



# LCC Physics&Detector Report

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SiD Meeting

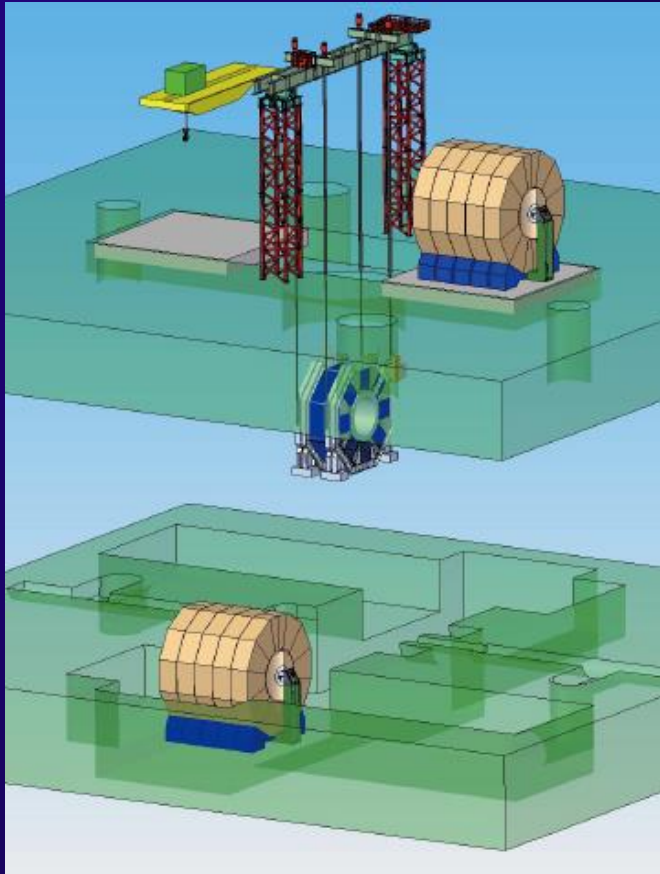
Jan, 2015



# Site-Specific Design

The Japanese government decides the site in Japan in the end.

The LCC is now working on site-specific designs based on the Kitakami site since the limited resources do not allow studies on more than one sites.



Vertical main Access  
(CMS-like detector assembly possible)

CMB (Change Management Board) has approved it and now it is baseline.  
(Possible for the Kitakami site)



## ■ Schedule:

- **Jan 13:** site visit. Meet with the mayor of Kesennuma, the governor of Iwate prefecture, etc.
- **Jan 14:** meet with the president of Tohoku U. , the governor of Miyagi prefecture, the chair of the Tohoku economic alliance, etc. and attend the meeting of the Tohoku University Council for the Promotion of the ILC.
- **Jan 15:** (Tokyo) meet key political figures (Shionoya, Shimazaki etc.)

## ■ Goals

- Advance site-specific design (incl. transportation)
- Strengthen communication with local governments, industries and universities



MEXT

ILC Taskforce

Academic Experts Committee

Particle&nuclear physics  
working group

TDR validation  
working group

Science  
Council of  
Japan



Recommendations  
Sep 30, 2013



Based on recommendations by SCJ ...

- MEXT has requested \$0.5M for investigatory study which was approved on Dec 24, 2013.
  - Will be doubled for the following year (i.e. ~ \$1M)
  
- An academic expert committee was established under MEXT (Early 2014)
  - Report to be completed by FY2015 (i.e. end of March 2016) (even though extendable)
  - Kickoff meeting held on May 8, 2014
  - 2<sup>nd</sup> meeting held on Nov 14, 2014 – status reports from the working groups presented.



- Two working groups under the Academic Experts Committee established :
  1. Particle&Nuclear Physics worknging group
    - On the ILC physics case with respect to other future projects
  2. TDR validation working group
    - On the cost and human resources as well as maturity of design
- The deadline is the same as that of the Academic Experts Committee (i.e. March 31, 2016)

SCJ may take up the outcome of the academic experts committee to make the final recommendation.



