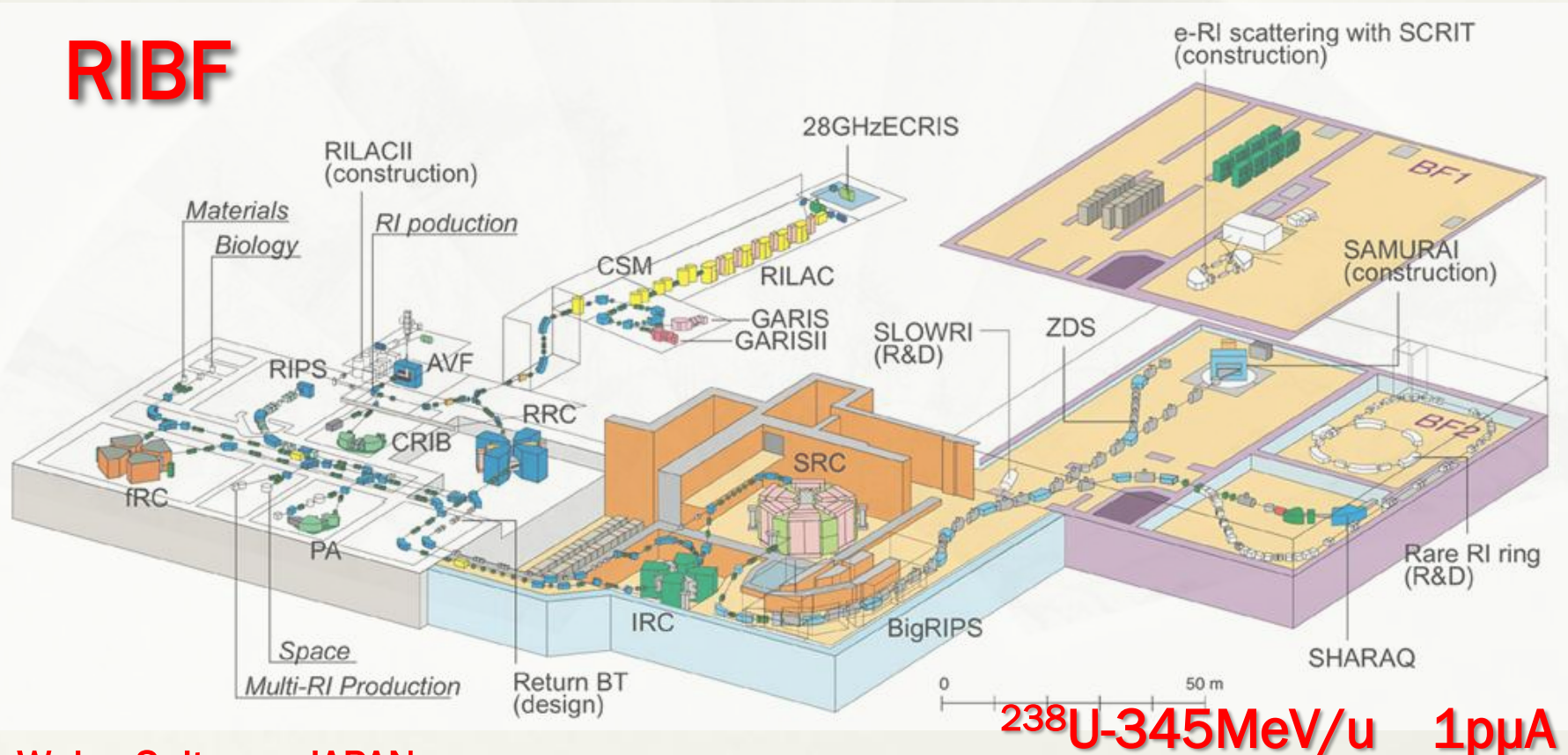


# Operations of RIKEN RI Beam Factory

RIKEN  
Masayuki Kase

## RIBF



Wako, Saitama, JAPAN

# RIKEN RIBF

## Accelerator Complex

Ring Cyclotron → RC  
(Separated Sector Cyclotron)

RRC, fRC, IRC, SRC

RRC - fRC - IRC - SRC

Very heavy ion ( $A > 100$ )

