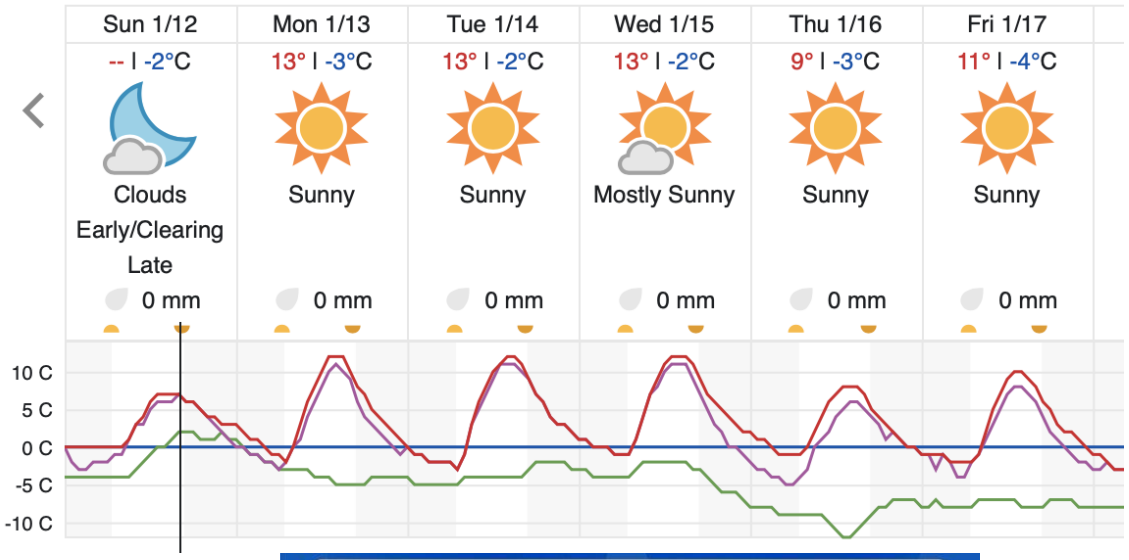
Welcome to KEK

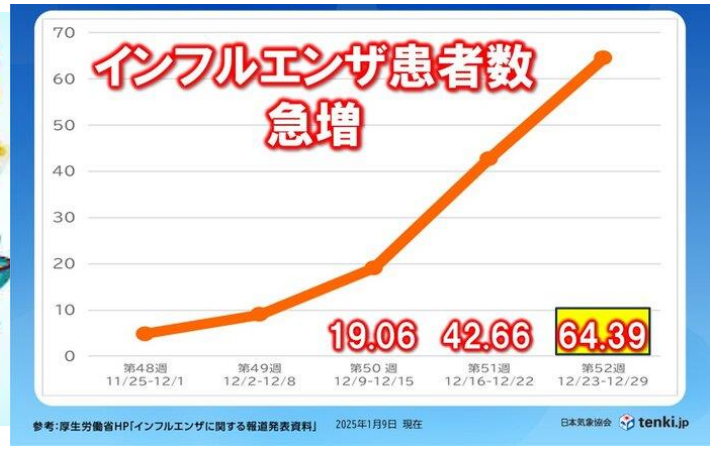
SuperKEKB ARC

Shoji ASAI (KEK)

14 January 2025

Now It is very cold.
Flu is in the highest level





Japanese Yen is also
very weak and very cold situation.

Reward of this committee is Yen-base.
When you change into € or $,
You will feel very cold.
I am sorry, but You can enjoy with it
in Japan

It is very cold,
especially in
Morning/ Night
Flu is in the dangerous situation
Be careful.

