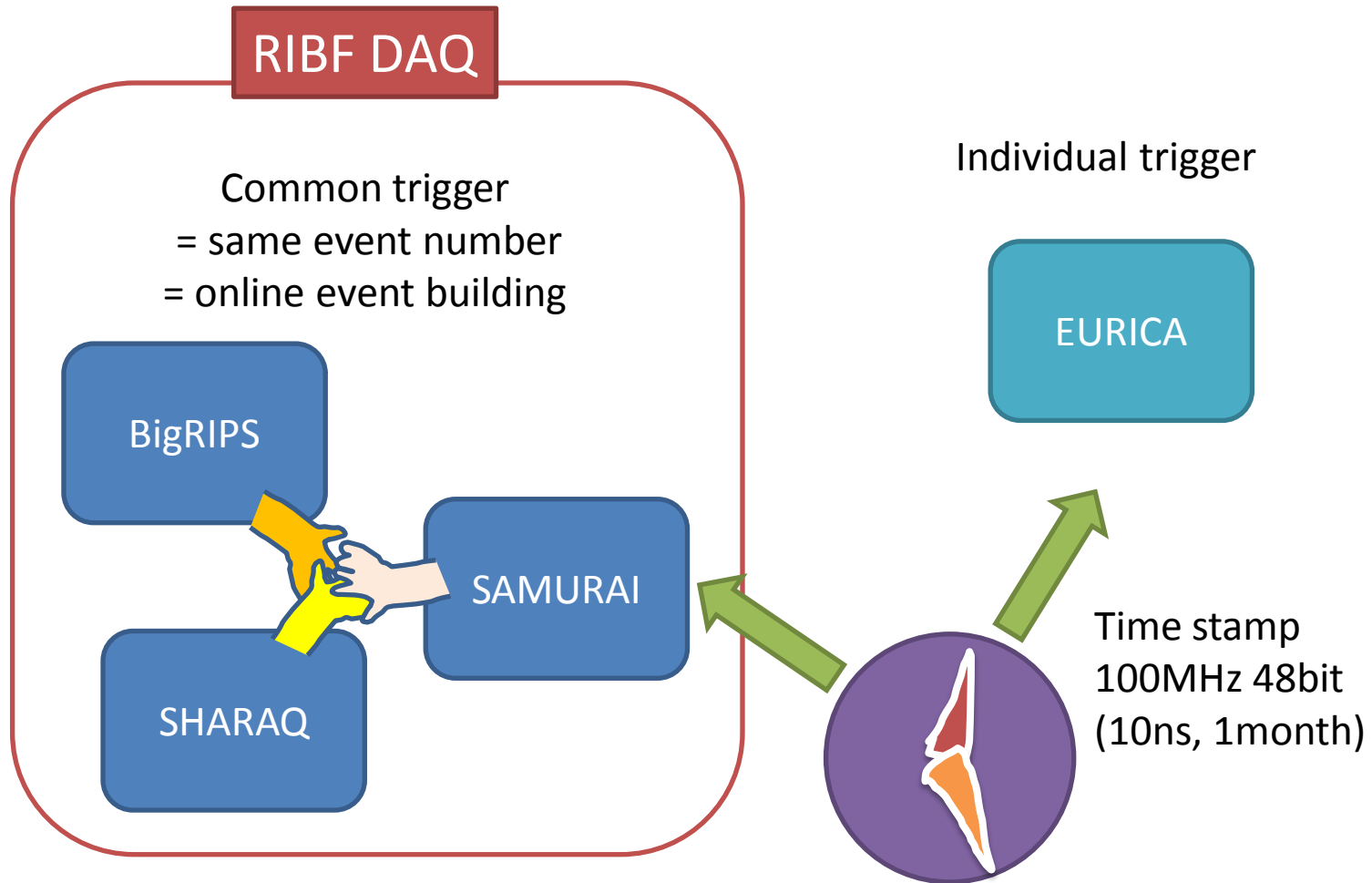


# Data Acquisition System @ RIBF

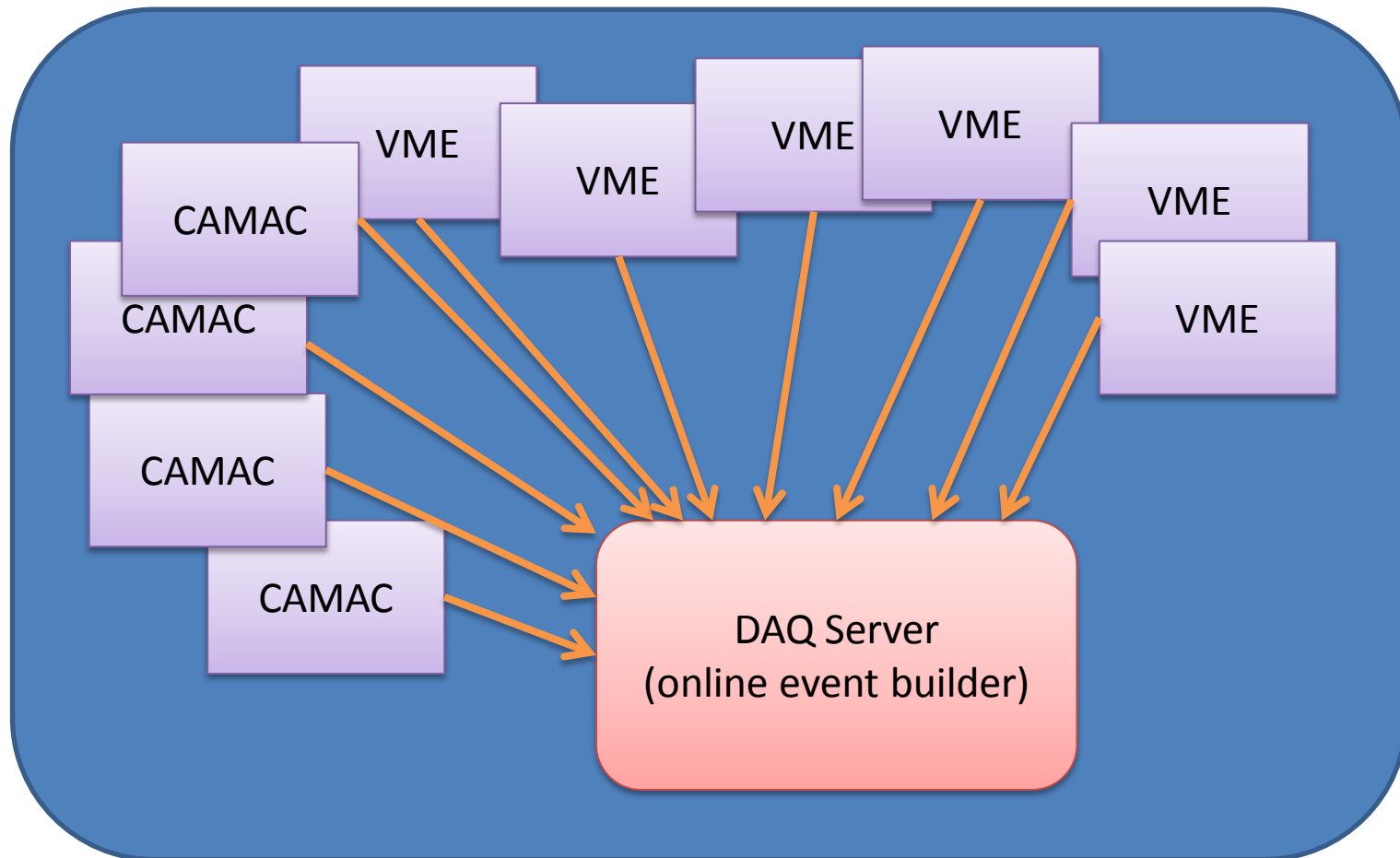