## Status Report

- If (HL-)LHC finds new particle(s) that appear to be SUSY or composite Higgs
  - (Future) The ILC elucidates mechanism of new physics related to LHC's discovery.
  - (Effect) Leads to proof of SUSY or extra-dimension etc. and one can expect significant discovery or advances in research.
  
- If (HL-)LHC observes significant deviation from SM in Higgs-related measurements
  - (Future) Identify deviations from SM or energy scale of new physics by detailed study of Higgs self-coupling and mass of Higgs as well as top properties.
  - (Effect) Significant discovery if phenomena beyond SM is confirmed, and one can expect advances in studies toward construction of new theory.



## Status Report– cont'd

- If (HL-)LHC sees indication of new phenomena (dark matter or extra-dimension etc.) other than the above
  - (Future) Study at ILC elucidates the properties of the new phenomena discovered by LHC
  - (Effect) First observation of dark matter or observation of 'toehold' of search or extra dimensions would be a great discovery and would significantly advance the field.
  
- If (HL-)LHC finds no phenomena that cannot be explained by SM
  - (Future) The ILC will scrutinize Higgs and search for new particles that are difficult to be found at LHC.
  - (Effect) If SUSY particles etc. are found, it will be a significant discovery. ILC has chances to find new particles missed at LHC.

\* In any cases, it is necessary to evaluate if the anticipated achievements would be widely accepted as matching the investment, considering required performances such as machine energy.





- The ruling parties kept the 2/3 majority
- The process would continue on the ILC without interruption
- MEXT minister Shimomura on campaign in Ichinoseki  
(Reported by an Ichinoseki official Onodera)  
(The speech by the minister was mostly on the ILC)  
'As an international project, Japan should take the leadership'  
'The Japanese government would like to deliberate carefully based on the recommendation of the SCJ'  
'We have secured an investigatory budget, and the deliberation is on-going.'  
'The overall cost is said to be 15000 Oku-yen or 20000 Oku-yen, and this is the most important issue.'  
(this number would include all costs such operation)





## Prime Minister Abe (Interview with Iwate Nippo)

'I think the ILC is a project with a great dream that closes in on the mystery of the birth of Universe. On the other hand, it requires a huge amount of money, and it is said that at least 8300 oku-yen is needed. Also, international collaboration with Europe and the US would be indispensable. The Japanese government has started the discussion on whether our country should host it or not. From now on, we would like to deliberate on it while listening to opinions of scientists.'

'Of course, it will be a big plus for Japan that scientists from all over the world gather together and form a town. The most important point is whether it is possible in terms of budget.'



- For the MEXT subcommittee:
  - Preparing material passed on to the MEXT subcommittee
    - Through Sachio who is a member of the subcommittee
  - Produced a brief document on the ILC physics case (27p)
    - A document for more general audience planned

## Precis of the Physics Case for the ILC

LCC Physics Working Group<sup>†</sup>

October 2014

### 1 Introduction

The physics potential of the International Linear Collider has been documented in a number of reports. Most recently, it is presented in some detail in Volume 2 of the ILC Technical Design Report [1] and in a series of reports to the American Physical Society's study of the future of US particle physics (Snowmass 2013)[2-5]. However, we thought that it might be valuable to add to these a brief and accessible review of the main points of these documents. You will find that here.

