

# *KEK View*



***SMTF Meeting at JLab (Sep.30, 2004)***  
***Nobu Toge, Accelerator Lab., KEK***

# Disclaimers

- This talk attempts to present you a “personal snap-shot view” (i.e.  $x$  and  $x'$  in the accelerator language) from N.Toge as of late September.
- You should note that the exact “transport functions” or how they would evolve are not known.

# Bottomline

- The ex-GLC group (with substantial addition from the rest of KEK and the Japanese HEP community) will work on ILC/GDI with colleagues from NA and EU.
- We (from JA/AS) would like to contribute to both the main linac technologies and beam sources/damping ring areas.
- And we will continue making our efforts to convince our government that supporting and hosting ILC is going to be a good idea.

# Organizational Aspects (1)

- Five internal “ILC-Asia” WGs
  - WG1 : Overall design (K.Kubo)
  - WG2 : Main Linacs (H.Hayano)
  - WG3 : Injectors (M.Kuriki)
  - WG4 : BDS/FFS/IP/IR/MDI (K.Yokoya)
  - WG5 : High-G SRF Technology (K.Saito)
- They are designed to match the ILC Workshop Org scheduled for Nov.13-15 at KEK.
- Activity info of our internal WGs are available at:
   
<http://lcdev.kek.jp/ILC-AsiaWG/>



## Organizational Aspects (2)

- Giving opportunities to younger-generation folks to lead the WGs (exceptions exist).
- “Intellectual collaboration” with the industry personnel is an integral part of the efforts.
- Re-organization of this grouping is likely when GDI/E is formally launched in 2005.

# Management Aspects

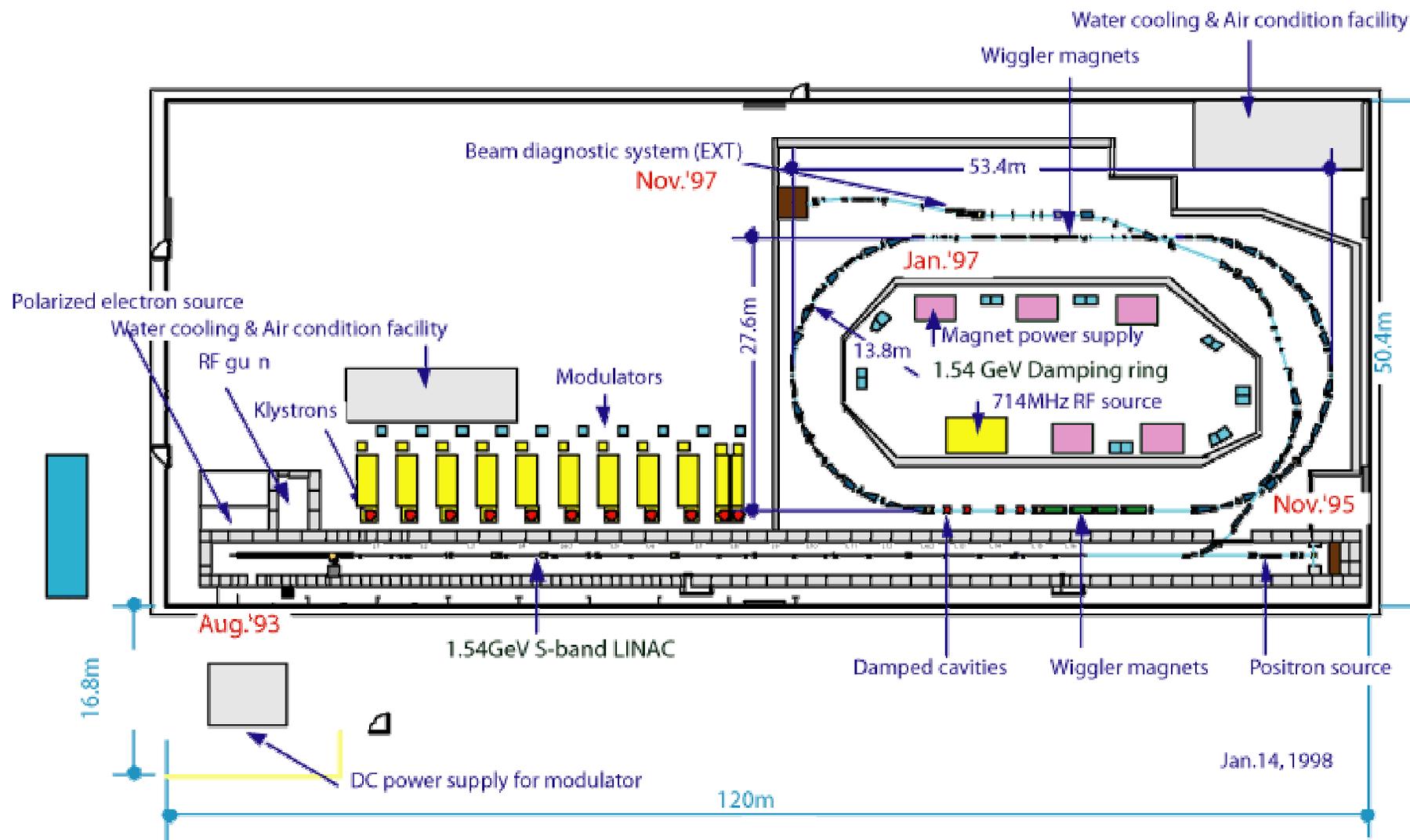
- KEK Boss : Yoji Totsuka
- ALCSC
  - Head : Won Namkung
- KEK Acc Lab (on LC matters):
  - Head : Yukihide Kamiya
  - Group Leader: Atsushi Enomoto
- KEK LC office:
  - Head : Fumihiko Takasaki
    - Secretariat : Nobu Toge, Satoru Yamashita
    - Kaoru Yokoya (ILCWS chair), Hitoshi Hayano (linac matters)
  - <http://lcdev.kek.jp/LCoffice/indexE.html>
- ILC-Asia WGs :
  - 5 WG leaders
- Reorganization is, again, likely when GDI/E formally starts operation.