Hidetada Baba  
RIKEN, Nishina Center

# Overview

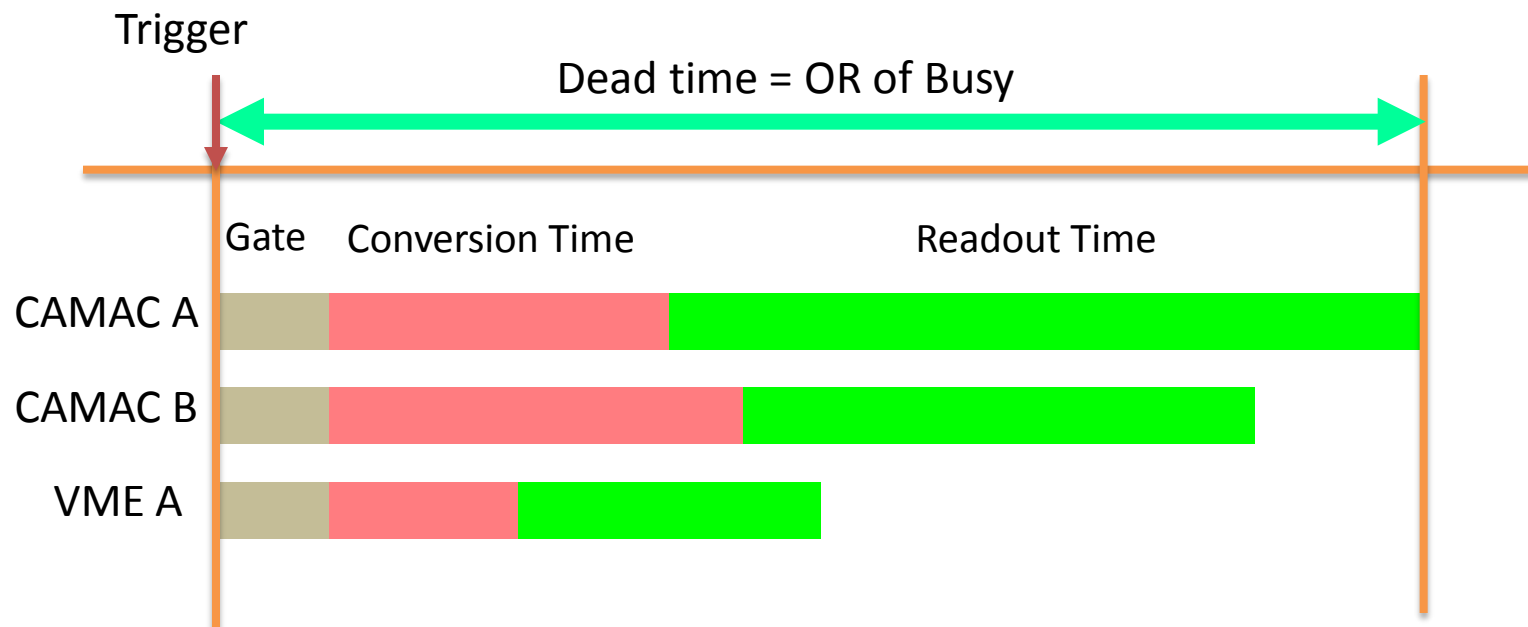


