Summary of MTCA Workshop in Japan 2025 and Status of MTCA at J-PARC in 2025

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J-PARC Center

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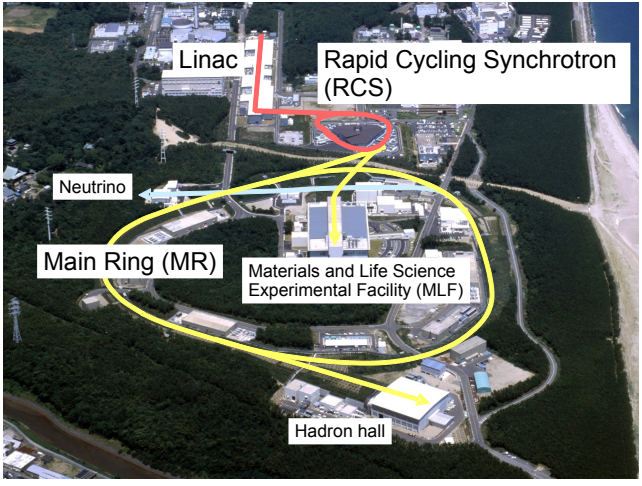
Contents

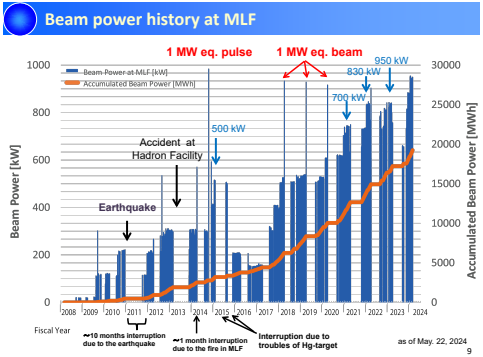
Japan Proton Accelerator Research Complex (J-PARC)

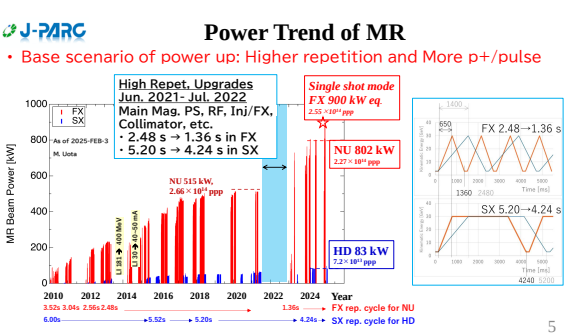


J-PARC Consists of 400 MeV linac, 3 GeV RCS, 30 GeV Main Ring, and experimental facilities (MLF, Hadron, Neutrino).

- Very high intensity proton beam
- Secondary particles used for material/life science and nuclear/particle physics

