

Summary of TTC-TB meeting at Fermilab

2023, December 08

Co-chairs

Hiroshi Sakai (KEK)

Detlef Reschke (DESY)

Outline

- Updated member list
- Report from SPC meetings

Discussions

- Topics for in-depth discussion at the next TTC
- Proposal of WG-organization at the next TTC
- Others

Updated TTC-TB member list (2023, Dec)

Co-chairs

H. Sakai (KEK)
D. Reschke (DESY)

Total w/o observer = 28 (27)
(EU=9, NA=12, Asia=7)
gender balance: 6/28

TTC at Fermilab
participation = 12 of 28

Cavity and couplers

S. Calatroni (CERN) => e-mail
R.L. Geng (ORNL) => excused
J. Hao (PKU)
A. Romanenko (FNAL)
K. Umemori (KEK)
J.Y. Zhai (IHEP) => Visa
D. Longuevergne (IJCLab)
Z. Conway (BNL)
N. Sakamoto (RIKEN)
L. Monaco (INFN Milano)
L. Popielarski (FRIB) => e-mail
M. Martinello (SLAC)
P. Dhakal (JLab) => e-mail

RF and tuning

F. Gerigk (CERN)
A. Wheelhouse (STFC) => P. McIntosh
C. Hovater (JLab) => e-mail

Cryomodule and cryogenics

S. Aderhold (SLAC)
T. Arkan (FNAL)
S. Barbanotti* (DESY)
J. Mammosser (ORNL)
A. Neumann (HZB) => e-mail
Han Li (IASF) => at TTC

Integration and operation

M. Liepe (Cornell)
E. Harms (FNAL) => resigned
J. Branlard (DESY) => excused
M. Nishiwaki (KEK)

Honoris causa (observer)

C. Pagani (INFN)
M. Ross (SLAC)
O. Napoly (CEA) => resigned
H. Padamsee (Cornell)
W.-D. Moeller (DESY)
P. Pierini (ESS)

Regional representatives (observer)

C. Madec (CEA Saclay)
H. Weise (DESY)
A. Yamamoto (KEK)
Gao Jie (IHEP)
S. Belomestnykh (FNAL)
A-M. Valente (JLab)

Add. Observer:
Eiji Kako, Bob Laxdal

TTC-TB members and participation

- **Welcome to new members** confirmed by CB-meeting (improved gender balance):
 - Han Li
 - Michiru Nishiwaki
- **Thanks to resigned colleagues**
 - Elvin Harms (e-mail after the meeting)
 - Olivier Napoly
- Number of TB members fixed to 28 (27) presently (Eiji)
- Participation of TB members to be strengthened!

SPC meetings + organisation

Scientific Program Committee meeting by remote;

(SPC members: **Sergey, Grigory**, Eiji, Anne-Marie, Catherine, Hans, Bob, Jie, Sergey, Akira, Hiroshi, Detlef)

- Fourteen SPC meetings held: well-organized by LOC chairs
- From last meeting:
SPC expresses its wish to reduce the number of preparation meetings for the next TTC meeting => failed (see below)
- Beginning with 8th meeting participation of WG conveners
- Smooth and effective organization of scientific program with 2 parallel WG
- **Visa issues** and subsequent discussions **of remote participation** including replacement of plenary speakers required significant effort
- **Thanks to all the WG and Hot Topic convenors!**

Participants

Location	Date	Participants	Parallel	WGs
Fermilab	2023, Dec	~190	2-para	4 WG's
QST	2022, Oct	~120	2-para	4 WG's
QST/KEK (remote)	2022, Jan.	304	2-para	2 WGs
DESY (remote)	2021, Jan.	260	2-para	2 WGs
CERN	2020, Feb.	187	2-para	4 WGs
TRIUMF	2019, Feb.	108	2-para	4 WGs
RIKEN	2018, June	140	2-para	4 WGs
INFN-Milano	2018, Feb.	178	2-para	4 WGs
MSU	2017, Feb.	123	2-para.	4 WGs
CEA-Saclay	2016, July	127	2-para.	4 WGs
SLAC	2015, Dec.	130	2-para.	4 WGs
KEK	2014, Dec.	108	2-para.	6 WGs

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History of WG topics to be prepared