# Common trigger DAQ = RIBF DAQ

Network distributed



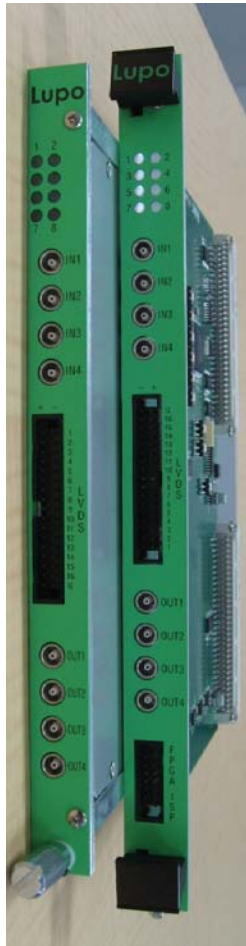
# Dead time in Common trigger DAQ



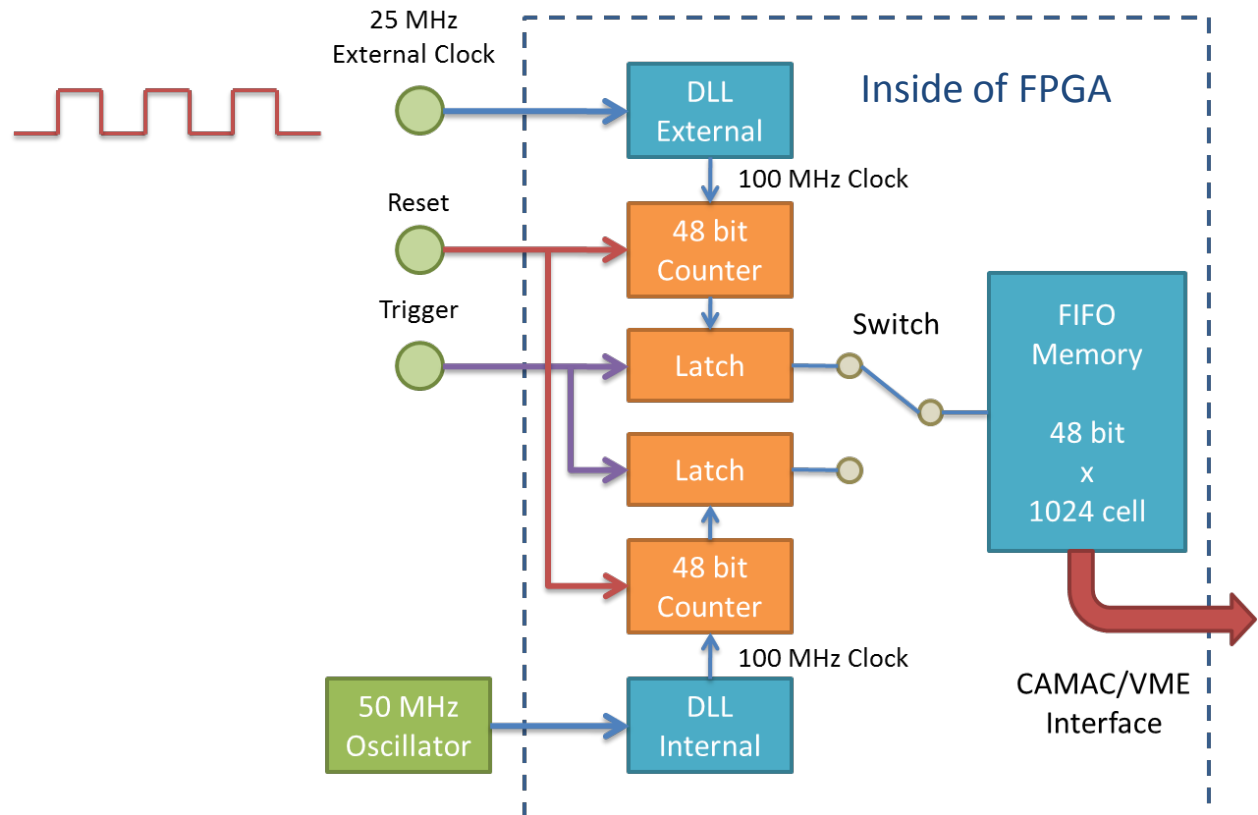
Dead time = the slowest front-end

