JAHEP
- Japan Association of High Energy Physicists -
日本語

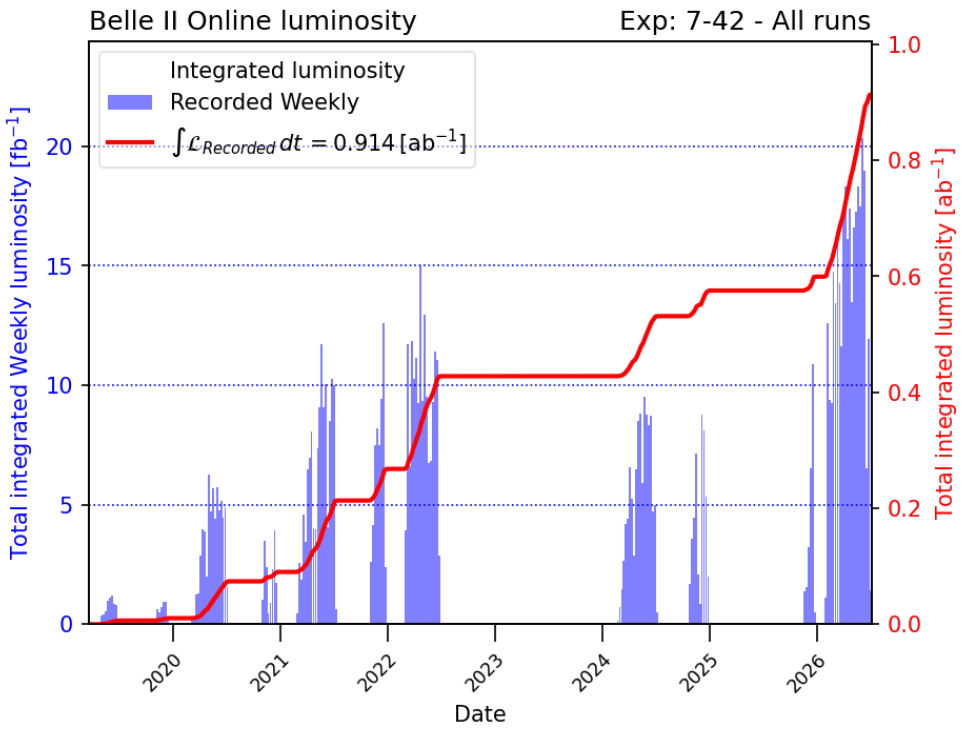
KEK

Japan & KEK update

13th October 2026

Shoji ASAI (KEK)

1. SuperKEKB operation



Integrated Luminosity **914 fb-1**

Peak Luminosity is updated

5.32*10^34

(Target 2*10^35 @ 2031)

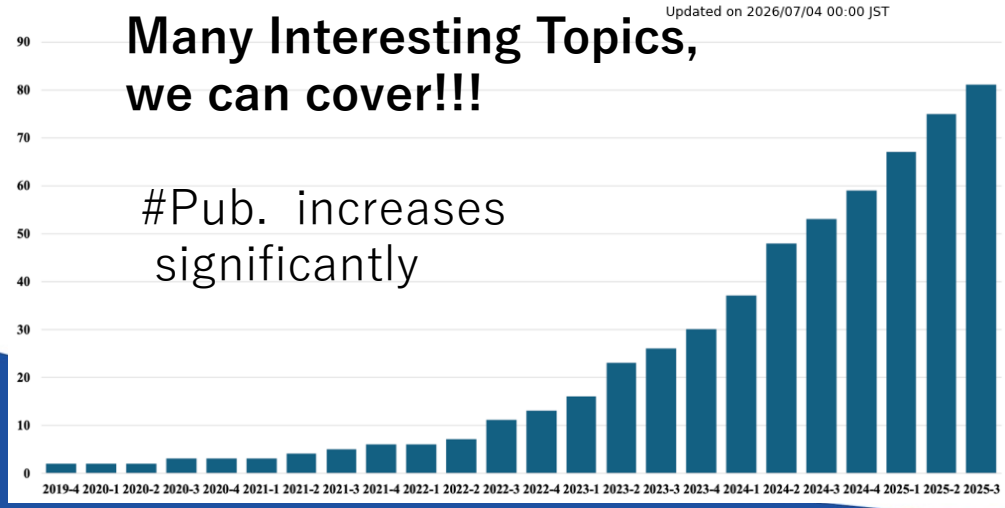
KEK and CERN start collaboration for SupkerKEKB and FCCee.

