

# (Thermal) Muon Source

- Mibe-san (KEK), 石田 (Ishida-san, RIKEN)



鈴木一仁  
特任講師(名古屋大)

阿  
研

- ▶ Suzuki-san (Nagoya)
- ▶ 上岡 Kamioka-san (Postdoc → 助理教授)
- ▶ Otani-san (KEK)



大谷将士  
助教(KEK加速器施設)



三部勉  
教授



上岡修星  
研究員

- 每周： local source meeting <https://kds.kek.jp/event/43895/>
  - Saito-Mibe meeting <https://kds.kek.jp/event/43894/>
- 每个月： global source meeting
  - 日本-加拿大 (TRIUMF)
  - K. Saeid (aerogel, UBC), **Art Olin, Glen Marshall (Jess)**

# Local source meeting

- Students:
  - ▶ Mai Yotsuzuka, Nagoya, D1, D2 -> SOA+RFQ acceleration, 2023 beam time
  - ▶ S. Aritome, M2
  - ▶ S. Sugiyama, M1



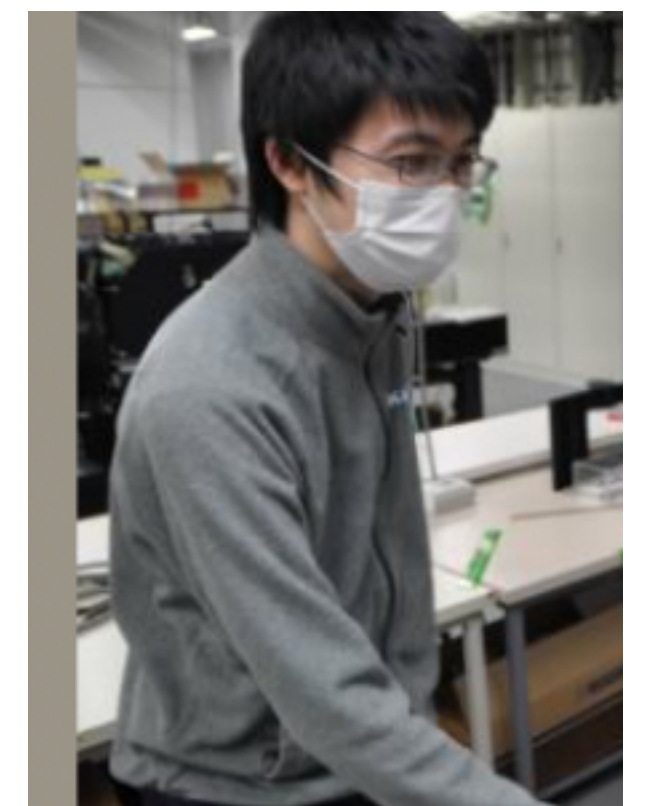
**四塚麻衣**

名古屋大学大学院 理学研究科  
高エネルギー素粒子物理学研究室(N研)



**有留翔一**

M2(東大)



# Mu1S-2S

<https://www.xqw.okayama-u.ac.jp/people>

- Uetake-san (OkayamaU)

