

Little Higgs T-parity @ILC

Optimization meeting

2011.5.6 Eriko Kato

Polarization study motivation

■ Analysis Flow chart

- Cross section, coupling, gauge charge

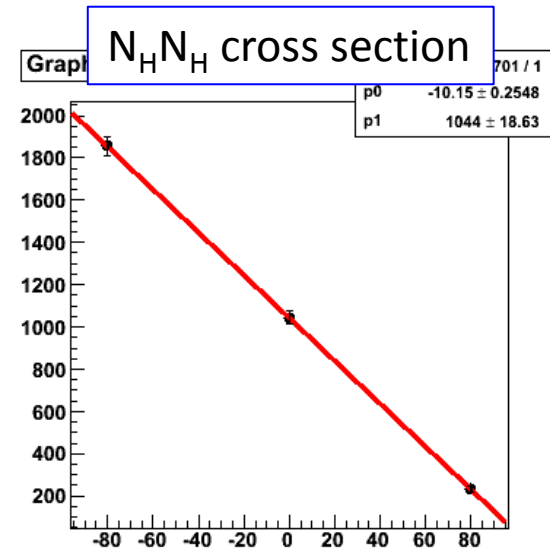
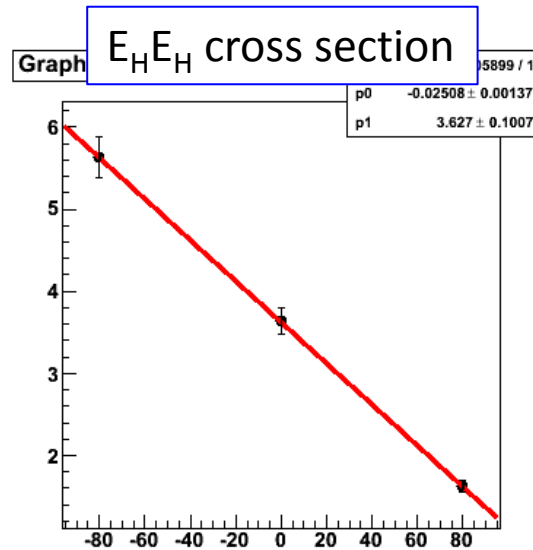
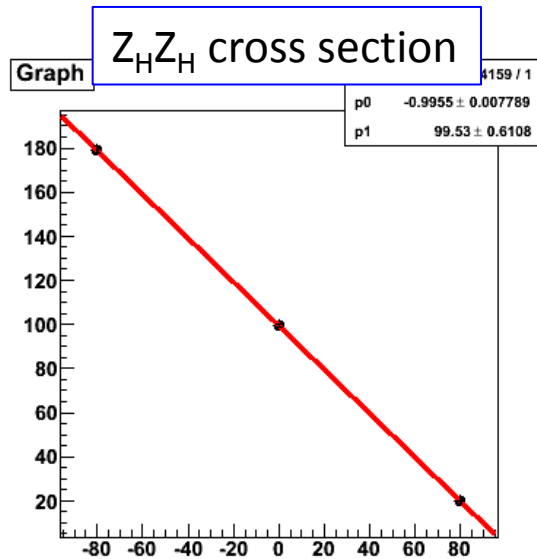
Cross section $\Rightarrow C_V, C_A \Rightarrow T_3, Q$

- Derive gauge charge for LHT particles.

cross section vs polarization

- Assuming 0.25% polarization error.
- Statistical error is calculated assuming BG pol. dependence is the same as the signal.
- Background pol. dependence will be studied more carefully later on.(now generating...)
- Derive coupling

✘ True cross section is plotted



Polarization(%)

Signal angular distributions

motivation

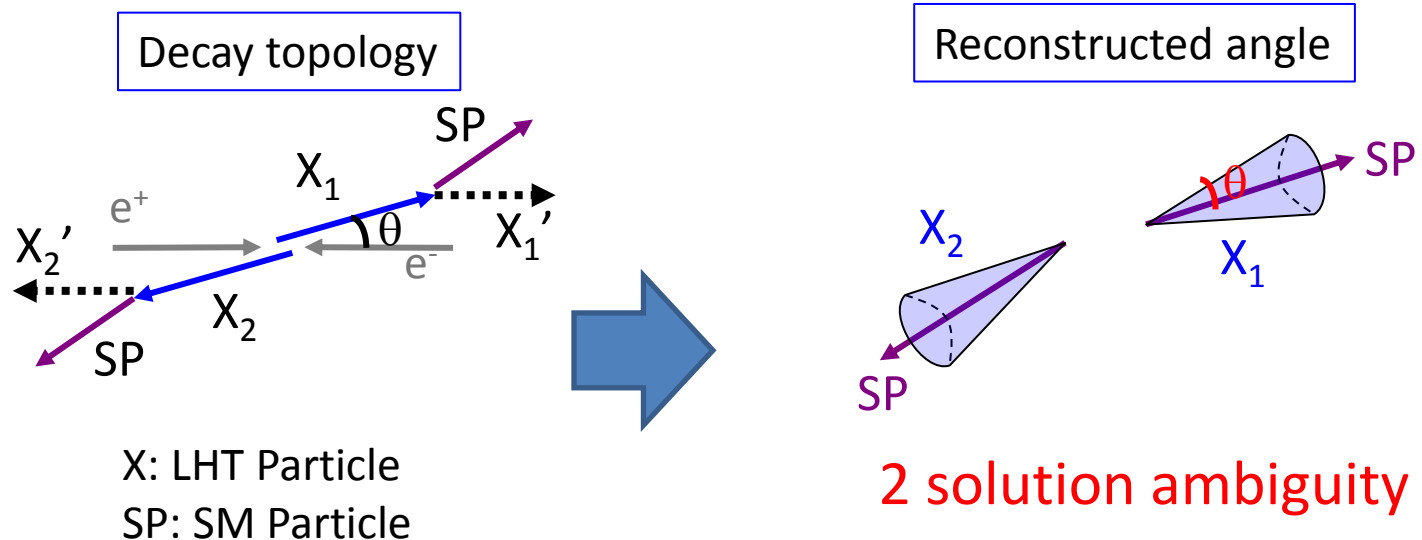
- coupling is derived assuming fermion/boson.
- we already know LHT particle masses.
- We need to/can determine spin.