We have many synergies.

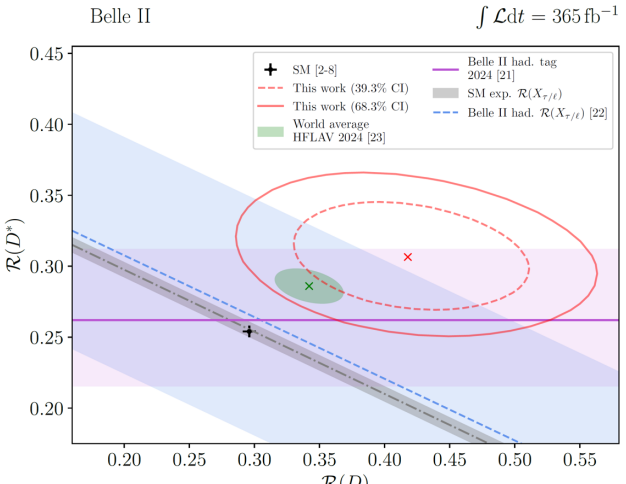
- High beam currents
- Nano Beam
- High Power Sources
- Beam dynamics

Many Interesting Topics, we can cover!!!

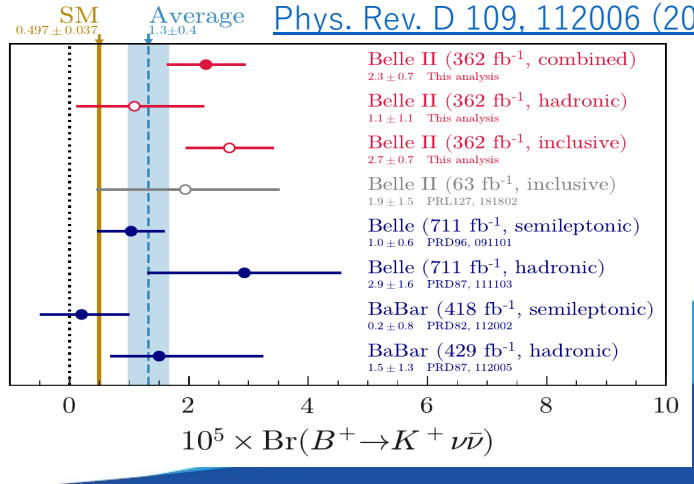
#Pub. increases significantly



B→D(*)τν.



B→ K ν ν



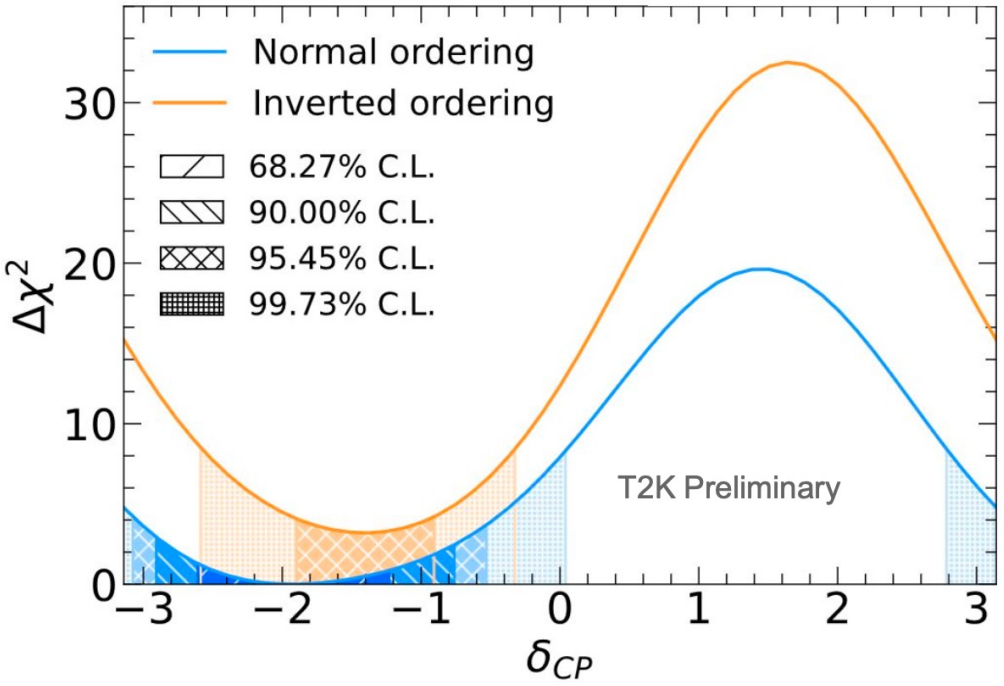
Phys. Rev. D 109, 112006 (2024)

