

# **LHT status report**

7.30 physics meeting  
Tohoku Univ. Eriko Kato

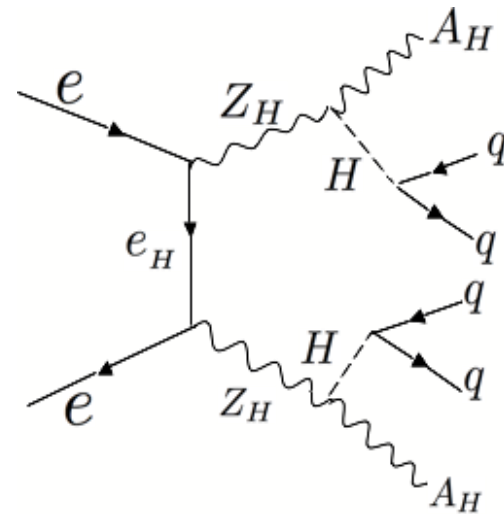
# Simulation environment

## Signal

- $e^+e^- \rightarrow Z_H Z_H$  (99.52fb)

## Background

- $e^+e^- \rightarrow WW$  (3069fb)
- $e^+e^- \rightarrow tt$  (192.9fb)
- $e^+e^- \rightarrow WWZ$  (63.86fb)
- $e^+e^- \rightarrow \nu\nu WW$  (14.67fb)



