



International collaboration for SuperKEKB

Makoto Tobiya

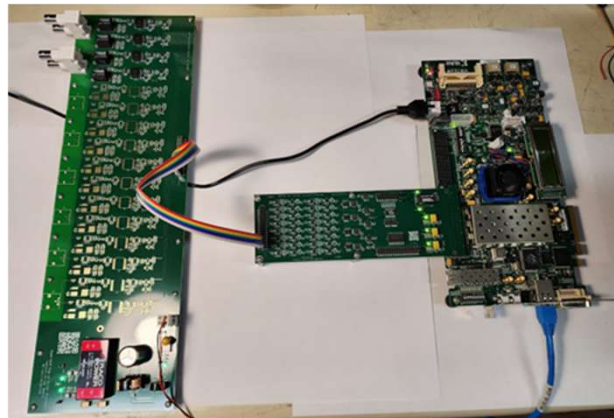
KEK Accelerator Laboratory

International collaboration scheme

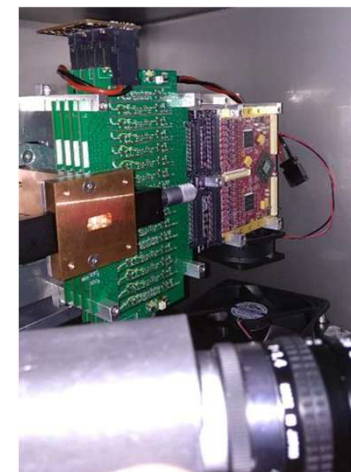
- **US–Japan collaboration on High Energy Physics**
 - R&D for SuperKEKB and the next generation high luminosity colliders (M. Tobiya(KEK), J. Seeman(SLAC)) since 2002
 - Development of the SuperKEKB Interaction Region Nb₃Sn Quadrupole Magnet(Y. Arimoto(KEI), S. Stoynev(FNAL))
 - Development of superconducting magnets and the quadrupole field vibration measurement system for SuperKEKB upgrade (R. Ueki(KEK), V. Teotia(BNL))

High Luminosity

- SuperKEKB commissioning, development of dithering-based IP feedback(SLAC, ANL, KEK)

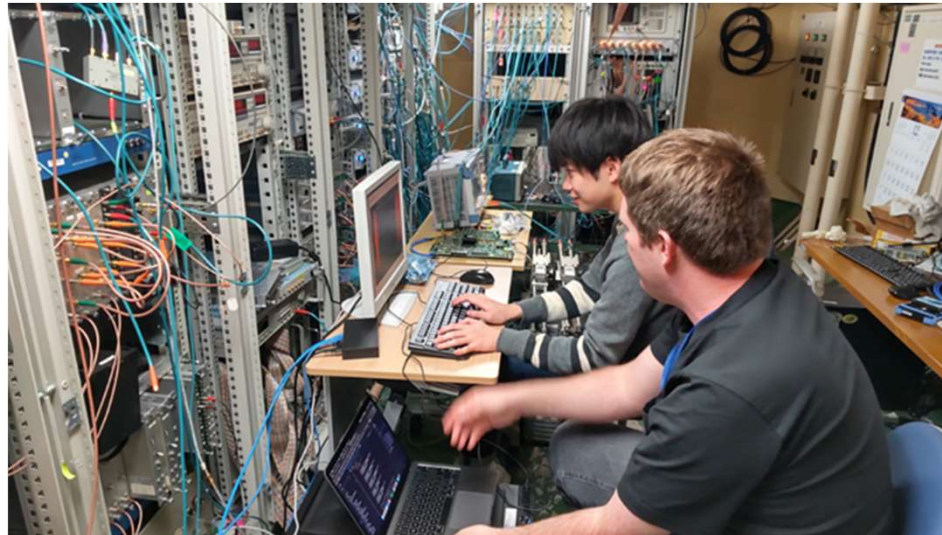


- High speed bunch-by-bunch X-ray beam size monitor diagnostics (XRM) (U. Hawaii, SLAC, KEK)



