Status of summary table of Higgs couplings

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LCNote: http://www-jlc.kek.jp/jlc/sites/default/files/users/tianjp/HiggsCouplingsCombine.pdf

Independent Higgs measurements @ ILC
(MH = 125 GeV)

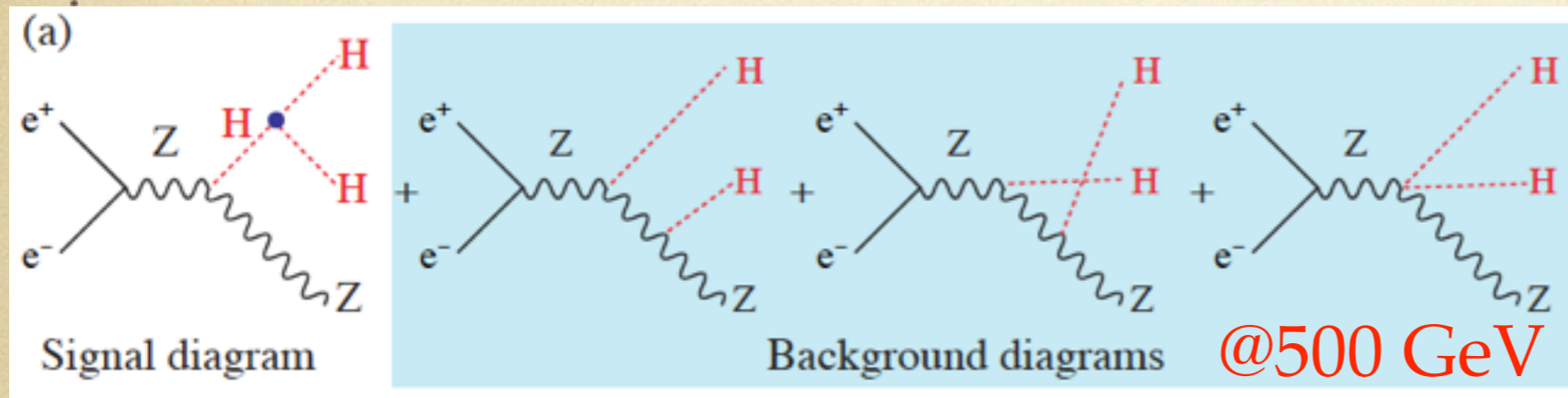| ECM	@ 250 GeV		@ 500 GeV		@ 1 TeV
luminosity · fb	250		500		1000
polarization (e-,e+)	(-0.8, +0.3)		(-0.8, +0.3)		(-0.8, +0.2)
process	ZH	vvH(fusion)	ZH	vvH(fusion)	vvH(fusion)
cross section	2.6% (FC)	-	-		
	$\sigma \cdot Br$	$\sigma \cdot Br$	$\sigma \cdot Br$	$\sigma \cdot Br$	$\sigma \cdot Br$
H-->bb	1.2% (FC)	10.5%	1.8%	0.66% (FC)	0.32% (FA)
H-->cc	8.3% (FC)		13%	6.2%	3.1% (FA)
H-->gg	7.0% (FC)		11%	4.1%	2.3% (FA)
H-->WW*	6.4%		9.2%	2.6% (FC)	1.6% (FA)
H-->ττ	4.2%		5.4% (FC)	14% (FB)	3.5%
H-->ZZ*	19%		25%	8.2%	4.1%
H-->γγ	29-38% (FB)		29-38%	20-26% (FB)	7-10%
H-->μμ	-		-		31%
ttH, H-->bb	-		35% (FB)		7.8%
H-->Inv. (95% C.L.)	< 0.80%		-		

status:

to be more optimistic

by adding more searching modes   ---Keisuke's comments

- most ZH analyses haven't included Z-->$\tau\tau$.

- in $\nu\nu$H-->$\nu\nu$WW* analysis, only full hadronic mode used. (semi-leptonic full simulation is almost done, comparable result with full hadronic mode)

- ttH with H-->WW*?

- in self-coupling analysis, investigate HH-->bbWW*. (ZHH-->bbbbWW* @ 500 GeV ongoing, preliminary ~2σ; $\nu\nu$HH-->$\nu\nu$bbWW* @ 1 TeV would give more significant contribution)

- H-->ZZ* no analysis available yet. (Akiya has prepared the signal samples, full simulation started)

- H-->γZ?

new couplings to be added: g_{ZZHH}, g_{WWHH}

---would be unique at Linear Collider
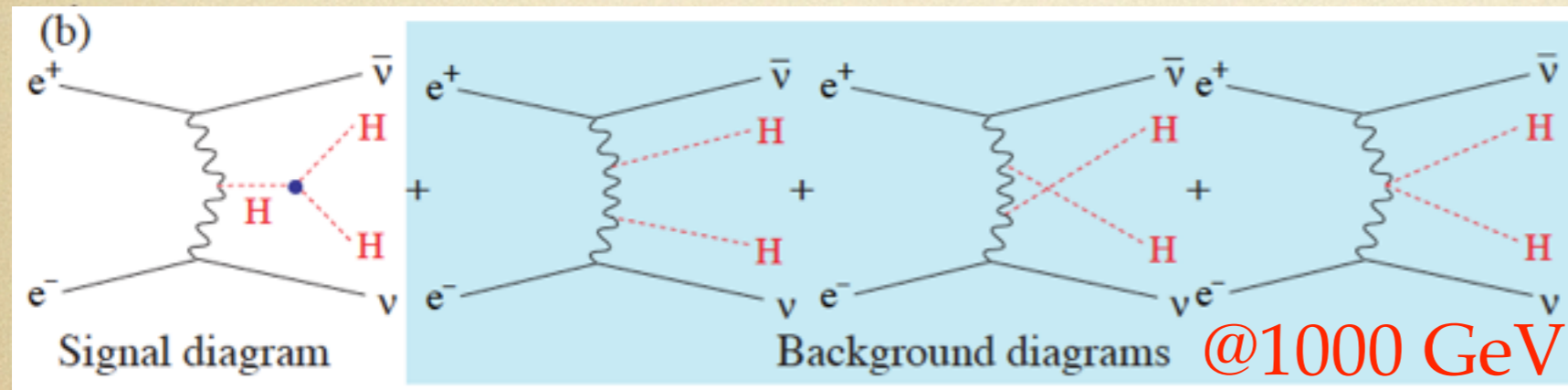
$$\frac{\delta\lambda_{HHH}}{\lambda_{HHH}} = 1.8\frac{\delta\sigma_{ZHH}}{\sigma_{ZHH}}$$

$$\frac{\delta g_{ZZHH}}{g_{ZZHH}} = 0.97\frac{\delta\sigma_{ZHH}}{\sigma_{ZHH}}$$

@500 GeV

more sensitive!

@1000 GeV

$$\frac{\delta\lambda_{HHH}}{\lambda_{HHH}} = 0.85\frac{\delta\sigma_{\nu\bar{\nu}HH}}{\sigma_{\nu\bar{\nu}HH}}$$

$$\frac{\delta g_{WWHH}}{g_{WWHH}} = 0.29\frac{\delta\sigma_{\nu\bar{\nu}HH}}{\sigma_{\nu\bar{\nu}HH}}$$

coupling	500 GeV	500 GeV + 1 TeV
HHH	104%	26%
ZZHH	62%	30%
WWHH	-	11%

preliminary! correlation with HHH not included