Weekly Updates

-- About the ZH background --

Ryuta

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Fixing/Floating parameters

Branch: master ▾ hig2zz / calculate / cepcFit / jobs / new_zz.sh

YonsiG put five channel /run in a parallel directory Latest co

1 contributor

10 lines (6 sloc) | 379 Bytes

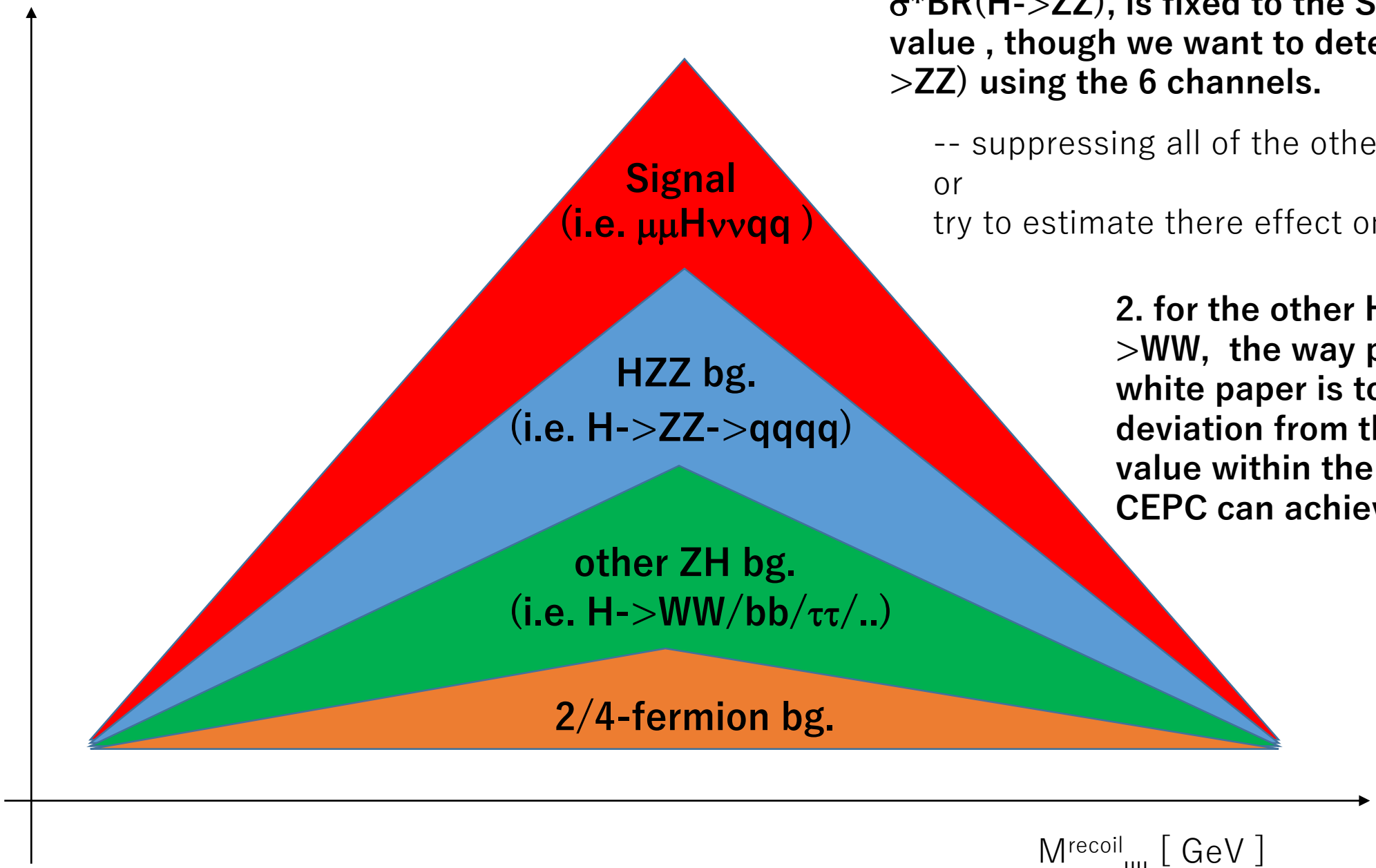
```
1  # setup root
2  source setup.sh
3
4  # make
5  make
6
7
8  fitScan -f ../workspace/out/workspace/cepc_5.root  -n nuis* -p mzvj_s=1_-5_5,mzjv_s=1_-5_5,vzmj_s=1_-5_5,qzmv_s=1_-5_5,qzvm_s=1_-5_5
9  fitScan -f ../workspace/out/workspace/cepc_5.root  -n nuis* -p mu_s=1_-5_5  --hesse 1 --minos 1 -o outs/singleFit/singleFit_CEPC-mu_s
10
```

Z(->μμ)H(Z->νν, Z*->qq) yield is set as floating (-500% to 500%).

The other components, H->ZZ/WW/ττ/.. and SM(4-fermion/2-fermion) backgrounds are all fixed == uncertainty of BRs are "0"

 # if I understood the code correctly, since I have only looked the source code briefly.

An image (stacked: recoil mass distribution)



1. To have HZZ bg. estimation, the yield, σ*BR(H->ZZ), is fixed to the SM expected value , though we want to determine σ*BR(H->ZZ) using the 6 channels.

-- suppressing all of the other HZZ bg. events
or
try to estimate there effect on the final results.

2. for the other Higgs decays, H->WW, the way presented in the white paper is to allow their deviation from the SM expected value within the precision which CEPC can achieve.

From the white paper

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Precision Higgs physics at the CEPC*

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https://iopscience.iop.org/article/10.1088/1674-1137/43/4/043002

Table 11. Estimated precision of Higgs boson property measurements for the CEPC-v1 detector concept operating at $\sqrt{s} = 250$ GeV. All precision are relative except for m_H and BR_{inv}^{BSM} for which Δm_H and 95% CL upper limit are quoted respectively. The extrapolated precision for the CEPC-v4 concept operating at $\sqrt{s} = 240$ GeV are included for comparisons, see Section 6.2.

property	estimated Precision			
	CEPC-v1		CEPC-v4	
m_H	5.9 MeV		5.9 MeV	
Γ_H	2.7%		2.8%	
$\sigma(ZH)$	0.5%		0.5%	
$\sigma(\nu\bar{\nu}H)$	3.0%		3.2%	
decay mode	$\sigma \times$ BR	BR	$\sigma \times$ BR	BR
$H \to b\bar{b}$	0.26%	0.56%	0.27%	0.56%
$H \to c\bar{c}$	3.1%	3.1%	3.3%	3.3%
$H \to gg$	1.2%	1.3%	1.3%	1.4%
$H \to WW^*$	0.9%	1.1%	1.0%	1.1%
$H \to ZZ^*$	4.9%	5.0%	5.1%	5.1%
$H \to \gamma\gamma$	6.2%	6.2%	6.8%	6.9%
$H \to Z\gamma$	13%	13%	16%	16%
$H \to \tau^+\tau^-$	0.8%	0.9%	0.8%	1.0%
$H \to \mu^+\mu^-$	16%	16%	17%	17%
BR_{inv}^{BSM}	–	<0.28%	–	<0.30%

for the case of H->WW , we just need to add
“mu_ww=1_0.99_1.01” in the fitting code (correct ?)

Comments

- for the other HZZ bg.

  -- have a list (number of events)
  -- try to suppress it or estimate their effect on the final result

- for the other ZH bg.

  -- to see and compare the result with floating and fixing (=current one)