# So what do we do technically?

## Key areas are -

- Site studies in Japan will be continued.
- Studies of cold-oriented CF issues will be re-launched.
- Beam I&C studies at ATF will continue.
- Roles of ATF in conjunction with SRF-LC injector systems are being re-examined.
- SRF is an area where we would like to play big roles.
- X-band technologies are to be maintained with limited-scale activities separated from ILC.

# ACCELERATOR TEST FACILITY FOR LC

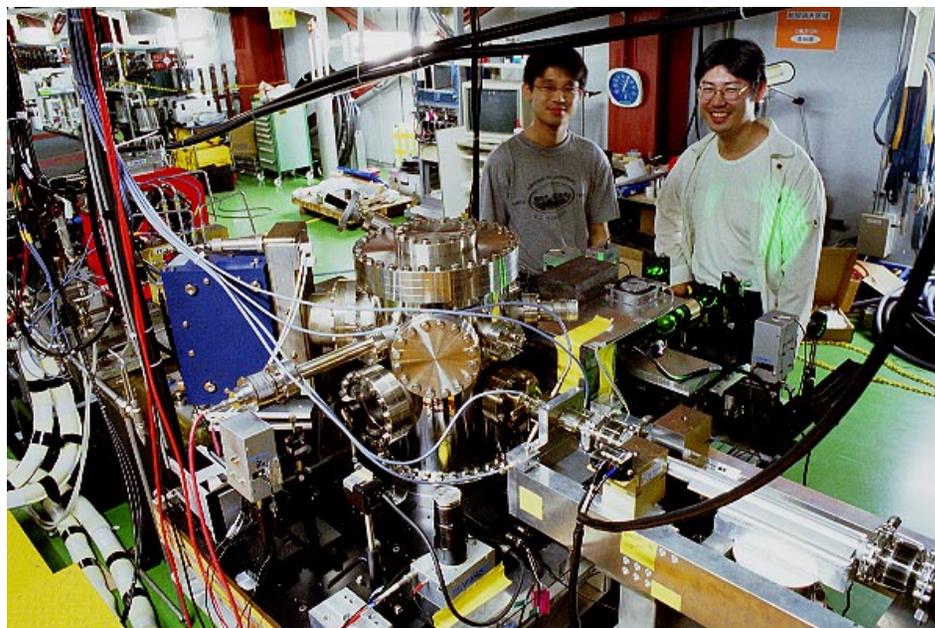


Jan.14, 1998

# ATF

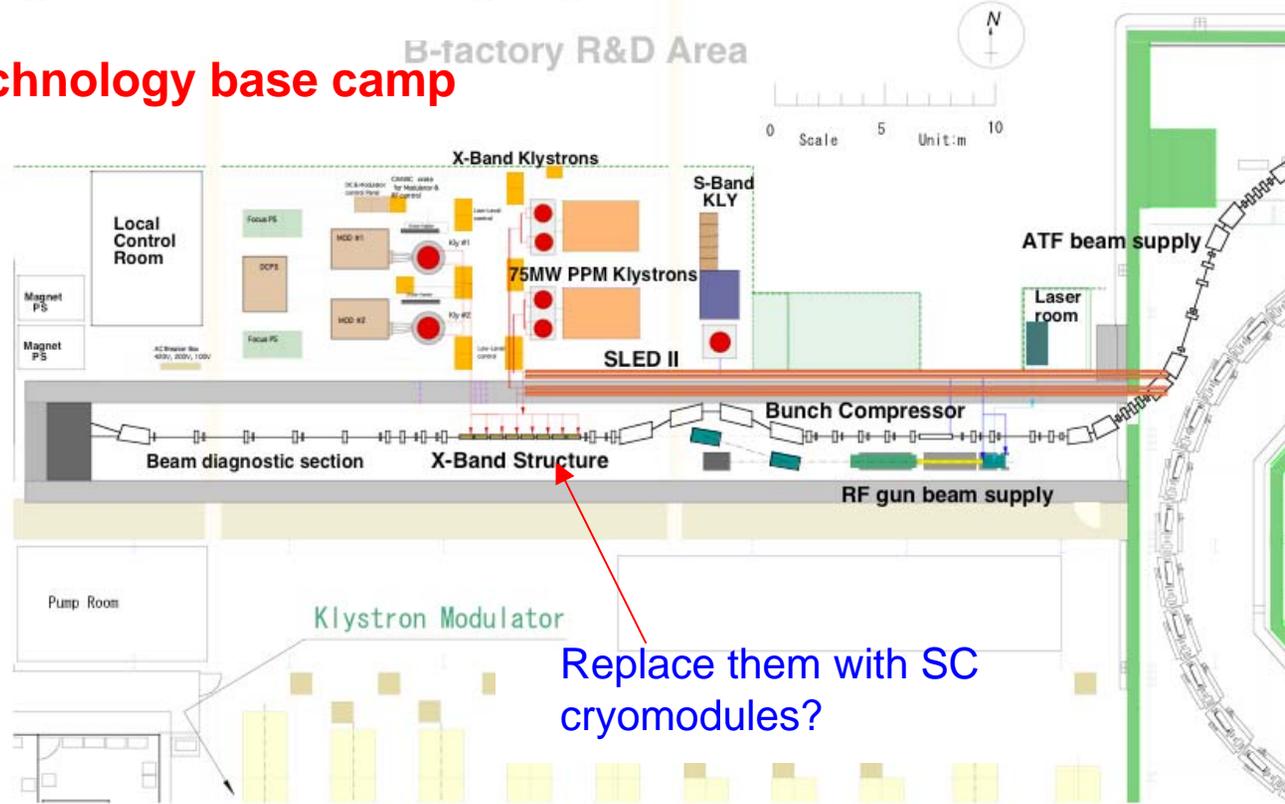
Prototype Global Collab.

- International Collaboration: Participants from JA, AS, US, RU, and EU
- Educational Function: Active training ground for the younger generation of scientists for the future of LC and HE accelerators: 13 Ph.Ds, 34MAs. Have 9 students now.
- Near-future missions
  - Multibunch emittance
  - Wigglers
- In conjunction with ILC.
  - Kickers
  - Some aspects of ILC-DRs?



# GLCTA → SCRFTA???

Technology base camp



- Note: Another site, “high-intensity proton linac” (for J-PARC) is considered more attractive by some influential members.
- There where-about of this “project” is still under discussion.

