Sélection de LCWS14

D. Boumediene, 17/10/2014

LPC Clermont-Fd.

LCWS14 - Belgrade

https://agenda.linearcollider.org/conferenceTimeTable.py?confId=6389

Selection d'items :

- Option chinoise de circulaire a electrons
- Timeline ILC
- Options pour la machine ILC
- Les détecteurs ILD, SiD

Strategy on Future High Energy Colliders of China

1) On "The 464th Fragrant Hill Meeting， June 12-14， 2013", Chinese High Energy Physics Community arrived at the following consensus:

a) China supports ILC and will participate to ILC construction with in-kind contributions and requests R&D fund from government

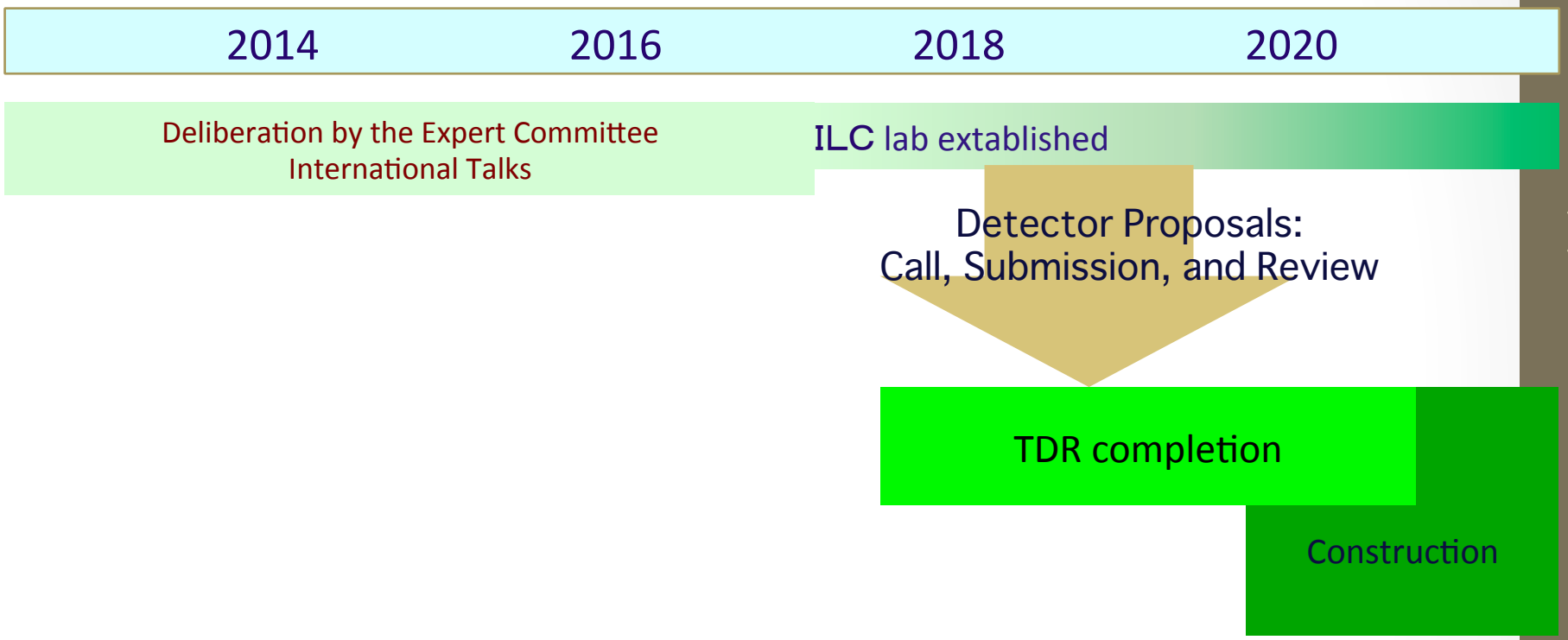
b) After the discovery of Higgs, as next collider after BEPCII in China, a circular e+e- Higgs factory（CEPC）and a Super proton-proton Collier (SppC) afterwards in the same tunnel is an important option and historical opportunity.