2. T2K

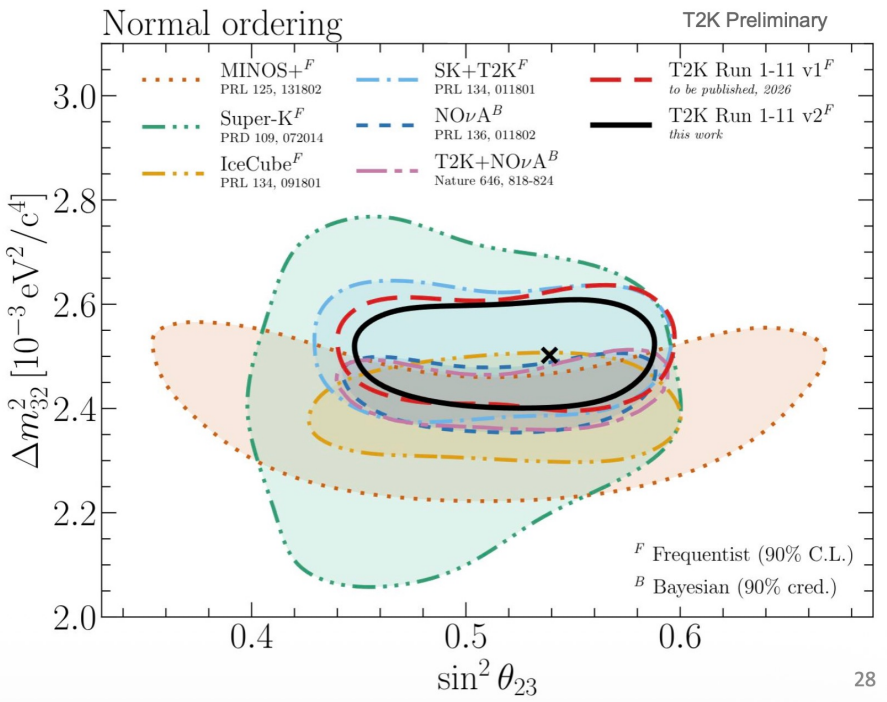
New Results are shown at Neutrino Conference in June
Data set is not updated, Just Near Detector analysis is updated.

Systematic error is reduced.

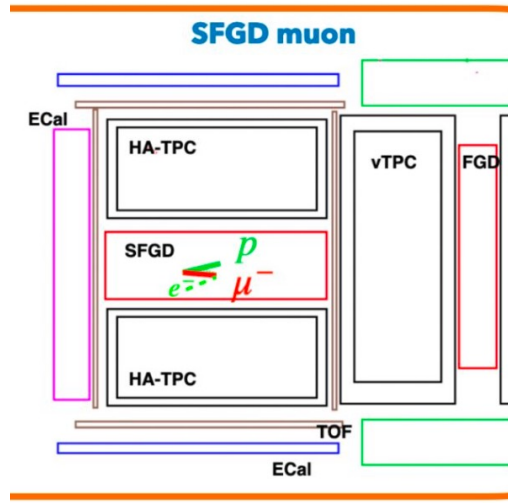
-> Data with Full Stat. will be presented in the next Nov.

