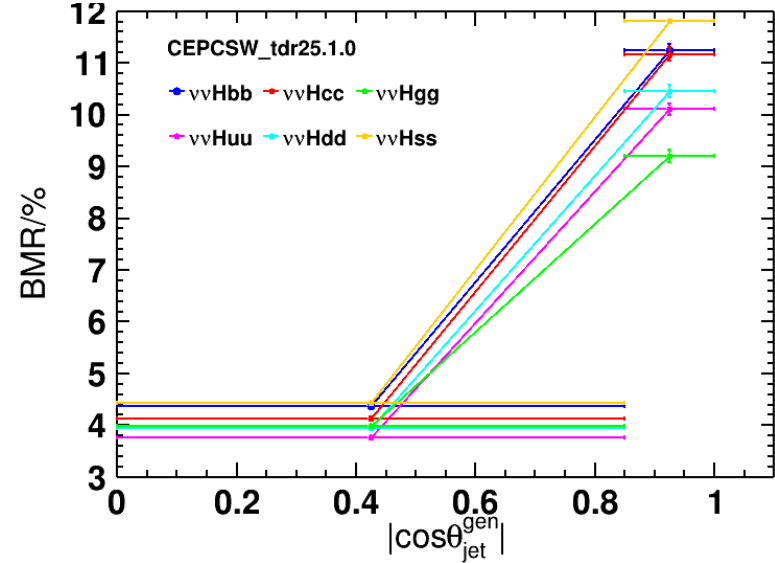
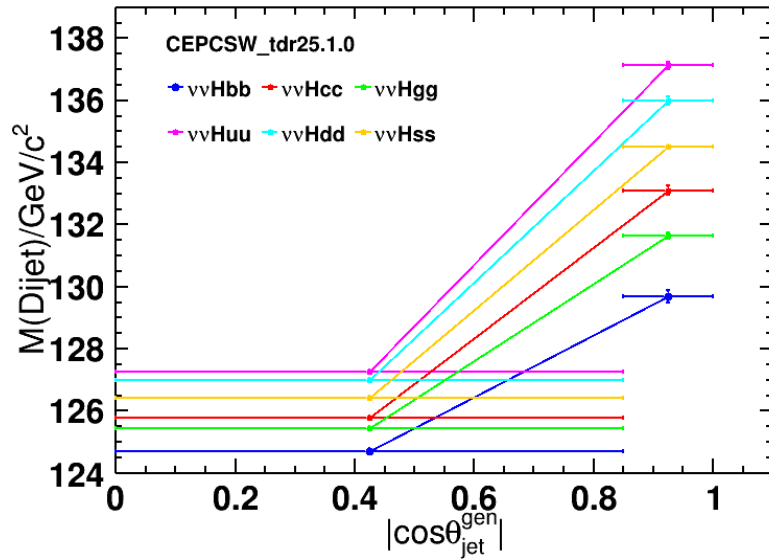
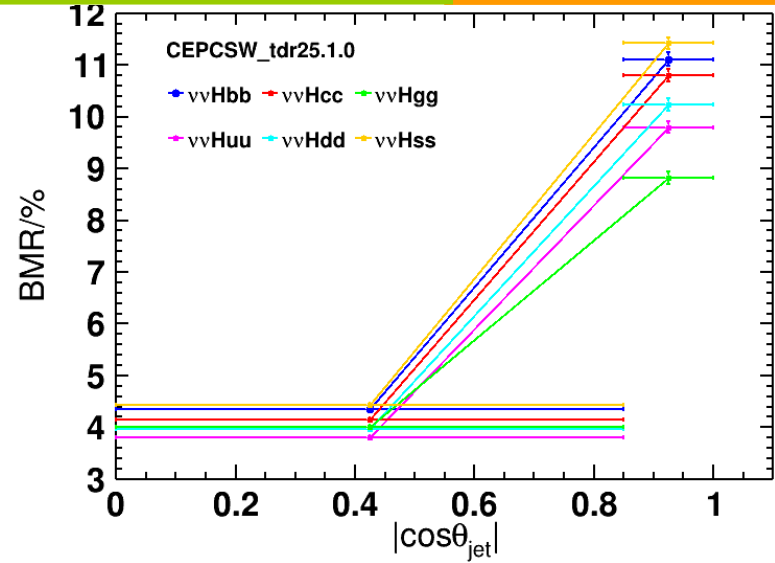
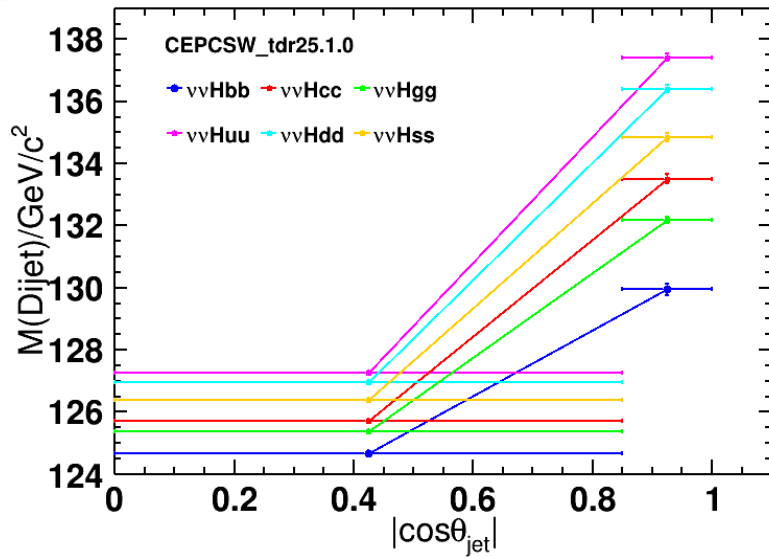