Beam power history of J-PARC

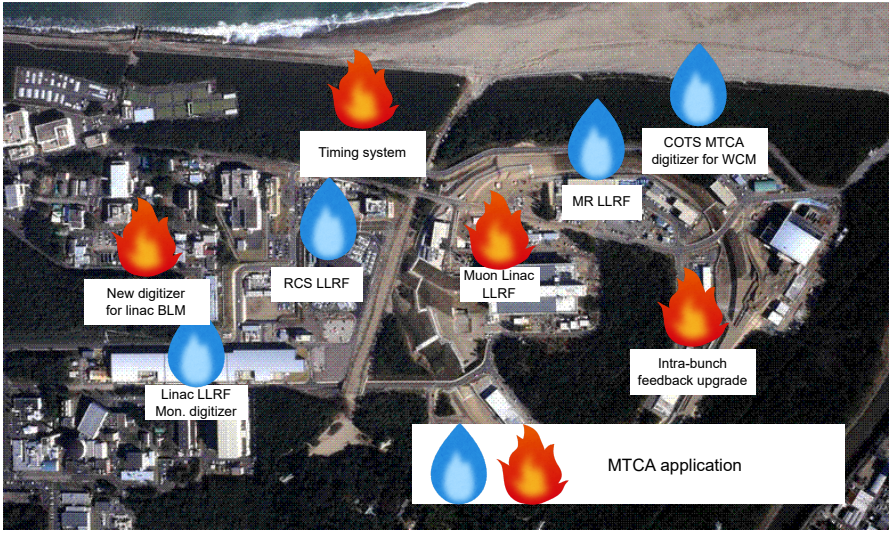




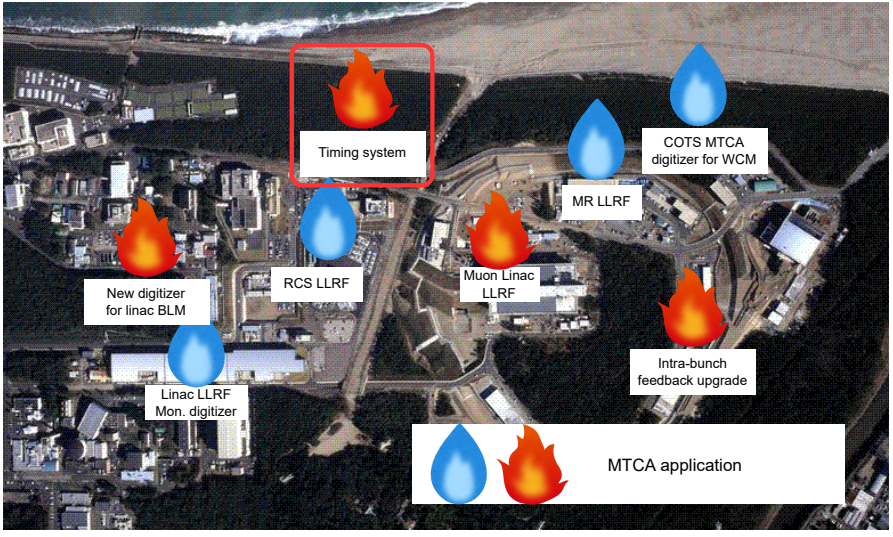
Design output beam power (RCS: 1 MW, MR-FX: 750 kW) has been achieved.

- MTCA systems contributed to the achievement

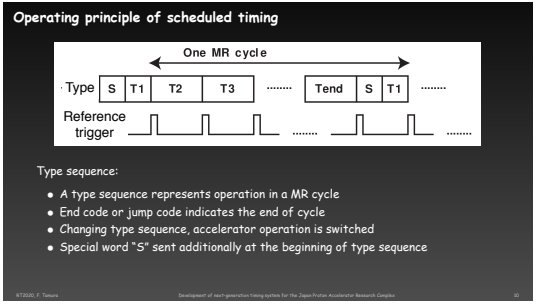
MTCA applications in J-PARC

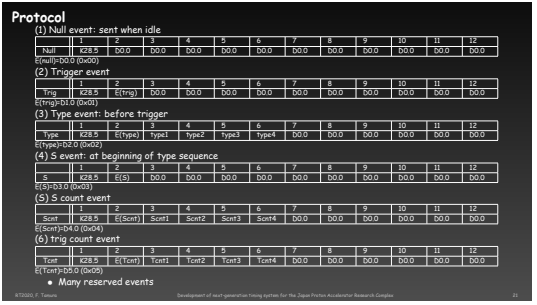


MTCA applications in J-PARC



J-PARC timing system





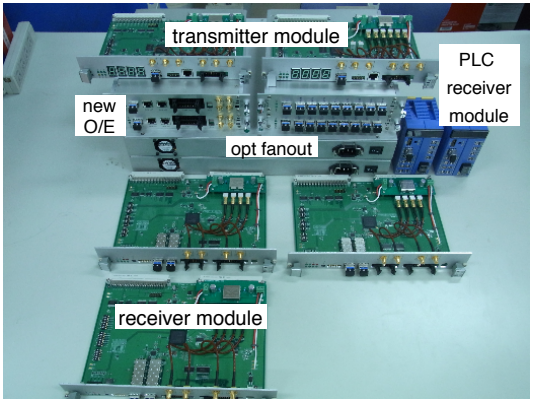
J-PARC employed a dedicated timing system (not WR or MRF).

- It is a kind of event timing system
- Functionality is optimized for synchrotron

F. Tamura, H. Takahashi, N. Kamikubota, Y. Ito and N. Hayashi, "Development of Next-Generation Timing System for the Japan Proton Accelerator Research Complex," in IEEE Transactions on Nuclear Science, vol. 68, no. 8, pp. 2043-2050, Aug. 2021, doi: 10.1109/TNS.2021.3083791.