RRC - IRC - SRC

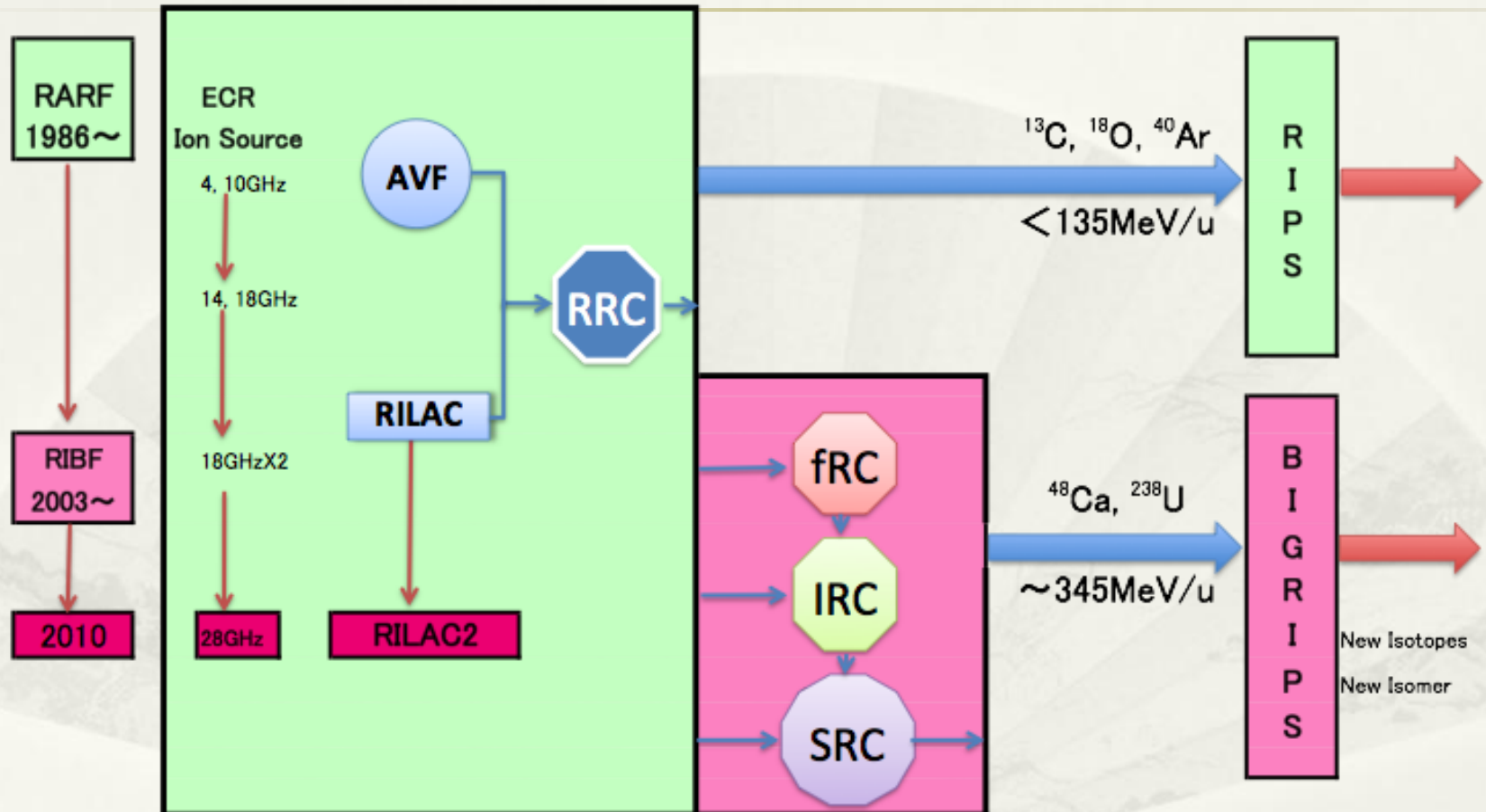
Heavy ion ( $A < 100$ )

RRC - SRC

Light ion ( $A/q = 2$ )

## Accelerators

## RI-Beam Generator





$K = 2,600 \text{ MeV}$

3.8T (240 MJ)