2) During the meeting of Chinese High Energy Physics Association on "China High Energy Physics based on Particle Accelerators", Feb. 28, 2014, it was concluded that: "Circular e+e- Circular Higgs Factory(CEPC) +Super pp Collider (SppC) is the first choice for China's future high energy physics accelerator.

- It is considered that CEPC (250GeV upper limit) is *supplementary to ILC in terms of its energy range down to W and Z boson and to the number of detectors from both machines*
- *International collaboration and participation are necessary*

- e+e- circular machine progress/planning in China (Gao)
  - https://agenda.linearcollider.org/contributionDisplay.py?contribId=8&confId=6389

Possible Timeline of ILC Detectors



Detector groups are preparing for this period by
Re-optimizing and re-organizing their detectors.

ETUDE DE LA MACHINE STAGING A L'ILC

News - Resources

We are starting to get feedback from the agencies in recognition of the fact that we need some support during the "pre-decision phase" although nothing yet in hand but:

Japan €8M/yr
US €5M/yr (P5 report critical)
Europe, of course, remains opaque but head count slowly improving.

We anticipate that this state of affairs will not change significantly until a Japanese decision is forthcoming.

It does however provide a basis for planning

WHY STUDY STAGING?

- Construction of the full 500 GeV ILC from the start remains the preferred plan of the LCC
- It has been suggested that a staged approach might be necessary, starting at a lower energy for a few years, before upgrading to 500 GeV.
- This study is meant to prepare to discuss staging should it be necessary, but the full 500 GeV machine remains the main plan of the LCC for the ILC

See http://pages.uoregon.edu/jimbrau/temp/main.pdf

Main Physics Goals vs. Energy

250 Gev

- precision Higgs couplings and branching ratios, in particular g_{HZZ} and BR(H → bb)
- precision Higgs mass
- search for invisible and exotic Higgs decay modes

350 Gev

- top quark mass from threshold scan
- precision **W** couplings
- precision Higgs couplings, in particular **g**HWW, and overall normalization of Higgs couplings

500 Gev

- precision Higgs couplings
- precision electroweak couplings of the top quark
- Higgs couplings to top
- Higgs self-coupling
- precision **W** couplings
- precision search for **Z′**
- search for supersymmetry
- search for Dark Matter
- search for extended Higgs states

Summary of scenarios

	$\int \mathcal{L}dt$ [fb^{-1}]			
$\sqrt{s}$	A	B	C-250	C-500
250 GeV	2000	2000	2000	500
350 GeV	200	200	200	200
500 GeV	3000	3000	3500	5500

Table 1: Proposed total target integrated luminosities for $\sqrt{s} = 250, 350, 500$ GeV.

