

Activities toward ILC in Japan

- **The academic sector**

 - by the HEP researchers

 - by KEK and universities

 - by the Science council

- **The Government**

- **Diet members**

- **The Industry sector**

- **Local governments**

Academic Sector

- **HEP community's roadmap in 2007**
- **KEK's road map in 2008**
(First step was super KEK-B, which started in 2010)
- **Recommendation of the sub-committee of the future projects of HEP, March 2012 (next 2 slides)**

Academic Sector: HEP Researchers Organization

The Final Report of the Subcommittee on Future Projects of High Energy Physics

February 11, 2012

**Subcommittee: about 20 members
including various HEP fields and
some theorists**

http://www.jahep.org/office/doc/201202_hecsubc_report.pdf

Recommendations

The committee makes the following recommendations concerning large-scale projects, which comprise the core of future high energy physics research in Japan.

- Should a new particle such as a Higgs boson with a mass below approximately 1 TeV be confirmed at LHC, Japan should take the leadership role in an early realization of an e^+e^- linear collider. In particular, if the particle is light, experiments at low collision energy should be started at the earliest possible time. In parallel, continuous studies on new physics should be pursued for both LHC and the upgraded LHC version. Should the energy scale of new particles/physics be higher, accelerator R&D should be strengthened in order to realize the necessary collision energy.

Strategy group for ILC

HEP researchers organization created it with 14 leading members of HEP community including a few phenomenology theorists

It is working on an action plan.

Draft action plan includes:

- Promote collaboration among domestic universities
- Discussions with other nearby fields and engineering, civil engineering, humanity societies.
- Contact the Science Council and the Government and Diet members
- Outreach to the wide community
- Contact the local governments of the candidate sites
- Recruiting younger generation to the accelerator science
- Studies of international moves, possibilities for cooperation
- Study how to share the host's role when hosting ILC
- etc

Science Council of Japan

2009: Symposium on **nuclear and particle physics**

2010, March: Japanese Master Plan of Large Research Projects

- **A Table of 43 Selected Projects** of all basic science, engineering, medical research and humanity arts
- **Report was published:**

<http://www.scj.go.jp/en/report/index.html>

There were 5 facilities among the Nuclear/Particle Phys

superKEKB, financed (being constructed)

JPARC running

ILC,

HyperK,

RIBF running

The Advisory committee of MEXT in 2010 Sept

Evaluation of ILC

Positive aspects:

- Aimed scientific target is important.
- Japanese scientists make high level contribution.

As of today

Remarks: (reasonable as of Sept 2010)

- R&D is on-going, the progress need to be watched including the development in other counties.
- By seeing the expected new results from LHC, the project can be considered as a next step after super KEK-B.
- The support of the whole community in the country, particularly for its urgent need, will be necessary.
- Effort of outreach is desirable.

Now TDR/DBD are being completed

LHC discovered a new Higgs-like boson of 125 GeV

These remain very important and efforts are strengthened now.

Discussion material of the MEXT on ILC
Submitted to Science & Technology Council
In the cabinet office

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平成23年9月1日

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基盤研究課 量子放射線研究推進室

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総 括 G

総合科学技術会議
有識者議員懇談会資料より

<http://www8.cao.go.jp/cstp/gaiyo/yusikisha/20110901.html>

Presently searches for Higgs particle is ongoing at LHC. When it is found, its properties need to be investigated to verify that it is the SM Higgs particle. Experiments at ILC is necessary for this study.

国際リニアコライダー計画について

1. 国際リニアコライダー (International Linear Collider : ILC) 計画とは

(1) 概要

直線の線形加速器(全長:約30km)で、電子と陽電子の衝突実験を実施する計画。これにより、質量の起源とされる「ヒッグス粒子」の性質の解明や「超対称性粒子」など未知の粒子が発見され、宇宙創成の謎の解明につながると期待されている。



(2) 意義

現在、欧州合同原子核研究機関(CERN)は、円形加速器(周長約27km)の大型ハドロン衝突型加速器(LHC)を用いて「ヒッグス粒子」の発見等を目指す実験を行っているが、そこで「ヒッグス粒子」が発見されても、その性質を解明しなければ、標準理論が正しいことについての物理的な証明ができないため、ILCによる実験が必要。

