

# Introduction and Status of DAQ

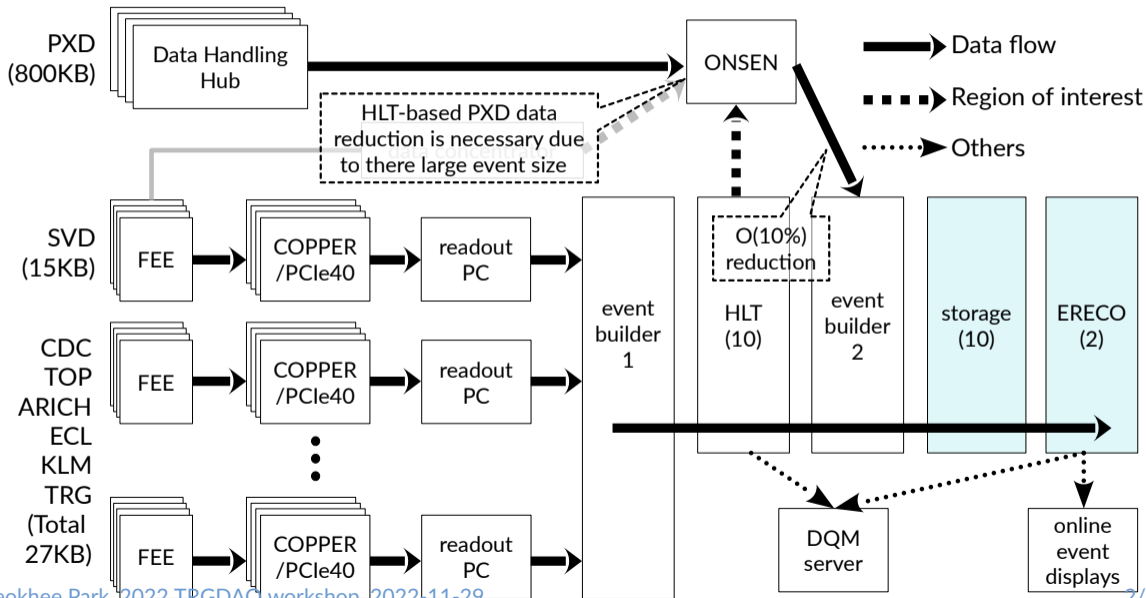
Seokhee Park

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KEK IPNS

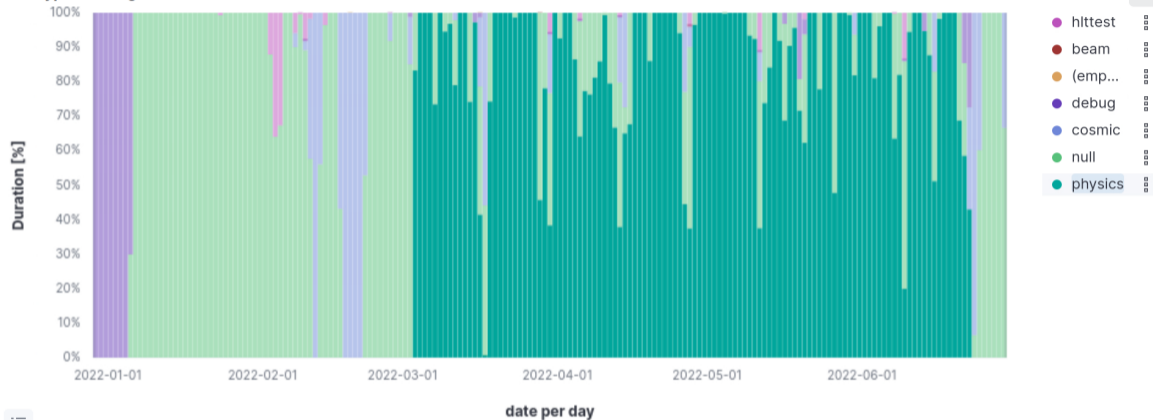
2022, Nov. 29th

# Introduction



# 2022ab DAQ status summary

RunType in histogram



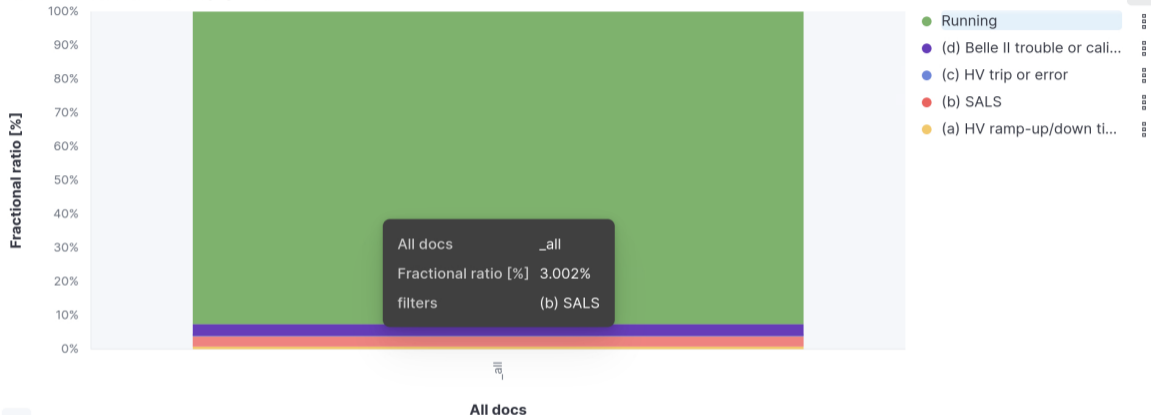
# 2022ab DAQ status summary

## 2. Run-time fraction - Total [physics]



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# 2022ab DAQ status summary

## ■ Overall run time fraction is 92.61%

- ▶ SALS makes 3% dead time
- ▶ If we can reduce the SALS time, we can achieve 95% running time

## ■ A few major downtime solely from DAQ → mostly resolved

- ▶ Splited NSM 9020 network → resolved by Nakao-san
- ▶ DAQ DB connection lost caused by automatic Postgresql update
  - The automatic update is disabled in temporary
  - Suggestion from Nakao-san: rename the postgresql-11.service to postgresql-11-configdb.service since the postgresql-11-logdb.service was not crashed
- ▶ HLT10 hltwk01 down → mis-communication between DAQ and CR shifter caused the downtime
  - DAQ shifter need to check what CR shifter did
- ▶ Fake interlock → Uehara-san will fix the grounding of the PLC during shutdown period

