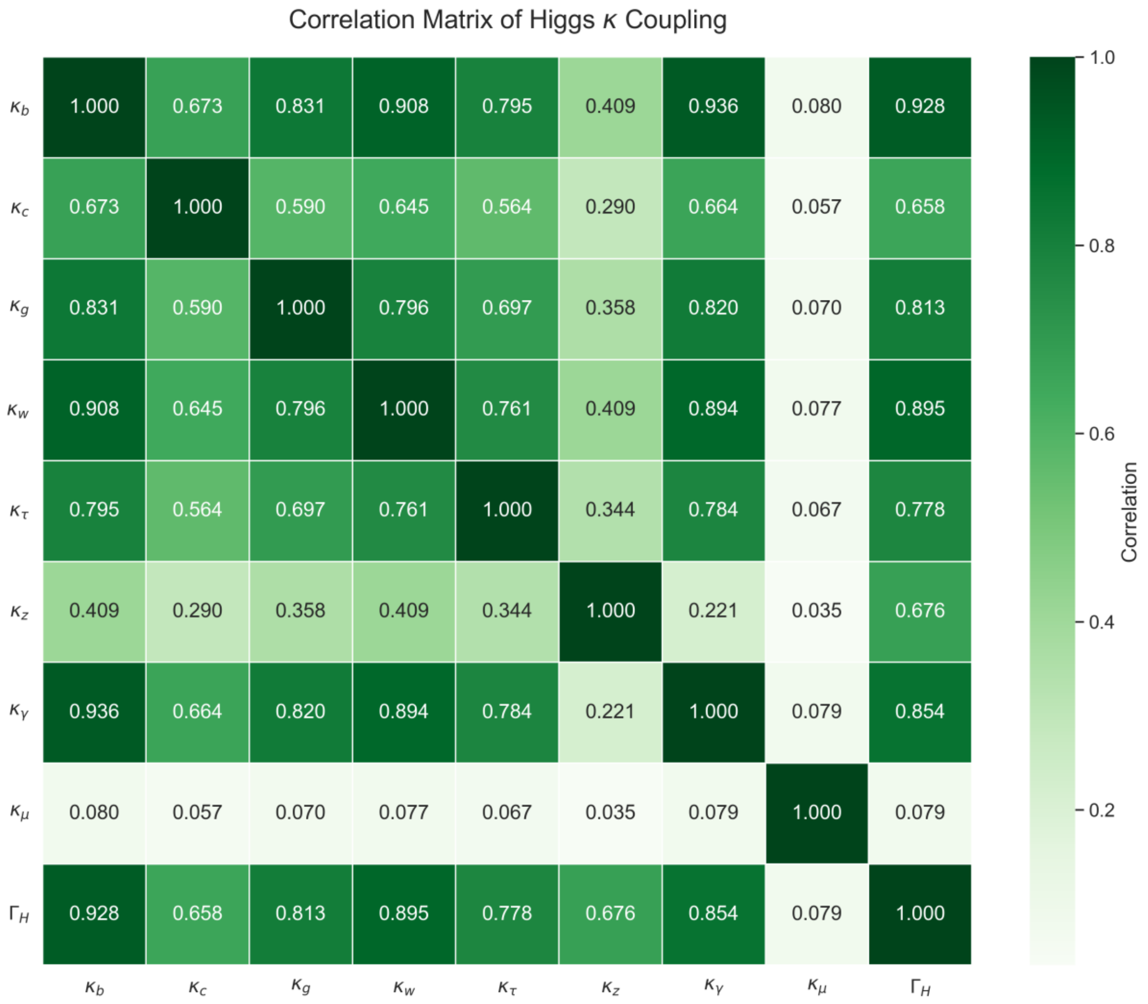


Kappa framework

Major improvement from ZZ hadronic measurement.



Kappa correlation



To dos

- Merge PrimeTagSvc to CEPCSW master
- JOI future development;
  - Generator, VTX, uncertainty, feature engineering…
- Multihead including backgrounds, final states specific