particle	mass	sensitivity
A_H	81.9(GeV)	1.3%
W_H	369(GeV)	0.20%
Z_H	368(GeV)	0.56%
e_H	410(GeV)	0.46%
ν_H	400(GeV)	0.01%

	spin	
W_H	1	} studied
A_H	1	
Z_H	1	
E_H	$\frac{1}{2}$	} Study!!
N_H	$\frac{1}{2}$	

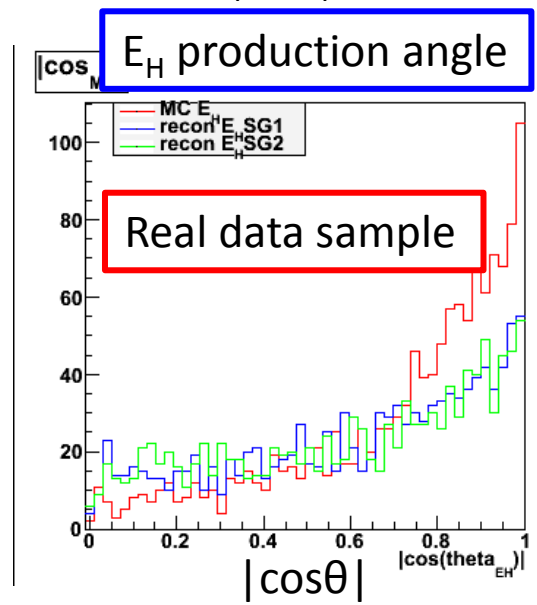
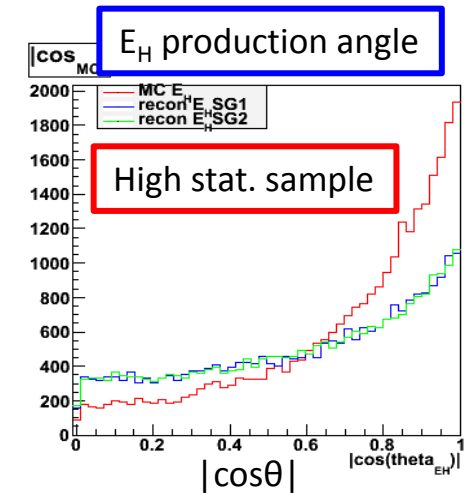
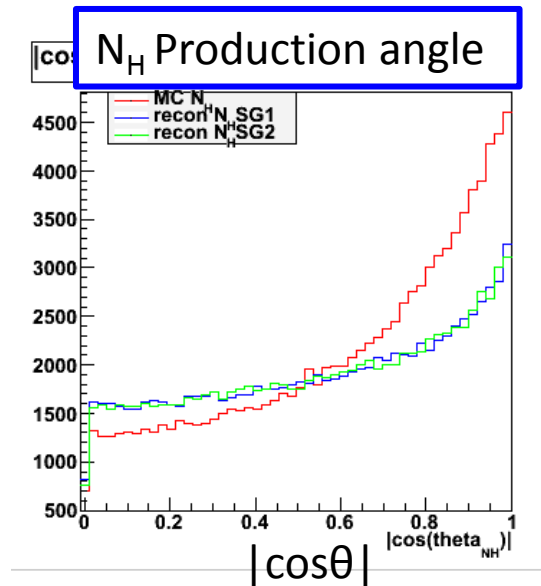
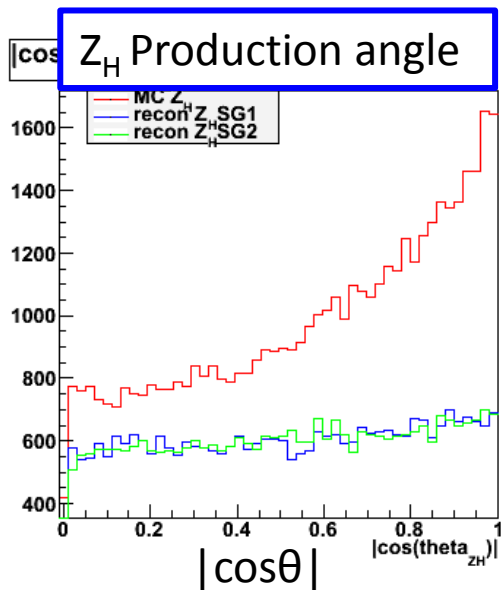
Production angle