# 2022ab DAQ status summary

- **PCIe40 was used for TOP and KLM**
  - ▶ It was working well and we experienced many cases
- **ERECO dataflow checking via Rocket.Chat (temporary solution)**
- **DCS group finally organized and started to improve current HV status**
- **Many minor things**
  - ▶ Basf2 release test using HLT test bench
  - ▶ Continuous problem solving related with runrecord and list\_send
  - ▶ Storage RAID recovery failed from degraded mode
  - ▶ ...

# Short summary of LS1 plan

- **During LS1, we proceed many project to achieve better DAQ**
  - ▶ Full PCIe40 implementation
  - ▶ HLT reinforcement
  - ▶ Ring buffer implementation inside the HLT worker
  - ▶ STORE and ERECO upgrade
    - ZeroMQ implemenation
    - Direct ROOT output
  - ▶ Downtime reduction
    - Partial SALS, etc.
  - ▶ DCS group
    - Solid HV state transition scheme
  - ▶ DQM upgrade



# HLT reinforcement in LS1 (not included in the workshop)

- **Until now: 10 HLT units with ~4000 cores**
- **During LS1: 13 HLT units with ~6400 cores**
  - ▶ HLT can treat 20 kHz input rate
  - ▶ HLT13 will be used as a test bench until we close to 20 kHz
  - ▶ 4 more worker nodes per ExpReco unit will be added
    - More statistics of ExpReco DQM