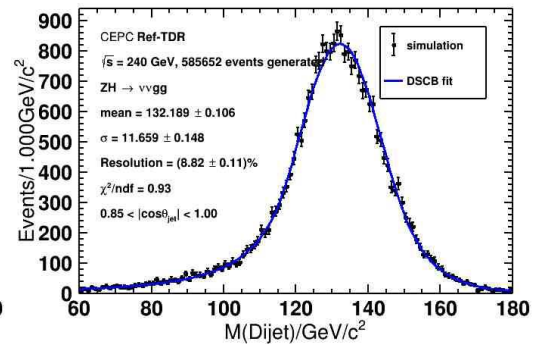
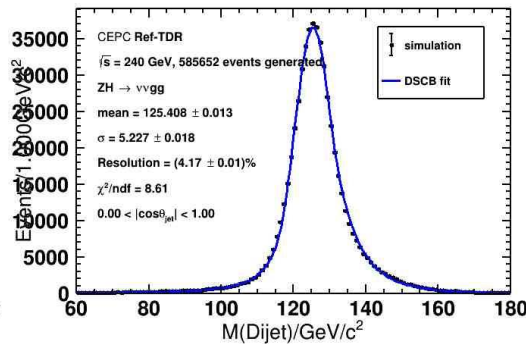
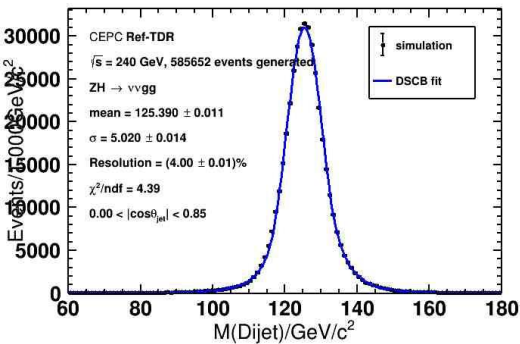
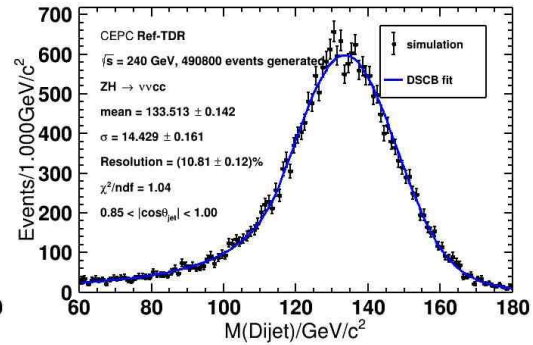
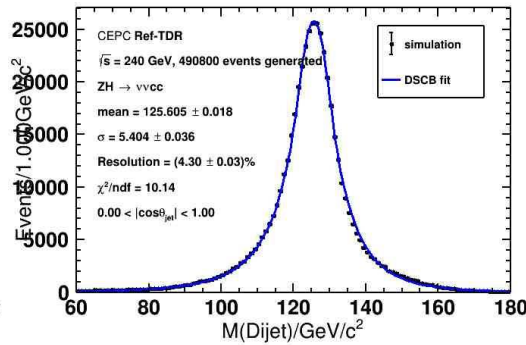
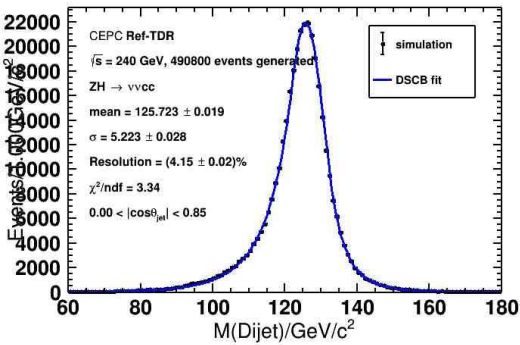
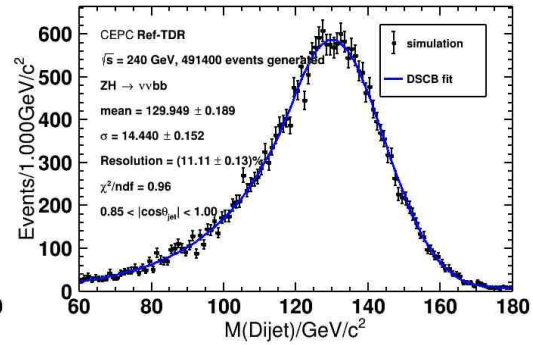
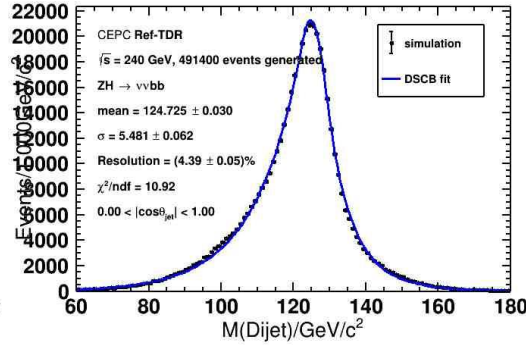
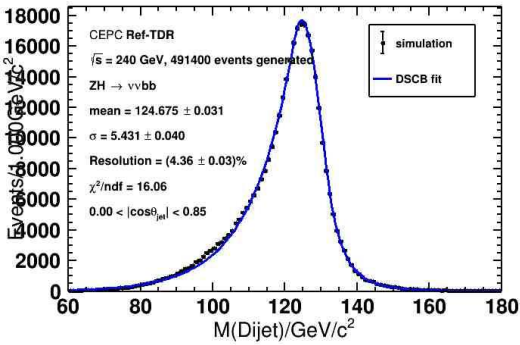
BMR -- Status

- ❖ BMR performance in $ZH \rightarrow \nu\nu + gg/bb/cc/uu/dd/ss$ with $\sqrt{s} = 240\text{GeV}/c^2$
- ❖ Update results with new samples with ISR on
 - Endcap have much larger BMR and larger dijet mass than barrel's
 - Meet problems dealing with ROOT628 and ROOT630
- ❖ Compare performance under CEPCSW_tdr25.1.0 and CEPCSW_tdr24.12.0
 - Samples with ISR worse than samples without ISR
 - Performance of $|\cos\theta_{\text{jet}}| < 0.85$ is still better than that of $|\cos\theta_{\text{jet}}| < 0.7$
- ❖ BMR dip in bb and worst BMR in ss
 - bb samples with ISR don't have such dip
 - Z mass cut don't influence the dip
 - KL takes away more energy in ss

