

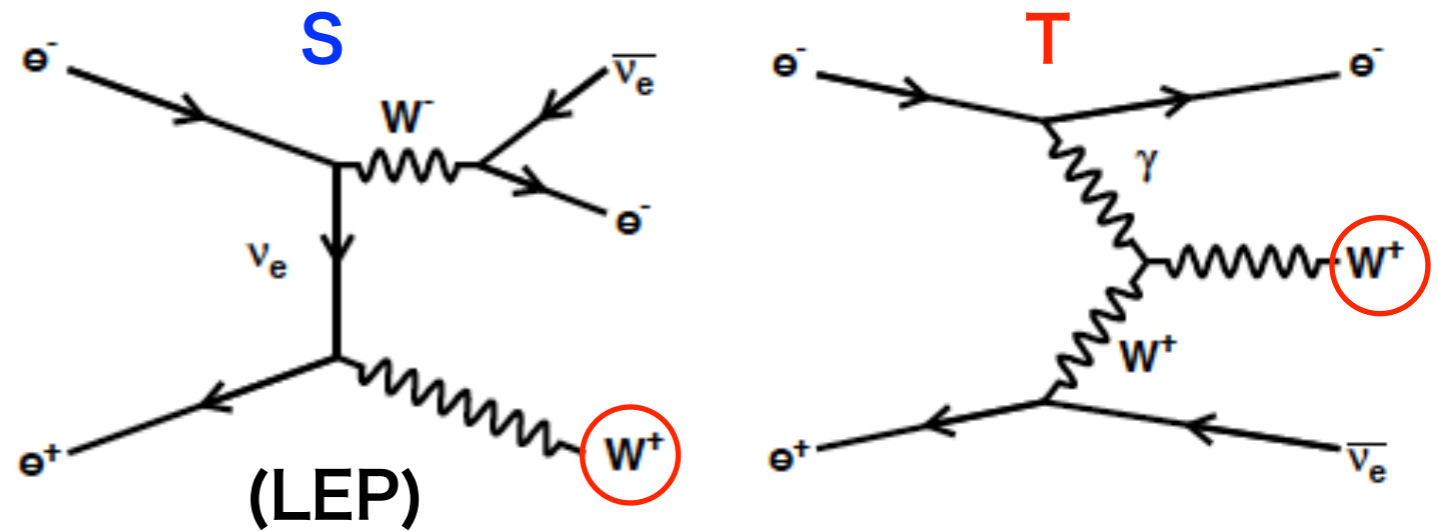