# Time stamping system

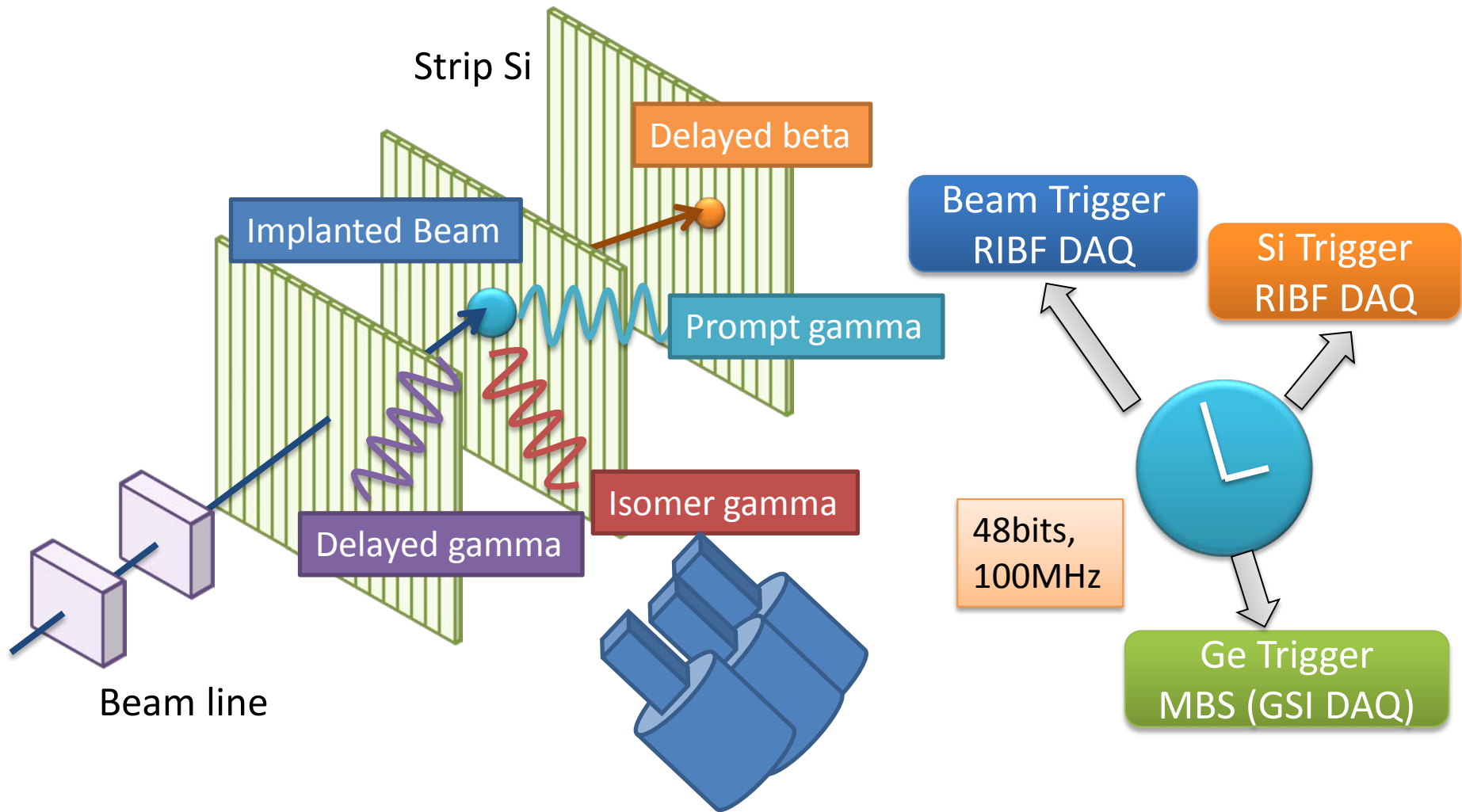
CAMAC and VME  
FPGA module  
(LUPO)



