

# ADIJ (ADI in Japan)

K. Yokoya

ADI, Jul.2.2015

(presented at Technical Board Meeting, Jun.30. 2015)

# ADI-J (ADI of Japan)

- Responsibility of Japanese team
  - Expected to take more leadership
- Lack of human resources in the international team of LCC
  - Human resources are relatively abundant in Japan
- Need closer relation between International and Japanese team
  - In addition to LCB, LCC, TB, CRB, etc.
- Communication among groups
  - Right now Japanese members are attending international meetings individually

# Activities

- Range
  - CFS, lattice, positron, BDS, etc
  - SRF issues not included directly
- Regular meeting
  - Every Monday 13:45-14:30 (actually, 2-3 times a month like the regular meeting of LC Office)
- Topics
  - Technical issues & design issues
  - Report to each other on what is happening in each group
  - Status of change requests
  - Think what is missing
  - Requests to the international ADI team
  - Requests from the international ADI team
- Regular report in monthly ADI meeting
  - From KEK LC Office (First report on Jun.4)
  - From ADI-J

# ILC-ACC 国際協力・組織構成

## ILC Accelerator Organization

LCC-ILC Director: M. Harrison, Deputies: N. Walker and H. Hayano

\*KEK LC Project Office Head: A. Yamamoto

Sub-Group	Global Leader Deputy/Contact p.	KEK-Leader* Deputy	Sub-Group	Global Leader Deputy/Contact P.	KEK-Leader* Deputy
ADI	<b><u>N. Walker (DESY)</u></b> K. Yokoya(KEK)	<b><u>K. Yokoya</u></b>	SRF	<b><u>H. Hayano (KEK)</u></b> C. Ginsburg (Fermi), E. Montesinos (CERN)	<b><u>H. Hayano</u></b> Y. Yamamoto
Sources (e-, e+)	<b><u>W. Gai (ANL)</u></b> M. Kuriki (Hiroshima U.)	T. Omori	RF	<b><u>S. Michizono (KEK)</u></b> TBD (AMs , EU)	<b><u>S. Michizono</u></b> T. Matsumoto
Damping Ring	<b><u>D. Rubin (Cornell)</u></b> N. Terunuma(KEK)	<b><u>N. Terunuma</u></b>	Cryogenics (incl. HP gas)	<b><u>H. Nakai: KEK</u></b> T. Peterson (Fermi), D. Delikaris (CERN)	<b><u>H. Nakai</u></b> Cryog. Center
RTML	<b><u>S. Kuroda (KEK)</u></b> A. Latina (CERN)	<b><u>S. Kuroda</u></b>	CFS	<b><u>V. Kuchler (Fermi)</u></b> M. Miyahara (KEK), J. Osborne (CERN),	M. Miyahara T. Sanuki
Main Linac	<b><u>N. Solyak (Fermi)</u></b> K. Kubo (KEK)	<b><u>K. Kubo</u></b>	Rad. Safety	<b><u>T. Sanami (KEK)</u></b> TBD (AMs) S. Roesler (TBD, CERN)	<b><u>T. Sanami</u></b> T. Sanuki
BDS	<b><u>G. White (SLAC)</u></b> R. Tomas (Cern) T. Okugi(KEK)	<b><u>T. Okugi</u></b>	Elect. Support (PS etc.)	TBD	<b><u>TBD</u></b>
MDI	<b><u>K. Buesser (DESY)</u></b> T. Tauchi (KEK)	<b><u>T. Tauchi</u></b>	Mechanical S. (Vac. & others)	TBD	<b><u>TBD</u></b>
			Dom. Program, Hub Lab. Funct.	TBD	<b><u>H. Hayano</u></b> T. Saeki

2015/01/26

ILCに必要な人材と育成(ILC HR)

# Members

- No rigorous border
  - Core members should attend every time
- Core members
  - Akira Yamamoto LCC, LC office
  - Masao KURIKI, sources
  - Tsunehiko OMORI sources
  - Nobuhiro Terunuma TB, CRB
  - Shigeru Kuroda RTML
  - Kiyoshi Kubo Main linac
  - Toshiyuki Okugi BDS
  - Toshiaki Tauchi MDI
  - Tomoyuki Sanuki Site
  - Masanobu Miyahara CFS
  - Toshiya Sanami Radiation safety
  - Kaoru Yokoya ADI
  - Hitoshi Hayano SRF
  - Shinichiro Michizono RF, division head