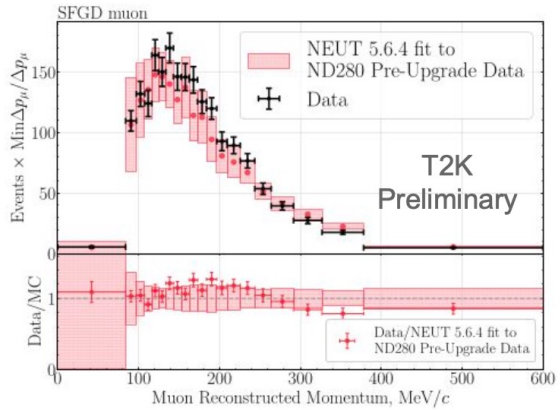


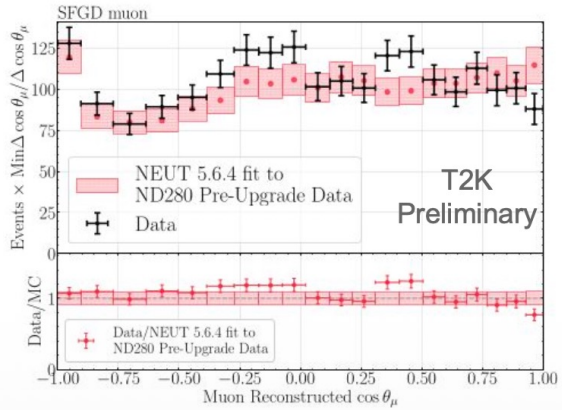
95% CL CPC(0,- π) is excluded



Accuracies on θ 23 and Δ m23 are improved.







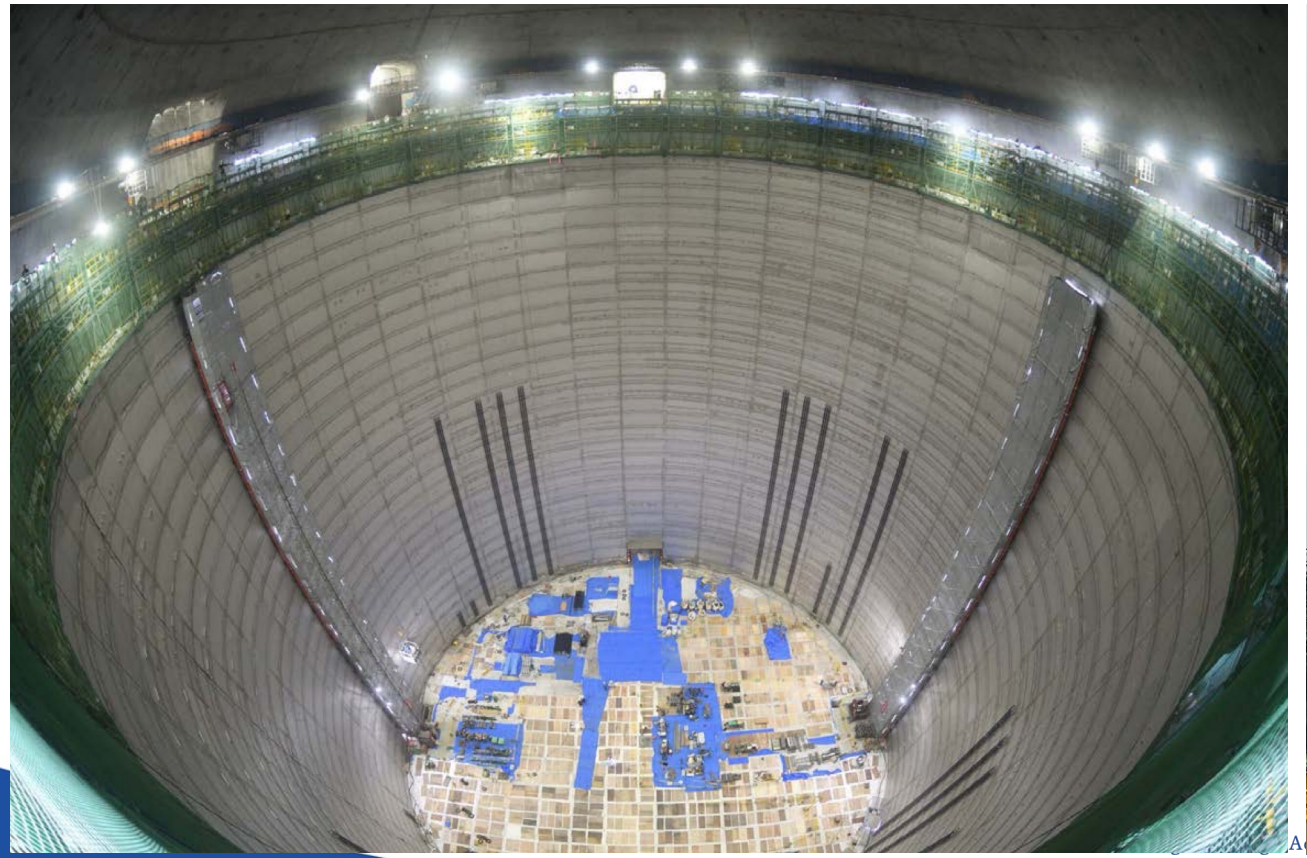
Insight through Accelerators.
KEK

3. Status of HK and IWCD

The tank lining work is completed.

