

Welcome to KEK

7th Plenary Workshop of the Muon $g-2$ Theory Initiative

September 9-13, 2024 @ KEK, Tsukuba, Japan

<https://conference-indico.kek.jp/event/257>



International Advisory Committee

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Michel Davier (University of Paris-Saclay and CNRS, Orsay), co-chair
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Martin Hoferichter (University of Bern)
Christoph Lehner (University of Regensburg), co-chair
Laurent Lellouch (Marseille)
Tutomu Mibe (KEK)
Lee Roberts (Boston University)
Thomas Teubner (University of Liverpool)
Hartmut Wittig (University of Mainz)



(9-2)₇

Local Organizing Committee

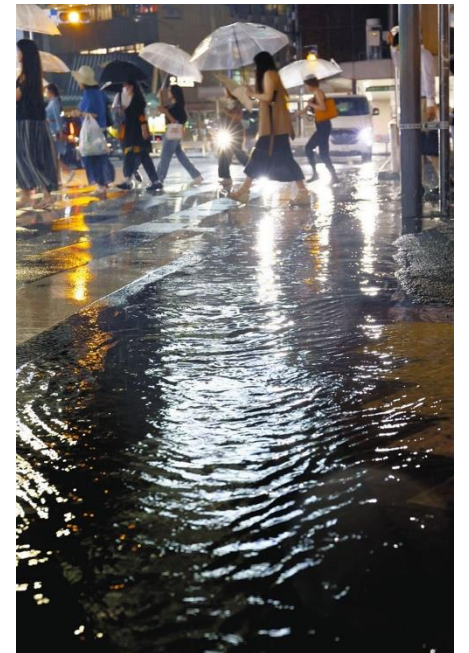
Kohtaroh Miura (KEK)
Shoji Hashimoto (KEK)
Toru Iijima (Nagoya)
Tutomu Mibe (KEK)

Still



Crazy Hot

Japan becomes
Tropical zone
Be careful to
crazy heavy rain



Shoji ASAI (KEK)

Insight through Accelerators.

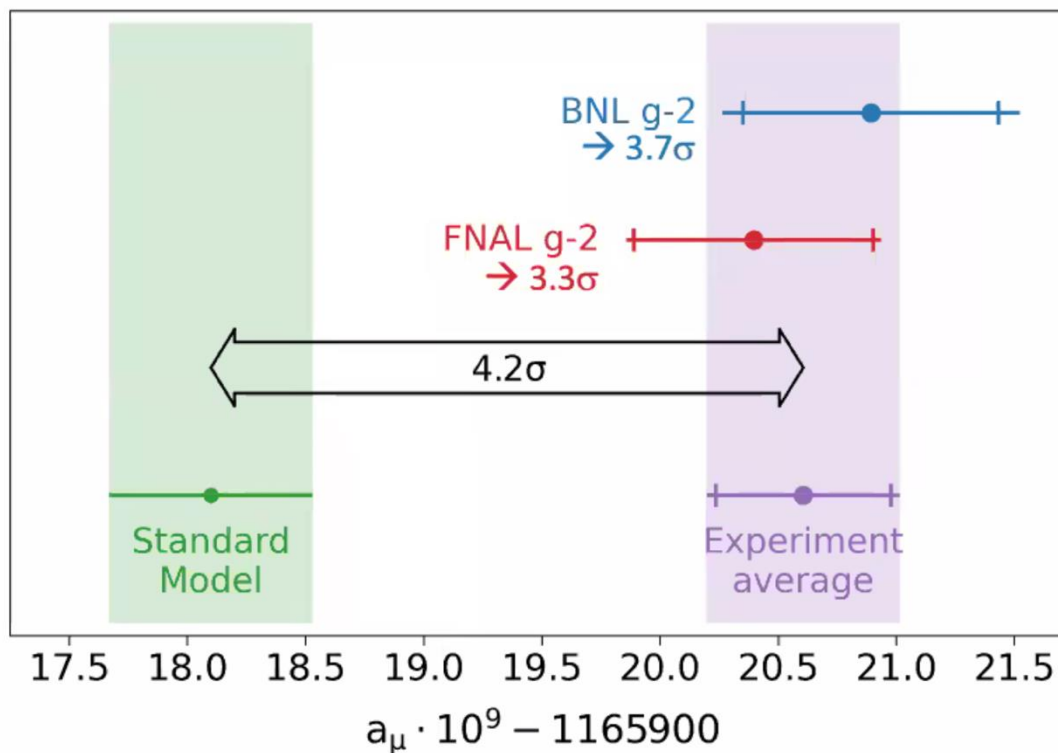


I also enjoyed.