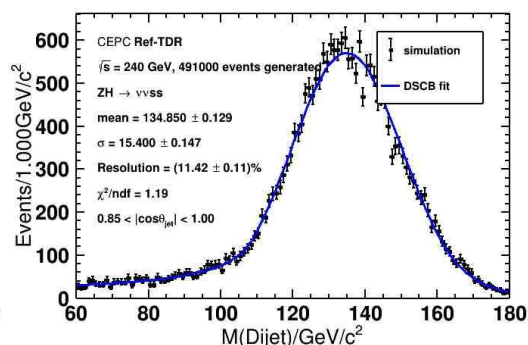
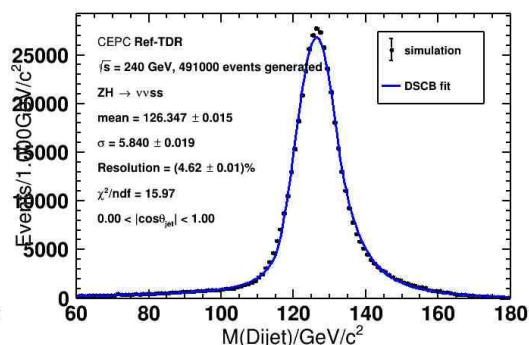
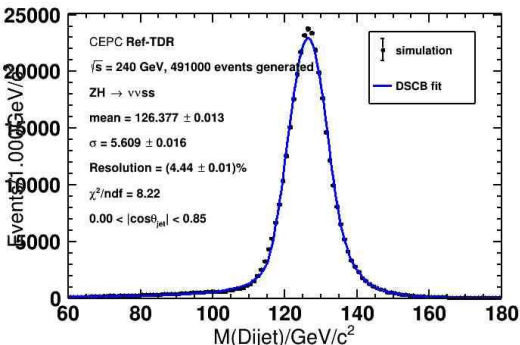
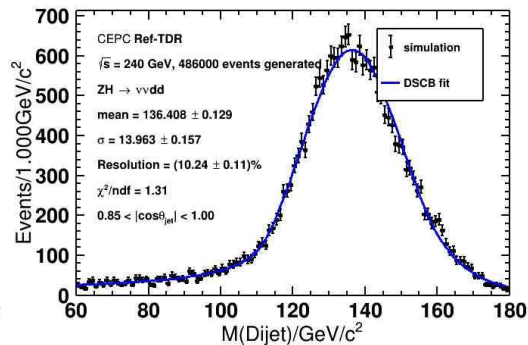
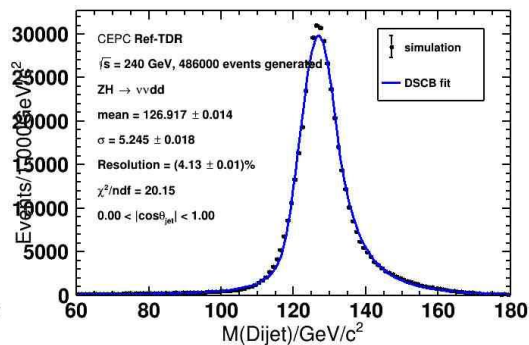
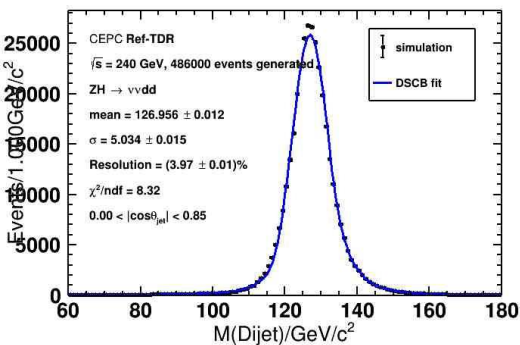
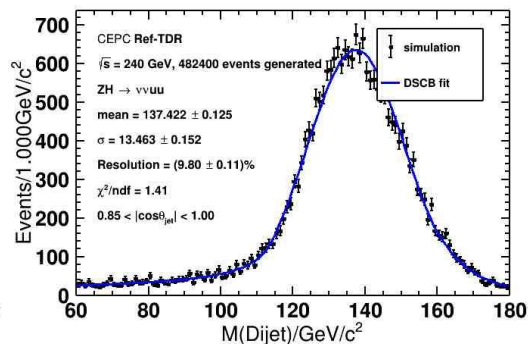
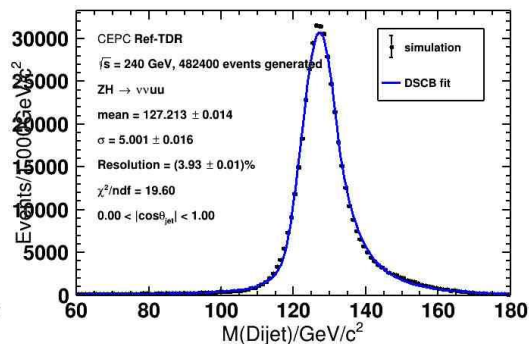
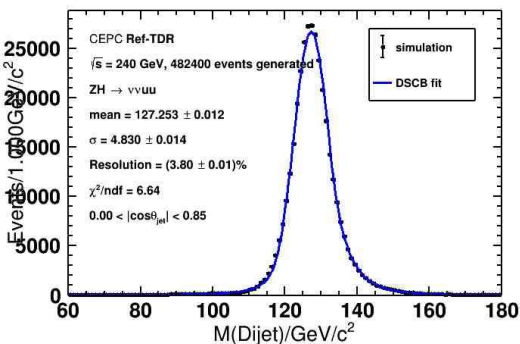
Dijet mass and BMR of barrel and endcap



Fit result at barrel/all/endcap



Fit result at barrel/all/endcap



Performance study – BMR of 25.1.0

- ❖ Perform BMR study in $ZH \rightarrow \nu\nu + gg/bb/cc/uu/dd/ss$ with $\sqrt{s} = 240\text{GeV}/c^2$
- ❖ Comparisons without/with event cleaning under $|\cos\theta_{\text{jet}}| < 0.85$

Case	process	$ZH \rightarrow \nu v gg$	$ZH \rightarrow \nu v bb$	$ZH \rightarrow \nu v cc$	$ZH \rightarrow \nu v uu$	$ZH \rightarrow \nu v dd$	$ZH \rightarrow \nu v ss$
Physical level	BMR/%	4.00 ± 0.01	4.36 ± 0.03	4.15 ± 0.02	3.80 ± 0.01	3.97 ± 0.01	4.44 ± 0.01
	Efficiency/%	73.3	73.7	74.0	74.1	74.1	74.1
Detector level	BMR/%						
	Efficiency/%						

- Event cleaning: $\Sigma|Pt_{\text{ISR}}| < 1\text{GeV}/c \ \& \ \Sigma|Pt_{\nu}| < 1\text{GeV}/c$
- Before event cleaning, BMR ranges from 3.80% to 4.44%
- After event cleaning, BMR ranges from to

❖ Samples generated under CEPCSW_tdr25.1.0

- /cefs/higgs/maxiaotian/25.1.0/CEPCSW/jet_isr
- /cefs/higgs/zhangkl/Production/2501

Performance study – BMR of 25.1.0 without ISR

- ❖ Perform BMR study in $ZH \rightarrow \nu\nu + gg/bb/cc/uu/dd/ss$ with $\sqrt{s} = 240\text{GeV}/c^2$
- ❖ Comparisons without/with event cleaning under $|\cos\theta_{\text{jet}}| < 0.85$

Case	process	$ZH \rightarrow \nu v gg$	$ZH \rightarrow \nu v bb$	$ZH \rightarrow \nu v cc$	$ZH \rightarrow \nu v uu$	$ZH \rightarrow \nu v dd$	$ZH \rightarrow \nu v ss$
Physical level	BMR/%	3.96 ± 0.03	4.22 ± 0.07	3.99 ± 0.05	3.76 ± 0.02	3.96 ± 0.02	4.35 ± 0.02
	Efficiency/%	73.1	73.7	73.7	73.8	73.8	73.7
Detector level	BMR/%	3.93 ± 0.03	3.70 ± 0.04	3.91 ± 0.03	3.76 ± 0.02	3.95 ± 0.02	4.34 ± 0.02
	Efficiency/%	68.9	29.4	50.9	73.4	73.4	73.3

- Event cleaning: $\Sigma|Pt_{\text{ISR}}| < 1\text{GeV}/c \ \& \ \Sigma|Pt_{\nu}| < 1\text{GeV}/c$
- Before event cleaning, BMR ranges from 3.76% to 4.35%
- After event cleaning, BMR ranges from 3.70% to 4.34%

- ❖ Samples generated under CEPCSW_tdr25.1.0 without ISR

- /cefs/higgs/maxiaotian/25.1.0/CEPCSW/jet
- /cefs/higgs/zhangkl/Production/2501/wo_isr

BMR performance of 24.12.0

- ❖ Perform BMR study in $ZH \rightarrow \nu\nu + gg/bb/cc/uu/dd/ss$ with $\sqrt{s} = 240\text{GeV}/c^2$
- ❖ Comparisons without/with event cleaning under $|\cos\theta_{\text{jet}}| < 0.7$