- 25/50/100 MHz external clock
- Time Reset Signal (T zero)
- Trigger

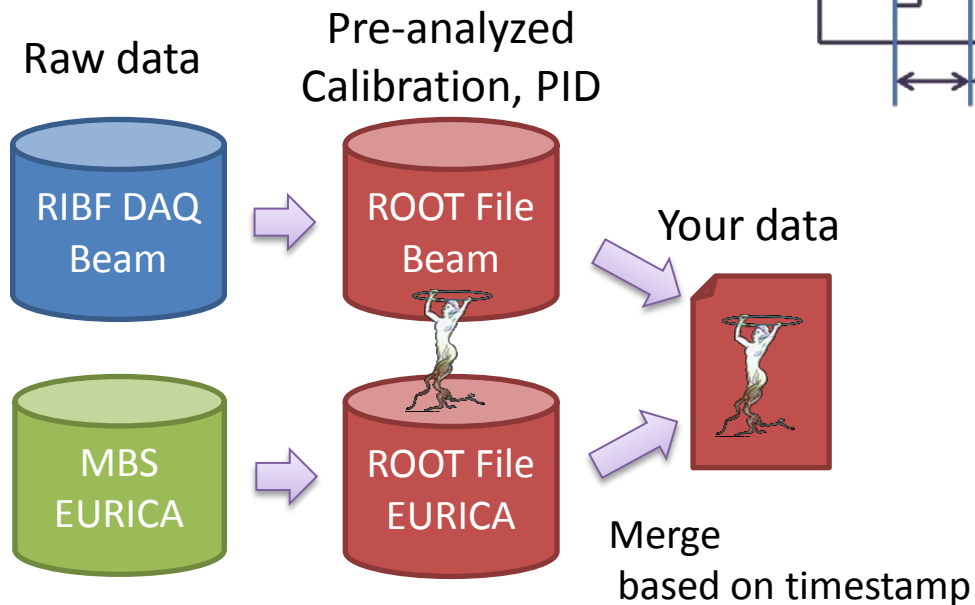
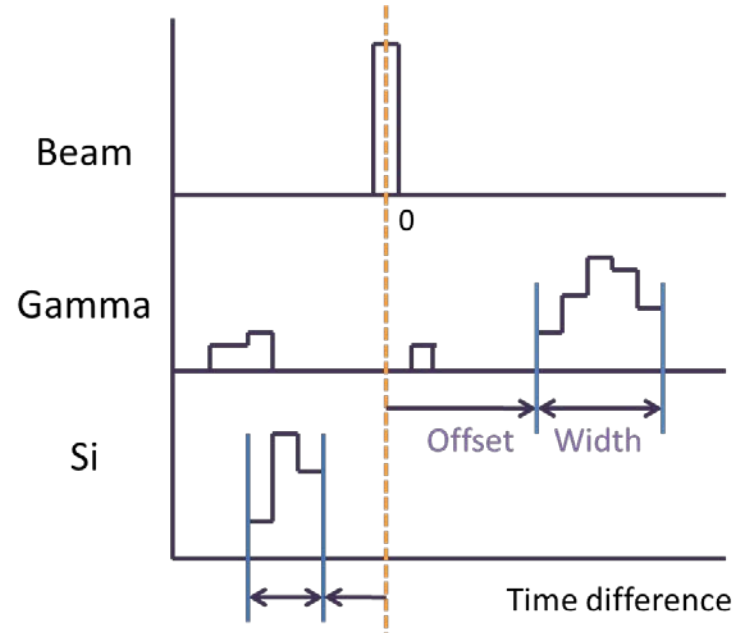


# Beta decay experiments with EURICA



# Time stamp based event build (offline)

- Timing histogram relative to Beam timing
- Coincidence window (**Offset** and **Width**) is set by human hands



# Special case = Multi Time Stamp

16ch Time  
stamping  
firmware

16 x trigger



up to 500kHz  
= dead time free



Usual case,

1 detector array = 1 trigger = 1 time stamp

Multi Time Stamp case,

16 detectors = 16 self trigger = 16 time stamp

Store **time stamp information only**  
without dead time



Suitable for beta decay experiments  
(if you need timing information only)