LHCで何をやるべきか？

$$a_{\mu}(\text{SM}) = 0.00116591810(43) \rightarrow 368 \text{ ppb}$$

My slide
in 2021

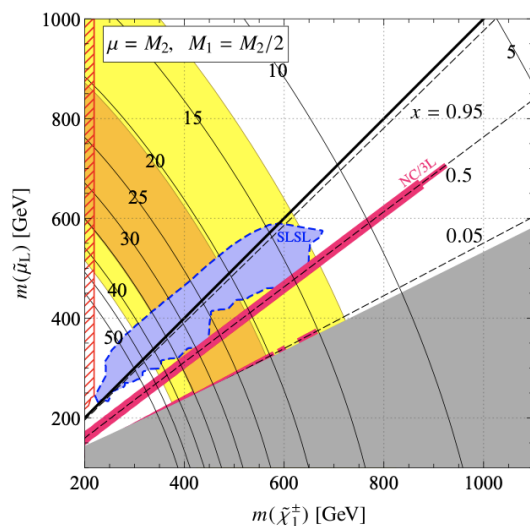


- Individual tension with SM
 - BNL: 3.7 σ
 - FNAL: 3.3 σ

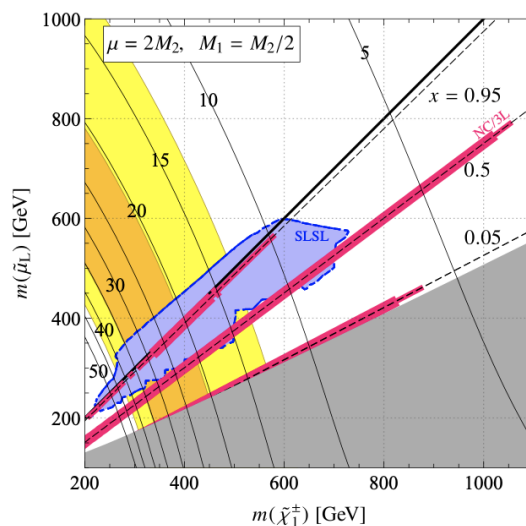
$$a_{\mu}(\text{Exp}) - a_{\mu}(\text{SM}) = 0.00000000251(59) \rightarrow 4.2\sigma$$

I am
SUSY
hunter.

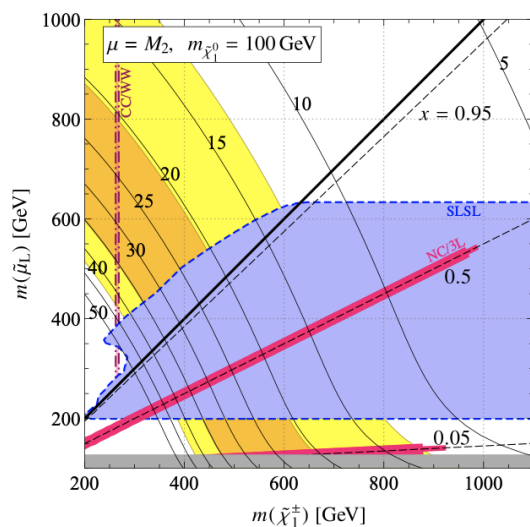
pMSSM で M3 decouple / Msquark Mslepton decouple