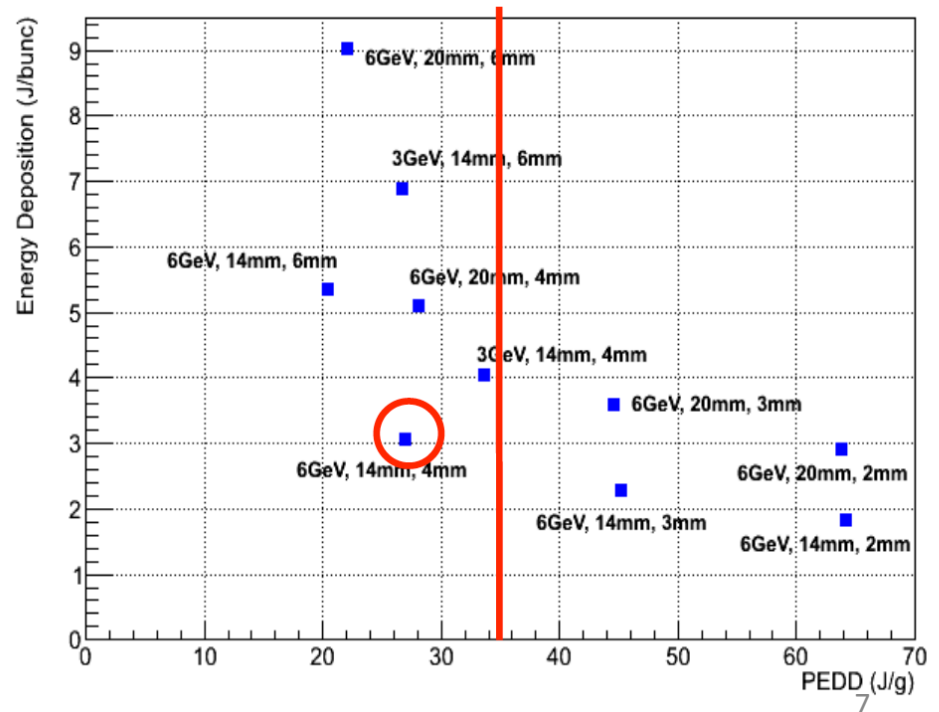
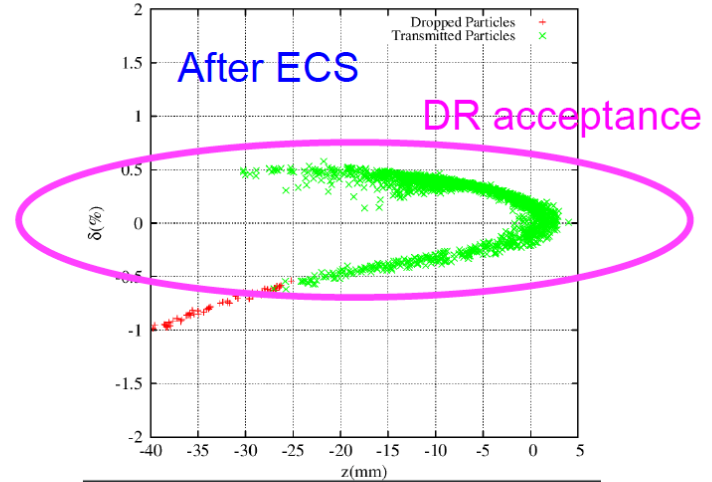
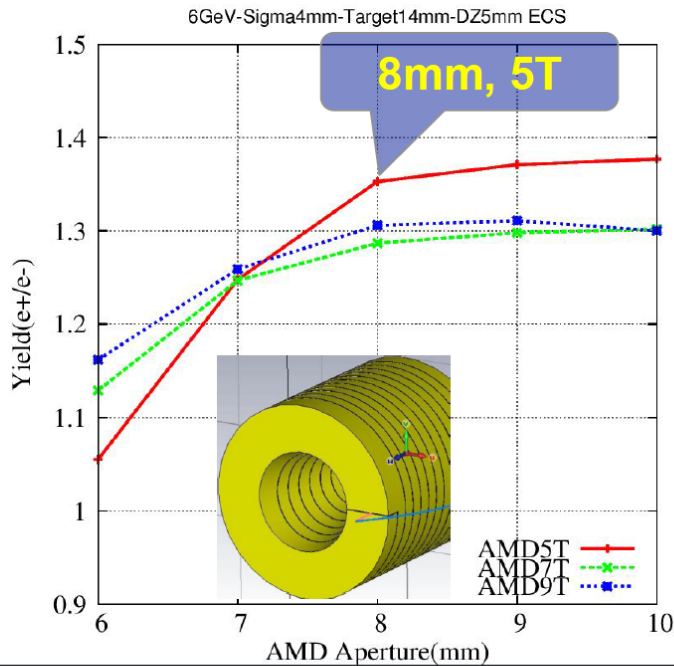
# Meetings

