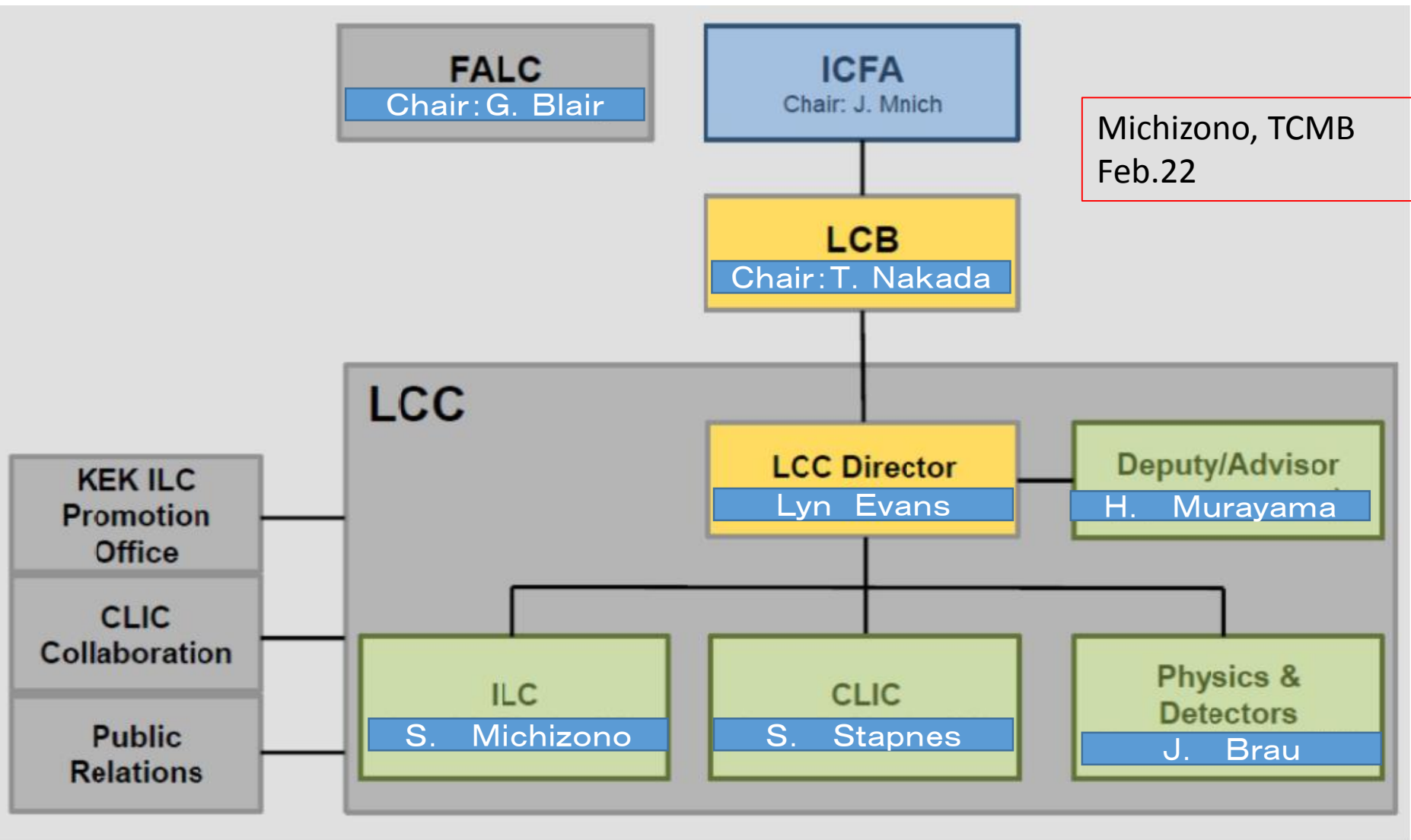


Positron Source Working Group Plan

K. Yokoya

2017.3.2 Positron WG 1

New LCB/LCC structure



Organization in LCC-ILC

LCC-ILC (Mike Harrison)

Technical board

LCC Associate Director responsible for ILC Accelerator: M. Harrison (BNL)
 - Deputies: H. Hayano (KEK) and N. Walker (DESY)