- Derive production angle using SM particle information and solving kinematics.
- Used LHT particle masses derived in previous study.
- $|\cos\theta|$ has 2 solutions.



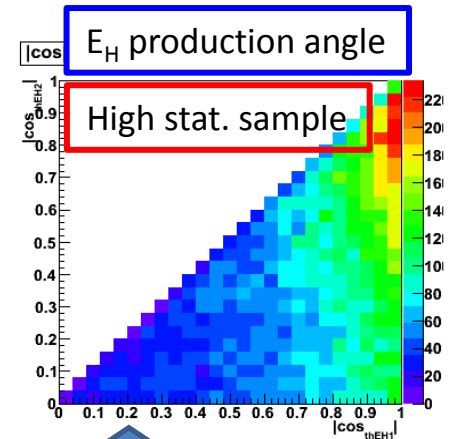
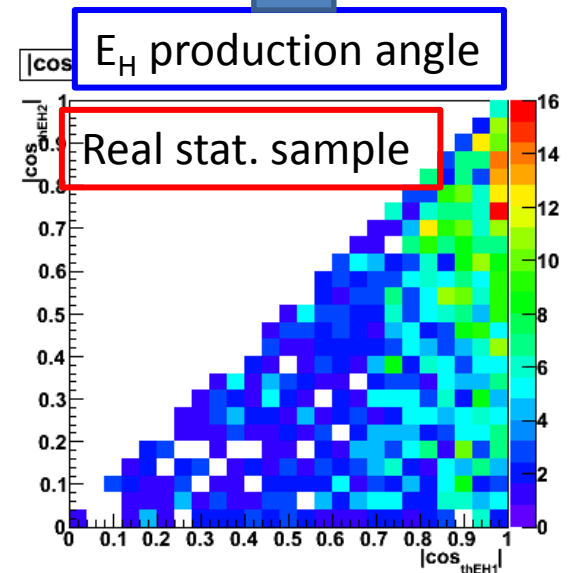
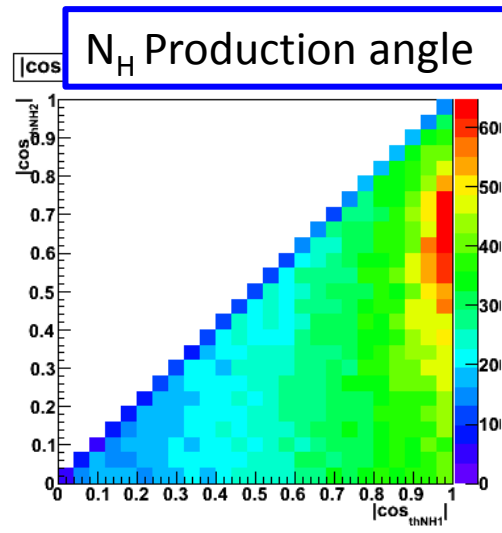
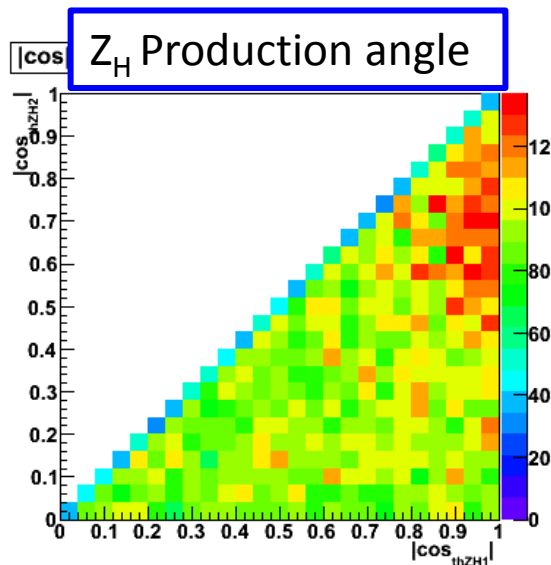
Production angle distribution

- We cannot assume that the false solution has a flat distribution.
- Clearly they don't.
- Template fitting.



$|\cos\theta_1|$ vs $|\cos\theta_2|$

- Plot $|\cos\theta_1| > |\cos\theta_2|$
- Correlation appears.
- Perform template fitting using high stat. sample.



plan

- Generate background samples.
- Derive coupling from polarization study.
- All studies will be restudied including background.