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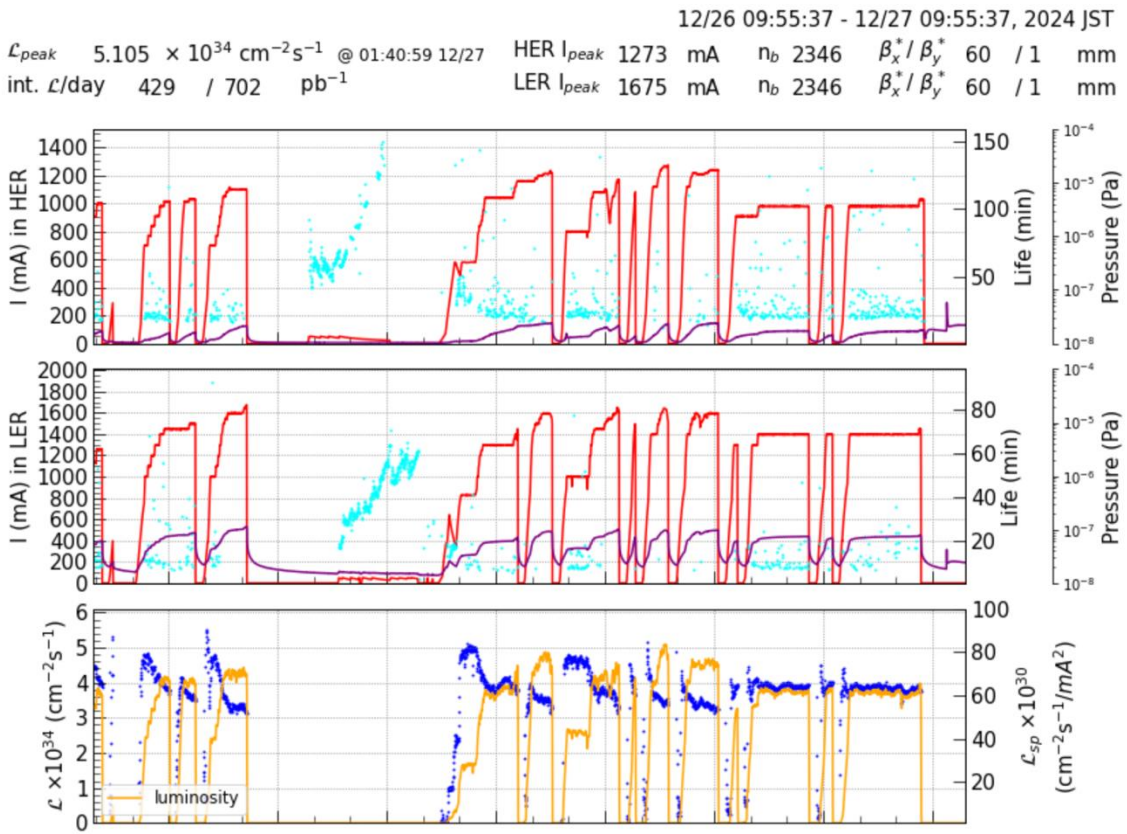
Peak Luminosity is updated @ December 27

Thanks to all members!!

SuperKEKB 24-Hour Operation Summary

New peak luminosity 5.105 x 10^34 (cm-2s-1), December 27, 2024.



Operation room:
Celebration at that time.

