Opening Address

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HG2012 at KEK

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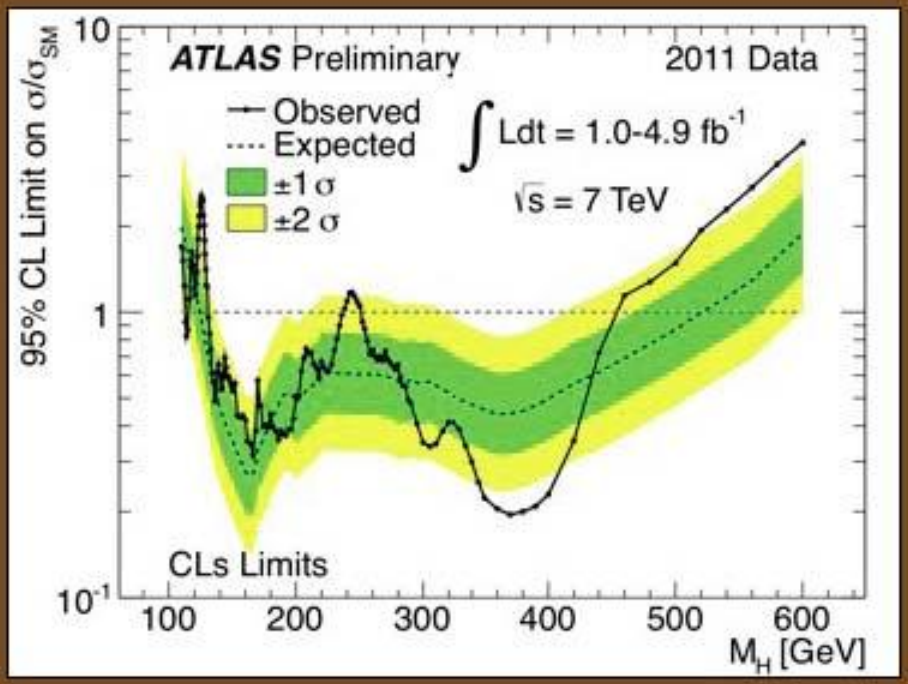
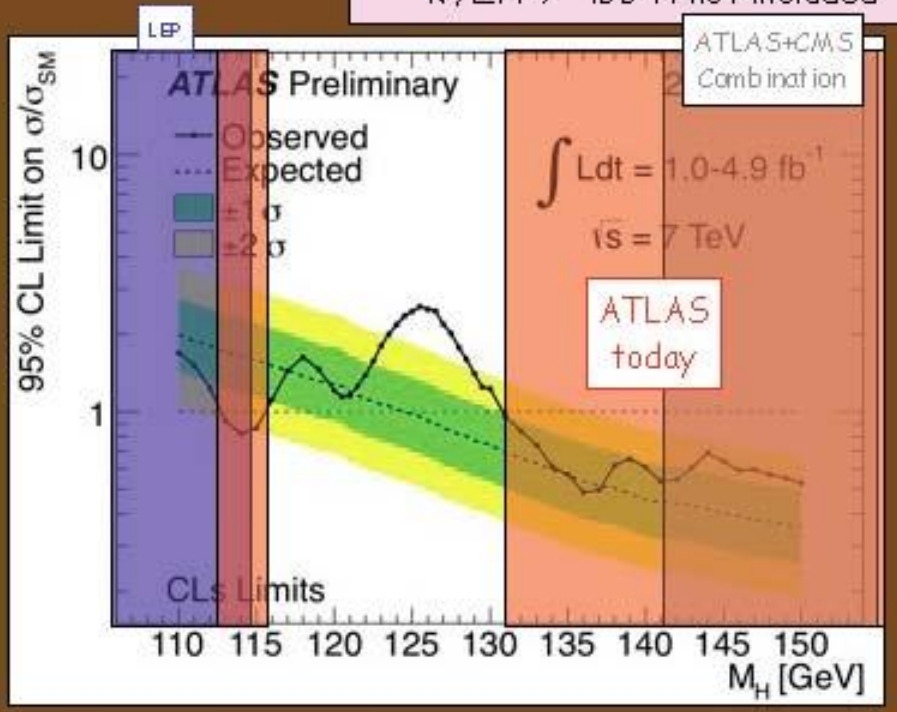
Putting all channels together → combined constraints

H→WW, H→ ττ
H→ WW(*)→ lνlν
H→ ZZ(*) → 4l, H→ ZZ → l
H→ ZZ → llqq, H→ WW→lνq
W/ZH→ lbb+X not included





Excluded at 95% CL

112.7 < m_H < 115.5 GeV
131 < m_H < 453 GeV, except 237-251 GeV

Expected if no signal

124.6-520 GeV

Excluded at 99% CL

133 < m_H < 230 GeV, 260 < m_H < 437 GeV

F. Gianotti
2011/12/13

- In a year or two there is a high possibility that Higgs will be discovered by LHC with a mass around 125 GeV.

- In my opinion, in order to investigate the nature of Higgs, an e^+e^- collider with a center of mass energy larger than 250 GeV and can reach at least 500 GeV will become absolutely necessary.

- We should construct ILC, or CLIC, or both.

- We should not forget the fact that high-gradient X-band linacs have a wide varieties of applications as compact linacs for medical use, industrial use, etc.

Technology	ILC	CLIC	
Centre-of-mass energy (GeV)	500	500	3000
Total (Peak 1%) luminosity (10^{34})	2.0(1.5)	2.3(1.4)	5.9(2.0)
Total site length (km)	31	13.0	48.3
Loaded accel. gradient (MV/m)	31.5	80	100
Main linac RF frequency (GHz)	1.3 (Super Cond.)	12 (Normal Conducting)	
Beam power/beam (MW)	20	4.9	14
Bunch charge (10^9 e+/-)	20	6.8	3.72
Bunch separation (ns)	176	0.5	
Beam pulse duration (ns)	1000	177	156
Repetition rate (Hz)	5	50	
Hor./vert. norm. emitt ($10^{-6}/10^{-9}$)	10/40	4.8/25	0.66/20
Hor./vert. IP beam size (nm)	640/5.7	202 / 2.3	40 / 1
Hadronic events/crossing at IP	0.12	0.19	2.7
Coherent pairs at IP	10	100	$3.8\ 10^8$
Wall plug to beam transfer eff	9.4%	7.5%	6.8%
Total power consumption (MW)	216	129.4	415

Towards 80-100 MeV/m
Fight against Breakdown

- 知彼知己者、百戦不殆。不知彼而知己、一勝一負。不知彼不知己、毎戦必殆。

- 彼を知り己れを知れば、百戦して殆うからず。彼を知らずして己れを知れば、一勝一負す。彼を知らず己れを知らざれば、戦うごとに必ず殆うし。

- If we know our enemies and ourselves well every time we will win; If we do not know them well and only know ourselves, sometime we win and sometime we lose; if we do not know them nor ourselves, we will lose every time.

Conclusion

Future HEP Projects (beyond LHC) will be:

GLOBAL!

Collaborations!

Innovative ideas and technology breakthroughs

R&D, R&D , R&D

Globally Coordinated Strategy

or will not be!

Welcome to Japan,
Welcome to Tsukuba,
Welcome to KEK,
and Welcome to HB2012

Thank you for your attention!