Case	process	$ZH \rightarrow \nu g g$	$ZH \rightarrow \nu b b$	$ZH \rightarrow \nu c c$	$ZH \rightarrow \nu u u$	$ZH \rightarrow \nu d d$	$ZH \rightarrow \nu s s$
Physical level	BMR/%	4.06 ± 0.02	4.43 ± 0.05	4.21 ± 0.04	3.90 ± 0.02	4.08 ± 0.02	4.56 ± 0.02
	Efficiency/%	59.3	58.0	57.9	58.2	58.3	58.2
Detector level	BMR/%	3.99 ± 0.02	3.81 ± 0.03	4.10 ± 0.02	3.90 ± 0.02	4.06 ± 0.02	4.53 ± 0.02
	Efficiency/%	53.1	22.0	38.0	55.1	55.2	55.1

- Event cleaning: $\Sigma|Pt_{\text{ISR}}| < 1\text{GeV}/c \ \& \ \Sigma|Pt_{\nu}| < 1\text{GeV}/c$
- Before event cleaning, BMR ranges from 3.90% to 4.56%
- After event cleaning, BMR ranges from 3.81% to 4.53%

❖ Samples generated under CEPCSW_tdr24.12.0

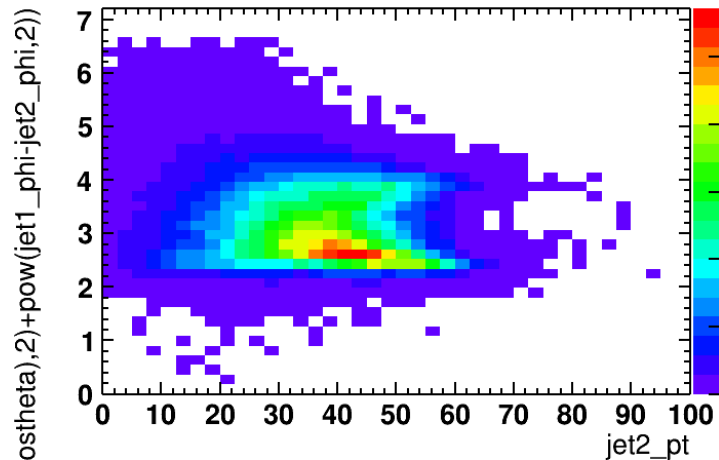
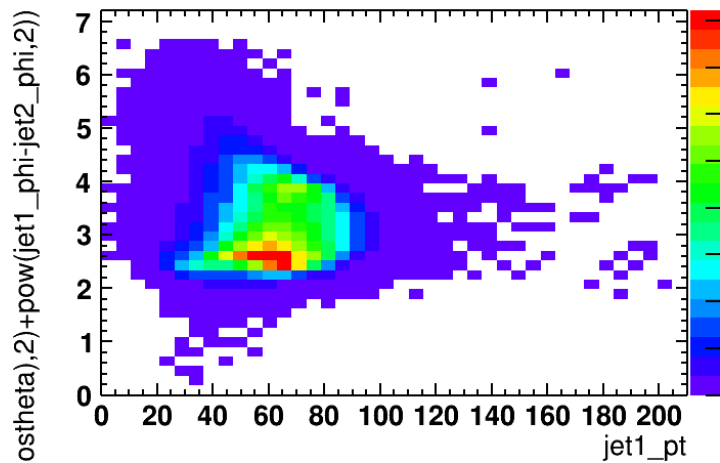
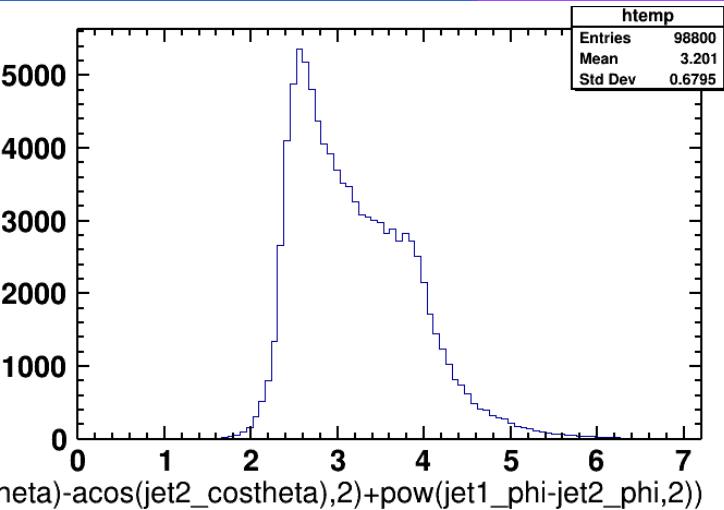
- /cefs/higgs/maxiaotian/CEPCSW/sample/nogenmatch/24.12.0
- /cefs/higgs/zhangkl/Production/2412/