No champagne fight

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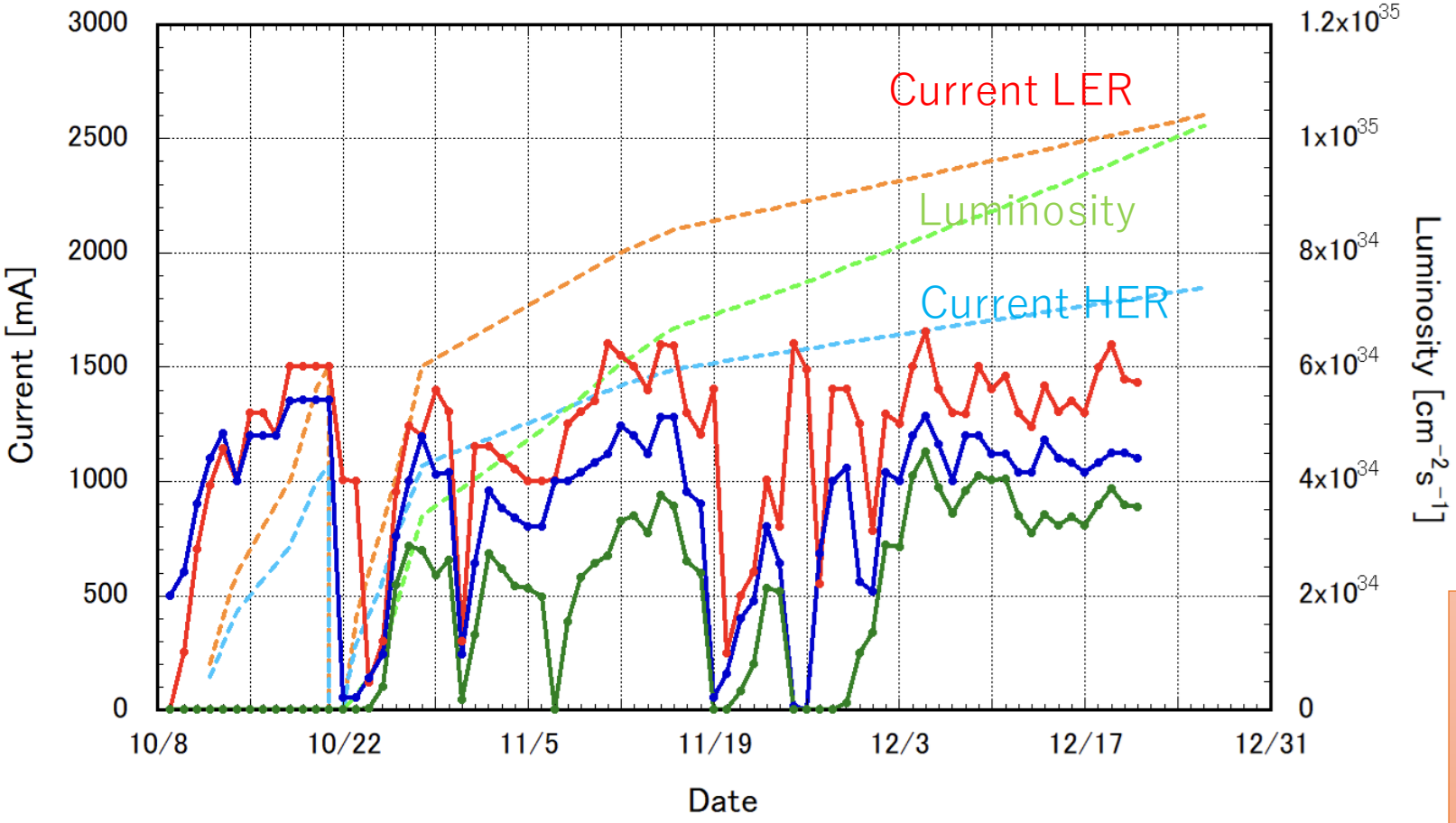
But we have still many problems to be fixed.



2024 target Luminosity
$> 1 \times 10^{35}$ cm^{-2}s^{-1}

Final target Luminosity after LS1 :
$\sim 2.4 \times 10^{35}$ cm^{-2}s^{-1}

1) Increasing total beam currents
2) Increasing bunch current (beam current)
3) Squeezing β y

Basic problems

1) Short beam lifetime
2) Beam instabilities (SBL)
3) Low machine stability
4) Low injection efficiency