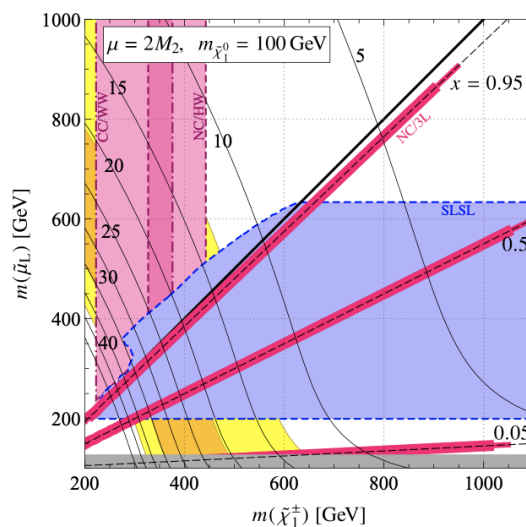
(A) $\mu = M_2, M_1 = M_2/2$



(B) $\mu = 2M_2, M_1 = M_2/2$



(C) $\mu = M_2, m_{\tilde{\chi}_1^0} = 100 \text{ GeV}$



(D) $\mu = 2M_2, m_{\tilde{\chi}_1^0} = 100 \text{ GeV}$

- 1) Smuon 400-600 GeV
Bino-Like DM
 $\Delta M \sim 50 \text{ GeV}$

Co annihilation

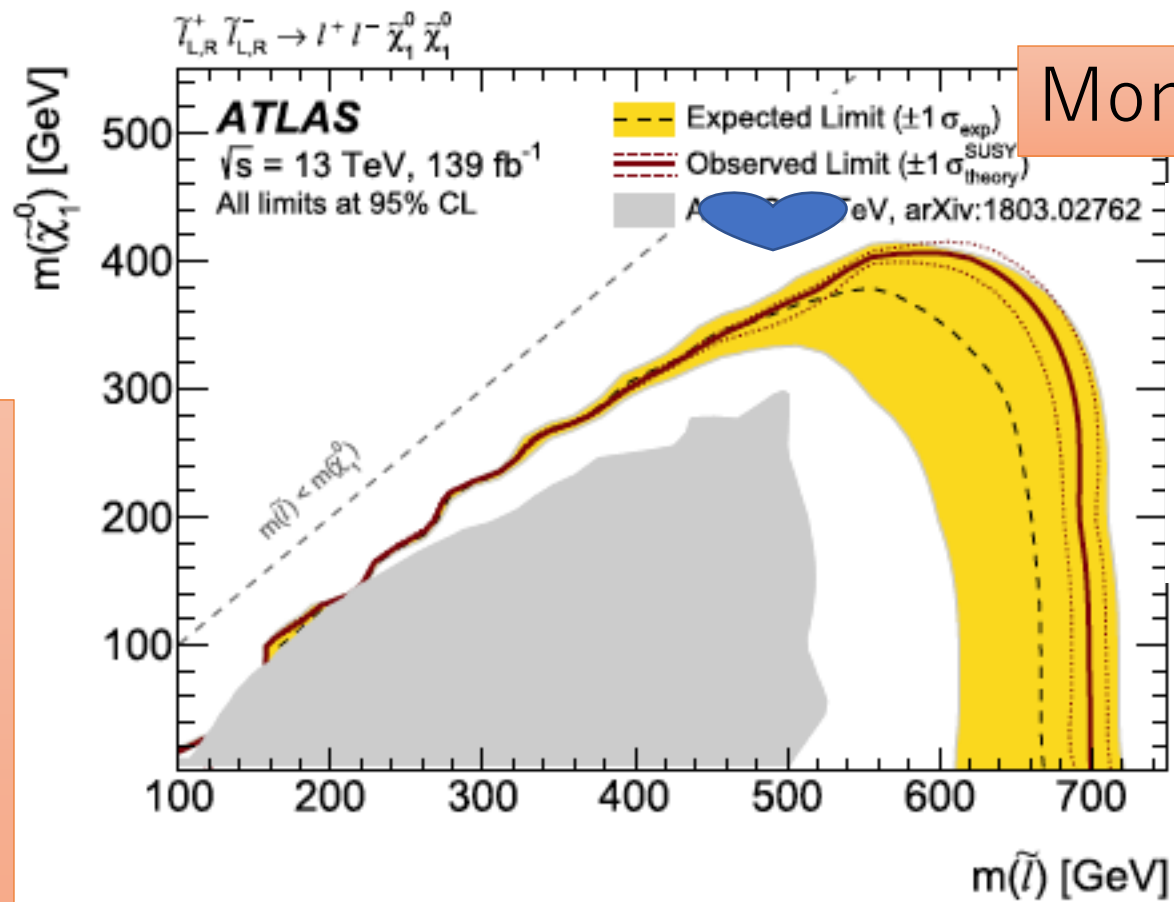
- 2) Chargino 350-500 GeV
Neutralino $\Delta M \sim 100 \text{ GeV}$