(3) 概念設計書

- 2007年8月、研究者グループより概念設計書と建設コストが発表された。
- 建設コスト約66億ドル(当時のレートで約7,700億円。運営費・土地取得等の経費は別)、建設期間7年、実験期間20~30年、年間運転経費1.5~2.7億ドル(約180~320億円)、必要電力約23万kW。

(4) 位置づけ

- 内外で広く利用されている小型汎用加速器や国内でも数台しかない先端大型加速器を凌ぐ世界最先端の超大型加速器であり、現在考えられている加速器の中で、ビッグバン(宇宙の始まり)にもっとも近い状態(1兆分の1秒後)を再現できるもの。
- その成果は人類共通の財産となることが期待されるが、巨額の経費と長期間を要する計画であるため、1カ国だけでは実施できない計画であり、国際協力によって進めていくことが必要。

山下了

<大臣・総合科学技術会議有識者議員会合資料:報告>

Support of the Diet members

2006: some leading members of LDP (Government party that time) formed a support group for ILC.

- Support for R&D budget,
- and studies of merits/issues of ILC regarding the domestic policy.

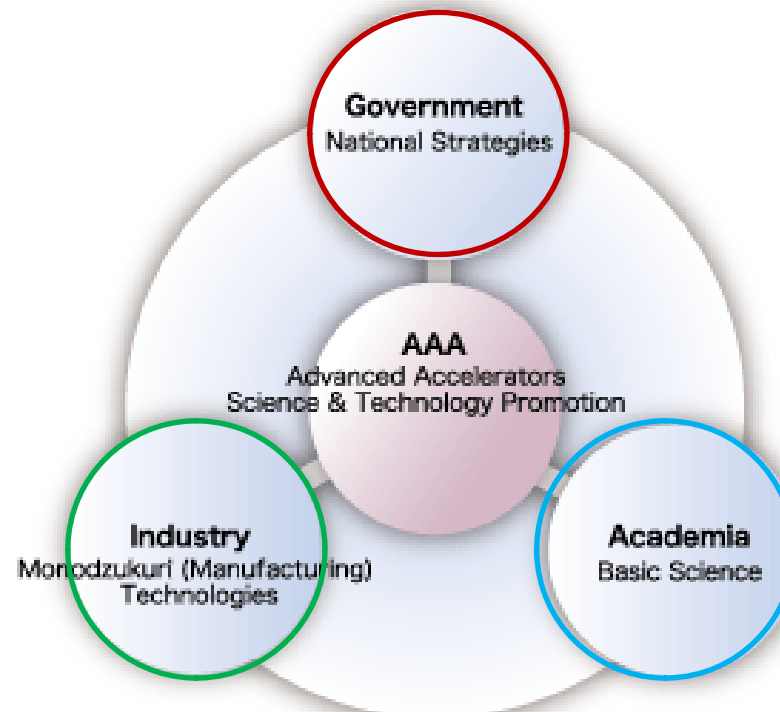
2008: expanded with new members including all parties

- support realization of ILC under international cooperation and inviting it to Japan.
- Support necessary budget for R&D, site studies,
- Facilitate collaboration among ministries.

Cooperation among three sectors (Government, Industry and Academic sectors)

2008: Start of AAA (Advanced Accelerator Association for Promoting Science and Technology)

- In order to realize ILC, facilitate cooperation among different sectors and promote advanced accelerators.
- **4 working groups:**
Technology study,
Out reach,
Intellectual property,
Large project organization



90 industries

>30 universities/
Research institutes

Leading figures of AAA and supporting Diet members (Nov.2011)



