

ATF2 project in the ATF international collaboration, including coordination issues

- 1. Status of ATF collaboration**
- 2. R&D items in ATF**
- 3. Schedule**
- 4. Expectation**

Junji Urakawa, KEK
ATF2-IN2P3-KEK kick-off meeting
Annecy, LAPP, for AIL collaboration

ATF Collaboration History and Schedule

- ATF Construction and R&D's have been started with SLAC from 1993.
 - From 1997, International collaboration started for the R&D's with Damping Ring.
 - ATF MoU was established on 1st Aug. 2005.
New organized ATF international collaboration has been started. (20 Institutes or more were signed.)
- 1st ICB meeting in Snowmass,
1st TB meeting at KEK on Dec..
2nd TB meeting at KEK on May.
2nd ICB meeting in Vancouver on July, 2006.
3rd TB meeting at KEK will be held on Dec..
- From 2008, ATF2 : the final focus test beam line, will be operated.

CONCURRENCE

The following concur in the terms of this MoU. These terms will be updated as appropriate by appendices to this MoU.

Asia:

Advanced Research Institute for Science and Engineering, Waseda University,

Prof. Yoshimasa Hama

Signature



Department of Physics, Kyoto University,

Prof. Noboru Sasao

Signature



Department of Physics, Nagoya University,

Prof. Tsutomu Nakanishi

Signature



High Energy Accelerator Research Organization (KEK),

DG Yoji Totsuka

Signature



ICEPP, University of Tokyo,

Prof. Sachio Komamiya

Signature



Institute of High Energy Physics, Beijing (IHEP),

Dr. Jiuqing Wang

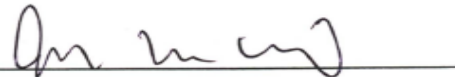
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Pohang Accelerator Laboratory (PAL),

DG In Soo Ko

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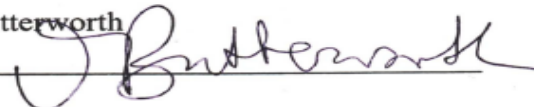


Europe:

Department of Physics and Astronomy, University College London,

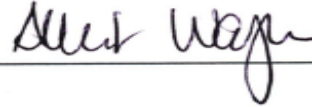
Prof. Jonathan M. Butterworth

Signature



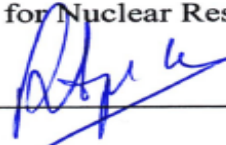
Deutsches Elektronen-Synchrotron (DESY),
DG Albrecht Wagner

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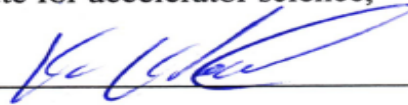
European Organization for Nuclear Research (CERN),
DG Robert Aymar

Signature




John Adams Institute for accelerator science,
Prof. Ken Peach

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Physics Department, Queen.Mary, University of London,
Prof. Philip Burrows

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Royal Holloway, University of London (RHUL),
Prof. Steven Wilson

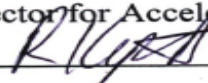
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North America:

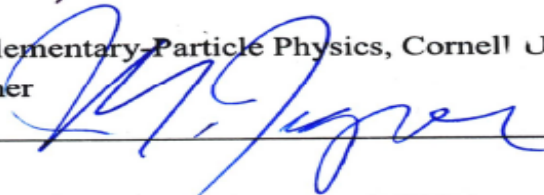
Fermi National Accelerator Laboratory (Fermilab),
Associate Director for Accelerators, Dr. Stephen D. Holmes

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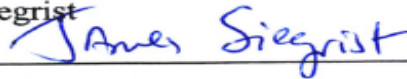
Laboratory for Elementary Particle Physics, Cornell University (LEPP),
Prof. Maury Tigner

Signature



Lawrence. Berkeley National Laboratory (LBNL),
Prof. James Siegrist

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Stanford Linear Accelerator Center (SLAC),
Director Particle and Particle Astrophysics, Prof. Persis Drell

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ICB-Members (18)

ICB Members:

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Washio Masakazu

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Jinhyuk Choi

jchoi@postech.ac.kr PAL

ATF Technical Board (TB) : **Total 13 members**

June, 2006

Europe.....

Eckhard Elsen, DESY (TB Co-chair)

G. Blair, RHUL (Royal Holloway, University of London)

P. Burrows, John Adams Institute (University of Oxford)

F. Zimmermann, CERN

A. Wolski, Cockcroft Institute in UK (TB Co-chair)

North America.....

T. Raubenheimer, SLAC

M. Ross, SLAC (Later, to FNAL)

S.Mishra, FNAL

Asia.....