About half of Caison are ready now.
Civil will be ready in the next summer.
Detector is constructed in parallel.

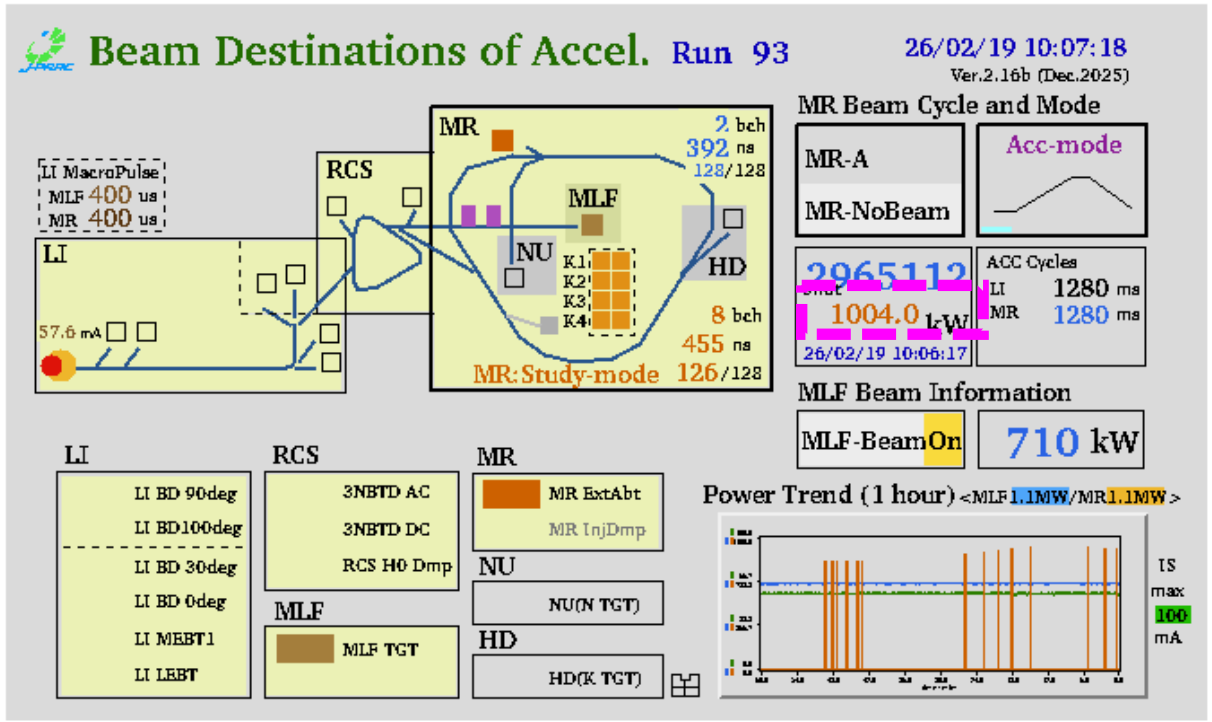
July 24, 2026@Kamioka



July 1 2026 @ Tokai



19th Feb. J-PARC MR Achieved 1MW



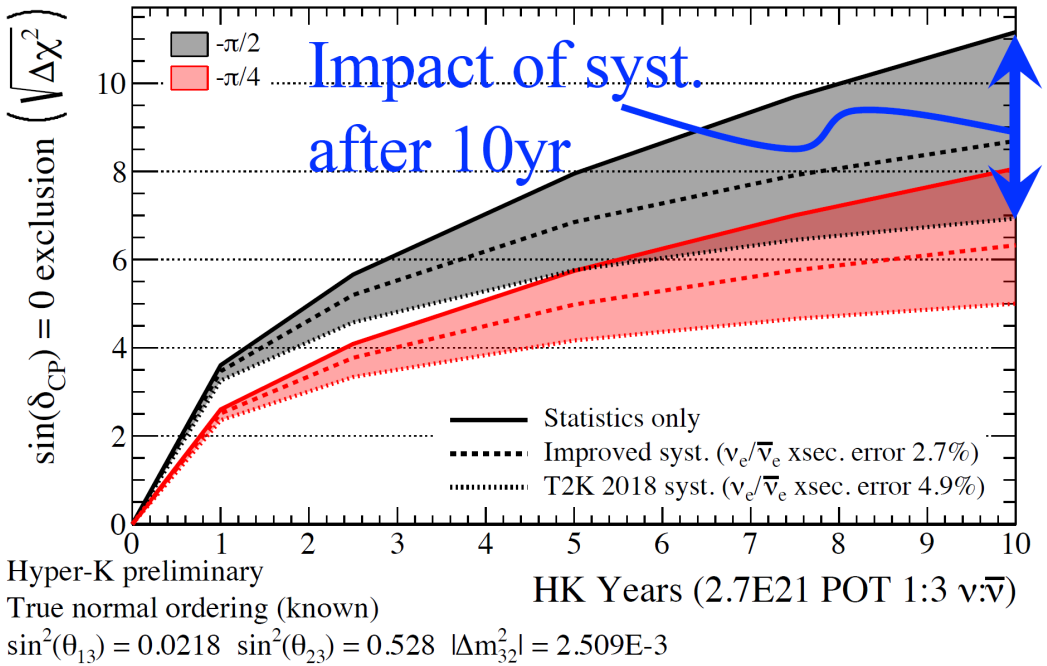
T2K Program(> 900 KW stable beam)

Data taking until 2027 May

- **We start commissioning for HK (1.3MW operation) from June 2027**