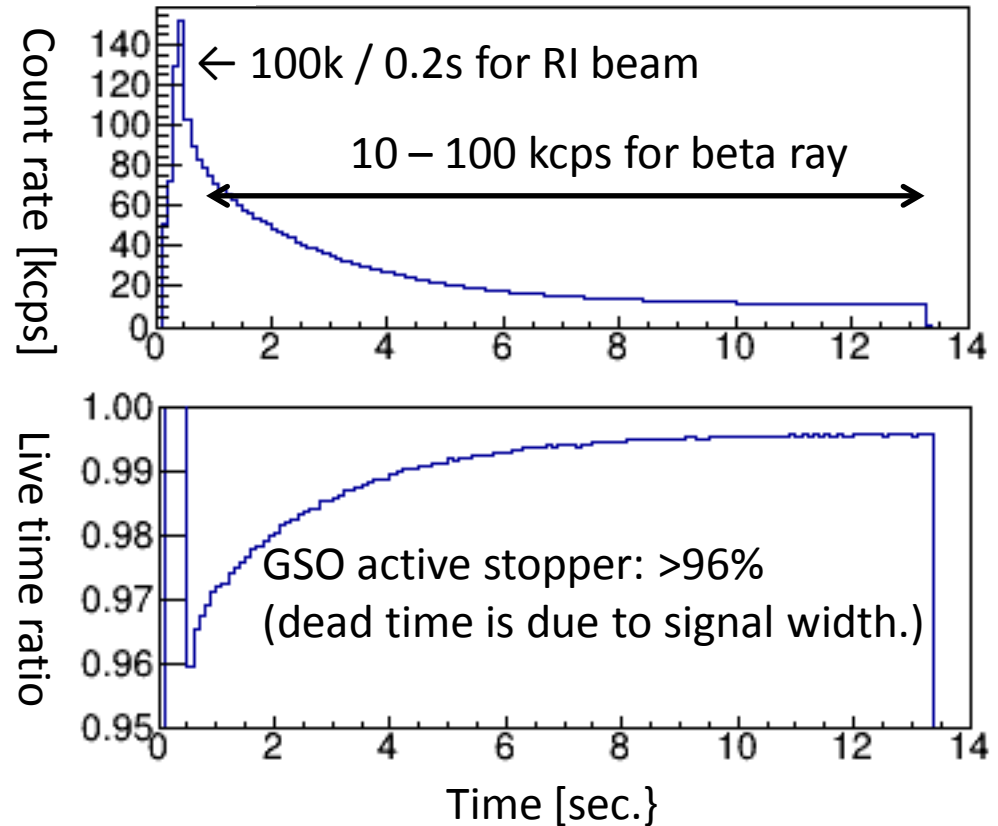
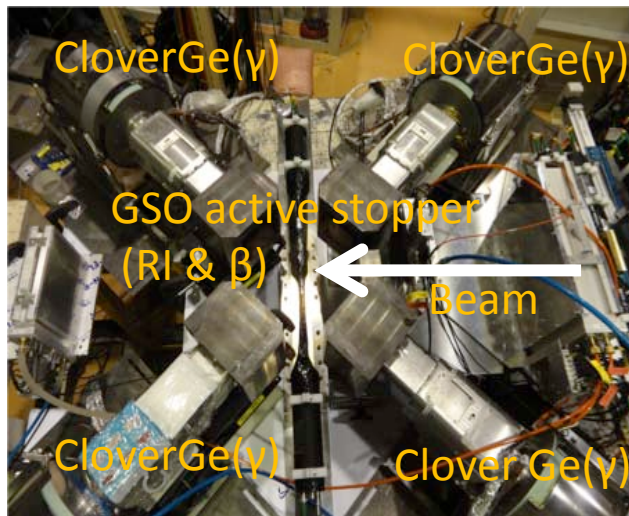
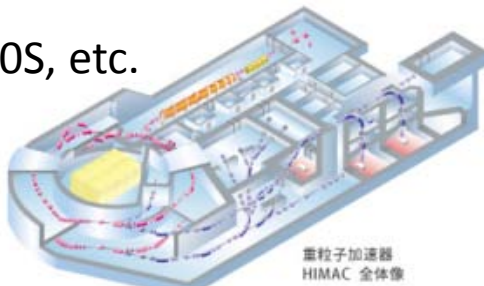
# Practical Example of Multi Time Stamp