- Jun.22
  - Introduction of the groups
- Jun.29
  - Positron status by T.Omori
- Jul.6
  - CFS by M.Miyahara
- No meetings on Jul.13 and Jul.20 due to confliction with other meetings



# Positron Yield

- Yield was evaluated with simulations.
- By optimizing the parameters,  $3.0 \times 10^{10}$  e+ (50% margin) is obtained in DR acceptance.

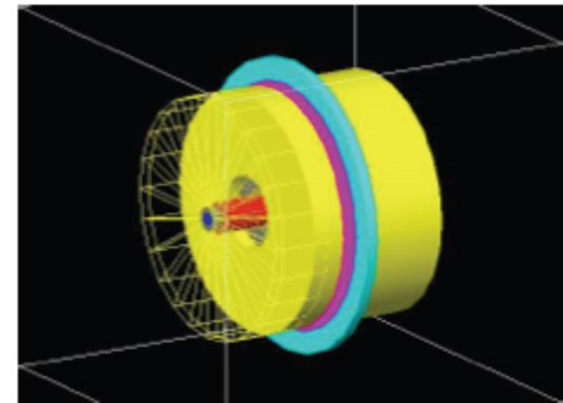
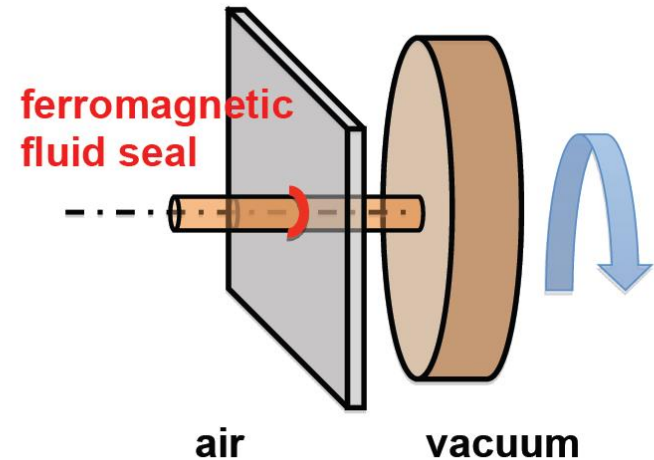


Y. Seimiya, M. Kuriki



## Target R&D (300Hz e-driven)

- A seal running test of 1 week at 417rpm: **No problem at all.**
- Another test of the seal after 4.7 M Gy irradiation: Viscosity is changed, but no vacuum problem.
- Expected radiation dose at the seal is **1.5 M Gy/year.**
- With a carefully designed shield, the radiation damage on the seal is manageable .
- The prototype which is reasonably compatible to the real one, will be manufactured in two years.