We are aiming to start HK operation in 2028 JFY(2029 Jan. or Feb.)

δ_{CP} Projected sensitivity to CPV



IWCD key detector for discovery of CP violation
We can reduce systematic error on water-neutrino Interaction significantly.

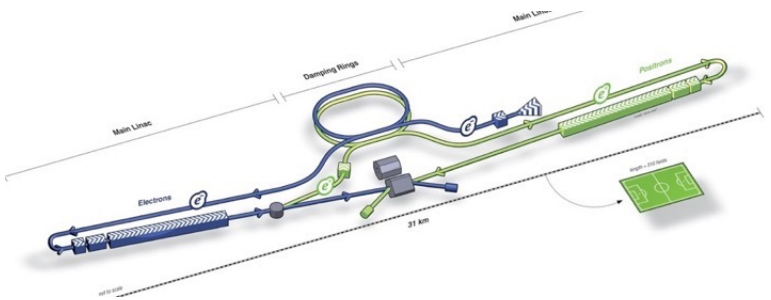
δCP=-π/2 (3 years -> 2 years run for 5 σ)

δCP=-π/4 (10 years -> 5years run for 5 σ)

Insight through Accelerators
KEK

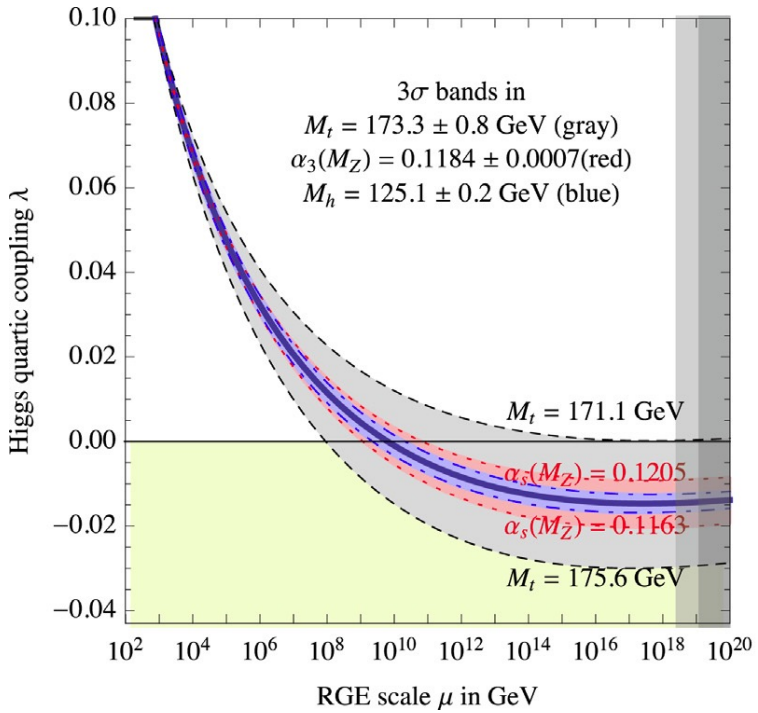
4. Three Higgs Factories are proposed now