D. Nishimura (Tokyo Univ. of Sci.) *et al.*

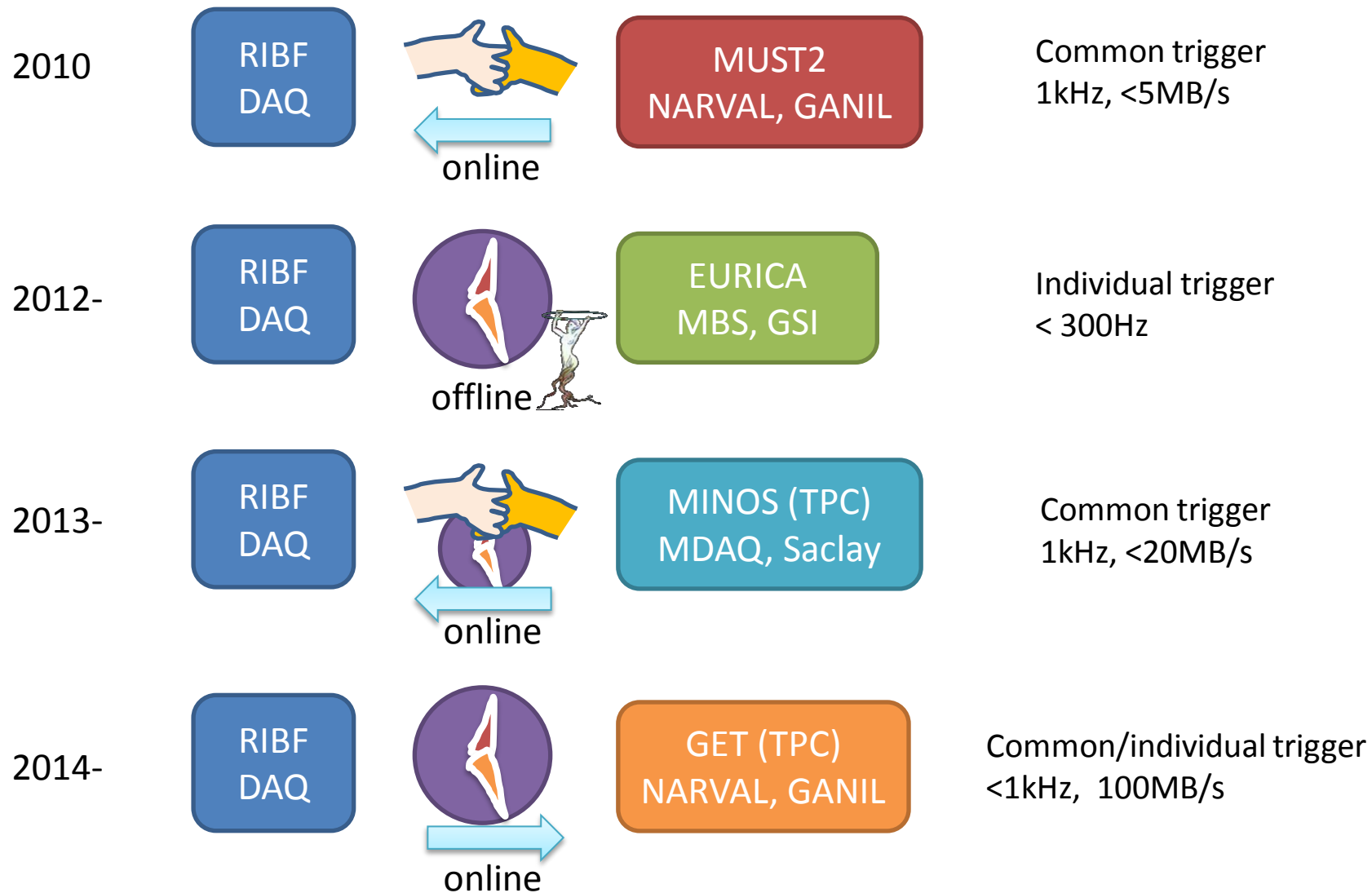
Branching ratio measurement  
for super-allowed Fermi-type  $\beta$  decay

$^{18}\text{Ne}$ ,  $^{26}\text{Si}$ ,  $^{30}\text{S}$ , etc.

NIRS-HIMAC  
Heavy-ion synchrotron



# Coupling DAQ, several cases



# For BRIKEN

- No dedicated DAQ system
  - please use RIBF DAQ
    - full support for CAMAC and VME
    - time stamping system
- If there are some existing systems
  - Time stamp
    - Clock synchronization
  - RUN Start/Stop synchronization?
    - in EURICA, we didn't
- Analysis
  - ROOT base
  - Offline event building
  - Time stamps into Database
- Man power for DAQ in RIKEN
  - very limited, let's discuss very long before the experiment