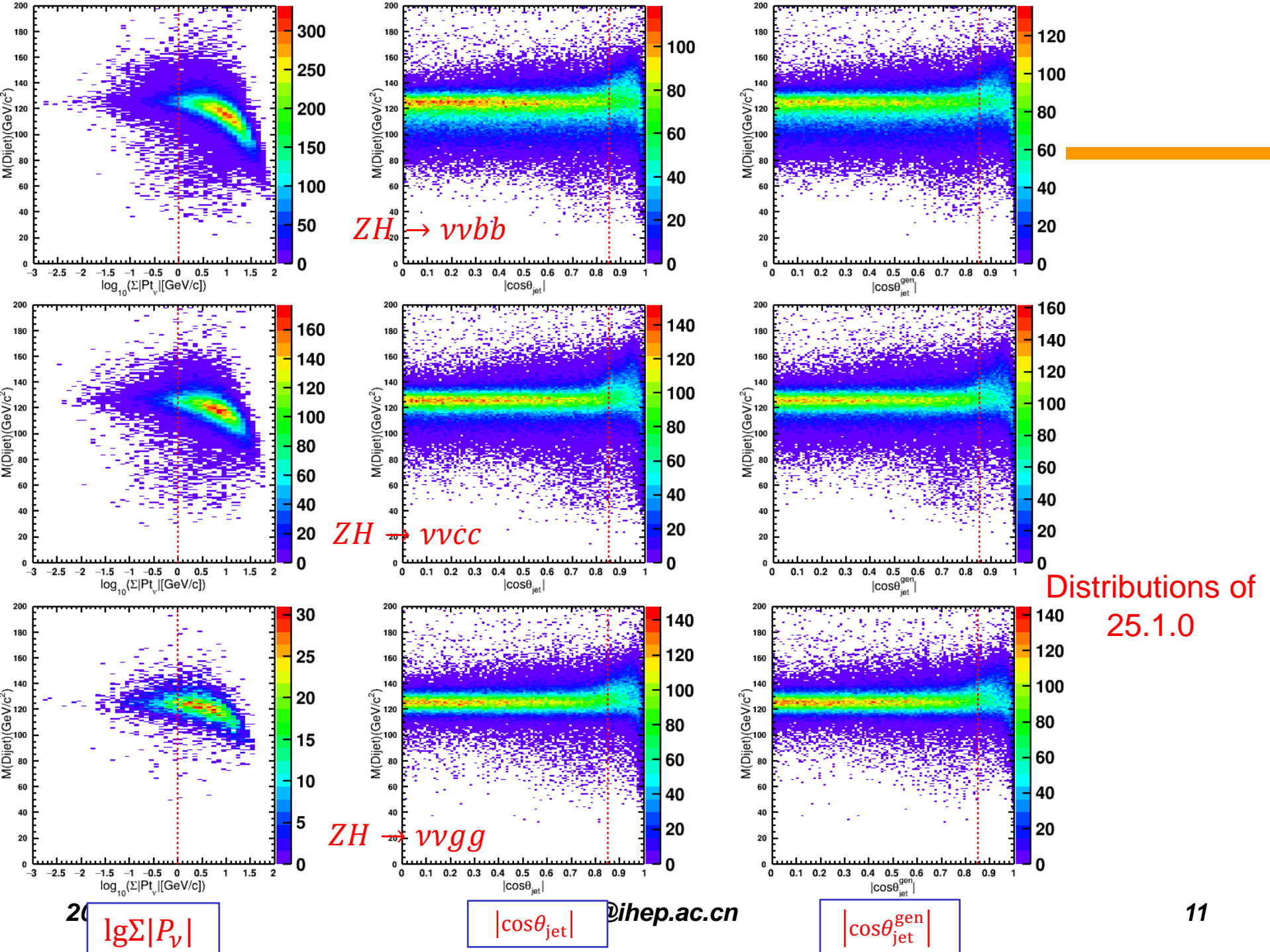
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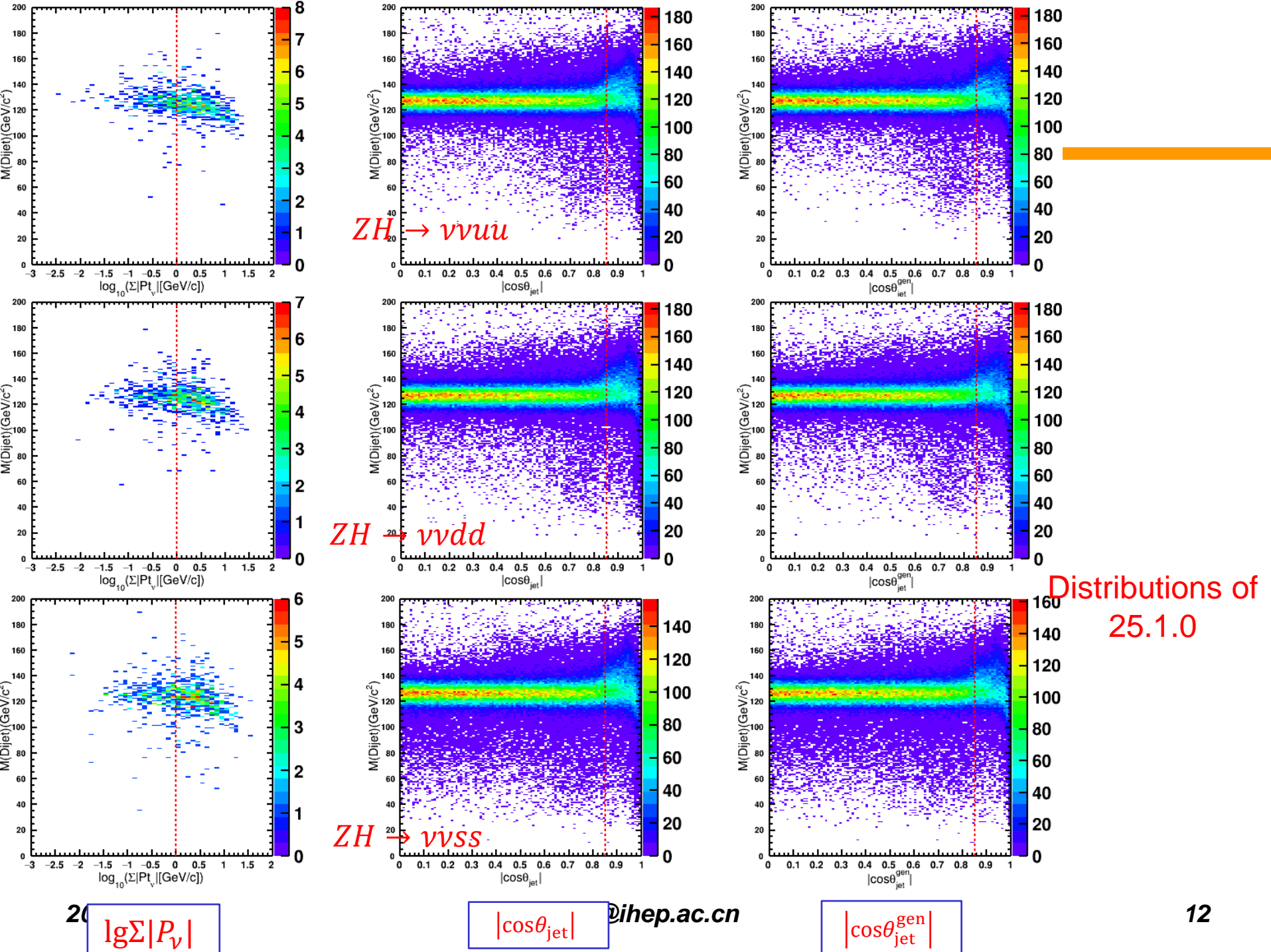


- ❖ Results and fit plots of 25.1.0 without ISR

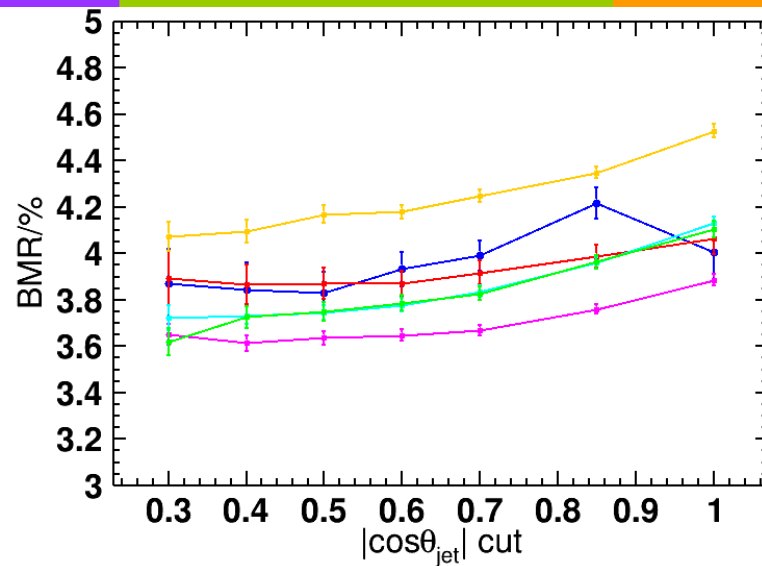
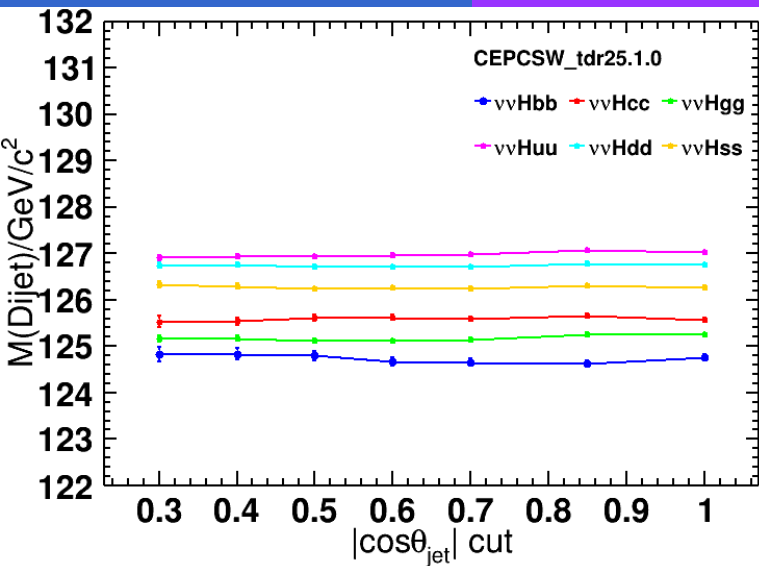
deltaR of 2 jets in vvbb



