

# **Workshop // on // Fast Realtime Systems // and // Realtime Machine Learning**



## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

## Welcome, information, scope of the workshop

*Monday, April 8, 2024 10:15 AM (15 minutes)*

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Fast DAQ and Trigger #1

Contribution ID: 2

Type: **not specified**

## **LHCb triggerless readout**

**Presenter:** NEUFELD, Niko (CERN)

**Session Classification:** Fast DAQ and Trigger #3

Contribution ID: 3

Type: **not specified**

## **LHCb triggerless readout, software trigger and online reconstruction**

*Monday, April 8, 2024 3:30 PM (45 minutes)*

**Presenters:** PERRO, Alberto (CERN); NEUFELD, Niko (CERN)

**Session Classification:** Fast DAQ and Trigger #3

Contribution ID: 4

Type: **not specified**

# **ALICE triggerless readout, software trigger and online reconstruction**

*Monday, April 8, 2024 10:30 AM (45 minutes)*

**Presenter:** ROHR, David (CERN)

**Session Classification:** Fast DAQ and Trigger #1

Contribution ID: 5

Type: **not specified**

## **FairMQ and other tools (DDS und ODC) for online Integration of high performance computing clusters**

*Monday, April 8, 2024 2:10 PM (30 minutes)*

**Primary authors:** RYBALCHENKO, Alexey (GSI Darmstadt); AL-TURANY, Mohammad (GSI Darmstadt)

**Presenters:** RYBALCHENKO, Alexey (GSI Darmstadt); AL-TURANY, Mohammad (GSI Darmstadt)

**Session Classification:** Fast DAQ and Trigger #2

Contribution ID: 6

Type: **not specified**

## **DAQ and trigger systems at present and future neutrino experiments (Jennifer2 project report)**

*Monday, April 8, 2024 1:30 PM (30 minutes)*

**Presenter:** RICHARDS, Benjamin (U Warwick)

**Session Classification:** Fast DAQ and Trigger #2

Contribution ID: 7

Type: **not specified**

## **TDC on FPGA and application n the DAQ system of the HADES experiment**

*Tuesday, April 9, 2024 9:40 AM (45 minutes)*

**Presenter:** TRAXLER, Michael (FAIR Darmstadt)

**Session Classification:** Fast DAQ and Trigger #4: FPGA



Contribution ID: 8

Type: **not specified**

## **ADC on FPGA**

**Session Classification:** Fast DAQ and Trigger #4: FPGA

Contribution ID: 9

Type: **not specified**

## **FPGA-based Belle II PXD readout (Jennifer2 Project Report)**

*Tuesday, April 9, 2024 1:15 PM (30 minutes)*

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Fast DAQ and Trigger #5

Contribution ID: **10**

Type: **not specified**

## **FPGA Firmware for new Kintex UltraScale board (AXIStream)**

*Tuesday, April 9, 2024 1:55 PM (20 minutes)*

**Presenter:** KREIN, Matthaeus (BELLE (BELLE II Experiment))

**Session Classification:** Fast DAQ and Trigger #5

Contribution ID: **11**

Type: **not specified**

## **Belle II Neutrotrigger**

*Wednesday, April 10, 2024 1:15 PM (30 minutes)*

**Presenter:** KIESLING, Christian (Belle/MPIM (H1 / MPI Muenchen))

**Session Classification:** Realtime ML #2

Contribution ID: 12

Type: **not specified**

# Real-time Graph Building on FPGAs for Machine Learning Trigger Applications in Particle Physics

*Wednesday, April 10, 2024 2:15 PM (20 minutes)*

**Presenter:** NEU, Marc (KIT Karlsruhe)

**Session Classification:** Realtime ML #2

Contribution ID: 13

Type: **not specified**

## **Hit Clean-up with GNNs for real-time tracking at Belle II**

*Wednesday, April 10, 2024 1:50 PM (20 minutes)*

**Presenter:** HEINE, Greta (KIT Karlsruhe)

**Session Classification:** Realtime ML #2

Contribution ID: 14

Type: **not specified**