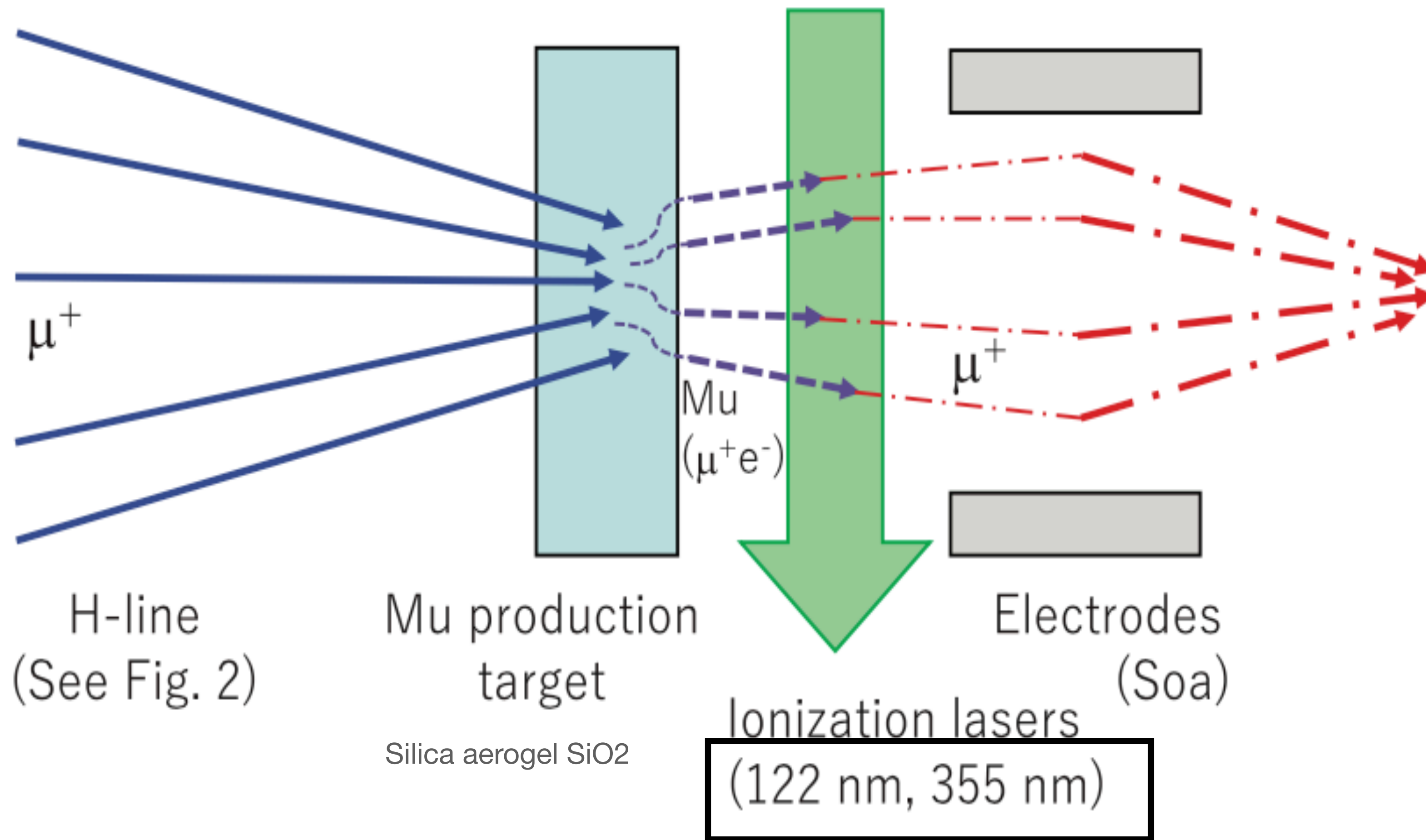


- ▶ 増田 Masuda-san, Hiraki-san



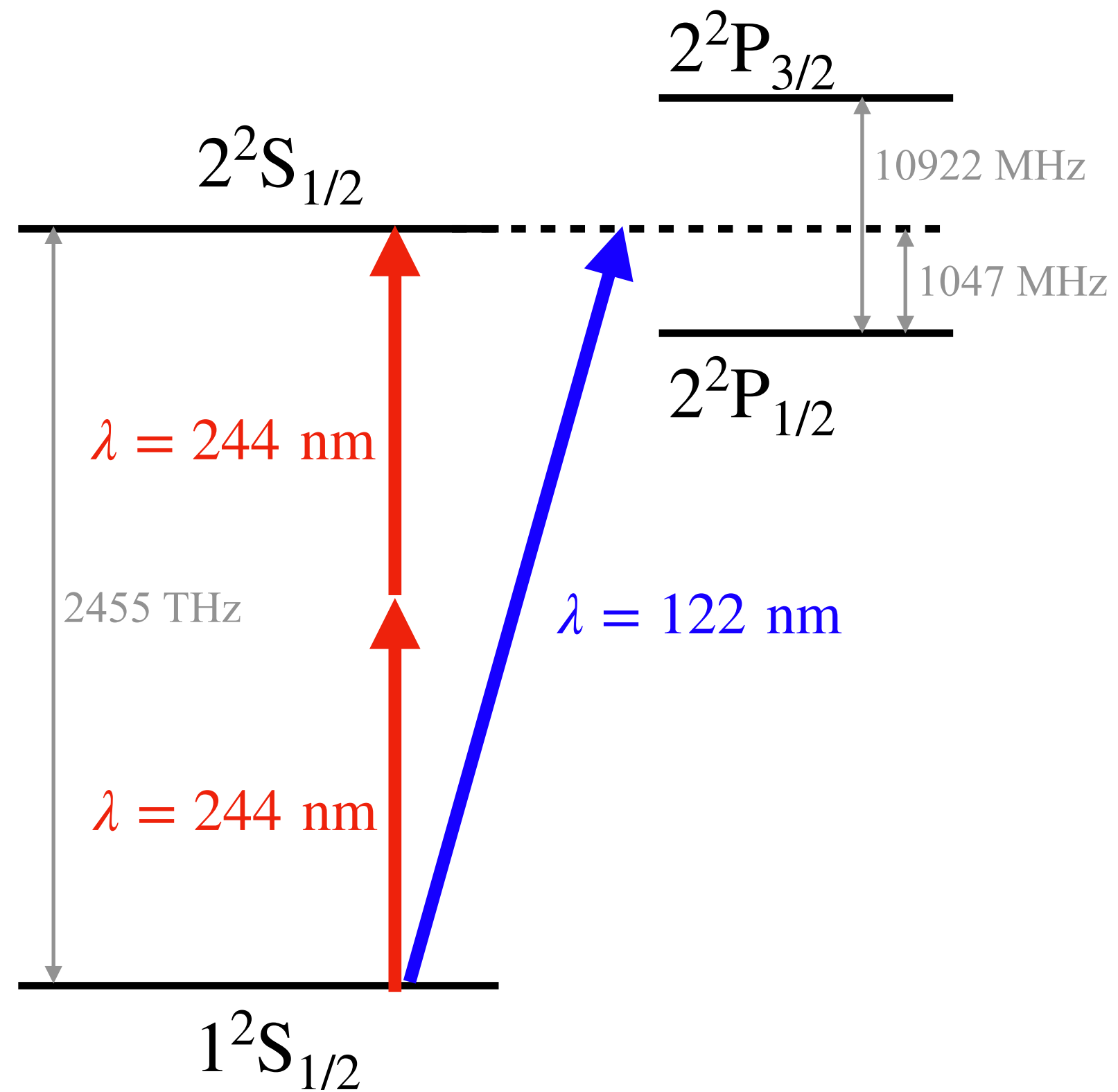
- ▶ Student:

- ▶ Yamamoto-san (D1), Saga-san (M1, M2?)
- ▶ Others: Hara-san, Imai-san, Miyamoto-san



2 potions:

- 122 nm: J-PARC U-line 下村 (g-2: H-line)
- **244 nm: Okayama U, Kamioka-san**



### 122 nm laser

- Challenging development needed
- 73% efficiency at 100  $\mu\text{J}$  planned for E34
- 5 to 10  $\mu\text{J}$  achieved
- Doppler boarding