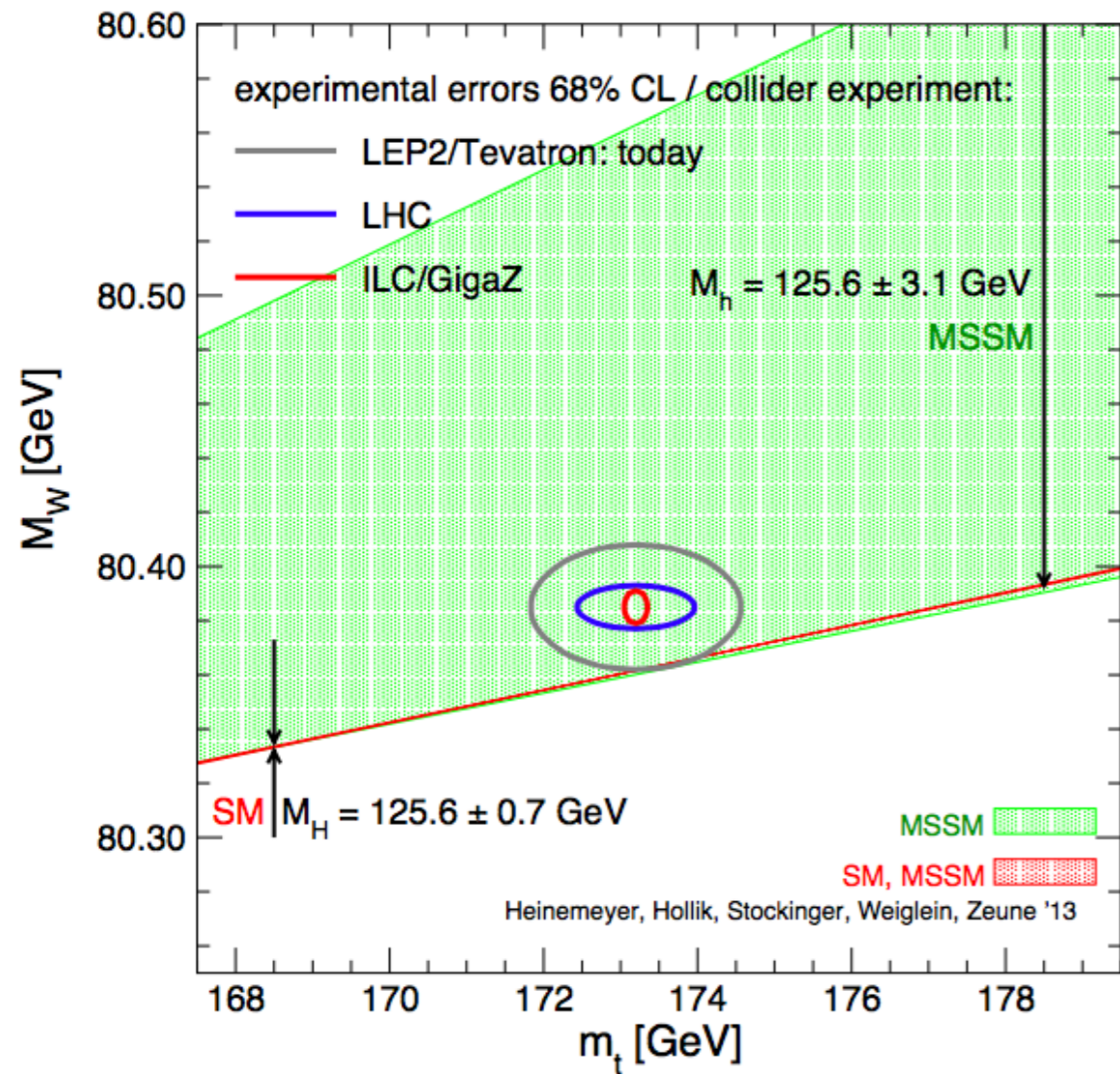
31 / August. 2016,