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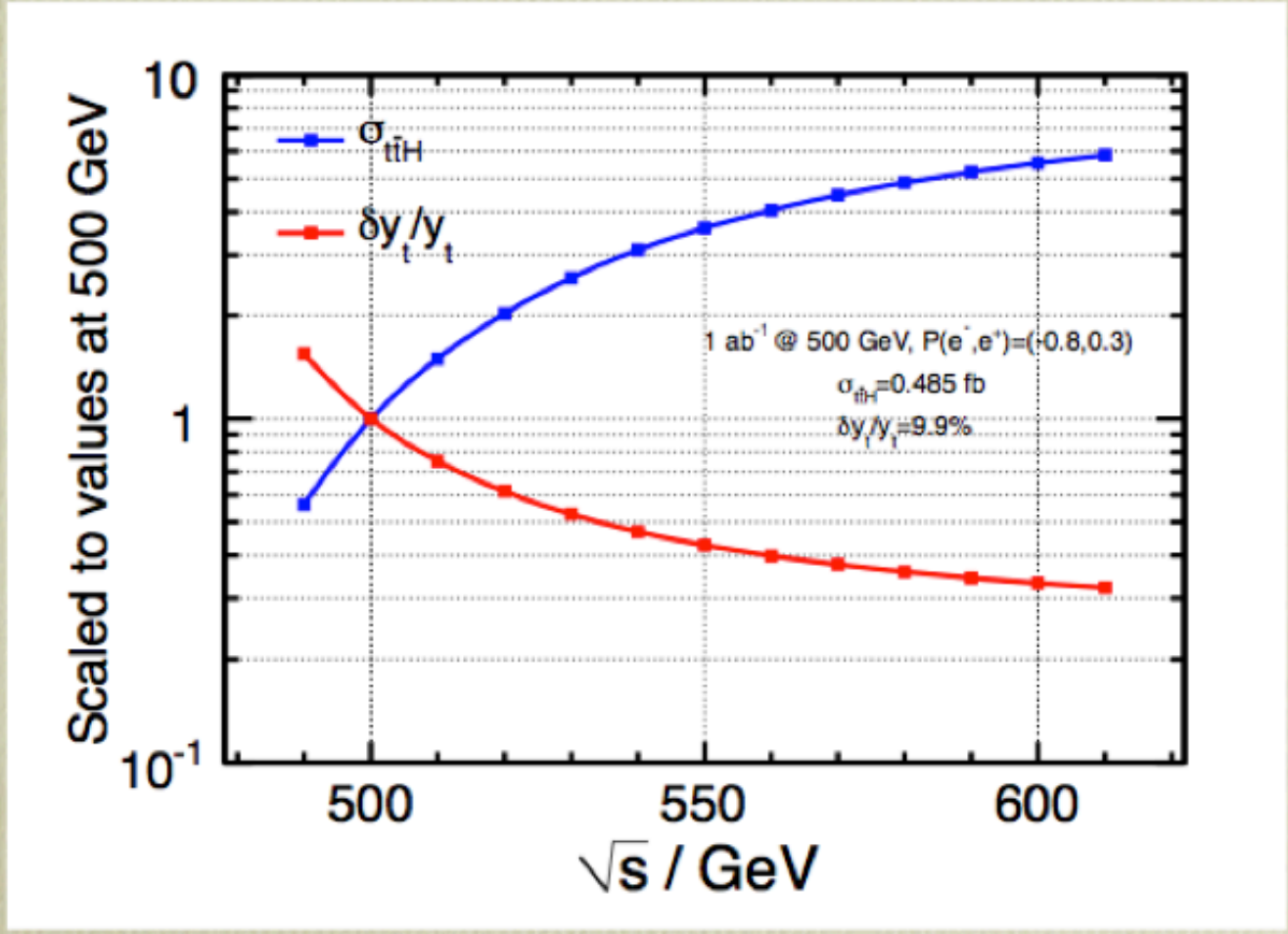
	total run time *before*		
	500 GeV	Lumi upgrade	TeV upgrade
Scenario	[years]	[years]	[years]
A	4.1	16.0	25.5
B	6.2	17.1	26.6
C-250	2.8	13.8	25.3
C-500	2.8	13.8	24.6

Table 5: Cumulative running times for the four scenarios, including ramp-up and installation of upgrades. Not included: calibration and physics runs at Z pole and WW-threshold or scanning of new physics thresholds.