$\sqrt{s} = 1 \text{ TeV}$

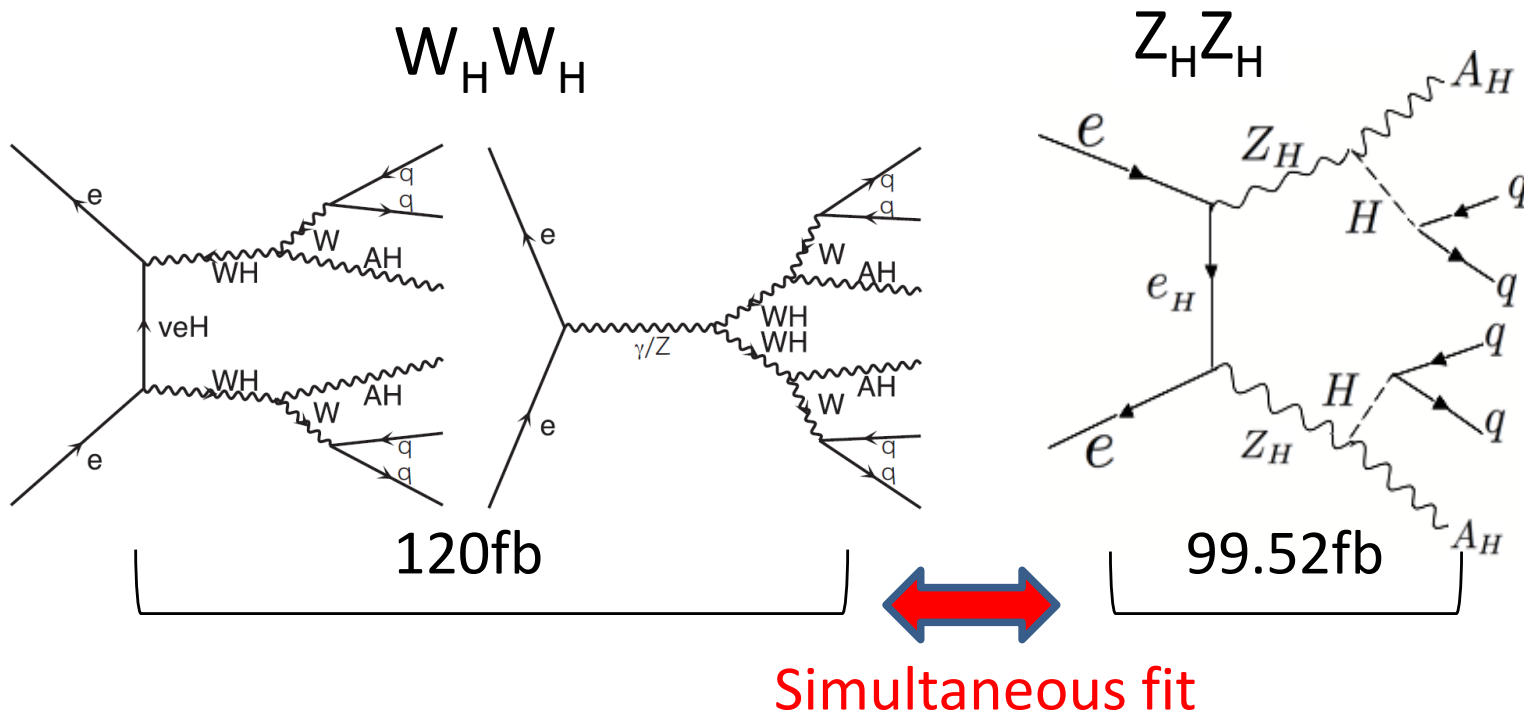
Luminosity =  $500 \text{ fb}^{-1}$

No beam polarization

Higgs mass =  $134 \text{ GeV}$

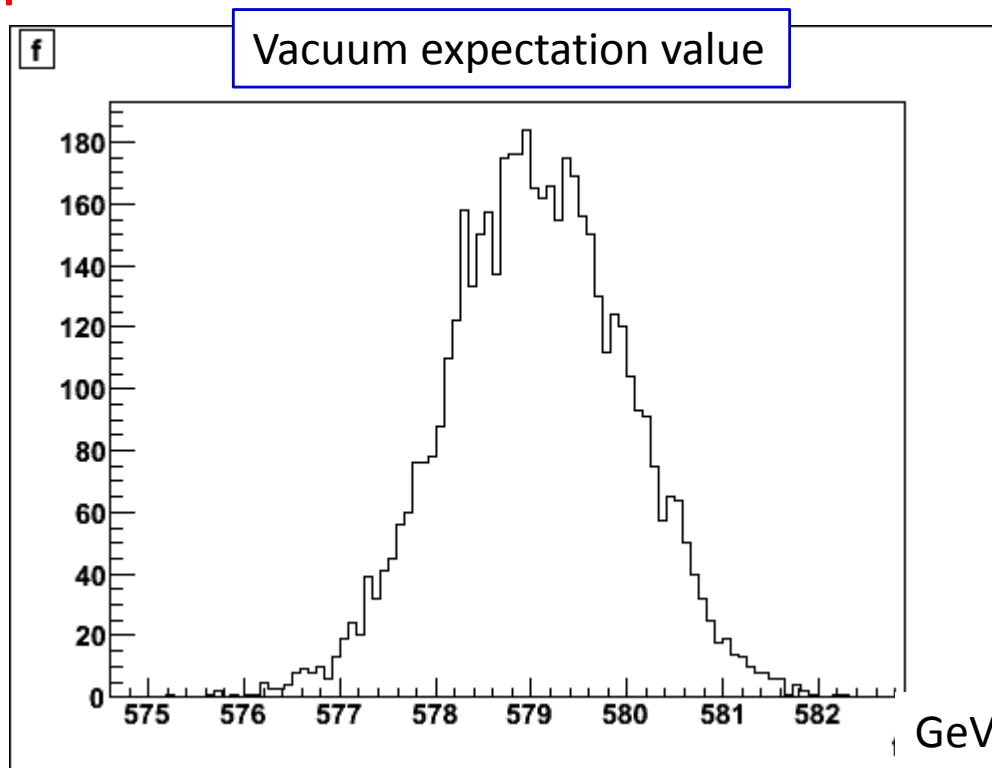
# Simultaneous fitting

- Using the fact that  $A_H$  mass can be obtained both from  $W_H W_H$  &  $Z_H Z_H$ , I performed simultaneous fit.
  - Sasakisan's  $W_H W_H$  analysis was used



# Simultaneous fitting :VUV

- Previously :  $A_H$   $W_H$   $Z_H$  mass were derived through simultaneous fitting .
- This time : Derived the corresponding  $f$ :Vacuume expectation value



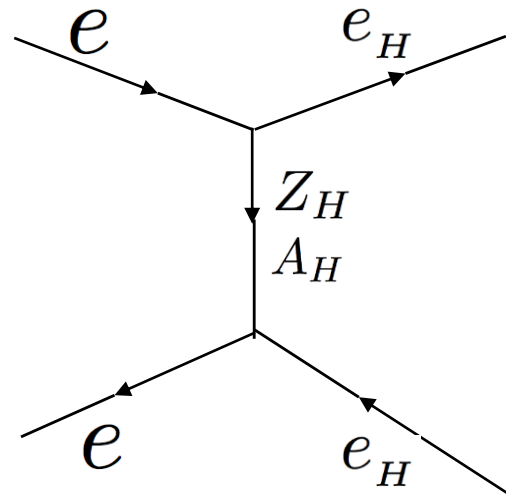
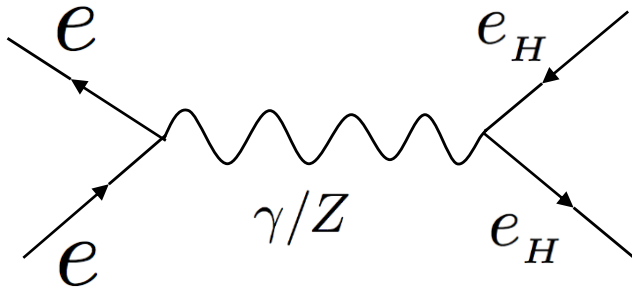
$f = 579.10 \pm 0.94$  GeV  
Resolution :0.16%  
True value 580 GeV