M_w through
 $ee \rightarrow e \nu$ ($W \rightarrow$ two hadrons)

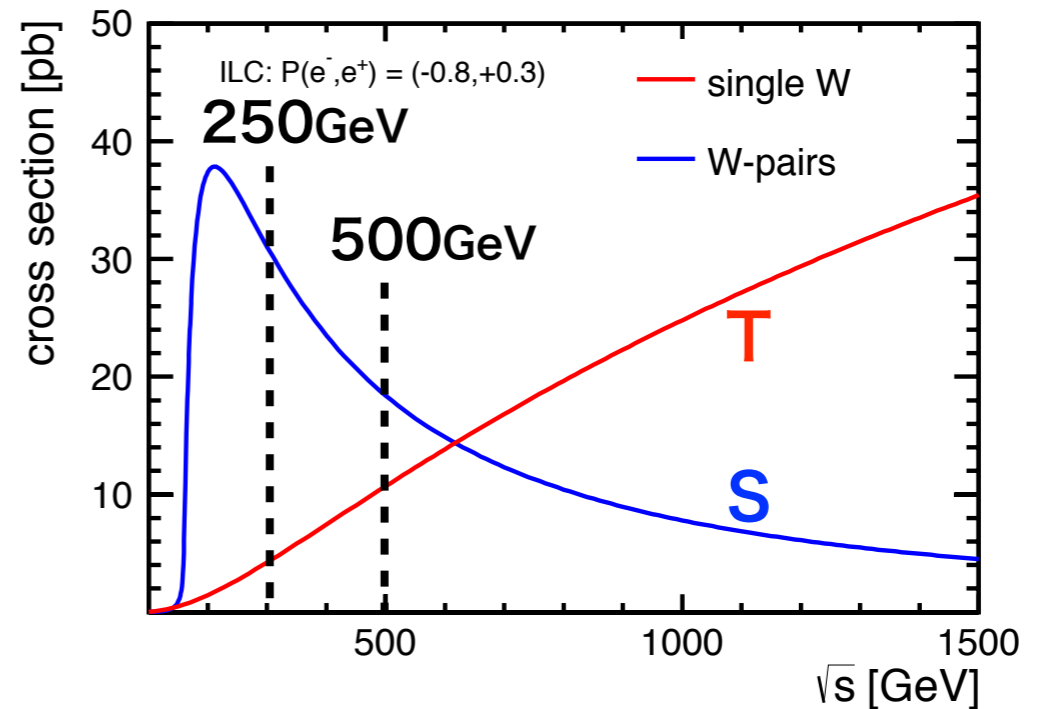
Higgs/EW group meeting

K. Kotera,

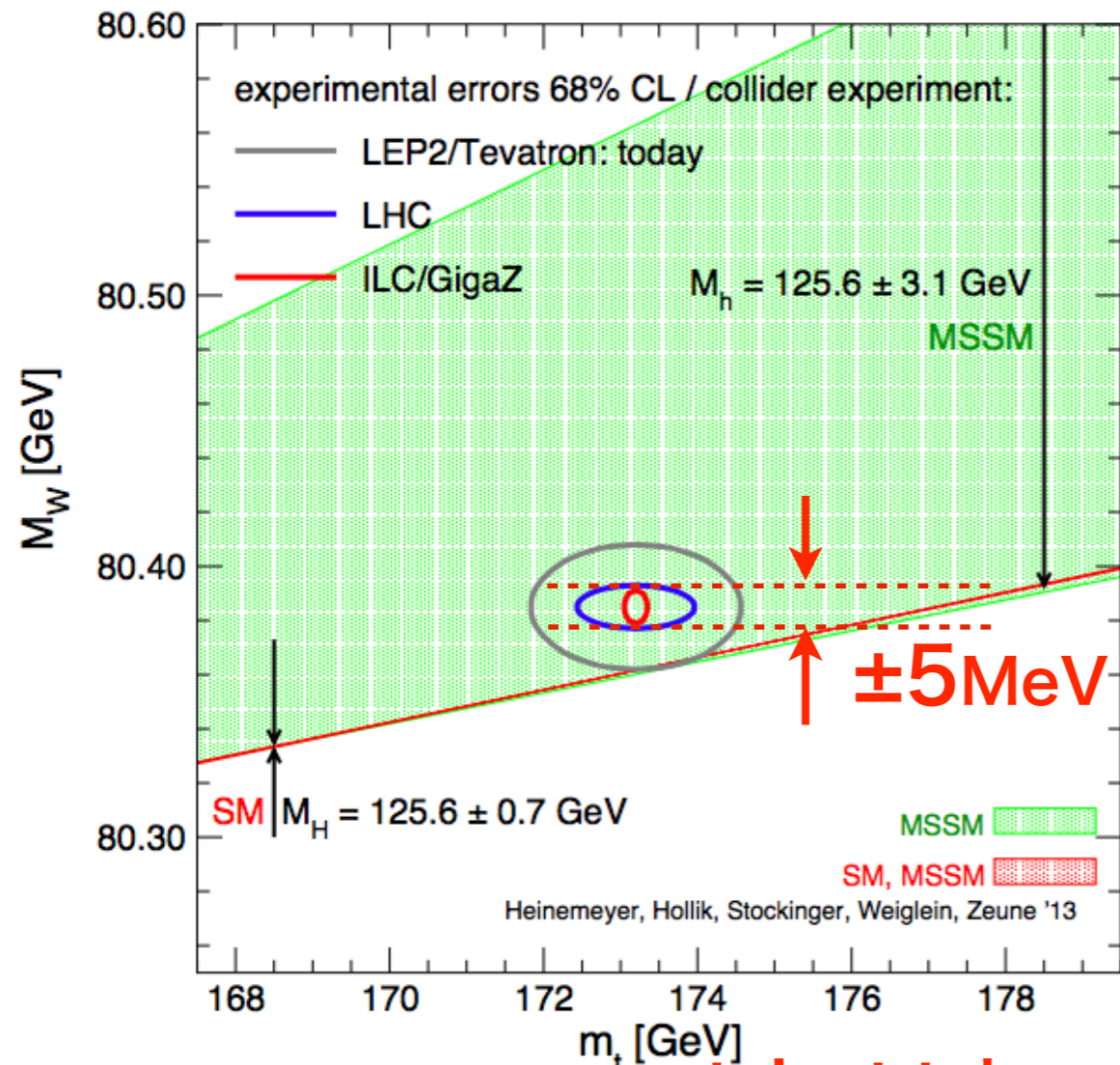
Purpose/Mode



via **W** → hadron, hadron

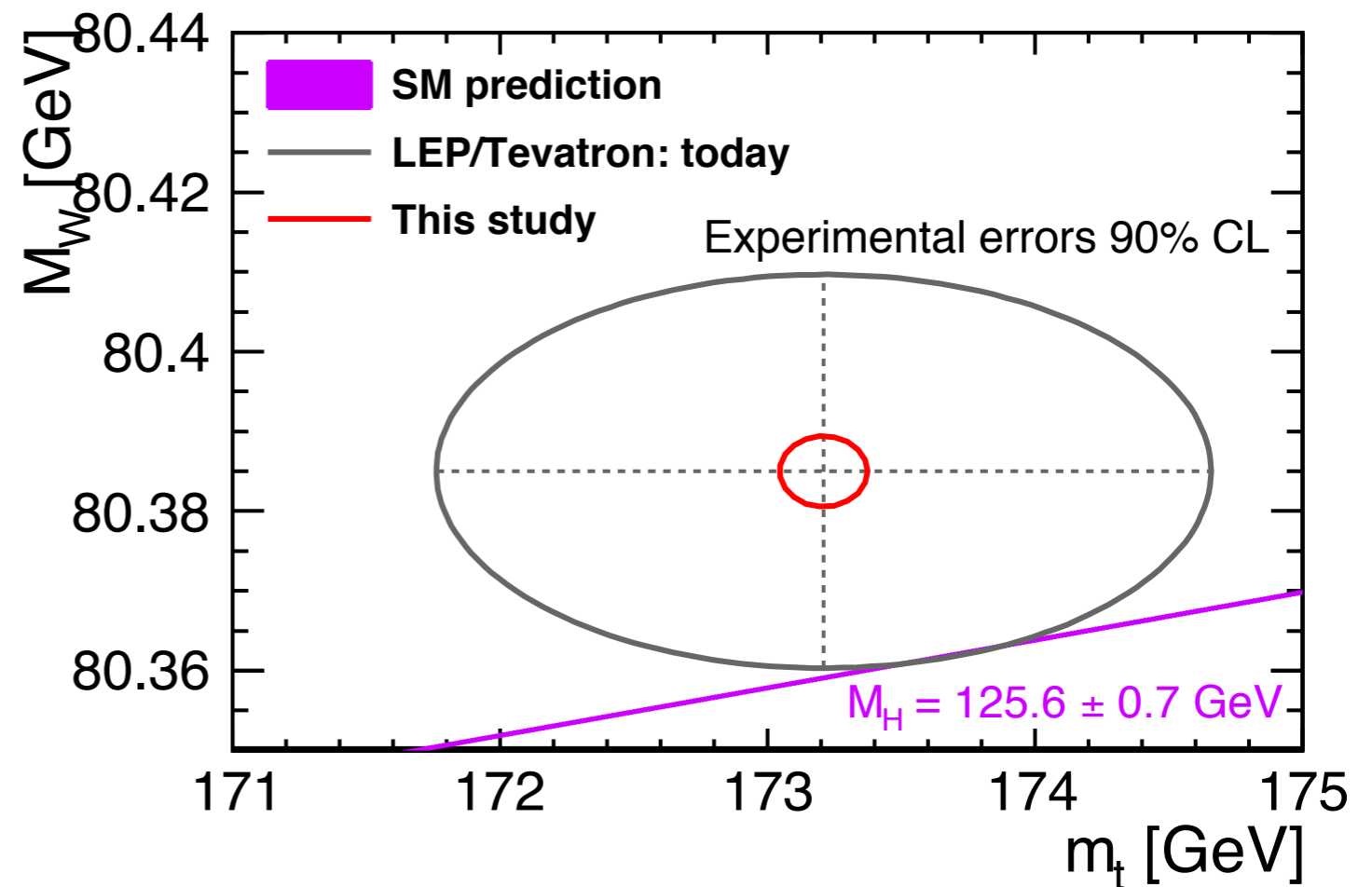


Koya Tsuchimoto's result(2015)



no argument, just take
1/3 of current exp.

arXiv.1311.1663



$\Delta M_W = \pm 2.7 \text{ MeV}$: H20 scenario

Koya's study

- Signal
 - DBD sample,
 - Full simulation in ILD_o1_v05 with ilcsoft v01-17-05,
 - corresponding # of events to H20 scenario,
- Jet energy scale calibration
 - via $ee \rightarrow ZZ$, $ee \rightarrow \gamma Z$, $ee \rightarrow \nu\nu Z$, $ee \rightarrow eeZ$