$t\bar{t}H$ & $\sqrt{s} \sim 500 - 550$ GeV

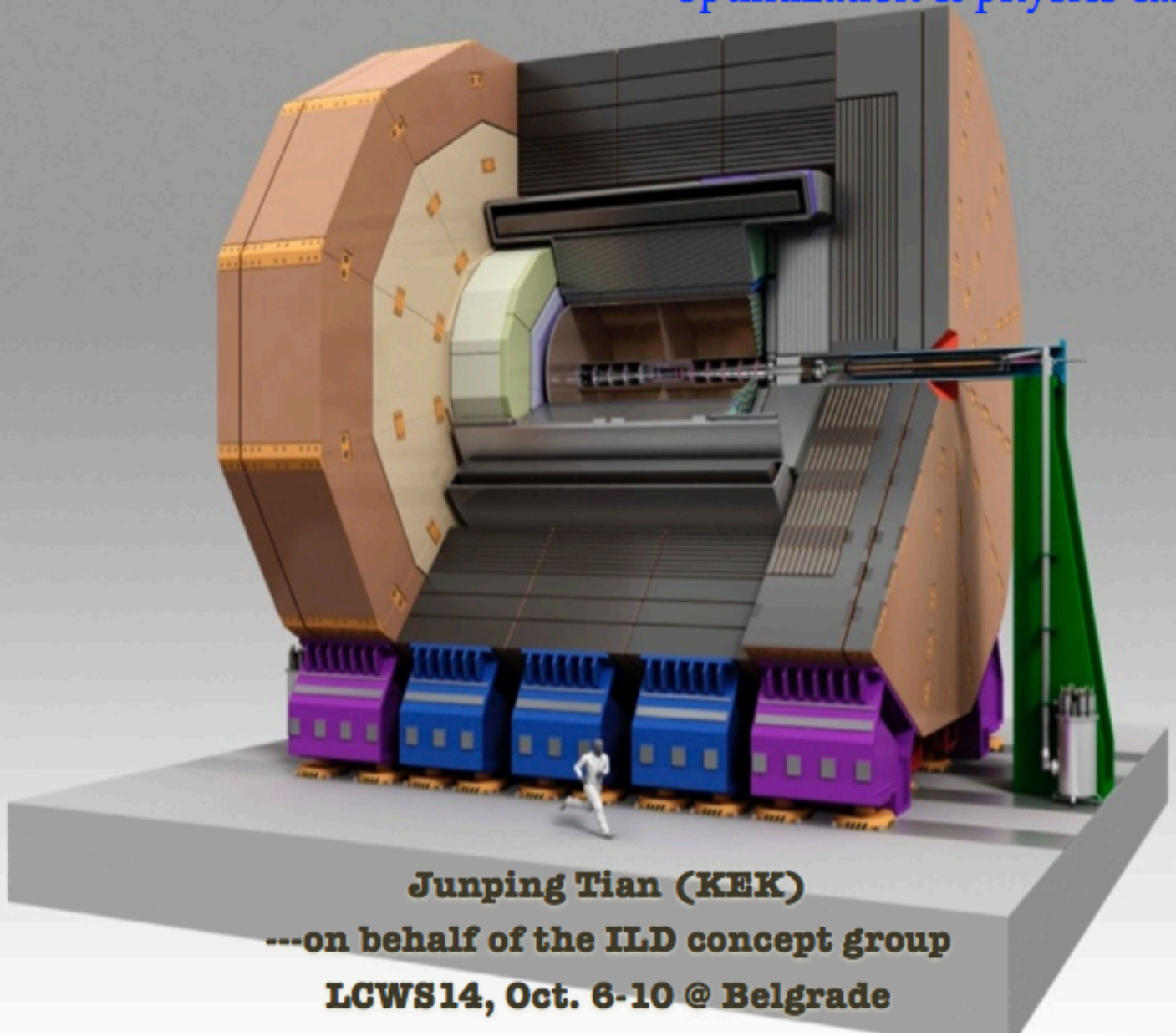


550 GeV is 2.4 improvement over 500 GeV

ILD

status of the ILD detector concept

— optimization & physics case



Junping Tian (KEK)

---on behalf of the ILD concept group

LCWS14, Oct. 6-10 @ Belgrade

(I) detector (re)-optimization

started since meeting at Cracow 2013 —> re-invent ILD the "detector"

LoI studied fairly in detail

- B field (for vertex, PFA, $\delta_{1/pt}$)
- TPC radius, aspect ratio
- ECAL segmentation
- HCAL segmentation/depth
- VTX layers
- SiW versus ScW ECAL
- AHCAL versus DHCAL

what've been changed?

- physics case more shaped, after discovery of Higgs
- sub-detector performance more realistic, learned from R&D, beam test, etc.
- simulation more detailed, material budget, dead area, beam background, etc.
- reconstruction tools improved, tracking, PandoraPFA, LCFIPlus, etc.

towards a more formal ILD organisation

Yasuhiro / Ties @ Oshu

Step 1: Define ILD membership

Call for groups to sign "Statement of participation" in ILD

No financial etc commitment,
but "formal" expression of the intent to participate in ILD.