18-38 MHz

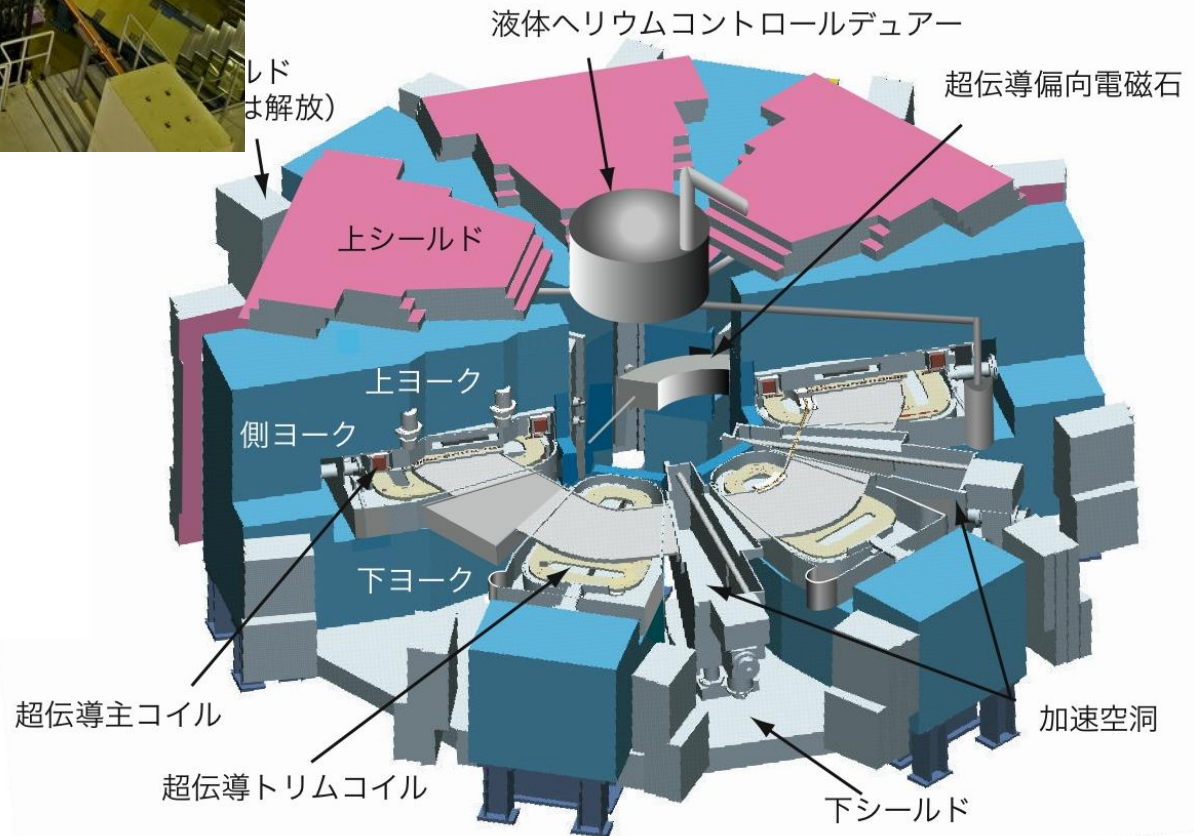
8,000 tons

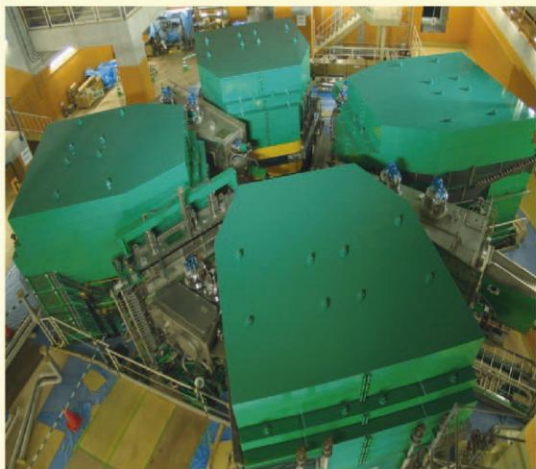