- History of WG topics will be used to define programs of future meetings
- **Dedicated topics to be revisited**

Homework for Hiroshi and Detlef

Decisions for WG's at next meeting

- High G, High Q (possibly incl. field emission, see below) => **confirmed**
 - 4K operation + higher temperature operation => **WG (or half WG) confirmed**
 - Supplier issue (availability of key components and materials) => **WG (or half WG) confirmed**
=> **requires good preparation of convenors**; maybe limited to Nb and some selected components
(Cavities, Nb material, Cavity bellows, Cold mass, Coupler, Valve, other)
 - SRF performance in operation is pushed to the limit
=> reduce down time, reduce/optimize conditioning, possible cryomodule/cavity retrofitting and reprocessing
 - Machines in operation and lesson learned
 - Efficient and sustainable accelerators / operation regarding production and operation
- Confirmed as one combined WG**
- Comparison of FE measurement (techniques) between labs=> definitely of interest!
Addendum: 1-2 talks about basics of FE/processing as introduction=> **possibly in WG 1**

Further proposals for future WG's

- SRF gun module design: Status, challenges (=> this meeting plenary talk; as part of cryomodule WG)
- **Microphonics in modules** (interesting, but requires **additional studies in preparation** of a WG) => possible WG
- 3.9 GHz cavities and modules for CW (several presentations at TTC2023; for later meetings; as part of cryomodule WG)
- Coupler and tuner (to be checked when this was a WG topic; several presentations at TTC2023)
- Large and medium grain Nb (fabrication, cavity performance, PED requirements) => open

Plenary talks for next TTC

- Status of commissioning (incl. cryomodule tests) at ESS => **confirmed**
 - Results and status of SHINE (incl. DALIAN, ...) => **confirmed**
 - Non-accelerator fundamental physics with SRF cavity => **confirmed**
 - ITN (ILC Technology Network) worldwide => **confirmed**
 - Novel fabrication techniques for SRF components (e.g. 3D printing, ..)
=> *at CERN meeting 2020; maybe difficult to get a speaker* => **confirmed**
 - Report of Thin-Film Workshop (Anne-Marie) => **confirmed**
 - Summary of ERL2024 workshop => **confirmed**

 - LLRF overview talk => *to be decided*
 - Report of Thin Film WG => Marc + Sebastian plan 1-2 meetings in 2024 => *to be decided*

 - Status (and commissioning) of PolFEL => *contact to project representatives to be established*
 - Status and first operation of PPU at SNS
 - Recent Status of LCLS-II operation experience (in WG at TTC2023; When next??; LCLS2-HE
 - Status of RAON operation experience
 - PIP-II first results (cavities, modules) => was plenary at TTC23, in TTC2025
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- **Hot Topic/Special Discussion Session => decided**

Future of SRF at 10/20 y horizon

Martina: “I think it will be very interesting to discuss about what the future of the SRF technology will be looking at the 10-20 years horizon. What will be the major srf-based accelerators ? What will be the major technological and scientific applications for the srf field aside from particle accelerators? What type of R&D will be needed within this timeframe and for these applications? Which type of workforce should we grow?

...”

WG-organization for next TTC

- Two parallel sessions => **confirmed**
- How many WG's? => **4 WG's confirmed**
- In case of overlapping topics: **Joining of WG's can be considered + maybe helpful**

- To be continued for next meeting(s):
 - separate large room for plenary talks (if possible)
 - two smaller rooms for discussion of WG's (no micro necessary?)

- Recommend less number of talks, more discussion time
 - => adequate adjustment & preparation by convenors necessary
 - => list of **“provocative” questions** to be prepared to stimulate discussion

- SPC meeting for the next TTC ~ **6 months** in advance
(visa situation, invitation of plenary speakers)

- Short discussion about shifting the Lab tour to Thursday (before dinner) => to be continued

Summary

- **Organizational** preparation of WG's and plenary talks has to start **~6 months in advance** due to more difficult political situation
- **Content** preparation of WG's for next meeting(s) by community:
 - Collection of data for microphonics very welcome as preparation of WG
 - Collection of critical components, materials, ... for "supplier issue" WG
- List of **"provocative" questions** to be prepared to stimulate discussion
=> convenors, but **all contributions** welcome

Thank you for your attention.