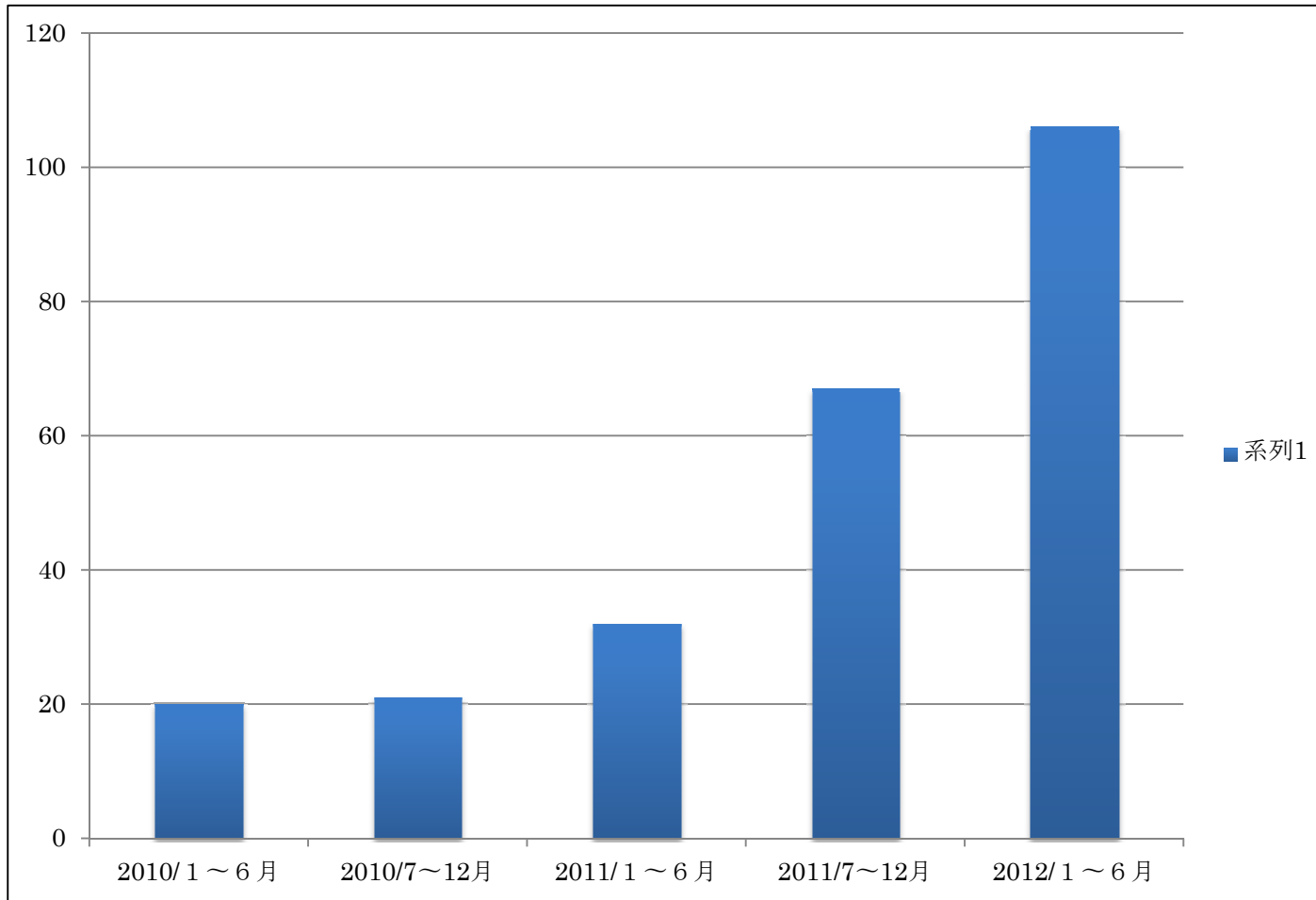
AAA organizes Symposia regularly to promote the accelerator science. **ILC is the main subject but accelerator science in general is covered** including industrial, environmental and/or medical applications.



AAA symposium in Tokyo on Dec.15, 2011



**Expectation of new discovery at LHC,
importance of accelerators in the
society
and necessity of out reach for a large
facility.**



