

Update for Combination Measurement of CEPC

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IHEP

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Subchannels Table

Dilepton channel like ee and emu have no specific Br so not included

Signal		abbr.	Who takes charge	Status	Signal		abbr.	Who takes charge	Status		
Z	H				Z	H					
ee	bb	eebb	ZhenXing	Considering Algorithm method.	vv	ZZ(lljj)	vvzz	Yuqian	need rescale		
	cc	eecc			μμ	ZZ(vvjj)	μμZZ				
	gg	eegg			ee	ZZ(vvjj)	eeZZ				
μμ	bb	mmbb			Bai Yu	Will update soon;	ee	WW(μμμμ)	Libo	need rescale	
	cc	mmcc						μμ			WW(evev)
	gg	mmgg						WW(eνμμ)			
qq	bb	qqbb	Feng	Will update soon;	μμ	WW(μμμμ)	Libo	Undergoing			
	cc	qqcc				ee			WW(evev)		
	gg	qqgg				WW(eνμμ)					
ll	γγ	llaa	Feng	Will update soon;	μμ	ττ	μμττ	Dan			
vv		nnaa			Inclusive	μμ	Cui	July			
qq		qqaa			qq	ZZ(vvvv)	Mo Xin	July			

Signal events check

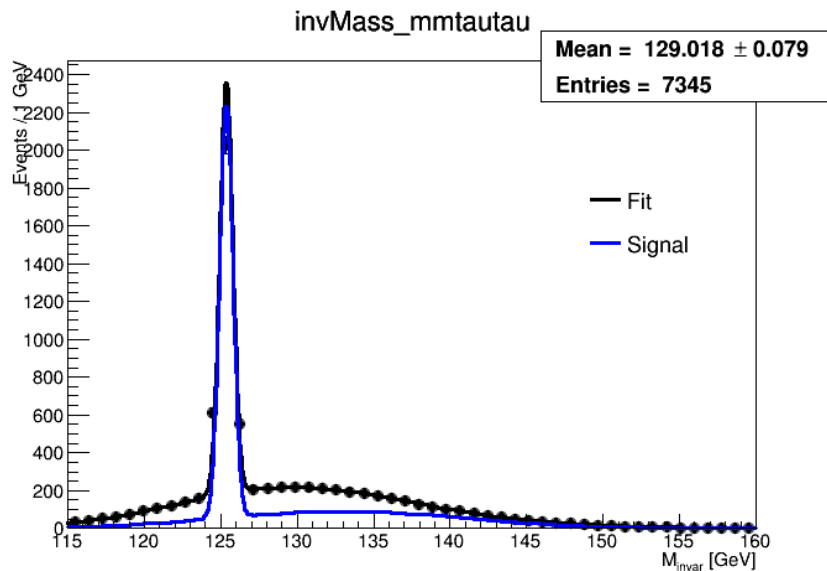
H	Z	Ntuple	Theory (before cut)
bb	ee	10853	20586
cc		319	961
gg		1176	3062
bb	$\mu\mu$	10773	20586
cc		283	961
gg		1815	3062
bb	qq	148749	428876
cc		3887	20034
gg		25564	63812
$\gamma\gamma$	ll	90	164
	$\nu\nu$	328	488
	qq	630	1707
ZZ(lljj)	$\nu\nu$	563	548+54.8*
WW($\mu\nu\mu\nu$)	$\mu\mu$	52	77
WW(e $\nu\mu\nu$)		36	77
WW(e $\nu\mu\nu$)		105	154
$\tau\tau$	$\mu\mu$	4635	2257
ZZ($\nu\nu\nu\nu$)	qq	225	784
$\mu\mu$	Inclusive		

Theoretic number
calculated by
 $1.06e6(5000\text{ifb}) * Br$
Which recorded in
PDG or Pre_CDR.

*WW fusion contributes ~10%.