K. Yokoya, KEK

N. Toge, KEK

T. Sanuki, University of Tokyo

J. Gao, IHEP

E-S. Kim, KNU(Kyungpook National Univ.)

ATF SGC (System and Group Coordinators) : Total 18 members

Three Deputies (with help of sub-Deputies of KEK): Total 6 Members

Deputy for Beam operation: S.Kuroda (T.Okugi)

Deputy for Hardware maintenance: N.Terunuma (M.Kuriki)

Deputy for ATF2: A.Seryi (T.Tauchi)

SGCs : Total 18 members

H.Weise of DESY,

F.Zimmermann of CERN,

Philip Burrows of UK,

Grahame Blair of UK,

M.Ross of SLAC,

A.Seryi of SLAC,

R.Meller of Cornell University,

A.Wolski of UK,

J.Gao of IHEP in Beijing,

E.S.Kim of KNU,

K.Kubo, S.Kuroda, N.Terunuma, M.Kuriki, T.Tauchi, T.Okugi, R.Sugawara of KEK,

T.Sanuki of Tokyo University

1. Usually schedule of ATF machine operation is divided to **two blocks every year** with about four months summer long shutdown. One block is **from mid. of Oct. to Dec.**, and the other is **from mid. of Jan. to mid. of June**. Since there are many collaborators, we proposed two meetings of TB per year in Dec. and May for review and recommendation of the research programs at ATF.

We can allocate following points to TB and SGC Joint Meeting, if necessary.

*TB and SGC Joint Meeting in Dec. is mainly devoted for the evaluation on present R&D's.

*TB and SGC Joint Meeting in May is mainly devoted for the evaluation on new proposals.

Of course, we will **discuss both issues on R&D's and new proposal in TB and SGC Joint Meeting.**

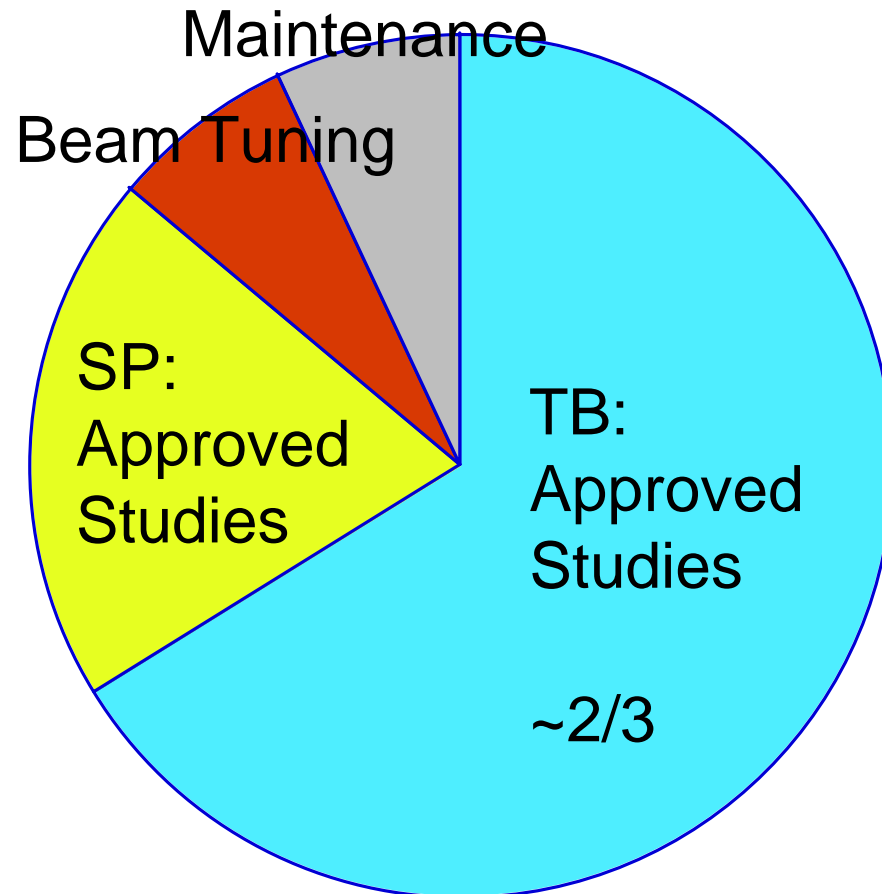
2. Requests to new proposal : **Purpose, Research method, Period of the research, Manpower, Budget plan etc.** should be reviewed for the approval.

See Template for the new proposal (see <http://atf.kek.jp/>).