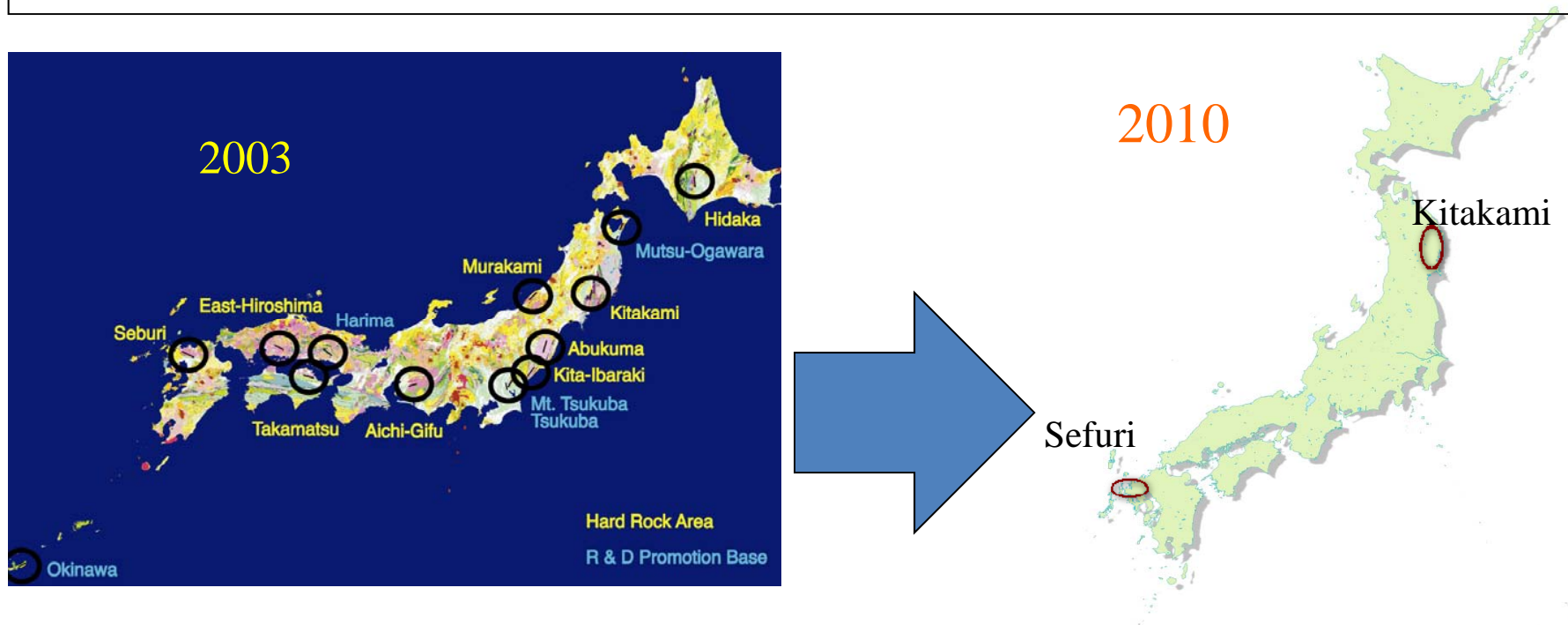
Appearance of ILC in media per half a year
After LHC's announcement of the new particle,
it jumps higher. (By S. Yamashita)

Activity of the local governments

- There are two candidate sites, in Kyushu and Tohoku areas.
- The local governments in the both areas are very active to invite ILC, and people are positive for it.
- They organized various site studies with their budget (2007-2009).
- Now the national government supports these activities. This year in the 3rd supplementary budget, site studies were financed for the both candidate sites (through KEK). More detailed studies will start very soon.

1. Survey of domestic candidate sites

Japanese Society for Civil Engineering



3. Establishment of **local core-groups in two candidate areas** (2007-2009)
4. Start of the dedicated investigation of geology by **joint efforts by local governments and universities** in the area. (2010-)
5. New activity for ILC (standard guidance for civil engineering) by **Japanese Society for Civil Engineering (JSCE)** (2010-)
6. Detailed study in the various construction process by **KEK with AAA** (2010-2011).



GDE executives visited Japanese mountain candidate sites on January 17-18, 2012.

Their visit was nationally broadcasted as a five-minutes segment on the NHK TV morning news, **reaching an estimated 30 million homes.**



Summary

- ILC is promoted and supported in various sectors; academic, government, diet members, industry and the local governments of the candidate site areas.
- The government is watching the development; technology and people's atmosphere.
- LHC's discovery of Higgs like particle is a big news and pushes ILC. Now some medias refer to ILC to be the next step for further studies.