 - cut base event selection
 - uncertainty is estimated by extension; a/\sqrt{N}
 - uncertainty on $M_W = 1.4\text{MeV}$
- Hadronization
 - OPAL tune (DBD)
 - uncertainty was taken from Graham's result: 1.5MeV ,
- SM-backgrounds
 - $ee \rightarrow \tau\nu qq$, $ee \rightarrow \nu\nu qq$, $ee \rightarrow \ell\ell qq$
 - ΔM_W : $1 \pm 10\text{MeV}(@250\text{GeV})$, $6 \pm 26\text{MeV}(@500\text{GeV})$

Koya's study

Uncertainties

ΔM_W [MeV]	ILC250-H20	ILC500-H20
\sqrt{s} [GeV]	250	500
$\int \mathcal{L} dt$ [fb $^{-1}$]	2000	4000
$P(e^-, e^+)$	shared	shared
jet energy scale	1.4	1.4
hadronization	1.5	1.5
pile-up	0.5	1.0
total systematics	2.2	2.3
statistical	2.3	4.9
total	3.1	5.4

(MeV)

statistical is dominant

Improve selection procedures (need)

Aiming improvements

- using some new techniques (ilcsoft v01-17-10),
 - π^0 finder,
 - upgrading of PID (using individual mass),
 - dE/dx,
 - selection criteria ,
 - improve isolate lepton tag @500GeV.
- Including $ee \rightarrow u \nu qq$, $ee \rightarrow \tau \nu qq$ (BG in Koya's) as signals.
- systematics come from Hadronization,
 - see both $W \rightarrow \text{hadron}$, $Z \rightarrow \text{hadron}$ (calib.JES) changing fraction of neutral Hadron.
- other backgrounds study,
 - $ee \rightarrow qq$ with ISR, - six fermions,

} directly
improve
 ΔM