3. Member of ATF operation group : **Shift leader** is responsible for the safety and should be KEK staff. Since ATF operation group is responsible for beam tuning, making a good beam and required beam by R&D group, **ATF operation group can involve many physicists and engineers from overseas countries.**

Assignment of the ATF Beam Time

Typical ~22 weeks/year



About 20 % of total will be used for the maintenance and the beam tuning.

It is estimated by current results.

Guideline for approved studies by SP.

1. Short term study
2. No conflict with approved studies by TB and ICB.
3. Test study for new proposal
4. SP can accept until two shifts/week but it depends on the situation of studies.

Schedule of ATF operation, TB meeting and Long shutdown

	Feb	Apr	Jun	Aug	Oct	Dec	Feb	Apr	Jun
JFY								NEXT JFY	
ATF Beam Schedule		Summer shutdown (KEK power contract)			22 beam weeks / 32 weeks				Summer Shutdown
		Upgrade / Maintenance Installation							
	May					Dec.		May	
	TB meeting					TB meeting		TB meeting	

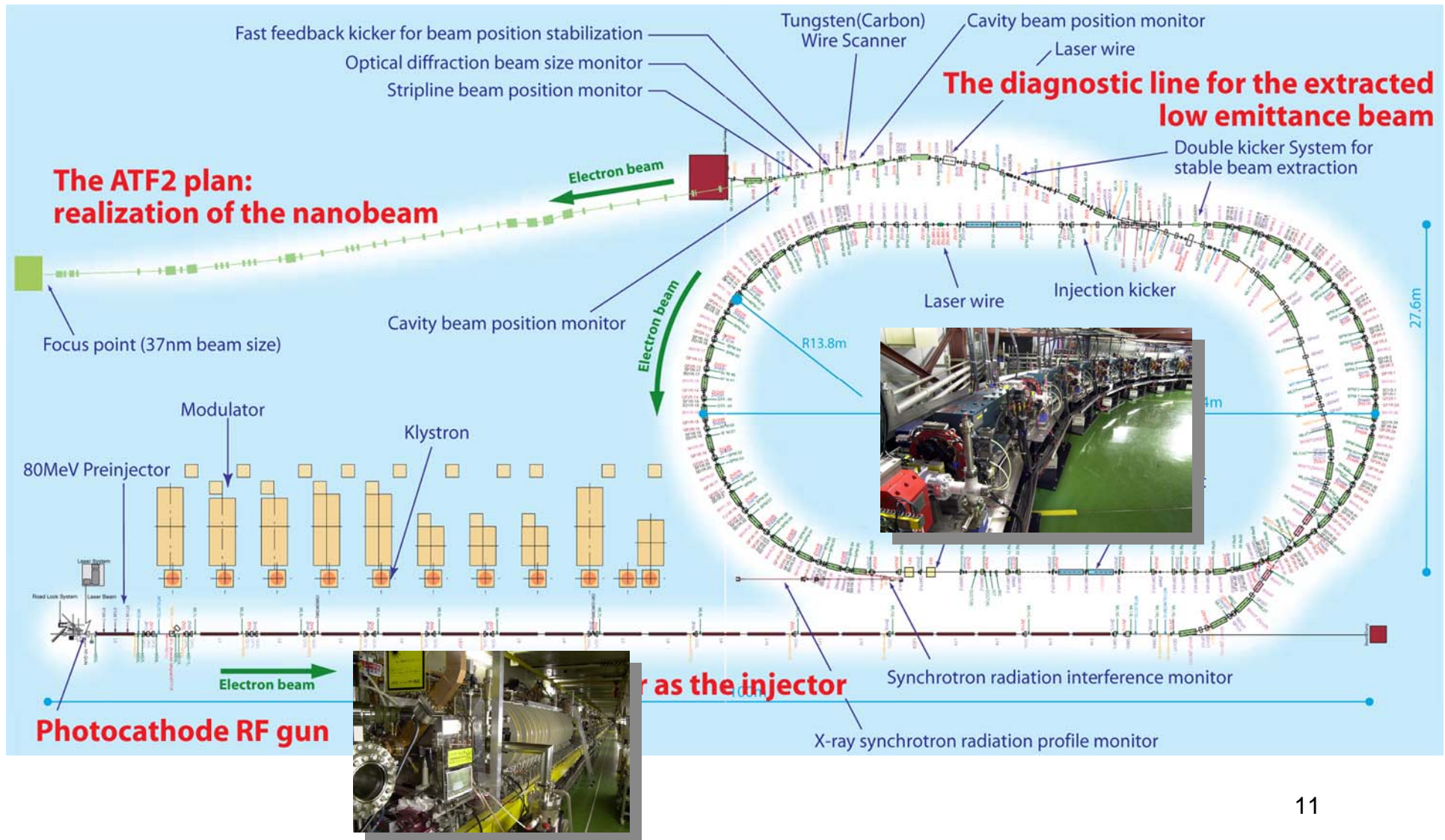
Mission of ATF

- 1. Establish the technologies associated with producing the electron beams of the quality required for ILC.**
- 2. Provide such beams to ATF2 in a stable and reliable manner.**
- 3. Serve the mission of providing the young scientists and engineers with training opportunities of participating in R&D programs for advanced accelerator technologies.**