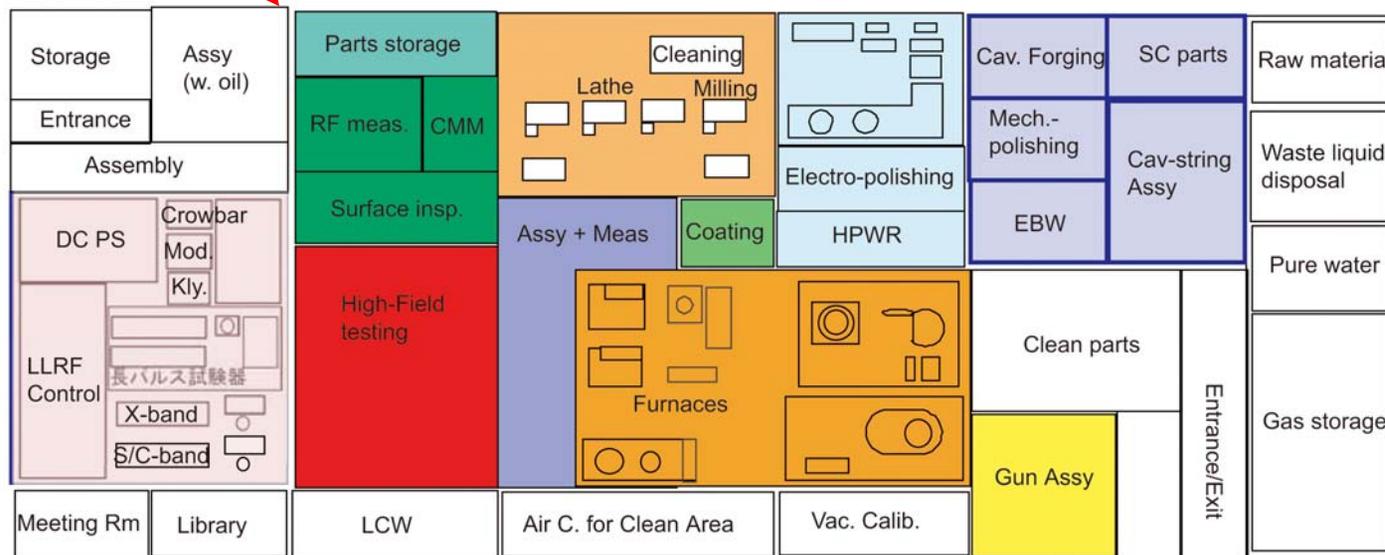
# Proposal: New, Advanced RF Lab



## Anoter Technology base camp

- This idea, which was presented at the time of ITRP-visit to KEK in May, still alive, because
- It is designed to support many aspects of SRF development, too.

Convert KEK's old proton synchrotron exp hall (or something similar in size) into this →



40m

100m

# SRF

- Looks we would like to pursue the following two areas with initial emphasis on the former:
- 35MV/m issues (2005-2006):
  - 35MV/m-grade cavities in cryomodules.
  - Reliable production techniques for 35MV/m-grade cavities
- 45MV/m issues (2005-2007/8):
  - Demonstration of feasibility
  - 45MV/m-grade cavities in cryomodules.

# 35MV/m issues

- DESY/TESLA-style cavity design.
- Environmental / process controls of the production sequence with the industries.
- Production engineering studies for cost control.
- Would like to integrate these efforts with the ones in EU and NA.
- This perhaps should be our initial world focus.

# 45MV/m issues

- With the known  $H(\text{rf})$  limit  $\sim 1750$  Oe, with suitable (i.e. non-crazy) cavity shaping,  $E_{\text{acc}} \sim 50\text{MV/m}$  appears to be within our reach.
- Hence, shoot for 45MV/m goal.
- Adequate cavity shape + careful surface treatment.
- Issues may remain with: reduced iris aperture  $\rightarrow$  HOM, increased  $E_s \rightarrow$  MP, new coupler designs, etc.
- Basic pilot studies first, engineering details later.

# Product of this week (Sep.30)



*Photo: K.Saito*

JLab-style LL cavity-shaped half cells x 4 (Nb, 4mm-t)

# Issues and Comments (1)

- On SRF, we seem able to consider a viable scenario for clearing the old “TESLA R1” and a step or two beyond it, within ~2 yrs.
  - i.e. 35MV/m-grade cryomodules
  - Establish reliable 35MV/m
- So we should just go ahead and do it.
- Industrial mass production of cavities needs attention.
- Engineering of cryomodules require much, much attention, too.