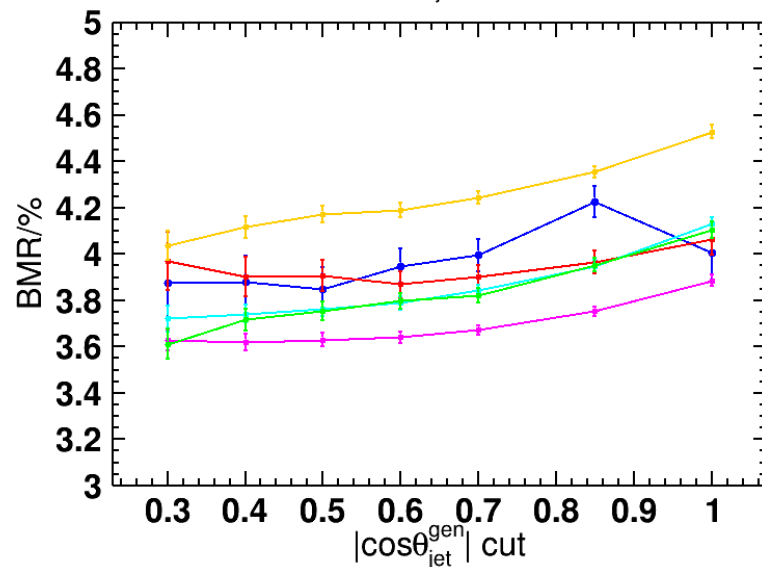
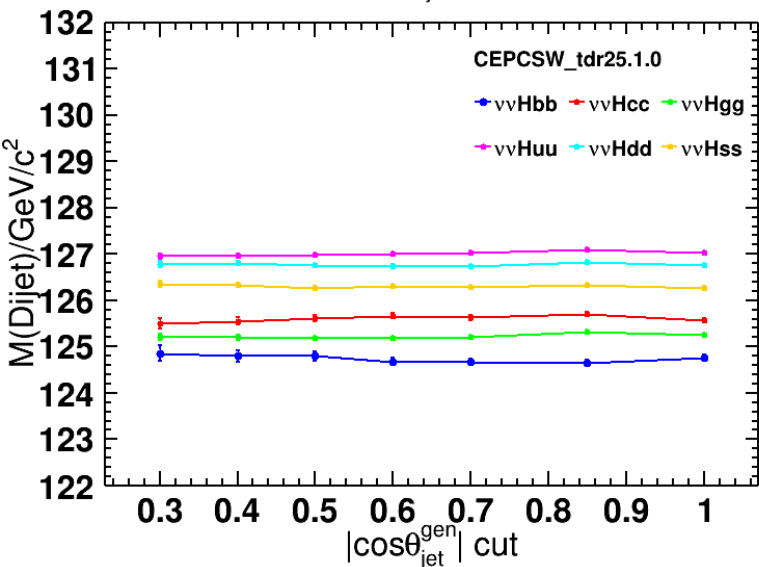




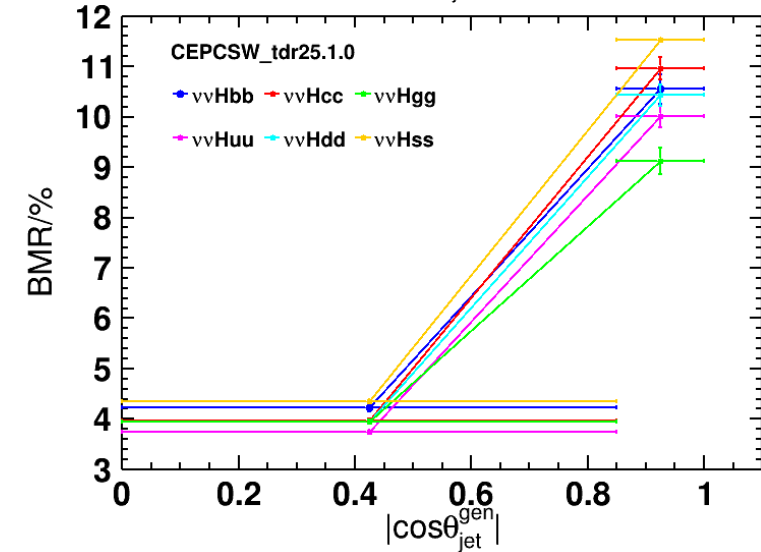
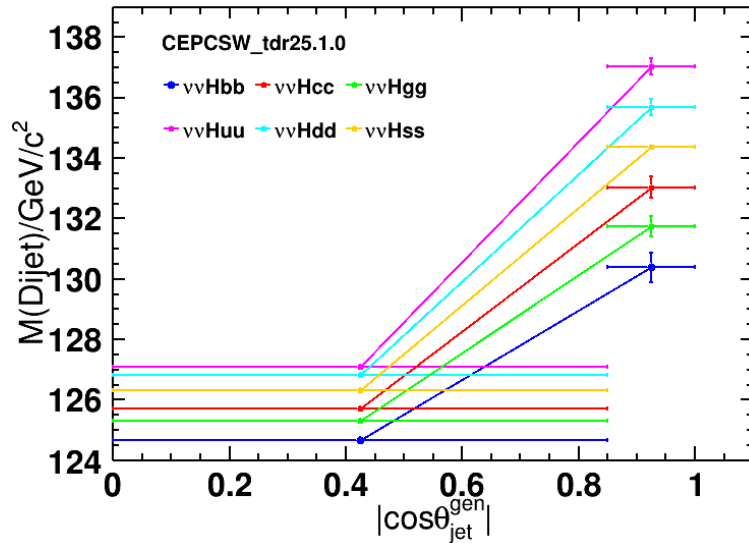
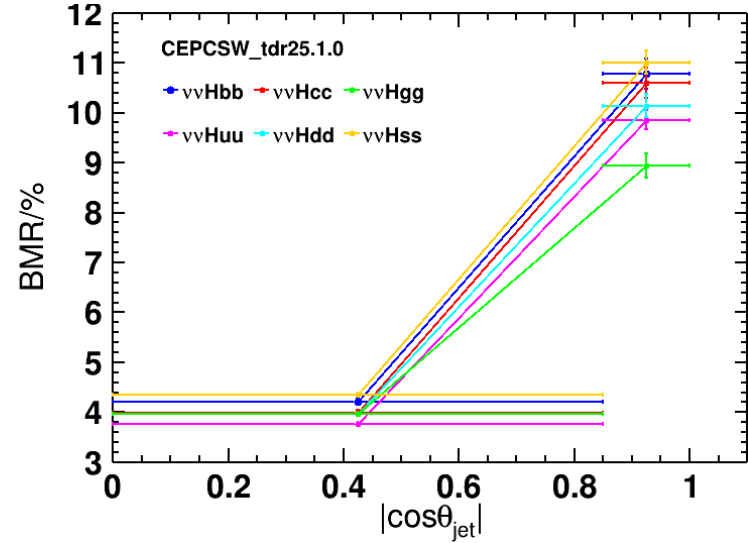
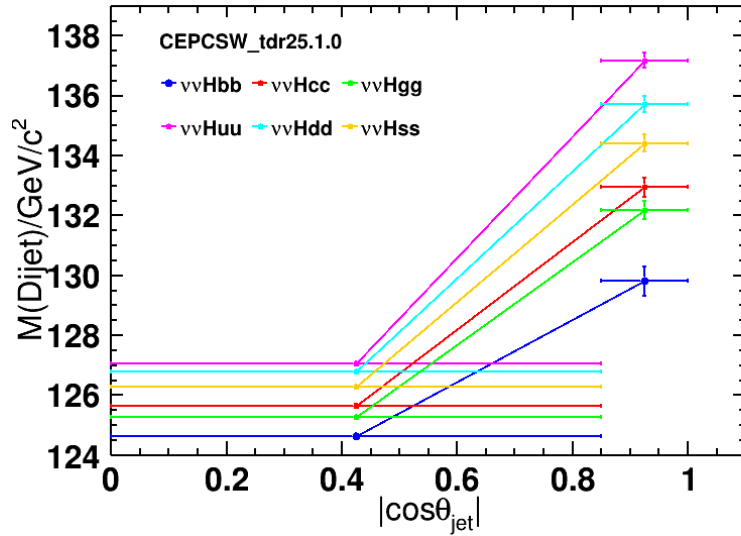
BMR – at different cos cut of 25.1.0