# TTD and COPPER

## **FTSW firmware overhaul project**

*Nara Women's University*

*Mikihiko Nakao*

09:00 - 09:20

## **FTSW4 development status**

*Nara Women's University*

*Mikihiko Nakao*

09:20 - 09:40

## **TTD software for non-stop DAQ**

*Nara Women's University*

*Mikihiko Nakao*

09:40 - 10:00

## **Discussion**

*Nara Women's University*

10:00 - 10:15

## **History of COPPER based readout**

*Nara Women's University*

*Satoru Yamada*

10:15 - 10:30

# Event builder and HLT

## **Event Builder**

*Soh Y. Suzuki*

*Nara Women's University*

10:50 - 11:20

## **Discussion**

*Nara Women's University*

11:20 - 11:30

## **HLT operation history and new framework**

*Ryosuke Itoh*

*Nara Women's University*

11:30 - 12:00

## **HLT test bench**

*Chanyoung Lee*

*Nara Women's University*

12:00 - 12:20

## **Discussion**

*Nara Women's University*

12:20 - 12:30

# DAQ upgrade (replacement of readout system)

<b>Overall status and commissioning in LS1</b> <i>Nara Women's University</i>	<i>Satoru Yamada</i> 13:30 - 13:50
<b>Belle2link implementation and data-error check</b> <i>Nara Women's University</i>	<i>Yun-Tsung Lai</i> 13:50 - 14:05
<b>B2tt firmware</b> <i>Nara Women's University</i>	<i>Dr Dmytro Levit</i> 14:05 - 14:20
<b>Slow-control preparation for SVD</b> <i>Nara Women's University</i>	<i>Qidong Zhou</i> 14:20 - 14:35
<b>Slow-control preparation for CDC and ECL</b> <i>Nara Women's University</i>	<i>Harsh Purwar</i> 14:35 - 14:50
<b>Slow-control preparation for ARICH and TRG</b> <i>Nara Women's University</i>	<i>Yun-Tsung Lai</i> 14:50 - 15:05

# DAQ upgrade (further improvement)

## **Software assisted event-building**

*Nara Women's University*

*Dr Dmytro Levit*

15:25 - 15:45

## **Development at IJClab : Double PCIeexpress and optical b2tt**

*Nara Women's University*

*Tak-Shun Lau*

15:45 - 16:05

## **Interface between FEE and PCIe40**

*Nara Women's University*

*Dr Dmytro Levit*

16:05 - 16:20

## **DAQ upgrade paper**

*Nara Women's University*

*Harsh Purwar*

16:20 - 16:30

# DAQ network

## **DAQ servers and network**

*Mikihiko Nakao*

*Nara Women's University*

16:45 - 17:15

## **Discussion**

*Nara Women's University*

17:15 - 17:35

# STORE and ExpReco

## **STORE upgrade**

*Mr Seokhee Park*

*Nara Women's University*

09:00 - 09:20

## **Discussion**

*Nara Women's University*

09:20 - 09:35

## **ExpressReco upgrade**

*Mr Seokhee Park*

*Nara Women's University*

09:35 - 09:55

## **ExpressReco sampling and performance test**

*Daniel Jacobi*

*Nara Women's University*

09:55 - 10:15

## **Discussion**

*Nara Women's University*

10:15 - 10:30

# DQM and MiraBelle

<b>DQM status and upgrade plans</b> <i>Nara Women's University</i>	<i>Bjoern Spruck</i> 10:50 - 11:15
<b>MiraBelle status and future plans</b> <i>Nara Women's University</i>	<i>Luka Santelj</i> 11:15 - 11:30
<b>DQM SVD</b> <i>Nara Women's University</i>	<i>Francesco Tenchini</i> 11:30 - 11:35
<b>DQM ARICH</b> <i>Nara Women's University</i>	<i>Kenta Uno</i> 11:35 - 11:40
<b>DQM CDC</b> <i>Nara Women's University</i>	<i>Yu Nakazawa</i> 11:40 - 11:45
<b>DQM ECL</b>	<i>Mikhail Remnev</i>



# Slow control and DCS

## Status of Slow Control

Takuto Kunigo

Nara Women's University

15:30 - 16:00

## Discussion

Nara Women's University

16:00 - 16:15

## DCS status

Takuto Kunigo

Nara Women's University

16:15 - 16:35

## EPICS based DCS

Bjoern Spruck



Nara Women's University

16:35 - 16:55

## OPC based DCS

Takuto Kunigo



Nara Women's University

16:55 - 17:15

## Alarm system and Phebus upgrade

Dr Michael Ritzert

Nara Women's University

17:15 - 17:35

## Discussion

Nara Women's University

17:35 - 17:50