ATF, Old version

Accelerator Test Facility



R&D items in ATF

- **1. kicker study for extraction of ILC-like bunch spacing.**
Multi-pole component of kicker and septum is under study.
- **2. Fast rise/fall strip-line kicker study for ILC Damping Ring.**
<3ns rise/fall is under study.
- **3. High resolution Ring-BPM for more small vertical emittance.**
application of digital signal process is under study.
- **4. Coherent Synchrotron Radiation(CSR) study.**
development of CSR detection is underway.
- **5. Cavity BPMs.**
nm resolution BPMs, PAL-BPM at ATF2, IP-BPM at ATF2.
- **6. Laser Wire beam size monitor.**
Fast sweep LW at EXT-line, Shintake-monitor at ATF2.
- **7. Fast orbit feedback for ILC collision point.**
digital feedback method is under development.
- **8. Many other instrumentation(ODR, XSR, LW@DR)**
- **9. S-band RF-gun study for stable injection into ATF-DR.**
- **10. Pol. positron generation R&D based on Compton scattering.**
- **11. Fast Ion Instability Measurement**
- **12. Multi-bunch Instability Study**

Highlight Studies in Extraction Line

1. *Stable beam extraction from DR*

Kick angle compensation for multi-bunch, Double kicker system

Multi bunch extraction with ILC like beam spacing (2005~)

3 bunch extraction with 150ns spacing by 300ns flat-top double kicker. Done

2. *Instrumentation developments*

Beam size monitors

Optical Diffraction Monitor, Wire scanners (Tungsten, Carbon), Laser wire (UK, 2005~)

Nano meter resolution Beam position monitors : Cavity BPM

3. *Intra-train beam feedback*

FONT (UK) / FEATHER (KEK)

Feed-forward to Extraction line from DR (UK, 2006~)

4. *Other R&D*

Polarized positron generation

Compton scattering with electron beam and polarized laser

Stabilization of components , Straightness monitor, StaFF (UK, 2006~)

5. *More new R&D's in ATF were proposed.*

Construction and Beam Commissioning Schedule

From 2007.6 to 2007.9, refurbishment of floor.

From 2007.10 to 2008.3, installation of magnet system, vacuum system, control system and monitor system.

All components for ATF2 will be completed until end of JFY2007(2008.3) except for devices of advanced instrumentations.

Precise alignment and tuning of devices from 2008.4

From 2008.6 to 2008.9, realign the existing components of ATF extraction line and connect the extraction line to ATF2.

Beam commissioning will be start from 2008.10.

Beam Tuning Strategy

The optics of ATF2 was designed by Woodley and Seryi.

Beam based analysis on all components is essential at first stage.

Coordination Issues

Andrei and Toshiaki are responsible for this issues as Deputies.

We need ATF2 project meeting to understand the situation of the project, to discuss the beam tuning strategy and coordination issues.

Schedule of ATF2 project meeting

1st ATF2 project meeting at SLAC, 2006. 2

2nd ATF2 project meeting at KEK, 2006. 5

3rd ATF2 project meeting at KEK, 2006. 12

4th ATF2 project meeting in UK?, 2007. May or June?

5th ATF2 project meeting in USA?, 2007. ???

6th ATF2 project meeting in Asia, 2008. ???

7th ATF2 project meeting in ?, 2008. ???

I am expecting enough budget support to collaborating institutes which are understanding ATF2 as the essential research activity for ILC.

Your requests are welcome.

Prospect of ATF

- ATF International R&D will demonstrate necessary results for ILC, especially how to control high quality beam, develop many kinds of advanced instrumentation, educate young accelerator physicists and engineers.
- ILC like beam which means 60 bunches with bunch spacing about 300nsec, in the future. (New idea is under consideration.)
- Realization of about 35nm beam for long period.

From US, EU, Russia, China, Korea, India and Japanese Univ.,
Many young physicists and engineers are learning and
developing advanced accelerator technologies for ILC project.



ATF Control Room

2005.3.9