

Hig2inv progress work

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My work:

- 1.Learn how to calculate confidence upper limit
- 2.Record the information of signal and background after scale.

Signal and background information:

	SM	Produced	scale	After cut number	After scale number	Efficiency(%)
ff_h_inv	1079	199863	0.0054	2679	14.48	1.342
$e^+e^- \rightarrow e^+e^-$	123854500	4000000		0	0	
$e^+e^- \rightarrow \mu^+\mu^-$	26663550	4000000	6.666	3321	22138	0.083
$e^+e^- \rightarrow \tau^+\tau^-$	23764450	4000000	5.941	973	5781	0.024
$e^+e^- \rightarrow \nu_\mu\bar{\nu}_\mu$	22081500	0		0		
qq	270534300	9999023	27	9	243	0
Sw_l	4363150	4406821		0		
Sw_sl	13063100	13193720		0		
Sze_l	5502600	5556664	0.9903	1792	1775	0.032

$$S = 15 \quad B = 57583 \quad B/S=3839$$

I discuss with Ryuta and think there is a problem with this value.

My thoughts:

240 GeV

Higgs signal

Process	$\int L$	Final states	X-sections (fb)	Comments
Higgs signal	5 ab^{-1}	$f\bar{f}H$	203.66	all signals
	5 ab^{-1}	e^+e^-H	7.04	including ZZ fusion
	5 ab^{-1}	$\mu^+\mu^-H$	6.77	
	5 ab^{-1}	$\tau^+\tau^-H$	6.75	
	5 ab^{-1}	$\nu\bar{\nu}H$	46.29	all neutrinos (ZH+WW fusion)
	5 ab^{-1}	$q\bar{q}H$	136.81	all quark pairs ($Z \rightarrow q\bar{q}$)

2 fermion backgrounds

The number of $\mu^+\mu^-H_{inv}$ maybe (in SM):

$$N_{\mu^+\mu^-H_{inv}} = 5000 \times 6.77 \times 0.00106 = 35.881$$

Our number after cut is $N = 14.48$

$$\text{Select efficiency} = \frac{14.48}{35.881} = 0.404$$

I don't whether this is reasonable.