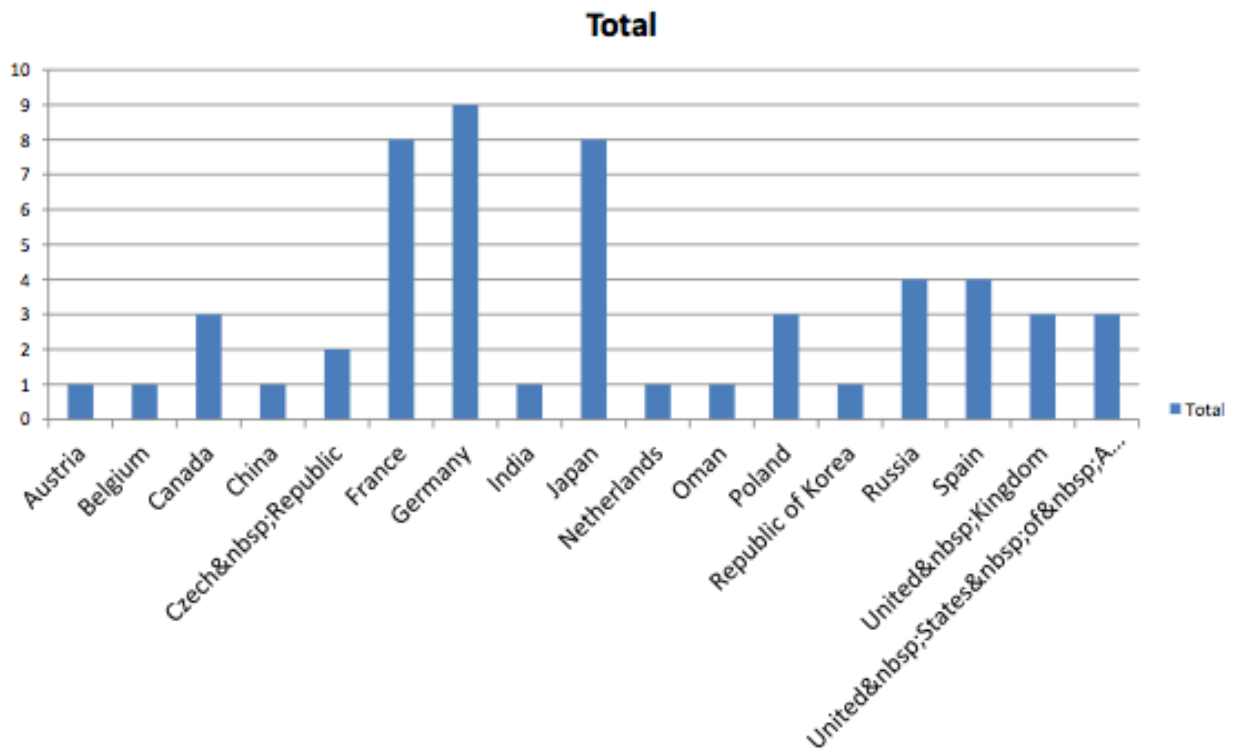
So far 57 Institutes have signed up: great success in my view

Step 2: ILD institute assembly elects a chair ongoing

Defines the next step of the ILD structure
Setup a procedure to move towards election of ILD leadership

ILD

IA: Country Distribution



+LPC depuis lundi 13 Octobre

SID

Institutions of the SiD Consortium Board

SiD Consortium currently comprises 21 institutions from all three regions (Asia, Europe, the Americas), most of which attended the inaugural Consortium Board meeting

Argonne National Lab
Bristol University
Cornell University
FNAL
LAPP (Annecy)
Los Alamos National Lab
Manchester University
Open University
Oxford University
Pacific NW National Lab
Queen Mary University
Rutherford Laboratory
SLAC
University of Barcelona
UC Davis
UC Santa Cruz / SCIPP
University of Iowa
University of Oregon
UT Arlington
Tokyo University
Yale University

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EVENEMENTS A VENIR

Evénements à venir

- ECFA High Lumi LHC
  - Développements de Physique & Technologies liees au LHC Haute Luminosite
  - 21-23 Octobre Aix-les-Bains
- Elections ECFA chair:
  - 4 candidats: Halina Abramowicz (ISR), Umberto Dosselli (I), Max Klein (UK), Guy Wormser (F)
  - Date: UK November 8
- JCL
  - 2eme édition – Grenoble
  - 1-3 Decembre
  - http://lpsc.in2p3.fr/Indico/conferenceDisplay.py?confId=1084