

Weekly Report

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CEPC $H \rightarrow \gamma\gamma$

Full sim sample:

- $ZH \rightarrow qq\gamma\gamma, \mu\mu\gamma\gamma, \nu\nu\gamma\gamma$ channel signal samples are ready.
- Background sample: plan to use old fast sim+smearing sample. Need to confirm the variable distributions for BDT.
- $ZH \rightarrow \tau\tau\gamma\gamma$ channel: tau jet reconstruction has some problem. Need some time.

generated	signal		background	
	old	new	old	new
$qq\gamma\gamma$	85.56%	99.893%	69.573%	5.25%
$E_{\gamma 1} > 35\text{GeV}$	99.16%	99.131%	0.868%	52.00%
$35\text{GeV} < E_{\gamma 2} < 96\text{GeV}$	98.42%	98.886%	46.041%	47.62%
$\cos\theta_{jj} > -0.95$	95.19%	95.618%	79.182%	79.23%
$\cos\theta_{\gamma\gamma} > -0.95$	91.00%	90.707%	83.600%	58.25%
$pT_{\gamma 1} > 20\text{GeV}$	93.59%	93.417%	61.100%	58.33%
$pT_{\gamma 2} > 30\text{GeV}$	93.24%	93.181%	52.191%	62.86%
$110\text{GeV} < m_{\gamma\gamma} < 140\text{GeV}$	93.47%	99.997%	36.785%	59.09%
$125\text{GeV} < E_{\gamma\gamma} < 145\text{GeV}$	71.70%	99.518%	90.639%	7.69%
$\min \cos\theta_{\gamma j} < 0.9$	99.97%	72.159%	50.409%	100.00%
	42.29%	53.088%	0.010%	0.01%

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