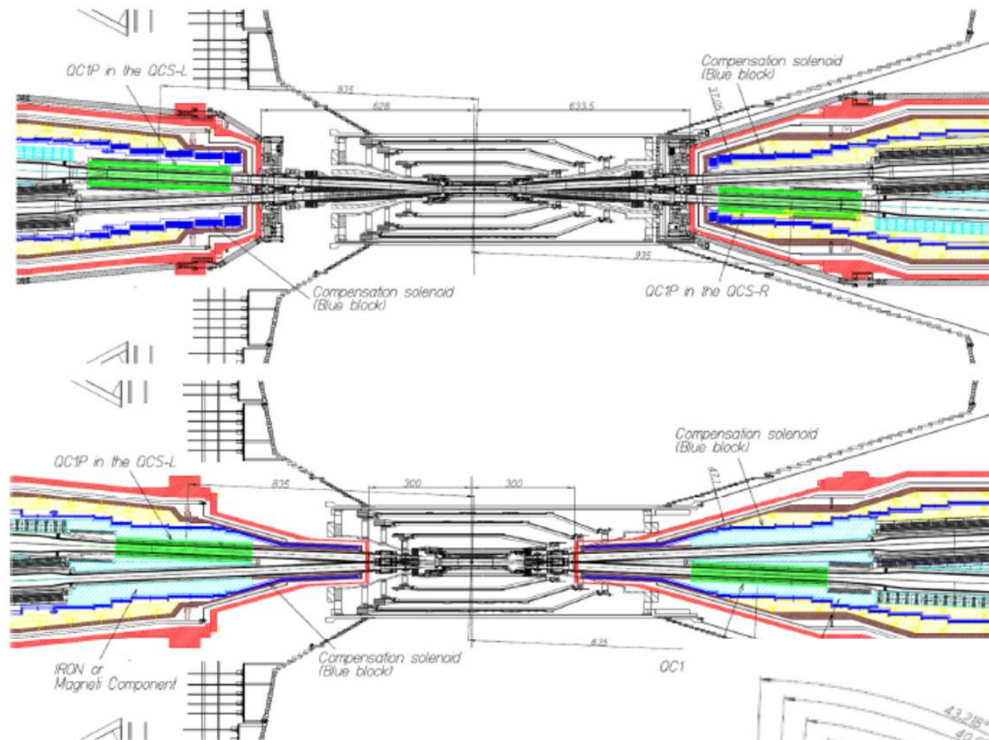
High Luminosity

- Fast Diagnostic Electronics (SLAC, KEK)



- Study of beam collimation
- Study of Electron Cloud Instability
- Large Angle Beamstrahlung monitor (Wayne St.)
- Accelerator Physics

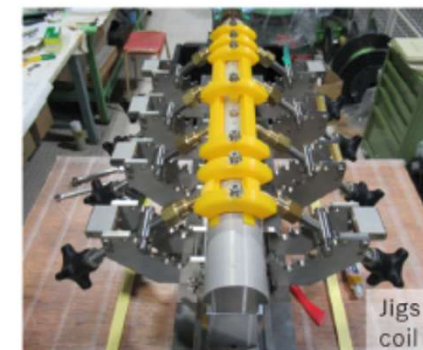
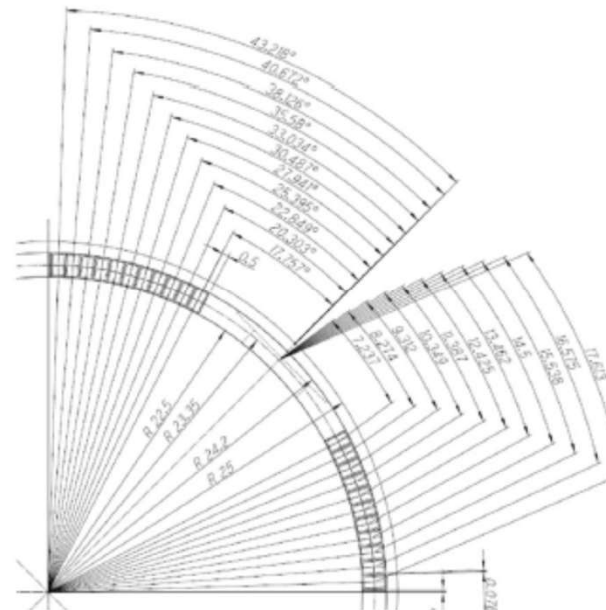
Nb₃Sn Quadrupole magnet