T. Omori, T. Takahashi

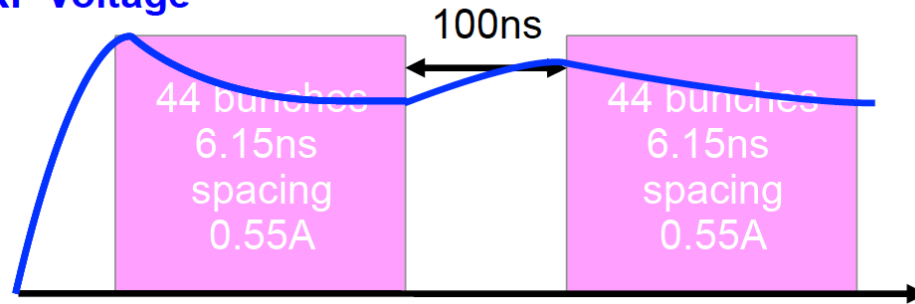




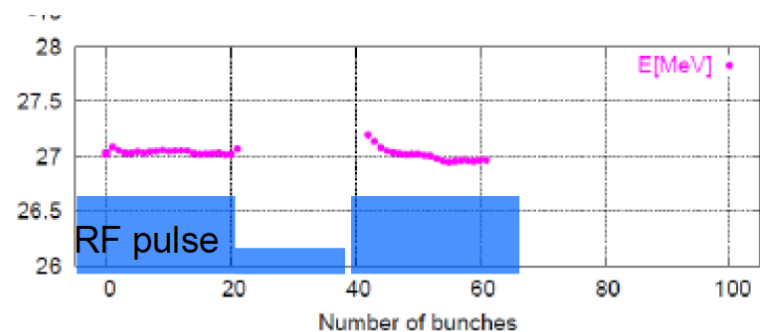
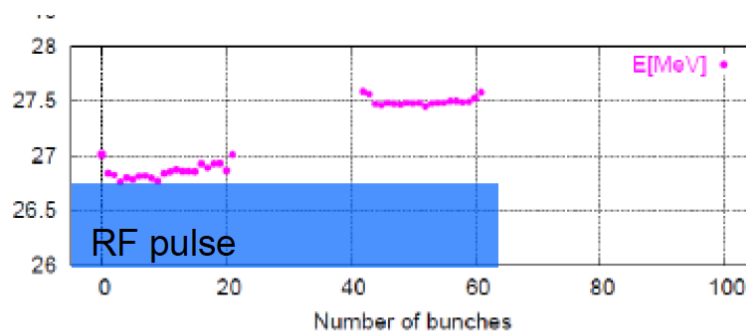
# Pulse Structure and Beam-loading

- Positrons are accelerated by triplet multi-bunch pulse.
- Transient beam-loading should be compensated, otherwise, the beam is not accepted by DR.
- Compensation with AM is proposed by J. Urakawa.
- A proof-of-principle experiment was carried out at LUCX/ATF. It works!