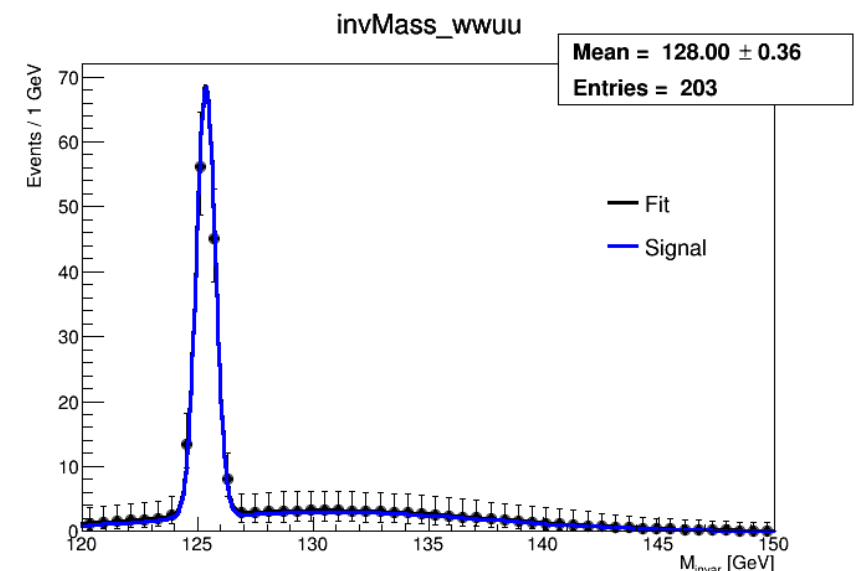
New data plot

Z- \rightarrow $\mu\mu$, H- \rightarrow $\tau\tau$



Z- \rightarrow $\mu\mu$, H- \rightarrow WW

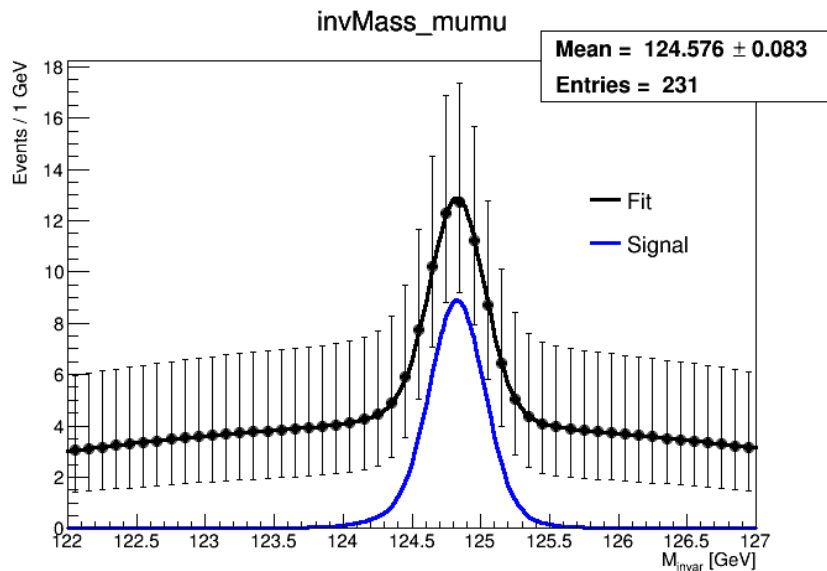
(even, $\mu\nu\mu\nu$, $e\nu\mu\nu$ combined)



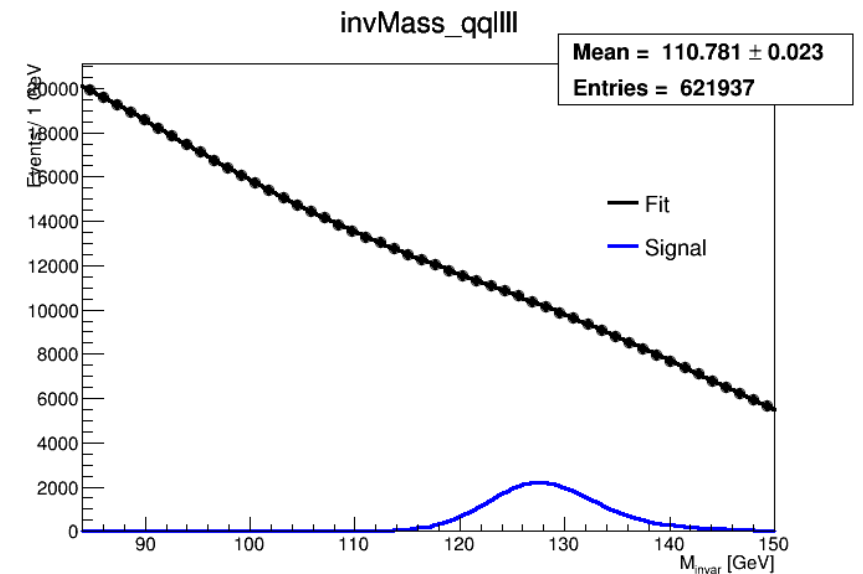
Stats low so combined WW channel;
Bkg low, 52+6, 36+4, 105+0
Need more toys to rebuild

New data plot

Z->Inclusive, H-> $\mu\mu$



Z->qq,H->ZZ->vvvv



Signal with Norm-factor 0.0007392
Signal shape Amplify 100 times for demonstration.

Current $\frac{\Delta(Br * CrossX)}{Br * CrossX}$ Fit result

CrossSection Precision set to 0.5%;
For 5000ifb;

	Fit type	μ	μ_{bb}	μ_{cc}	μ_{gg}	μ_{zz}	μ_{aa}	μ_{tt}	μ_{ww}	invisible	$\mu\mu$
My	$\frac{\Delta Br}{Br}$	0.554%	0.558%	3.083%	1.339%	6.472%	7.475%	1.790%	11.161%	255%	19.4%
	$\frac{\Delta(Br * CrossX)}{Br * CrossX}$	0.239%	0.248%	3.042%	1.242%	6.452%	7.458%	1.719%	11.151%	255%	19.4%
CDR's	$\frac{\Delta Br}{Br}$	\	0.57%	2.30%	1.70%	6.90%	9.00%	1.3%	1.60%*	0.28%	17%
	$\frac{\Delta(Br * CrossX)}{Br * CrossX}$	0.28%	0.28%	2.20%	1.60%	6.90%	9.00%	1.2%	1.50%*	/	17%

*All WW channels included.

Discussion

- Maybe wait to August to scale MC;
- For flavor tagging, under discussion;
 - Difficult to directly get correlation matrix;
 - Viewing their code, trying to solve
- Checklist
 - Examine the pdf shape used in fit Crystal ball, exp2, other form.....
 - Nuisance parameter, and their effect on event yields.
 - The method ChenZX and Yu used to fit
- Coupling Constant