J-PARC timing system

Existing modules:

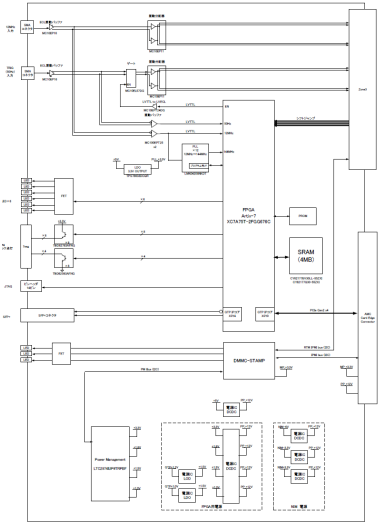


Form factor of existing transmitter/receiver modules:
VME and PLC.

New MTCA timing module is now under construction by Kanadevia (formerly known as Hitachi Zosen).

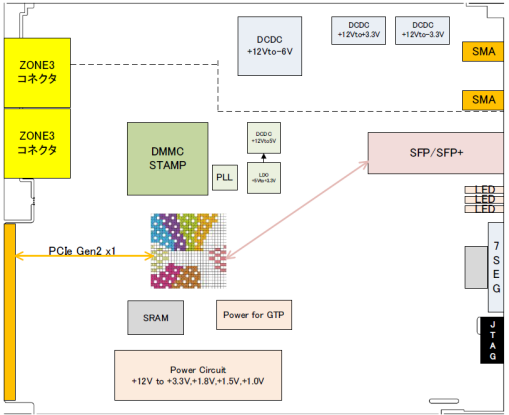
Important step in Japan. First AMC development for J-PARC for other than MEDS (Mitsubishi Electric Defense and Space technologies).

New MTCA timing system

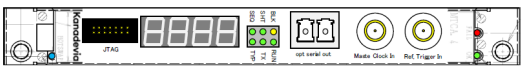


Core logic is the same as VME one.

DMMC Stamp is employed:



Front panel:



Timing system summary

The transmitter module will be delivered in the end of JFY2025 (March 2026) and the development of the receiver module will follow. If MTCA timing modules are fully deployed, J-PARC will look like...

Timing system summary

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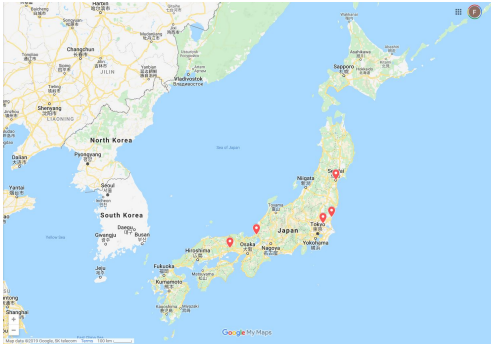
1. Introduction

2. Status of MTCA at J-PARC in 2025

3. Summary of MTCA Workshop in Japan 2025

Workshop indico: `https://conference-indico.kek.jp/event/326/`

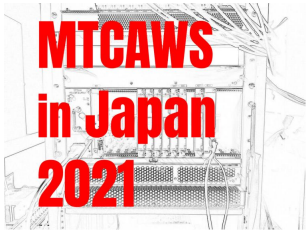
MTCA in the world and Japan



The number applications of MTCA in Japan is increasing.

Objective of the workshop

- MTCA is expected to be the new standard platform of the control systems for accelerators and physics.
- The goal of this workshop is to boost the application of MTCA in Japan by exchanging the information and experiences.



The last workshop in 2021 was held in a virtual format.
MTCAWS in Japan 2025 is the first workshop in person.

Face-to-face discussion is the most important!

Workshop Program

August 27 (Wed)
- Welcome address by Takeshi Komatsubara (J-PARC Deputy Director)
- Tutorial lecture by Cagil Guemues (DESY)

August 28 (Thu)
- Presentations
- Group photo
- Keynote talk by Shinichro Michizono (KEK)
- Workshop dinner

August 29 (Fri)
- Presentations
- KEK site tour

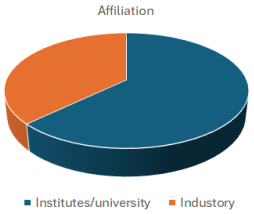
Numbers

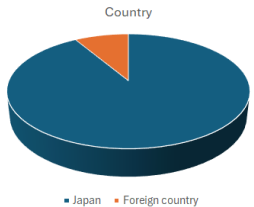
of registration: 70

- On-site: 52 (74%) / Online: 18 (26%)
- From institute/university: 44 (63%) /
  From industry: 26 (37%)
- From Japan: 64 (91%) /
  From foreign countries: 6 (9%)