## Issues and Comments (2)

- If  $\sim 45\text{MV/m}$  turns out promising, it would give significant impacts on the SRF systems and the whole LC design.
- We hope to see results seen, but full-scale integration of  $\sim 45\text{MV/m}$  system in the ILC design may have to wait beyond the time scale of CDR.

# Issues and Comments (3)

- There will be a large amount of exchanges of technical information and personnel across the borders in the next few years, including interactions with the colleagues from the industry.
- Need to establish a set of agreements on intellectual properties, copyrights, patents etc in the context of ILC CDR efforts in place, before too long.

# Issues and Comments (4)

- Japan-US collaboration program in HEP has been an important avenue for both the personnel and financial support for JA.
- During GDI/E (and beyond) we (JA) would like to maintain this collaboration with the budget scale similar to the past. The collaboration has been successful and it will be, IMHO.
- We will have to sit down and talk within this calendar year for JFY2005 plans.

# The First ILC Workshop (ILCWS)

- When: Nov.13 (SAT), 14 (SUN), 15(MON)
- Where: KEK – On-site Conf rooms
  
- Note: ILCSC will meet also at KEK on Nov.15.

# ILCWS - Organization (1)

- Plenary reports, parallel WG sessions, and discussions-for-Panel / All.
  
- WG1 = Overall machine design
- WG2 = Main linac systems
- WG3 = Sources, Injectors, DRs
- WG4 = BD, FFs, IR, MDI
- WG5 = High-gradient SC

Details still being worked out.

# ILCWS - Organization (2)

- It is under the auspices of ICFA/ILCSC.
- Host: KEK
- WS Chair: Y.Totsuka (KEK, DG)
- IAC:= ILCSC
- PC := K.Yokoya\*, H.Hayano, K.Saito, D.Burke, S.Holmes, G.Dugan, N.Walker, O.Napoly, J.-P.Delahaye

# ILCWS

- Is –
  - First occasion for accelerator-oriented people to get together for ILC (SCLC) design.
  - Opportunity for technical discussions.
  - To sort out what is OK, what needs more work and how, etc.
- Is Not –
  - GDI organization meeting.
  - Forum for political discussions.
  - Educational sessions for totally un-initiated, although we all will learn anyways.

# ILCWS - “Admission Policies”

- Short notice → Shortage of rooms to stay (max approx. 110 persons).
- Quota Guidelines: 40 from NA, 40 from EU, 10 from non-local AS.
- Submit applications from <http://lcdev.kek.jp/ILCWS> by Oct.1. (Suggest: Act today; Decide later)
- LOC, in consultation with NA/EU/AS LC steering committees/groups, will contact you by Oct.10 if we can accommodate you (or not).

# Web: <http://lcdev.kek.jp/ILCWS>



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## First ILC Workshop

### Towards an International Design of a Linear Collider

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In August this year (2004), a [recommendation](#) has been issued by the [ITRP](#) concerning the technology of choice for the main linacs of a TeV-scale electron-positron linear collider.

The recommendation was immediately endorsed at the joint [ICFA/ILCSC meeting](#) held in Beijing. Now, a large number of high-energy physicists, accelerator scientists and engineers are actively exploring the path towards rapid development of a conceptual design of [ILC](#), a linear collider, to be realized through a world-collaboration.

With this background and context, KEK has decided to host the "First ILC Workshop", under the auspices of [ICFA](#) and ILCSC. The goal of this Workshop is to facilitate the world-wide formation of an international design team of a linear collider. This Workshop is expected to create an expert-oriented opportunity for in-depth and comprehensive discussions on design and development issues of a linear collider, which is to be based on the advanced superconducting RF technologies deployed in the main linacs.

Workshop dates:

- November 13th (Saturday) through 15th (Monday), 2004.

Workshop venue:

- [KEK](#), High Energy Accelerator Research Organization, 1-1 Oho, Tsukuba, Ibaraki 305-0801, Japan.

Please note the latest admission policies for this Workshop (posted Sep.22, 2004).

Read [here](#).

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# Conclusions

- Prepare well.
- Travel well.
- We are all looking forward to seeing you in November.