ZH Branching ratio study

ILC physics and software meeting

Dec. 10. 2010

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Current status

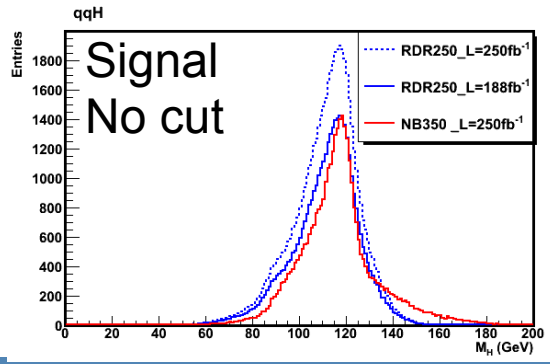
- llH mode analysis is conducted
  - μμ/ττH cross section difference at 250 GeV sample has solved with corrected sample created by Miyamoto-san.

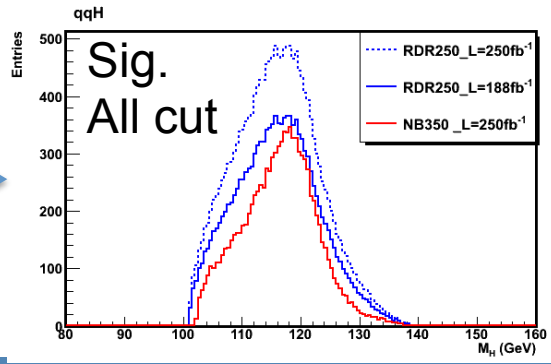
Mode	Ecm=250GeV	Ecm=350GeV
llH (lepton) (eeH/ μμH/ττH)	34.60→35.87 fb (12.55/11.66/11.65 fb)	25.25 fb (10.96/7.16/7.14 fb)

- Considering luminosity difference for 250/350 GeV
  - IntL=188 fb^{-1} @Ecm=250 GeV (PeakL=0.75)
  - IntL=250 fb^{-1} @Ecm=350 GeV (PeakL=1.0)
  - Ref : IntL=500 fb^{-1} @Ecm=500 GeV (PeakL=2.0x$10^{34}cm^{-2}s^{-1}$)

ZH→qqH mode BG reduction with Luminosity consideration

qqH	Ecm=250 GeV						Ecm=350 GeV		
Int. Lumi.	L=250 fb^{-1}			L=188fb^{-1}			L=250 fb^{-1}		
Cut type	No cut	All Cut	Eff.	No cut	All cut	Eff.	No cut	All cut	Eff.
H→cc	1916	804	41.95%	1437	603	41.95%	1296	460	35.50%
H→bb	34963	13651	39.04%	26222	10238	39.04%	24051	7623	31.70%
qqH all	52507	17617	33.55%	39380	13213	33.55%	36099	9675	26.80%
SM Bkg	44825201	504788	1.13%	33618900	378591	1.13%	17898000	47274	0.26%
Scc/sqrt(B)	0.05	1.13		0.25	0.98		0.31	2.12	
Sbb/sqrt(B)	0.86	19.21		4.52	16.64		5.69	35.06	





Next step

- Compare BR measurement accuracy between 250 GeV with 350 GeV including integrated luminosity diff.

- Check the difference of template samples between 250 GeV and 350 GeV
  →Can be a reason of better accuracy at 350GeV