The most important aspects of the ILC physics program are: (1) measurement

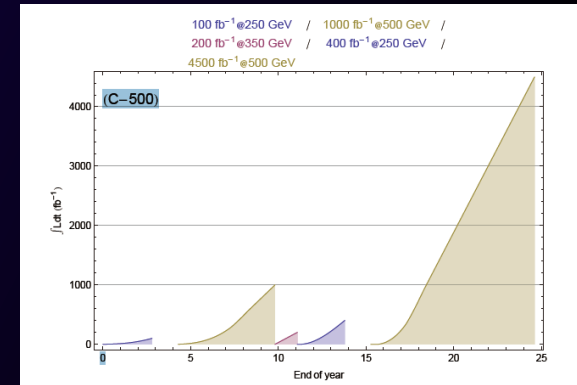
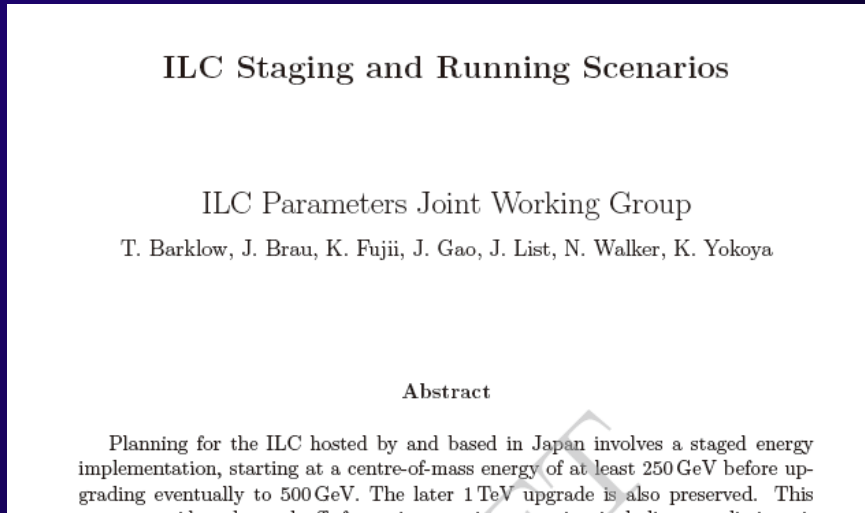


- Members
  - Sakue Yamada (chair), Kiyotomo Kawagoe, Yasuhiro Sugimoto, Frank Simon (Mary-Cruz Fouz:deputy), Karsten Buesser, Marcel Stanitzki, Marty Breidenbach
  
- Inputs to the MEXT TDR validation working group
  - The TDR validation WG is to review the detector issues in ~Feb, 2015
  - A brief input earlier
  
- Inputs also to the LCB subcommittee on governance and management

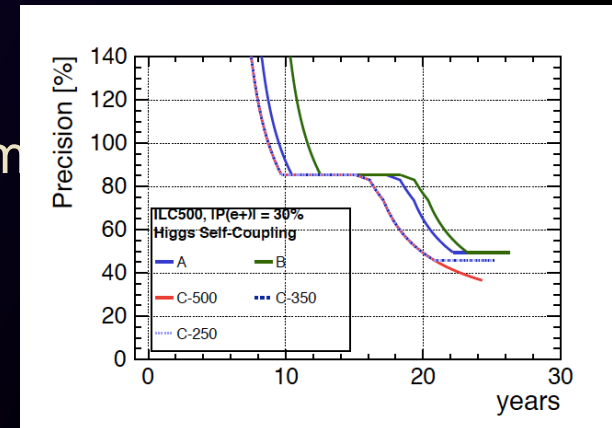


Goal: to come up with running scenarios of ILC  
→ consistent physics capabilities of ILC

- ILC parameter WG produced a document
  - One scenario was 'recommended' (C500)



- Presented at LCWS14 and asked comments from community
- There will be a discussion at the next LCB and PAC





- Chair: Paul Grannis
  
- At the last LCCPD EB meeting:
  - No benchmarks such as DBD at this point.
  - LCCPD EB can monitor progress of concept groups and detector R&D groups
  
- Suggestion:
  - LCCPD EB to organize a review with a few additions as reviewers including Paul Grannis
  
- Any comments?



## Summary

- As the Japanese government reviews the ILC, a tough time is ahead for us for a few years.
- LCC is actively talking to key political figures and also keeping the level of interest high also by strengthening communication with local organizations.
- This is a time of perseverance also for the ILC detector groups.
- We need to act on other governments also. (Obama is to meet with Abe in ~April. If Obama mentions the ILC to Abe...)