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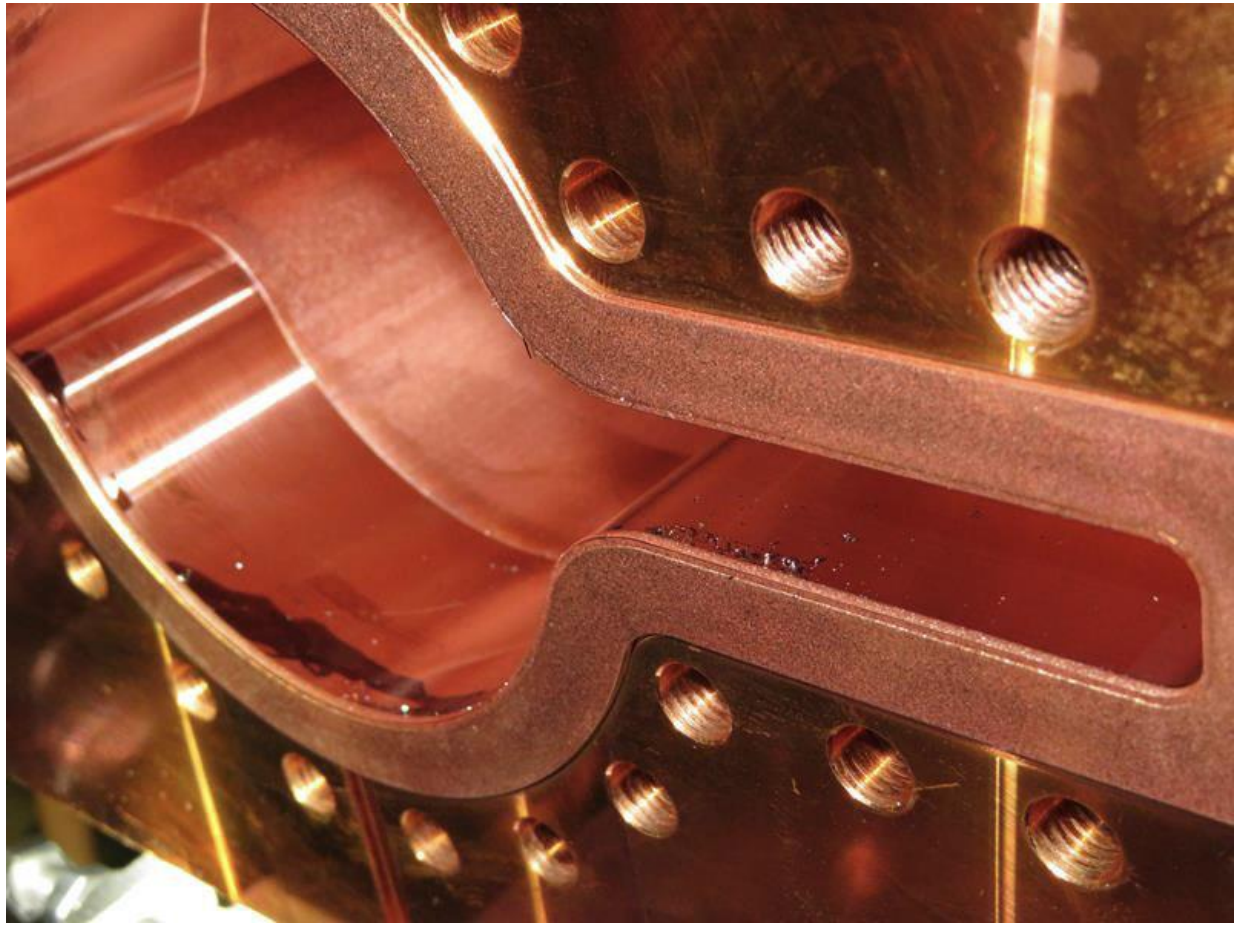
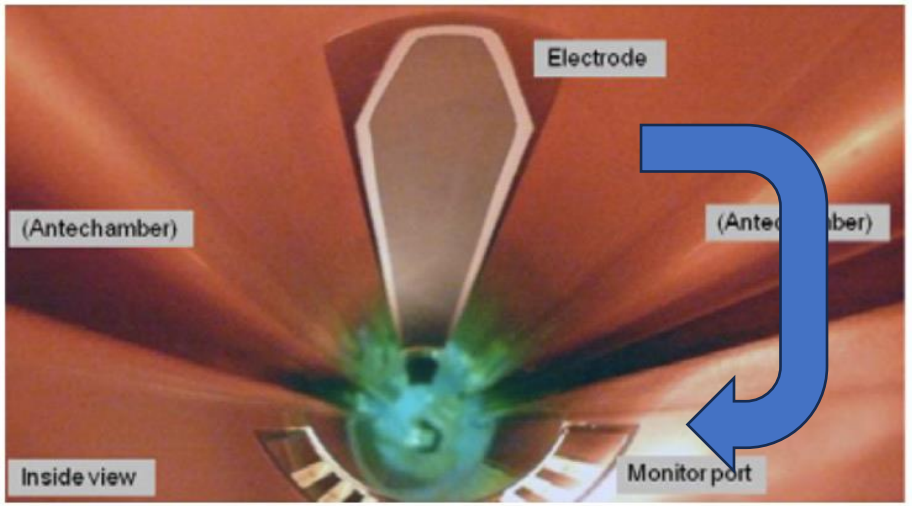
Good news 1