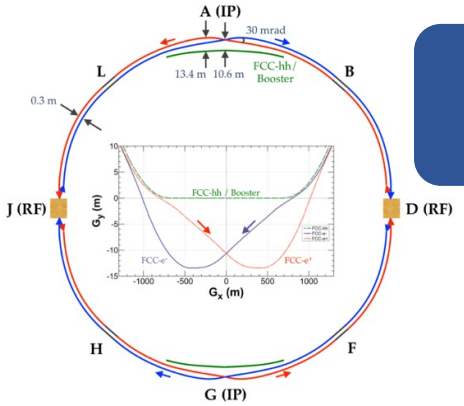
Power Consumption:120MW



ILC

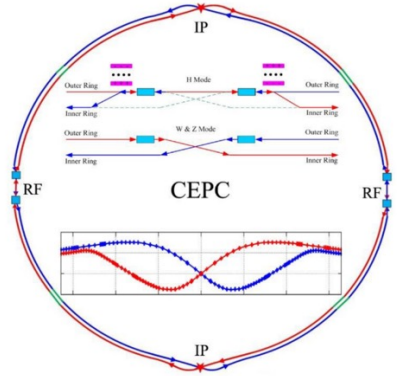
E_{CM} extendable: LC vision includes all technologies: SC, HELEN, CCC, CLIC, Plasma





FCC-ee (CERN)

16BSF
Power c onsumption :300MW



CEPC (中国)

Next Target is
EWSB / Self coupling
not precision @ 250GeV
HL LHC covers many values.

KEK

Extension of ILC Technology Network (ITN)

ITN is the global collaboration program.



Energy Recovery Technology could lead to significantly reduced power consumption and much higher luminosity (e^+ e^- reuse).
Principle of energy recovery has been demonstrated by cERL:

We are discussing with CERN / European Labs.
Let's join R&D for New technology

KEK/IDT/JHEP would like to extend not only for
"narrow sense" ILC but also the other R&D for
cutting edge technologies for Future collider;

HG-SC Cavity, High Q cavity,
Energy Recover, Nano-beam, Powerful sources.
Additionally
AI operation, Robotics for construction…