Co annihilation

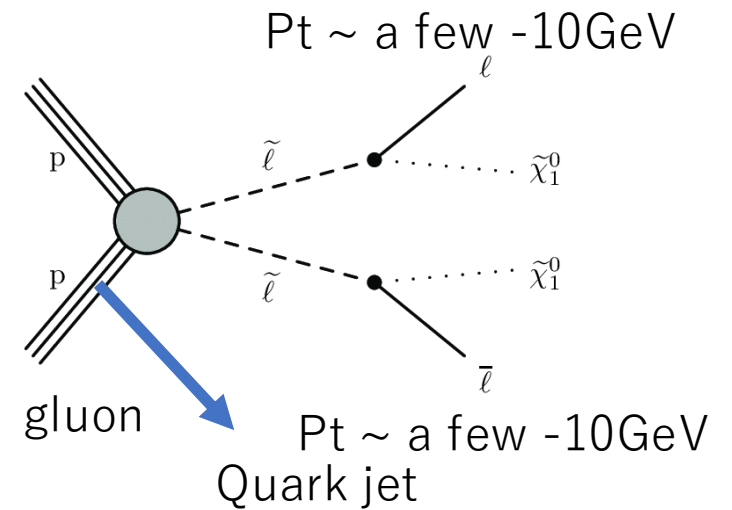
New topologies
Study has been
started.

Important point:

**Learn from
Failure**



Monojet + soft e/mu ?



(c) $\tilde{l}\tilde{l}$ production

Monojet -> gluon でなくて quark jet (AI)
soft lepton / muon electron ID < 10GeV
soft track 再構成 → MET 配分 再構成

KEK approaches g-2 from the three ways!

- 1) Theory group studies about both Lattice and Phenomenology



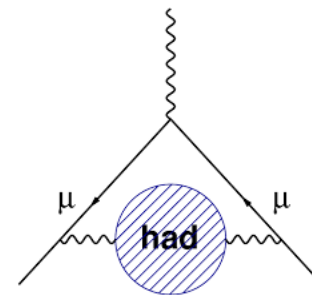
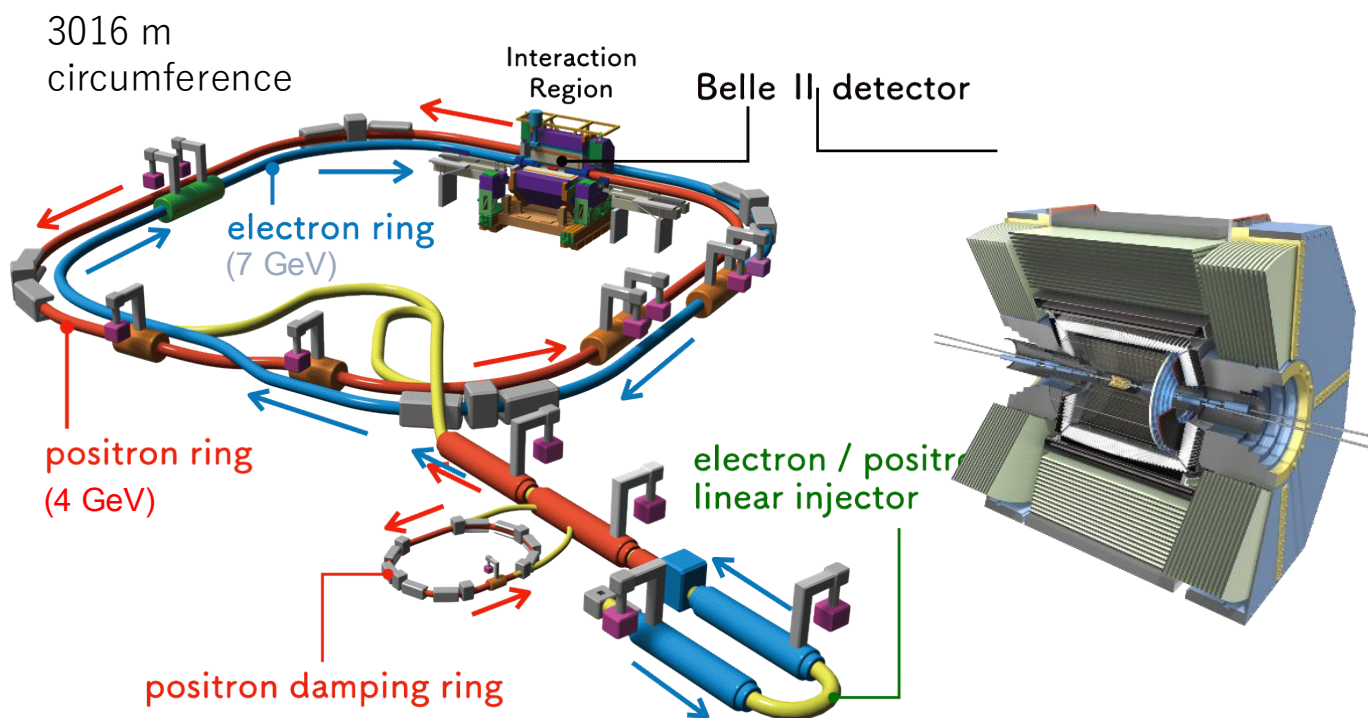
Hashimoto-san