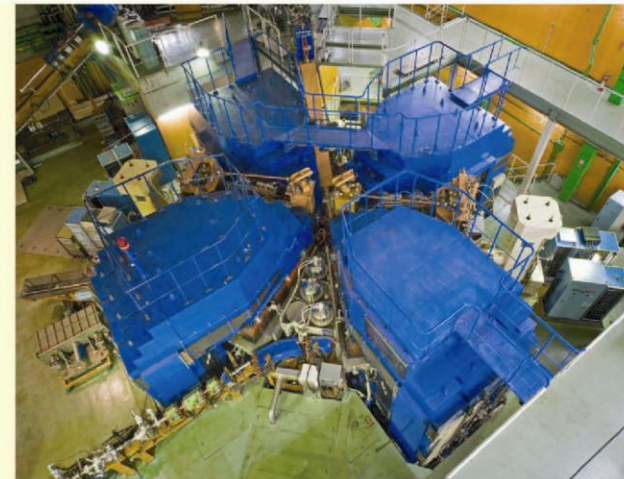
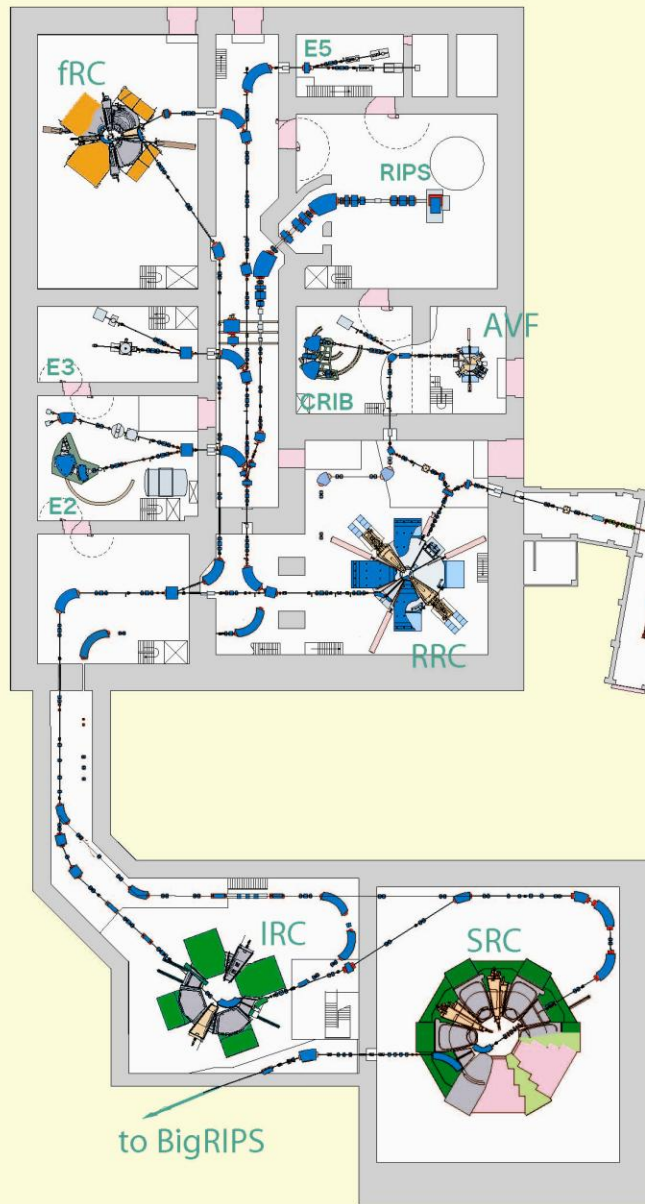
18m in dia.