# of tutorial lectures: 1
# of keynote talk: 1
# of oral presentation: 16

- Including 3 talks from industry

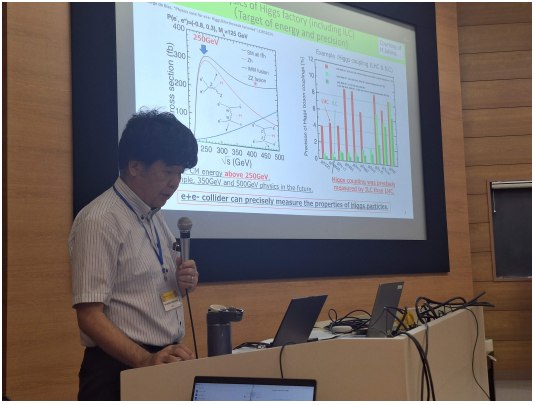




Welcome address and tutorial lecture

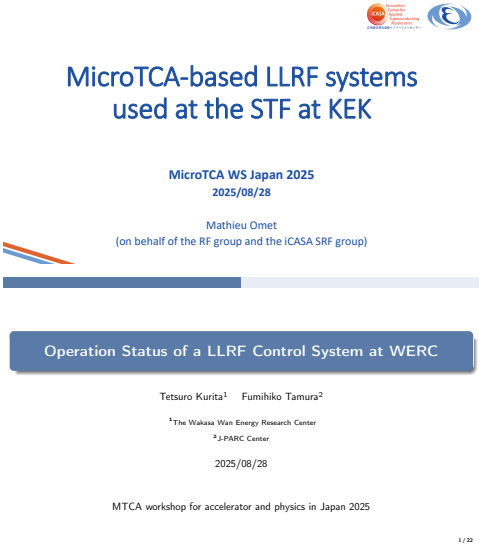
Tutorial Lecture: FPGA Development for MicroTCA Platforms: Open-Source Tools and Best Practices
by Cagil Gumus (DESY)

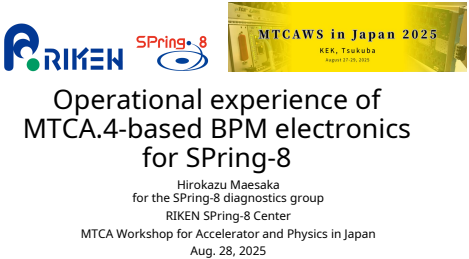
Group photo and Keynote talk



Keynote Talk: Future Linear Collider and its LLRF system by Shinichiro Michizono (KEK)

Talks from accelerators





KEK, SPring-8/SACLA, J-PARC, WERC...

- Now, many applications found in Japan

Talks from industry

MMC Software Engineering:
Challenges and Solutions

MTCA workshop for accelerator and physics in Japan 2025

2025/8/25

MITSUBISHI ELECTRIC DEFENSE AND SPACE TECHNOLOGIES CORPORATION

NAT-MCH Gen4

MTCA workshop for accelerator and physics in Japan 2025
KEK, Tsukuba
August 28th, 2025

UNCLASSIFIED

MEDS, Teledyne SP Devices, NAT

Sales & Field Application Engineer
Yoshikazu.Kawamata@teledyne.com (Kazu)

Industry exhibition

MEDS Technologies

UBER SUBRACK・CASE & PANEL

Kanadevia
Technology for people and planet

StarBridge
A Switched Fabric Technology Company

HR HAYASHI-REPIC

embeck®

CANDOX Systems

TELEDYNE SP DEVICES
Everywhereyoulook™

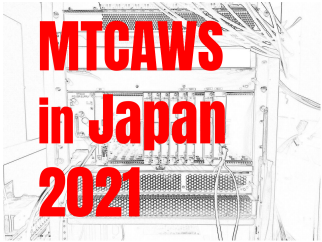
Eight important companies exhibited their products.

- I would like to thank again for their participation
- Company-to-company conversation

Workshop dinner / KEK tour

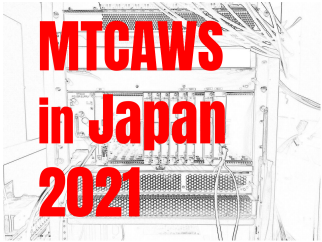
PF, STF, cERL

Conclusion


MTCAWS
in Japan
2021


MTCAWS in Japan 2025
KEK, Tsukuba
August 27-29, 2025

Conclusion


MTCAWS
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2021


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MTCAWS in Japan 20XX