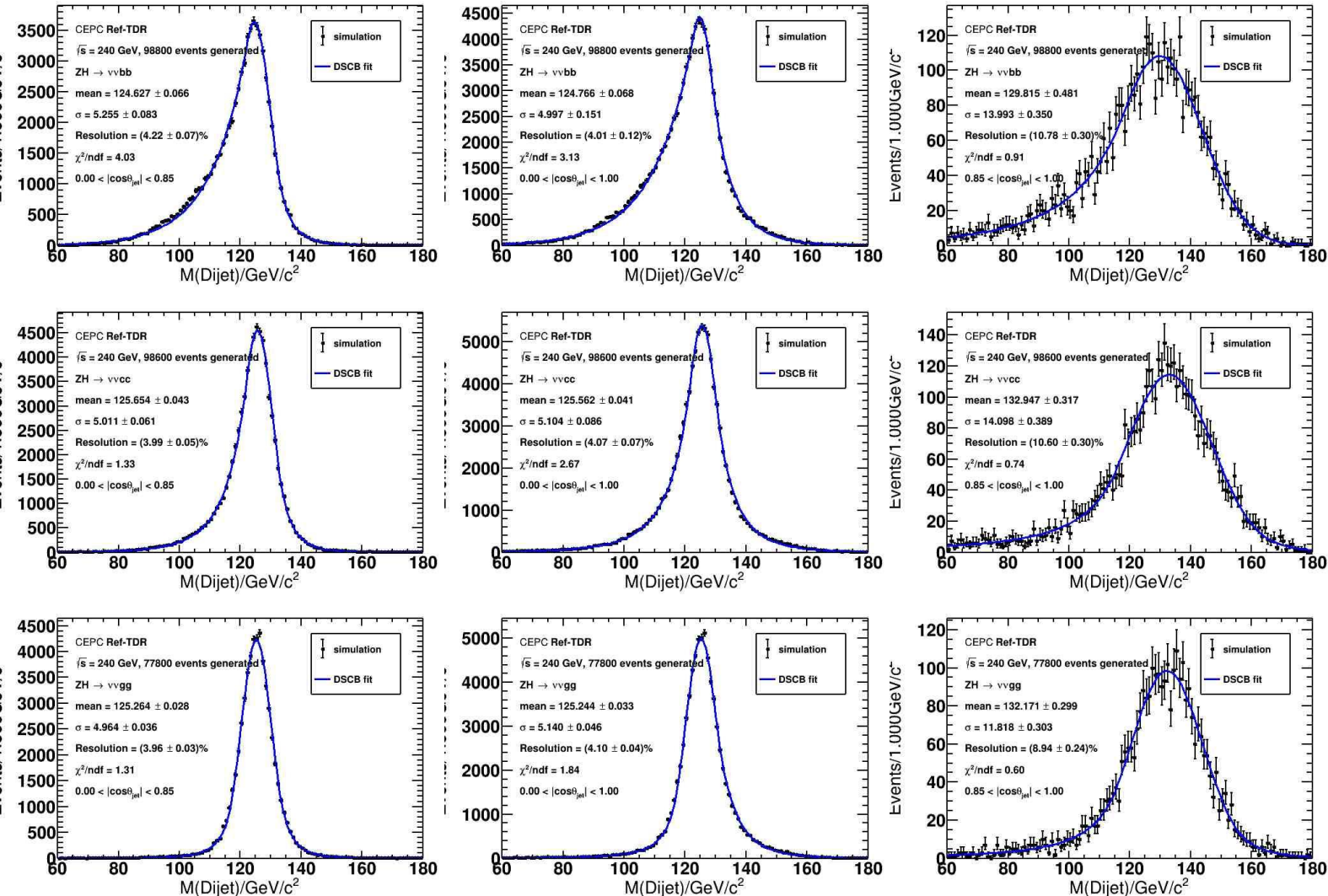
bb's BMR at
<1 falls
down



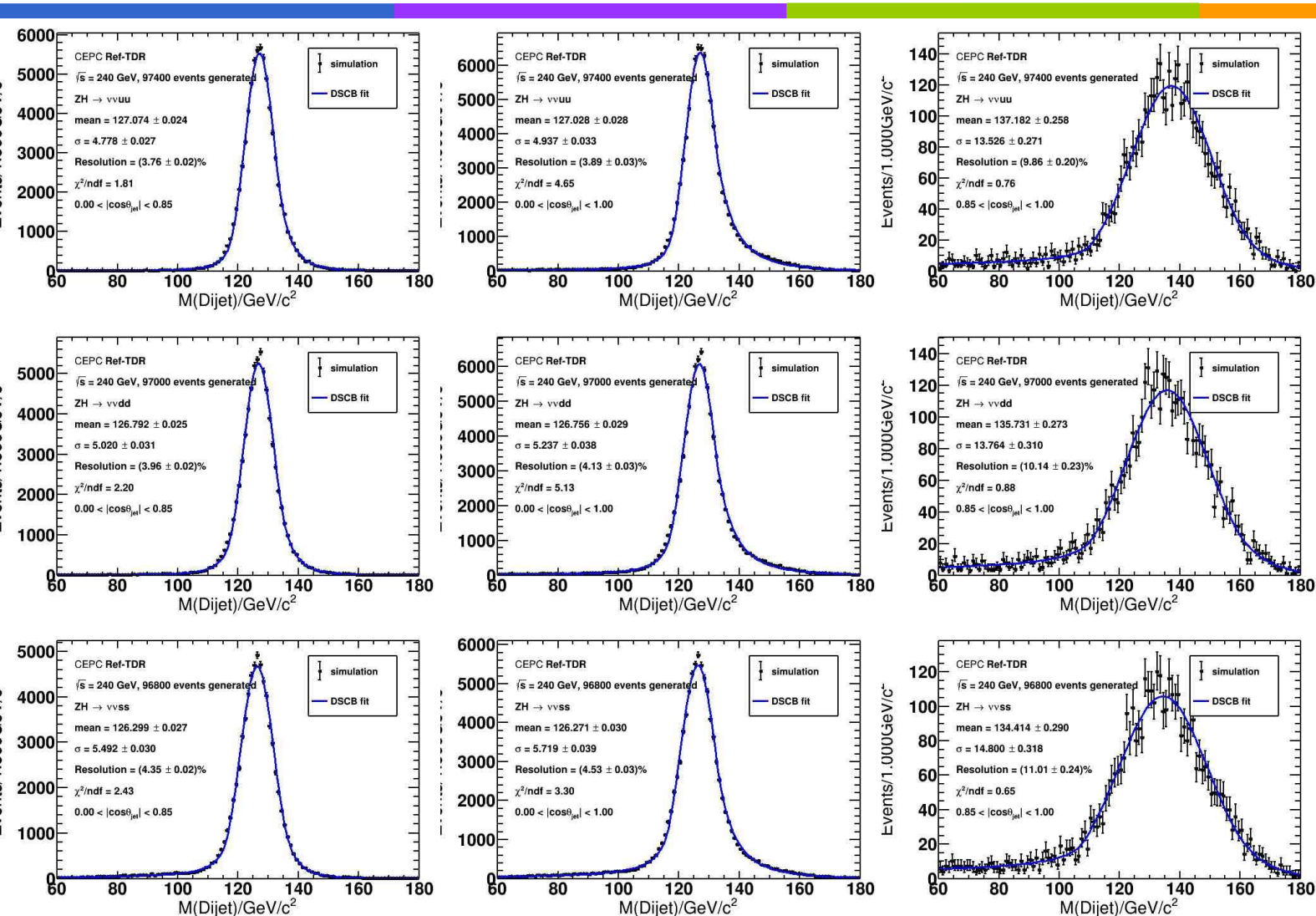
Dijet mass and BMR of barrel and endcap