8m in height

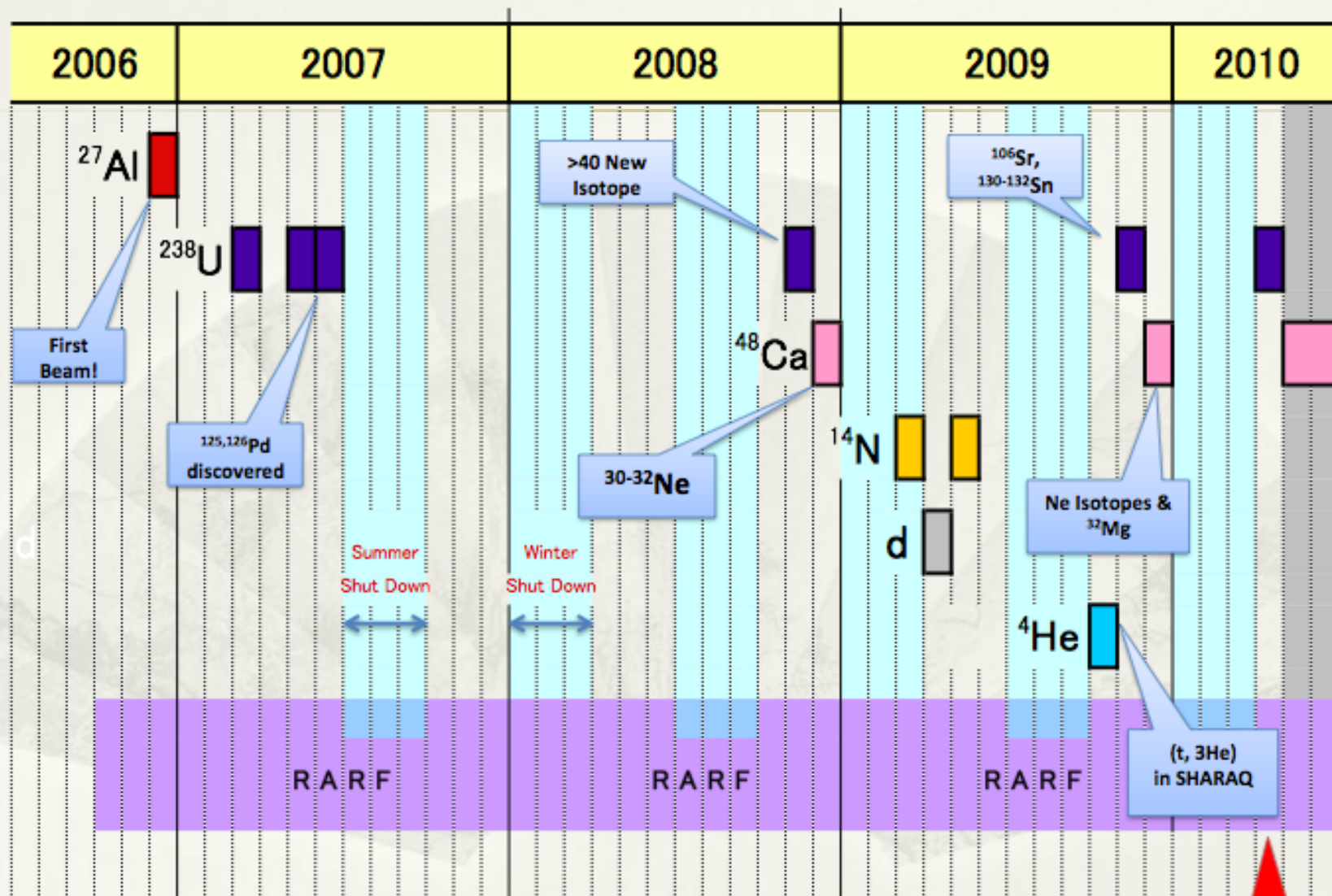
# SRC

Super-conducting  
Ring Cyclotron





# Milestones of RIBF Operation



# Beams used for RIBF experiments from 2007 to 2009

Beams used for RIBF experiments 2007 – 2009

Beam	RC cascade	E (MeV/n)	f (MHz)	Intensity(pnA)	Ope Hours
d	AVF+RRC+SRC	250	27.4	> 10	214
$\alpha$ ( $^4\text{He}^{2+}$ )	RILAC+RRC+IRC+SRC	320	35.6	> 600	413
$^{14}\text{N}$	AVF+RRC+SRC	250	27.4	> 200	775
$^{48}\text{Ca}$	RILAC+RRC+IRC+SRC	345	36.5	200	574
$^{238}\text{U}$	RILAC+RRC+fRC+IRC+SRC	345	18.25	0.5	1548

Total	3522
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# Troubles in SRC

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- \* Feed through ceramic cracked (L.He boiled)
  - \* 2007, 2months
- \* Oil contamination in He cryogenic system.
  - \* 2008, 6 months
- \* 20t Water flowed into vacuum chamber!
  - \* 2009, 4 months
- \* Some RF cavities work not well in presence of fringing fields.
  - \* aging process is important.



# RC control room



<b>RIKEN STAFF</b>	<b>29</b>
<b>OPERATORS</b>	<b>18</b>
<b>L. He CRYOGENICS</b>	<b>8</b>
<b>CGS and OTHERS</b>	<b>10</b>

# Summary

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- \* Achievements.

- \* Full mass range (d – U).
- \* Every acceleration modes.

- \* Several kinds of beam already used in Exp.