Kitano-san

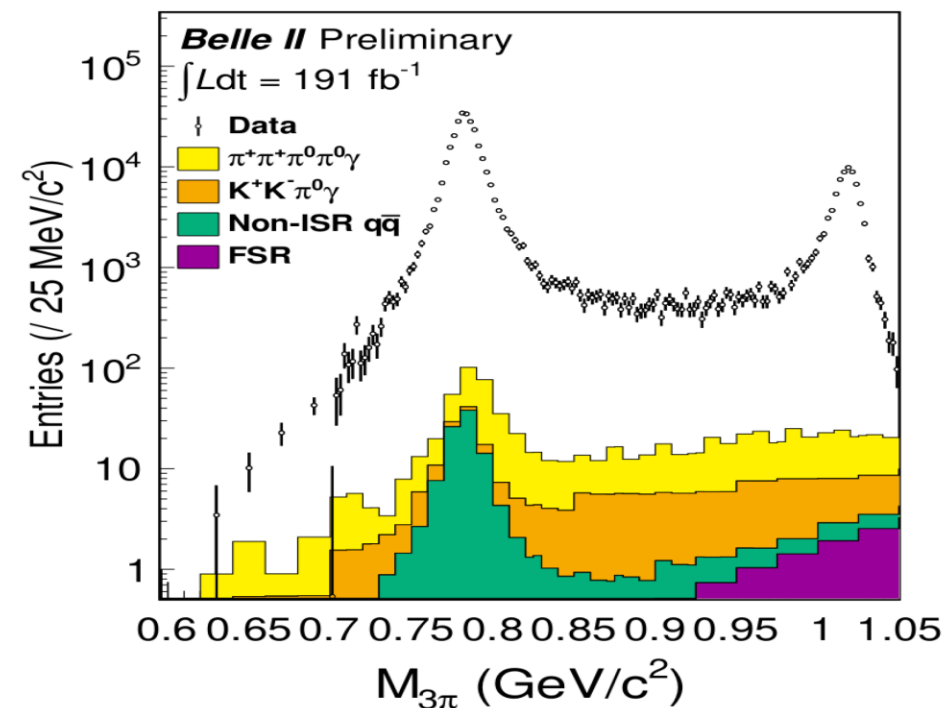
KEK approaches g-2 from the three ways!