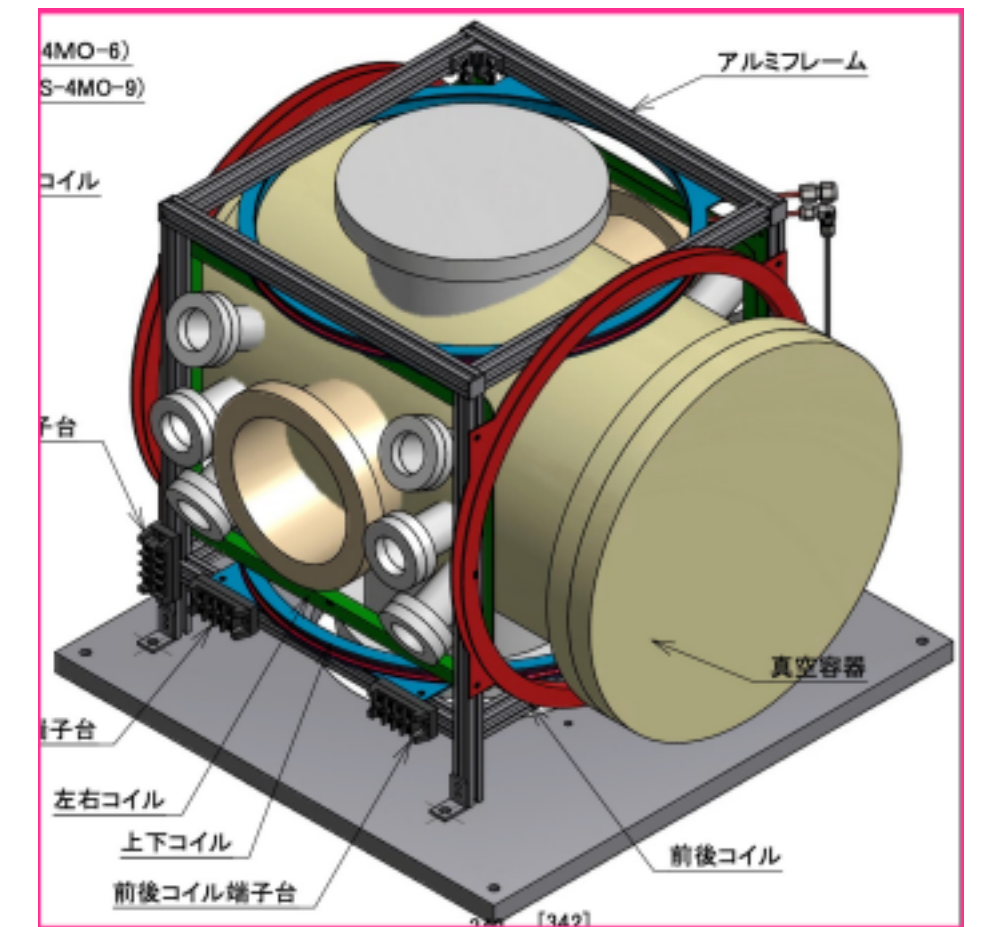
### 244 nm laser

- Established ones available
  - Pulsed laser for Mu ionization project
  - CW laser for the future high precision muon mass
- Efficiency under estimation
- Doppler-free

$$\Delta\nu_{1S2S} \simeq \frac{3\alpha^2}{8h} m_e c^2 \left(1 + \frac{m_e}{m_\mu}\right)^{-1}$$

# Muon source activities

- 244 nm 激光, 实验室在KEK, Kamioka-san
- New chamber, 给真正最后g-2用的 (2027) source chamber
  - ▶ 到KEK, 正在测试
  - ▶ HV, 磁场, Aritome-san, Ishida-san, (Suzuki-san)
- **Mu1S-2S**
  - ▶ 旧的chamber+SMBL
  - ▶ OkayamaU 合作。Me, Mibe-san, Ishida-san, (Suzuki-san)



# Study items in source group

① Surface muon, @ J-PARC MLF



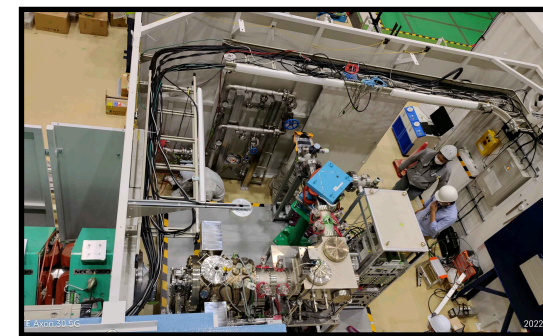
山崎高幸  
助教 (KEK物質構造科学研究所・素  
粒子原子核研究所)

② Silica aerogel target, chamber, Laser (now 244 nm from Okayama)

③ Thermal muon 引出、探測 (Me, 2022. 11.21 - / 2023 beam time: Yotsuzuka)