<i>Sub-System</i>	<i>Global Leader - Deputy Leader</i>	<i>Sub-System</i>	<i>Global Leader - Deputy Leader</i>
ADI	N. Walker (DESY) - K. Yokoya (KEK)	SRF	H. Hayano (KEK) - C. Ginsburg (Fermilab) - E. Montesinos (CERN)
e-/e+ Sources	W. Gai (ANL) - M. Kuriki (Hiroshima)	RF Power & Cntl	S. Michizono (KEK) - TBD - TBD
Damping Ring	D. Rubin (Cornell) - N. Terunuma (KEK)	Cryogenics	H. Nakai (KEK) - D. Delikaris (CERN) - T. Peterson (Fermilab)
RTML	S. Kuroda (KEK) - A. Latina (CERN)	CFS	V. Kuchler (Fermilab) - J. Osborne (CERN) - M. Miyahara (KEK)
Main Linac	N. Solyak (Fermilab) - K. Kubo (KEK)	Radiation Safety	T. Sanami (KEK) - S. Roesler (CERN) - TBD
BDS	G. White (SLAC) - R. Tomas (CERN) - T. Okugi (KEK)		

Table 1. ILC organization structure and sub-system responsibilities in 2015

Change management board



LCC-ILC (Shin MICHIZONO)

Technical & change management board (TCMB)

Chair: Benno List (DESY)

Deputy: Nobuhiro Terunuma(KEK)

Ad-hoc WG1
Positron (Kaoru YOKOYA)

Ad-hoc WG2
CFS for staging (Hitoshi HAYANO)

Ad-hoc WG3
Resource Optimization
(Akira YAMAMOTO)

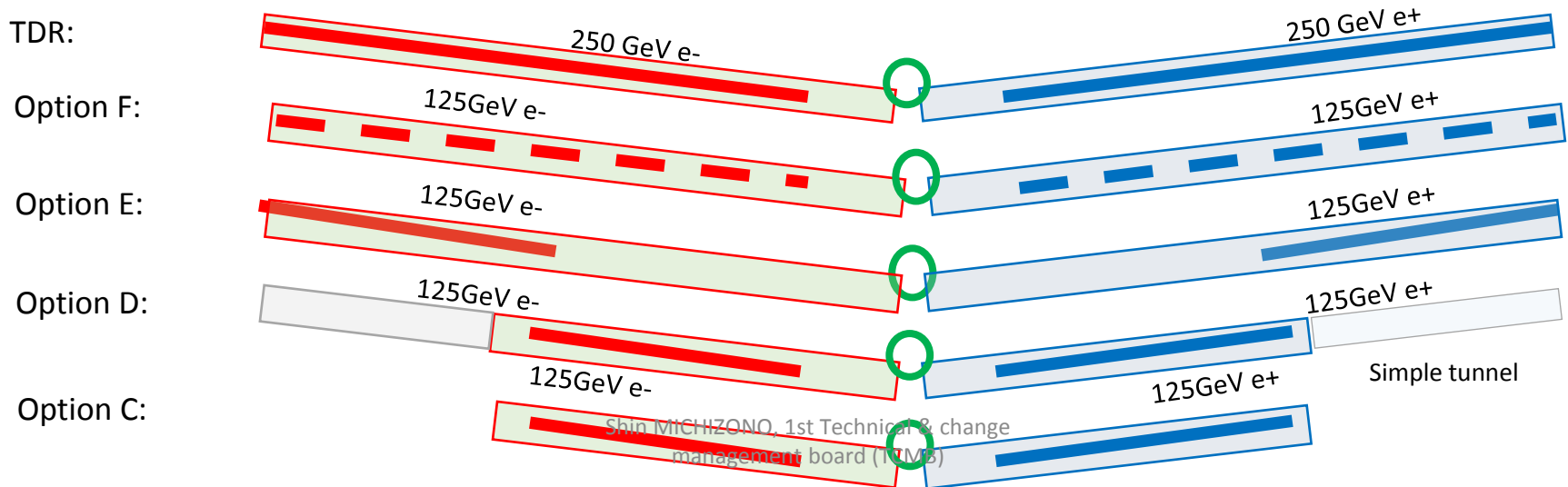


- Large overlap between “Technical board” and “Change management board”
- Limitation of the man-power
- ⇒ **consolidate these boards to “TCMB”**
- Main task (~6 months) is to review WGs for “staging”.