2) Belle2 will measure HVP



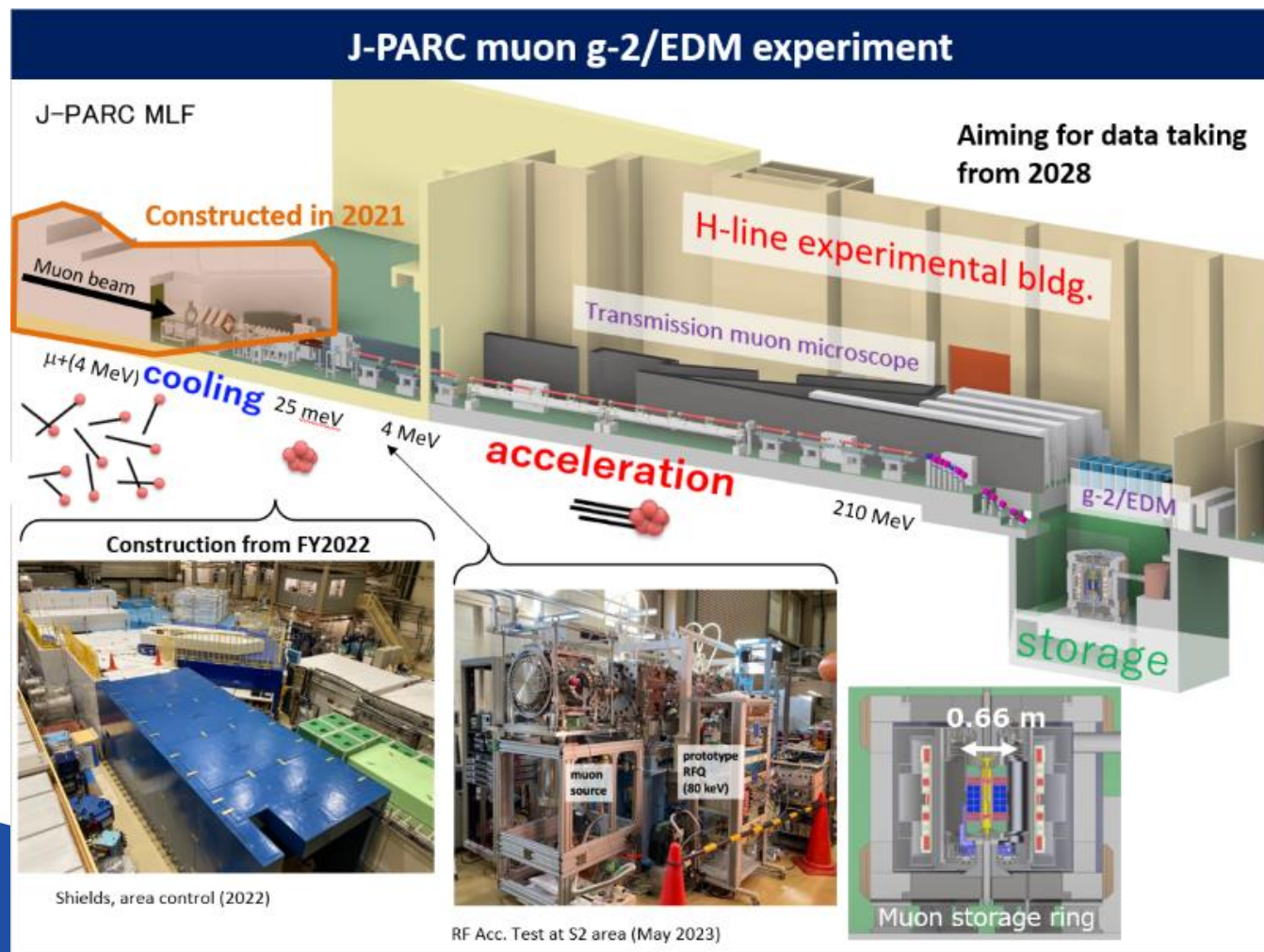
3pion process is sensitive to HVP.

$$\sigma(e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma) (191\text{fb}^{-1})$$



KEK approaches g-2 from the three ways!

3) Muon beam + muon g-2/EDM @ J-parc



Mibe-san

Partially founded.