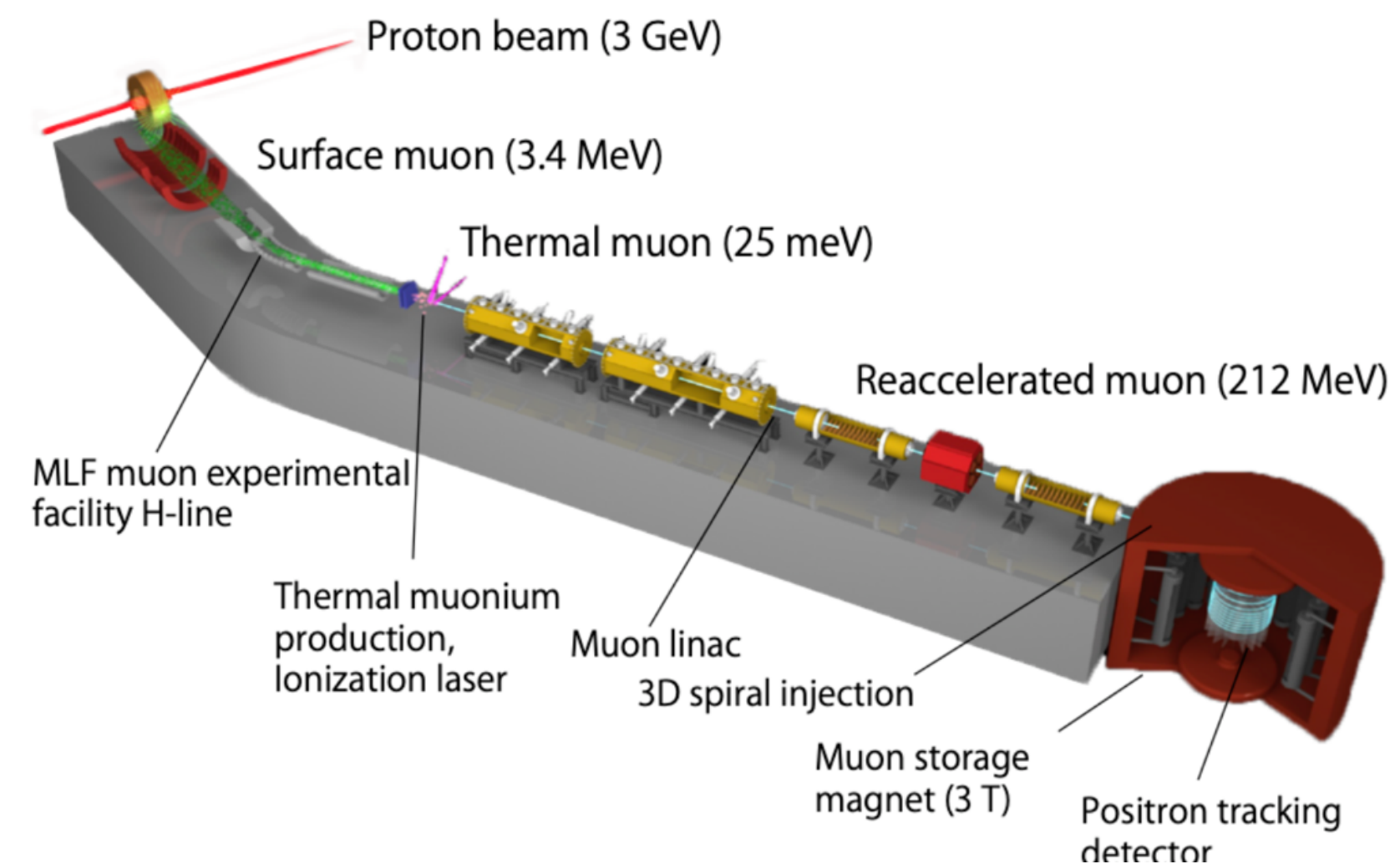
- Slow muon beam line (SMBL)

- Chamber + **RFQ** (Yotuzuka)



④ Mu 1S-2S

- 244 nm laser (Okayama)



MUON LINAC:

1. RFQ
2. DAW
3. DLS...