## RF Voltage



J. Urakawa, M. Fukuda

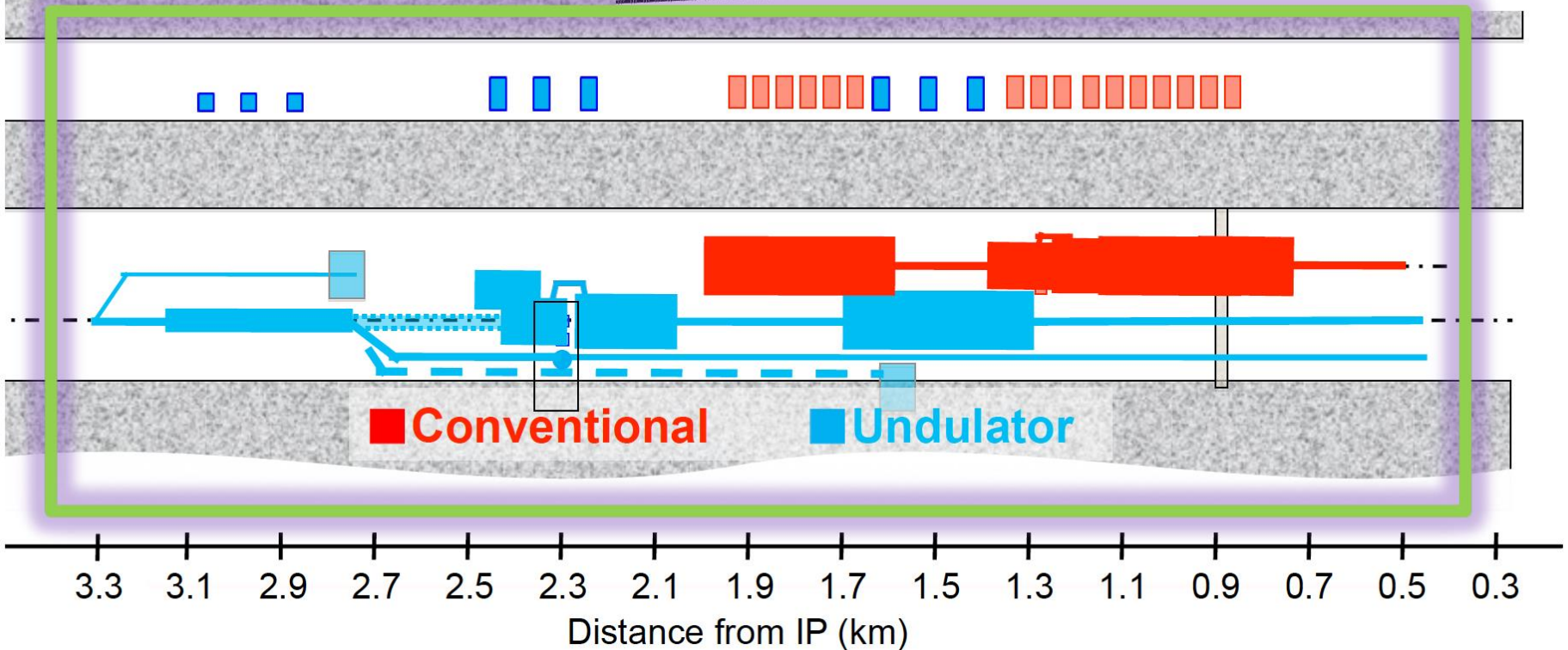
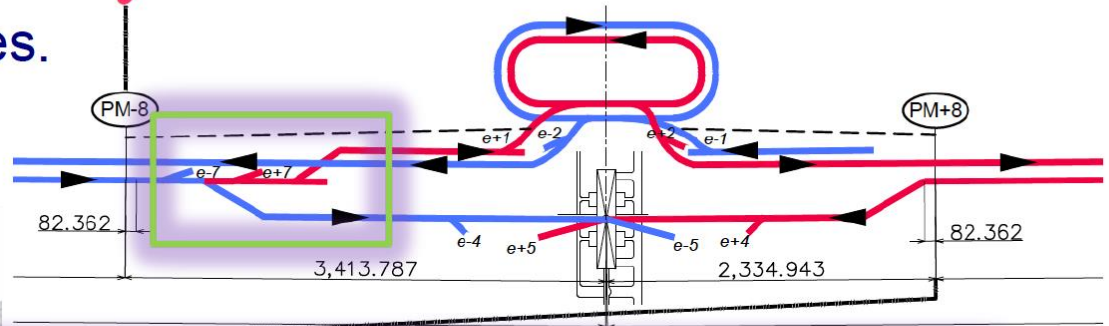




# Footprint Compatibility

T. Omori

- Accommodate both sources.
- Maximize the flexibility.
- Minimize additional engineering works.



# Who are Working? ~ 20 people

## Incomplete list

- Simulation: Seimiya<sup>1)</sup>
- Target: T.Omori, T.Takahashi<sup>1)</sup>, P.Sievers<sup>4)</sup>, M.Yamanaka, RIGAKU<sup>5)</sup>, J.Gao<sup>2)</sup>, S.Jin<sup>2)</sup>
- Flux concentrator: P.Martyshkin<sup>3)</sup>, T.Kamitani, G.Pei<sup>2)</sup>, X.Sun<sup>2)</sup>, M.Akemoto
- Linac: S.Fukuda, S.Michizono, J.Urakawa
- CFS: M.Miyahara
- General: M.Kuriki, T.Okugi, K.Yokoya

1) Hiroshima Univ. 2) IHEP 3) BINP 4) CERN 5) company, others are KEK  
Groups are actually overlapping

# Preparing a Detailed Report on e-Driven Source

- System design of e-driven source
  - Simulation
  - Electron driver linac (S-band NC)
  - Target
  - Flux concentrator
  - Capture section (L-band)
  - Booster linac (L-band + S-band)
  - Energy compressor
  - Tunnel, Radiation safety (coupled with general BDS tunnel design)
  - Cost
- Least advanced is the booster linac
  - Drives the design of the tunnel
- Timeline: end of September (well before the November workshop at Whistler)
- Possible change request in ~October
  - Compatible tunnel design for undulator plus e-driven sources
- This work is also needed for the response to Nomura survey