# New study of LHT

$$e^+e^- \rightarrow e_H^+ e_H^-$$

# Simulation environment

- Decay modes of  $e_H e_H$



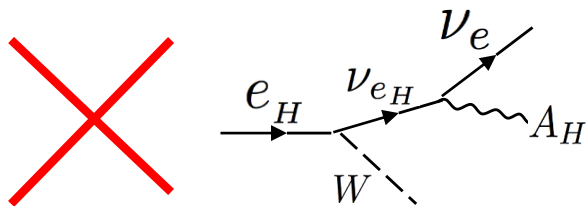
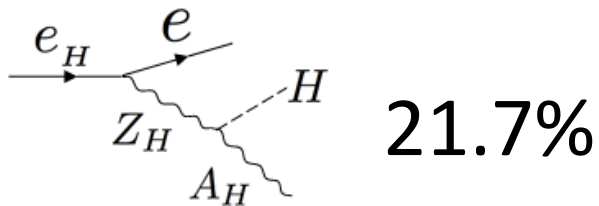
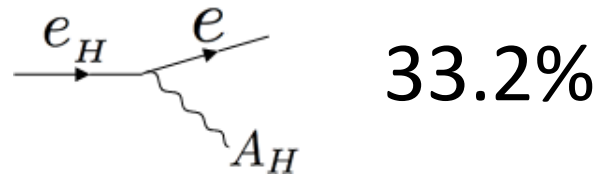
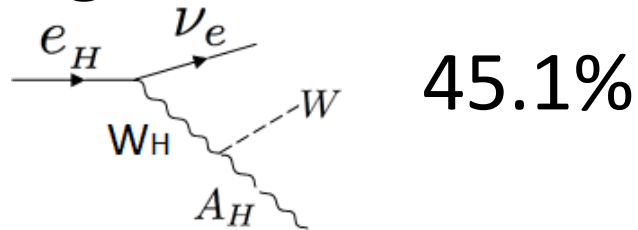
$\sqrt{s} = 1 \text{ TeV}$   
 Luminosity =  $500 \text{ fb}^{-1}$   
 No beam polarization  
 Higgs mass =  $134 \text{ GeV}$

$$m_{e_H} = \sqrt{2} k f = 410 \text{ GeV}$$

$$m_{\nu_H} = k f (\sqrt{2} + \sqrt{1+c}) / 2 \doteq 410 \text{ GeV}$$

# Decay modes of $e_H e_H$

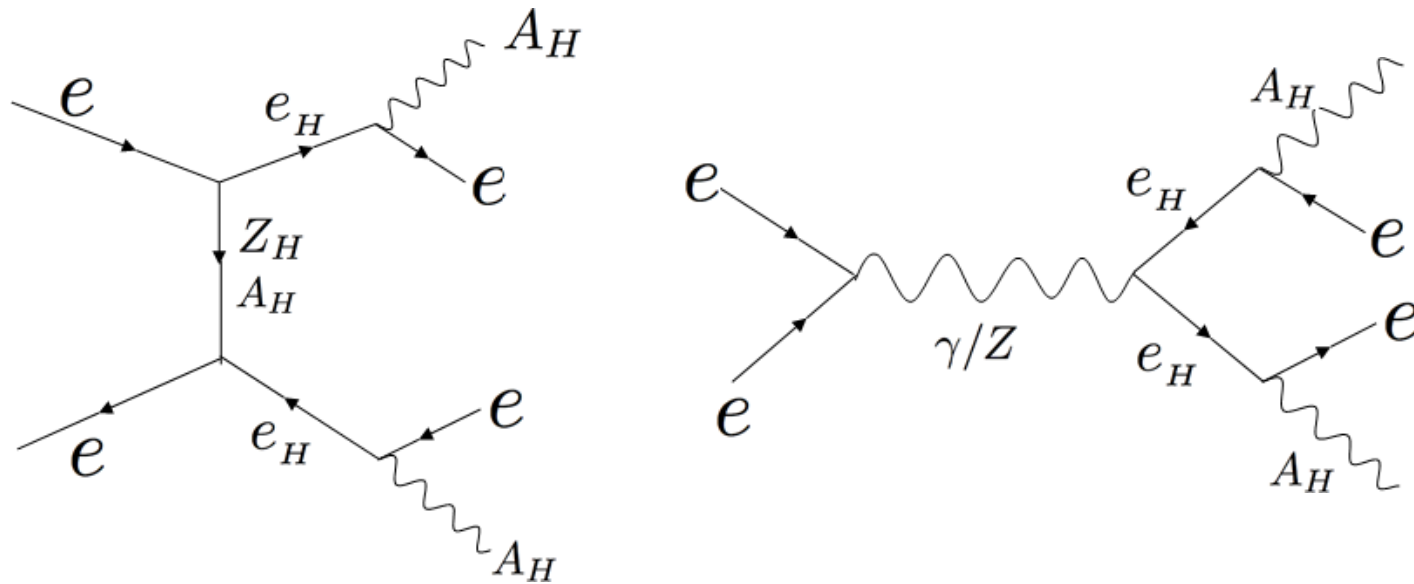
- $ee \rightarrow e_H e_H$   $\sigma = 116$  fb
- Branching ratio



$$m_{e_H} = 410 \text{ GeV} \doteq m_{\nu_H}$$

# Generator

➤ Generator of  $e_H \rightarrow A_H e$  done



➤ Currently analyzing this mode