Physics for Higgs Potential/ EW SB

Insight through Accelerators.
KEK

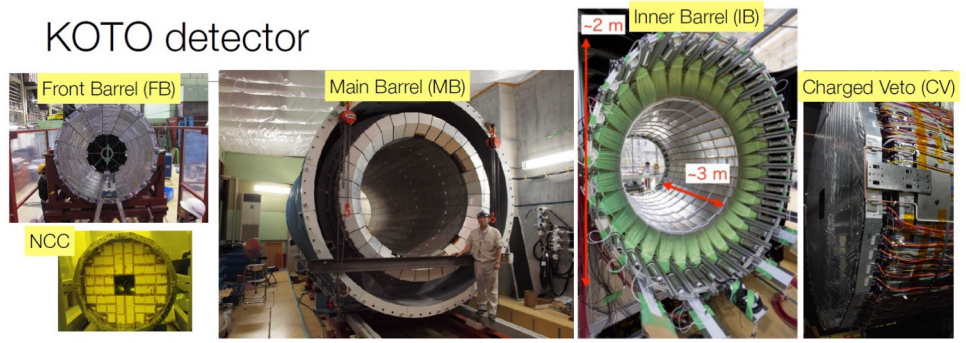
5. HD Hall

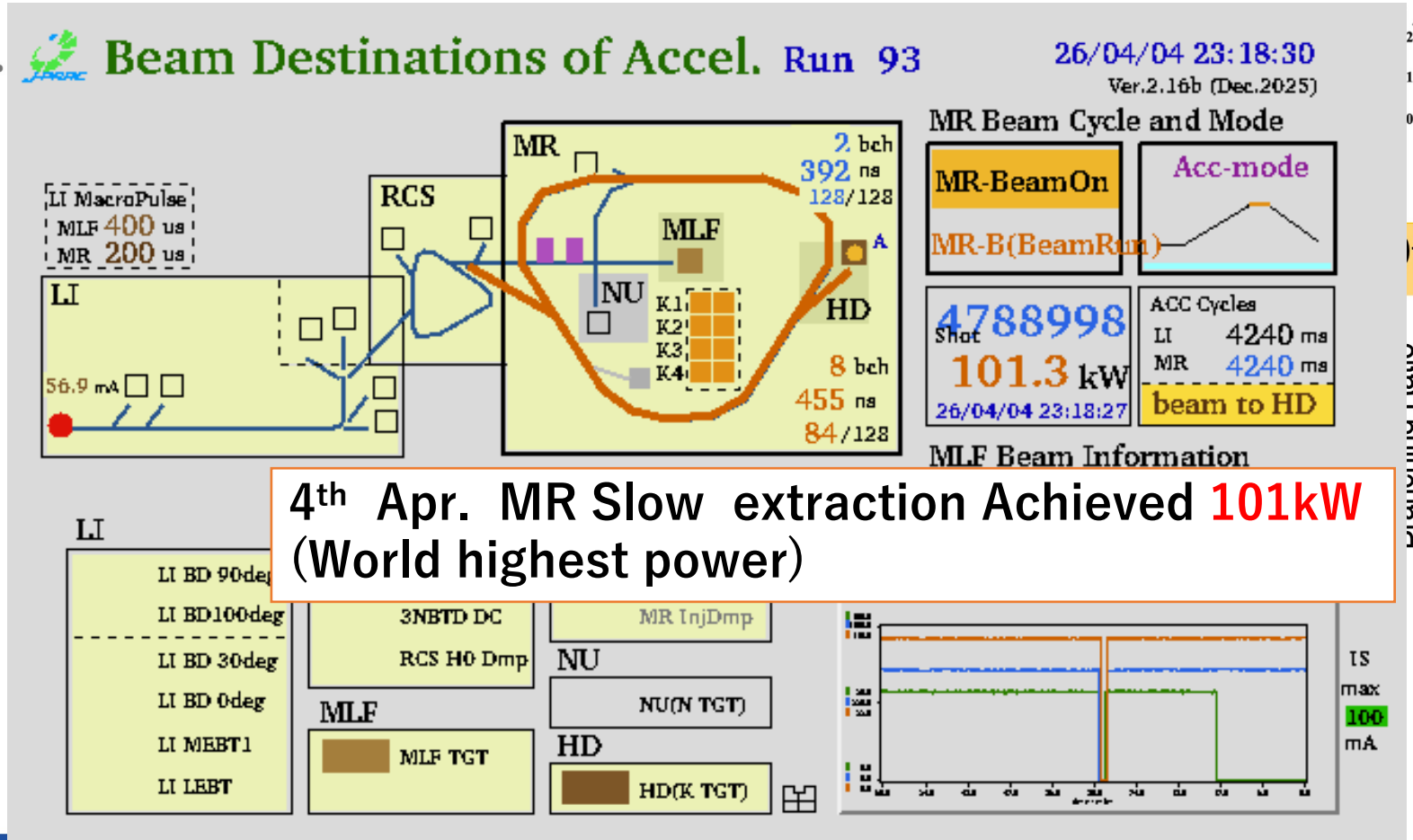
(CERN NA62) $K^+ \to \pi^+ \nu \bar{\nu}$
$9.6^{+1.9}_{-1.8} \times 10^{-11}$ (SM pred. 7.73)
-> GN Limit (6×10^{-10})

KOTO

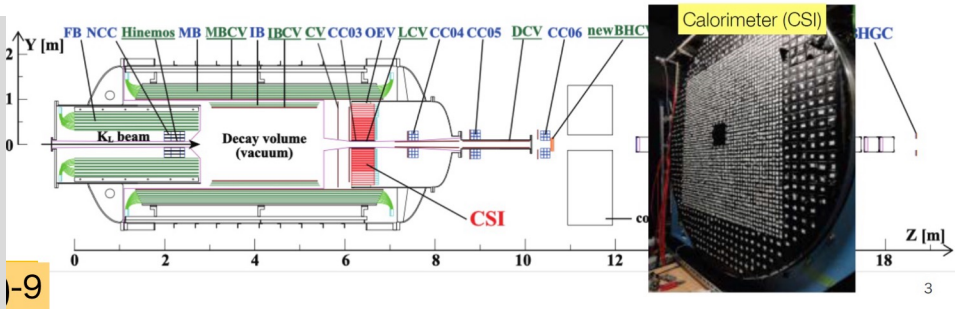
We have sensitivity exceeding GN limit with current KOTO detector

Search for CP-violating rare decay $K_L \to \pi^0 \nu\bar{\nu}$





4th Apr. MR Slow extraction Achieved 101kW (World highest power)



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$K_L \to \pi^0 \nu\bar{\nu}$ search history including KOTO