- \* RI beams produced as expected.
- \* New isotopes (>45) discovered and so on.

- \* Future program

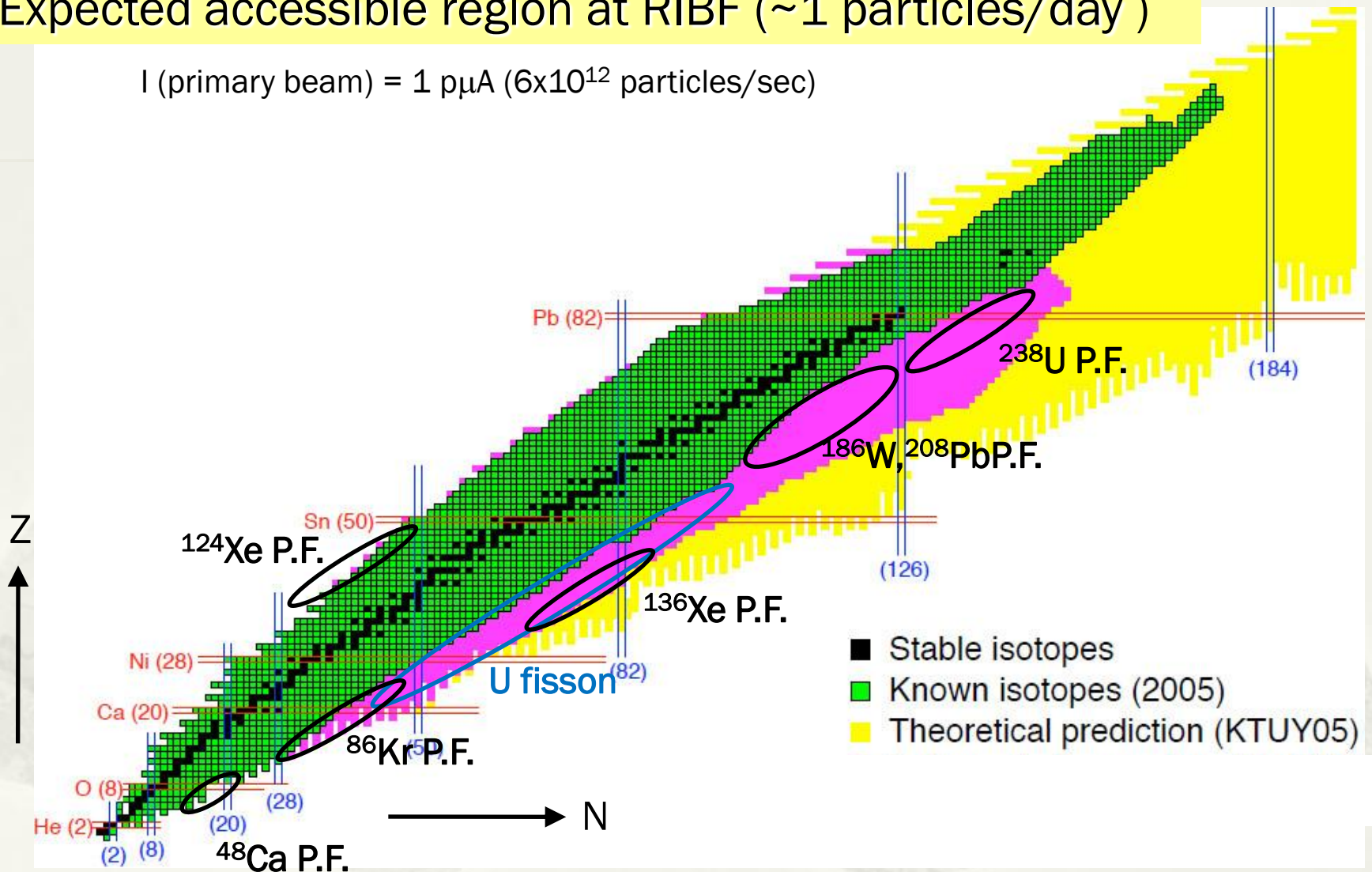
- \* Development of Ion source & Charge stripper.
- \* New injector (RILAC2)

감사합니다.



# Expected accessible region at RIBF ( $\sim 1$ particles/day)

I (primary beam) = 1  $\mu\text{A}$  ( $6 \times 10^{12}$  particles/sec)



Hope to open up a new isotope world !!