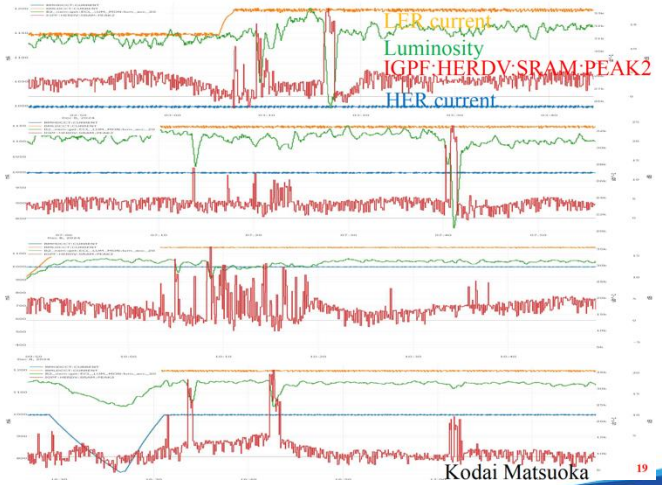
We have many data / experience in 2024 operation
We found the clue of SBL



At first, we suspected
Caused by dust (from Electrode)?



Turn upside downside



We have big data
of many monitors
operation data.
We can understand
more

Good news 2

Support and wide collaborations

- Collaboration between Acc. Division and Belle2 is on going

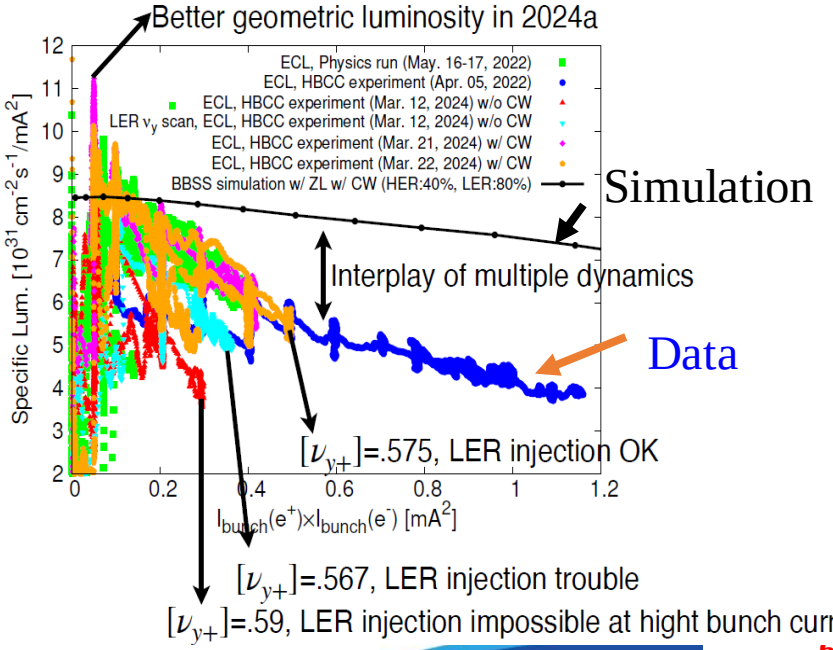
Prof. Shoji Uno plays an important liaison of Acc. and Belle2

- International Collaborations are also extended

Beam Beam interaction is very serious, this is the common problem in future colliders.
CERN,DESY,IHEP,US show the interests
Let's have more tight collaborations.

