

Closing Remarks


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2022 FIFA World Cup Group E

Games this morning

Japan 2 - Spain 1
Germany 4 - Costa Rica 2

Pos	Team	[V·T·E]	Pld	W	D	L	GF	GA	GD	Pts	Qualification
1	 Japan		3	2	0	1	4	3	+1	6	Advance to knockout stage
2	 Spain		3	1	1	1	9	3	+6	4	
3	 Germany		3	1	1	1	6	5	+1	4	
4	 Costa Rica		3	1	0	2	3	11	-8	3	

Congrats to Japan!
Sorry for Germany.

* Japan surprisingly beat both Germany and Spain. Miracle!

The purposes of this workshop and outcome (in my prejudice)

1. To confirm our readiness for 2023c run by examining the current works during LS1.

Outcome

Trigger: 50% reduction in CDC trigger rate expected!
DAQ: Full PCIe40 readout, R.I.P. for COPPER!

2. Think about possible improvements / upgrades in Trigger and DAQ in “LS2 and beyond”.

Outcome

Trigger: VXDTRG, Displaced vertex trigger
DAQ: Collab. with E-sys. New CDC FEE

Comment on auto-recovery

- Recently, for the recovery from FPGA error, “auto-recovery” or “one-push recovery” is implemented in some detector R/O.
- It is useful to reduce the DAQ down time, but please remember that “it is just an ad-hoc solution”. It is not a final solution to the problem.
- We should continue the effort to investigate the root cause of the trouble and find a way to fix the problem w/o stopping the run.
Ex.
 - * Self recovery mechanism of SEU implemented in ARICH readout.

“LS2 and Beyond”

- Belle II operation will continue for more than 10 years and we need to be prepared for such a very long term operation.
- The No. 1 priority is put on increasing sensitivity to new physics.
 - > Maximize efficiency for physics-interested events.
- Trigger: reduce the background as low as possible while improving the efficiency for low multiplicity NP events
- DAQ : reduce the DAQ dead time as low as possible while seeking for the way to go beyond the 30kHz limit.

- IMHO, it's time to consider "Triggerless DAQ" approach.
 - * LHCb already adopted this approach from Run 3 and the efficiency for events with low multiplicity / low momentum tracks is reported to be much improved.
 - * Fixed target experiments are also deploying the approach including J-PARC hadron experiments.
- It might be too early to go for it in LS2, but if we plan the further upgrade of Belle II (to Belle III(?)), I believe TRG/DAQ should be designed based on Triggerless DAQ concept.
- The improvement in NP sensitivity by adopting Triggerless DAQ has to be studied by MC as the first step.

- Triggerless DAQ needs to manage a huge data flow up to HLT and all event selection process relies on HLT processing, where HLT could consist of
 - * Hardware (FPGA) / GPU based HLT at the 1st stage
 - * More sophisticated software processing at the 2nd stage with much-faster
 - * Clock distribution
 - * Detector FEE
 - * Data transport and “continuous” event building
- Machine learning will take the major role to optimize the trigger menu.

-> To realize “Triggerless DAQ”, a closer collaboration of both Trigger and DAQ activities is essential.

History of TRG/DAQ workshop

- TRG/DAQ workshop series has been started from 1997 in Nara! and workshops were annually held until 2006 at various places in Japan. After 3-year intermission, the WS series was restarted from 2010.
- Due to CoViD situation, we could not have workshop in 2020 and 21.
- History:
 - 2010 : Seoul (Korea Univ. hosted by E.Won)
 - 2011 : Beijing (Peking Univ. hosted by Z.-A.Liu)
 - 2012 : Hawaii (U. of Hawaii hosted by G.Varner)
 - 2013 : Seoul (Hanyang Univ. hosted by B.G.Cheon)
 - 2014 : Taipei (NTU hosted by J.G Shiu)
 - 2015 : Osaka (OCU hosted by E.Nakano)
 - 2016 : Novosibirsk (BINP hosted by A.Kuzmin)
 - 2017 : Taipei (NTU hosted by J.G.Shiu)
 - 2018 : Karlsruhe (KIT hosted by S.Bauer)
 - 2019 : Seoul (Yonsei U. hosted by YJ.Kwon)
 - 2022 : Nara (NWU, hosted by Miyabayashi-san)

Next Workshop. Where and When?

- Our tradition is to have workshop somewhere in Asia.
- Recent venue:
Taipei (2018) -> Seoul (2019) -> Nara (2022)
- Sometimes we had workshop outside Asia
Hawaii (2012), Novosibirsk(2016), Karlsruhe (2018)
- So, where for next workshop? => ????
- When? => Could be late autumn in 2023, but depends on the situation of 2023c run start.

Let's thank Miyabayashi-san,
Hayasyii-san,
and students
for organizing this great workshop!



The Workshop adjourns.

Thank you very much for joining,
and have a safe trip to home.

See you again soon in February B2GM.