Michizono, TCMB
Feb.22

Staging

- Start with 250GeV CM
- A few possibilities on the tunnel length and location of 250GeV portion
 - 500GeV tunnel or 350 GeV tunnel
 - Upstream or downstream
- or just 250GeV
- Cost estimation
- Gradient: 31.5MV/m \rightarrow 35MV/m ? If so, RF unit?
- Cryogenics (quite discrete)



Positron Working Group

- Positron WG formed under Shin Michizono (LCC sub-director)
 - 2 other WGs formed
 - WG2: CFS related to staging, lead by H.Hayano (250GeV first stage)
 - WG3: Resource optimization (lead by A. Yamamoto)
- Charges (from Shin)
 - Evaluate undulator? Conventional? At 250GeV CM
 - Evaluate technical difficulty, cost (based on TDR), commissioning
 - Submit final report by June 2017 including
 - essential R&D in 2018-19
 - proposal of positron scheme
- Members
 - Germany
 - Andriy Ushakov, Gudrid Moortgat, Sabine Riemann, Peter Sievers, Benno List
 - Japan
 - Tohru Takahashi , Tsunehiko Omori, Masao Kuriki
 - Kaoru Yokoya (chair), Toshiyuki Okugi, Akira Yamamoto
 - US
 - Wei Gai

What to do? (My understanding)

A) Make a plan of R&D for FY2017-2019

- Main target: Answer to Nomura triangle issues
- Include cost estimation for the R&D
- Deadline: ~June this year (i.e., AWLC at SLAC)
 - Budget request for JFY2018 by summer this year

B) Consistent design

- Including
 - Undulator: target, shielding of target region, target replacement scenario, photon dump
 - e-driven: target, full simulation including transient loading, cavity cooling, target replacement, cost, etc.
- To the level which is sufficient for the central region group to discuss about the electron-side BDS tunnel
- No clear deadline but hopefully by summer-autumn

Discussion within KEK

- Michizono, Yamamoto, KY, Omori, Kuriki (later Urakawa, Takahashi). Early February.
- KEK budget situation
 - Minimum amount in JFY2017 (starting Apr.2017)
 - Significant budget might come in JFY2018-19
 - Must request the budget summer this year
 - It is not reasonable in this budget request to have 2 parallel schemes
- KEK should be active for the baseline undulator scheme
- Should finish e-driven study within JFY2017
 - Target study needs ~100k\$ (1\$=100yen)
 - For other components, simulation study is enough if we restrict to 1312 bunches. Can extend to JFY2018 (no money needed).
- Must request budget of JFY2018-19 for undulator scheme.
~500k\$???
 - Main theme to be discussed in the issue A)
 - Magnetic bearing, Ti-Cu joint,
 - Engineering design

WG Plan for e-Driven Scheme

- Here is a discussion result within Japan
 - Only briefly today because Omori+Takahashi are absent
- Concentrate on 1312 bunches
 - Problem with 2625 bunches is the bunch interval 3ns because of high and quick transient beam-loading
- Target
 - Prove feasibility within JFY2017
 - Evaporation of magnetic fluid?
 - 50cm diameter model (not tungsten)
- Presumably, downstream part (FC, capture cavities) are OK if 1312 bunches. Simulation studies are still needed but don't need money
- **Make a concrete plan before the start of JFY2017**
 - May assume 10 MYen (100k\$)?

WG Plan for Undulator Scheme (My View)

- Concentrate on radiation cooling
 - Is there any hope with water cooling/contact cooling?
 - Some info on water-cooling would be get from e-driven study (though rotation speed is low)
- Key issues
 - a. Target itself
 - b. Target replacement scenario
 - c. Shielding of target region
 - d. Photon dump
- The first issue for our WG is to make an R&D plan for JFY2018-19
 - Priority on the issues which
 - requires R&D money
 - is related to feasibility
 - Working hypothesis: Can spend ~0.5M\$.
 - What is the key for target for proving the feasibility?
 - Magnetic bearing, Ti-Cu contact,?
 - Is any hardware R&D needed for photon dump?
 - I believe only paper study is sufficient for b) and c)

Next Meetings

- Mar.16
 - e-driven plan (Omori, Takahashi, Kuriki)
 - JFY2017 target R&D plan
 - Simulation study
 - Undulator (Ushakov, Okugi)
 - Parameter choice for 250GeV CM → change request
 - Long undulator for positron production with $E_e=125\text{GeV}$
 - Move undulator closer to target
 - Short dogleg
- Mar.30
 - Undulator scheme R&D plan