Recent beam-beam machine studies

- HBCC studies compared
  - w/ CW, 2024.03.22
  - w/ CW, 2024.03.21
  - w/o CW, 2024.03.12
  - w/ CW, 2022.04.05



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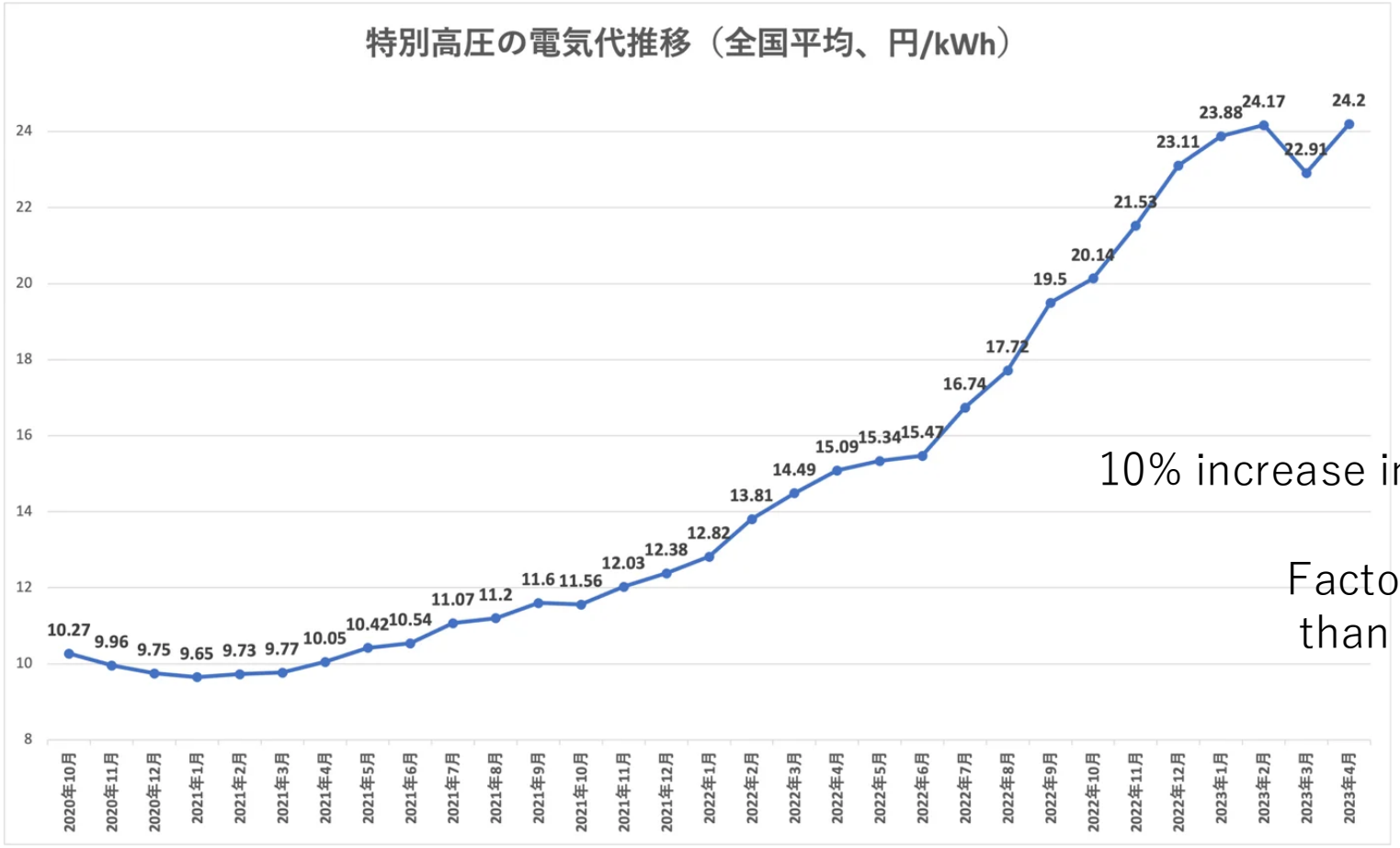
Bad news

Seriously High electricity cost



KEK will give top priority to SuperKEK B runtime

10% increase in this year

Factor 2.5 higher than Run1

Belle2 group kindly accepts that runs put into one (Autum/winter)