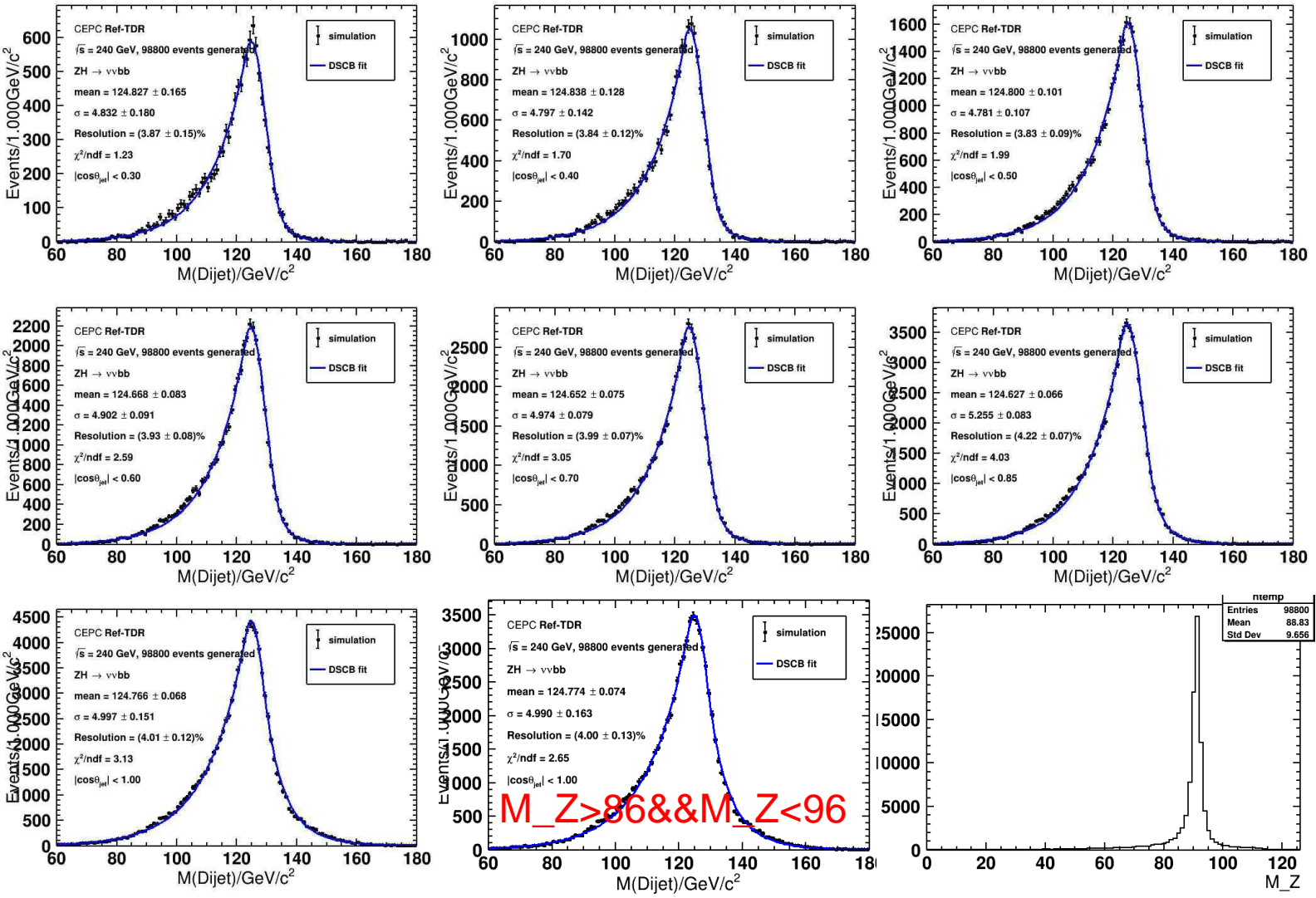
Fit result at barrel/all/endcap



Fit result at barrel/all/endcap



vvbb--jetcut



KL energy distribution in uu/dd/ss