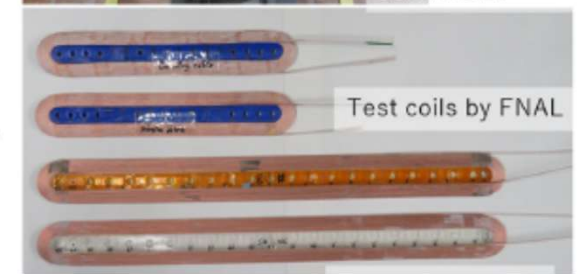
Current IP

IP with new QC1s(Nb₃Sn)

Winding design of
new QC1



Jigs for winding
coil in KEK



Multi-National Partnership Project

- **R&D for high luminosity colliders (MNPP-01)**
 - CERN, CNRS/IN2P3, SLAC, IHEP-Beijing, INFN
 - Visa support, daily life support
 - Many contributions from IHEP, CERN, LAL and SLAC
 - IJCLab: Fast luminosity monitor (LumiBelle2)
 - CERN: Ring Commissioning, Optics measurements
 - IHEP: Design(Hardware), Optics, Simulations,...

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Visiting collaborators in 2024c–

- Dr. Salvesen John Patric (CERN) Dec.2024
- Dr. LI Meng(IJCLab) 17/Nov–29/Dec
- Dr. Lin Chuntao (IHEP) Mar.2025–

- We surely welcome international collaboration to improve performance of the SuperKEKB accelerators. We would be very grateful if you or your colleague could visit KEK and help us.
- We would appreciate your consideration of the following points.
 - Our human resources are under extreme pressure, as you know.
 - During operation period, commissioning staff are often pressed for time and it can be difficult to respond adequately. Therefore, we may have to decline visits for “educational purposes”.
 - If you are planning to visit, please consult with the host in charge in advance and submit the required application form.

Application form items

1. Name (Family name, First name, Middle name)
2. Institute:
3. Overview of your research
4. Research plan
5. Research period (YYYY/MM/DD – YYYY/MM/DD)
6. Name of Fund; EAJADE, MNPP-01, US-Japan Co-operative Project, etc
7. Contact person/supervisor at your institute.
8. Contact person/supervisor at KEK, if any.

Remarks: This application form is sent to the international collaboration board for the SuperKEKB project. There, the proposed research is discussed, and a decision is made as to whether the proposal is accepted.

- Professor S. Asai, Director General of KEK, have asked several accelerator laboratories, such as CERN, DESY, IHEP, to support SuperKEKB accelerator.

Response

■ CERN

- We have proposed collaboration on “beam-beam simulation”—also received several collaboration items from CERN.
- We will have detailed discussion with Frank during this ARC period.

■ DESY

- We have received a proposal for joint research on Linac and BT.

■ IHEP

- They have agreed to send a young beam-beam expert to us for a long-term assignment.

eeFACT2025 (Mar.3–7 2025)

- We will have dedicated slot for SuperKEKB challenges in the workshop.



Invitation program

- KEK Short term invited fellow (14 days – 90 days)
- KEK Long term invited fellow (3 months – 1 year)
- Guest Researcher Program (14 days – 1 year)

- Normal invitation program
 - Partial support (such as daily allowance only) is also negotiable.
- If you are interested in the collaboration (MNPP-01, US-Japan) or the individual invitation program, please contact related accelerator staff(s) at first.

Summary

- We are grateful for the extensive international cooperation in improving the performance of the SuperKEKB accelerators.
- It would be so grateful if you could continue to give us your supports in the future.