Also We can not predict what happen in this year

We fix the price as the same as 2024

1) Russia
2) Gaza
3) Trump 2.0

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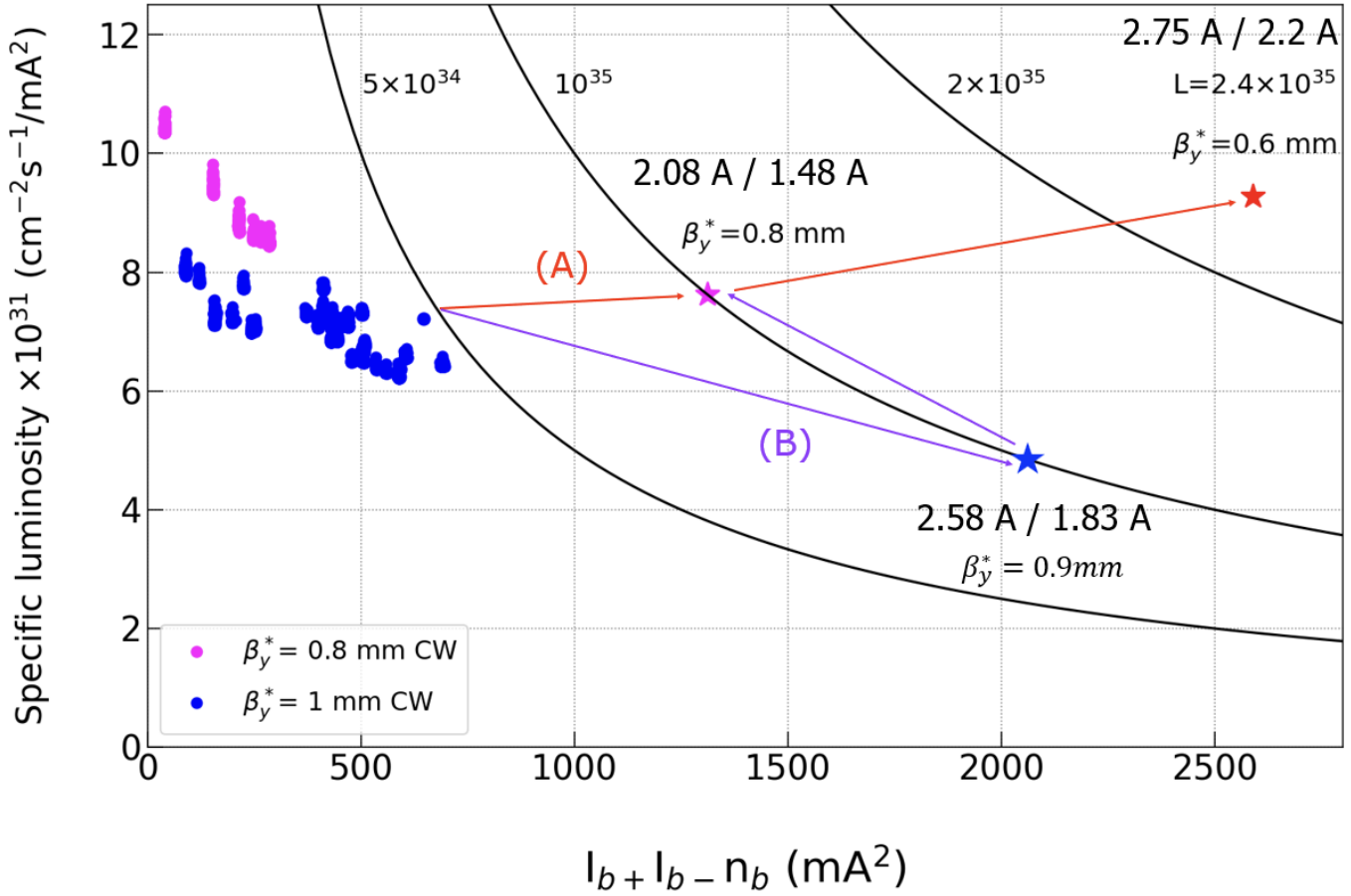
We understand / make more clear problems in the last Run.
Now problems are clear.

Please have Practical / Fruitful Discussion in ARC.

Many Thanks again!!!

$$L_{sp} = \frac{L}{I_{b+} I_{b-} n_b}$$

How to achieve
1) Current
2) Injection
3) Squeeze



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