## **Real-time Clustering with GNNs for the Electromagnetic Calorimeter Trigger at Belle II**

*Wednesday, April 10, 2024 3:30 PM (20 minutes)*

**Presenter:** HAIDE, Isabel (KIT Karlsruhe)

**Session Classification:** Realtime ML #3

Contribution ID: 15

Type: **not specified**

## **Anomaly detection on trigger level at CMS**

*Wednesday, April 10, 2024 9:00 AM (45 minutes)*

**Presenters:** LOBANOV, Artur (U Hamburg); KASIECZKA, Gregor (U Hamburg)

**Session Classification:** Realtime ML #1



Contribution ID: 16

Type: **not specified**

## **ErUM-WAVE Project, earthquake realtime analysis with FPGAs**

*Wednesday, April 10, 2024 10:00 AM (45 minutes)*

**Presenter:** JOCHEN STEINMANN, CONNY HAMMER (U Hamburg)

**Session Classification:** Realtime ML #1

Contribution ID: 17

Type: **not specified**

## **Project aNNomalie: Data mining and anomaly detection in realtime on detector-near embedded processors**

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Realtime ML #5

Contribution ID: **18**

Type: **not specified**

## **AMD/Xilinx Versal platform and related topics**

*Thursday, April 11, 2024 9:40 AM (45 minutes)*

**Presenter:** BÄHR, Steffen (AMD Xilinx AI Engine Architecture Team)

**Session Classification:** Realtime ML #4

Contribution ID: 19

Type: **not specified**

## **GNN live tracking and triggering on the Versal platform for Dark Matter searches**

*Thursday, April 11, 2024 10:35 AM (45 minutes)*

**Presenter:** LUPBERGER, Michael (U Bonn)

**Session Classification:** Realtime ML #4

Contribution ID: 20

Type: **not specified**

## Data I/O with UDP for hls4ml

*Wednesday, April 10, 2024 11:00 AM (20 minutes)*

**Presenter:** LEHNHARDT, Peter (JLU Giessen)

**Session Classification:** Realtime ML #1

Contribution ID: 21

Type: **not specified**

## **Versal @ Giessen and possible use for anomaly detection in the Belle II PXD**

*Thursday, April 11, 2024 11:30 AM (20 minutes)*

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Realtime ML #4

Contribution ID: 22

Type: **not specified**

## Cherenkov angle reconstruction on Xilinx Virtex

*Tuesday, April 9, 2024 2:20 PM (20 minutes)*

**Presenter:** MUSTAFA, Schmidt (U Wuppertal)

**Session Classification:** Fast DAQ and Trigger #5

Contribution ID: 23

Type: **not specified**

## **Plan for new device's R&D using Versal for the experiments at KEK**

*Thursday, April 11, 2024 9:00 AM (30 minutes)*

**Presenter:** LAI, Yun-Tsung (Belle (SuperKEKB Experiment))

**Session Classification:** Realtime ML #4



Contribution ID: 24

Type: **not specified**

## **Versatile FPGA-based DAQ system using synchronous Aurora links and AXI infrastructure**

*Tuesday, April 9, 2024 10:40 AM (20 minutes)*

**Presenter:** KORCYL, Grzegorz (Jagiellonian University Crakow)

**Session Classification:** Fast DAQ and Trigger #4: FPGA

Contribution ID: 25

Type: **not specified**

## **Hands-on experiences with Xilinx Zynq, UltraScale and UltraScale+**

*Tuesday, April 9, 2024 3:30 PM (45 minutes)*

**Presenter:** SAVINOV, Vladimir (BELLE (BELLE II Experiment))

**Session Classification:** Fast DAQ and Trigger #6

Contribution ID: 26

Type: **not specified**

## **Belle II DAQ Upgrade with PCIe40 (implementation, practical experience and performance)**

*Tuesday, April 9, 2024 9:00 AM (30 minutes)*

**Presenter:** LEVIT, Dmytro (KEK IPNS)

**Session Classification:** Fast DAQ and Trigger #4: FPGA

Contribution ID: 27

Type: **not specified**

## Jennifer2 Project

*Monday, April 8, 2024 1:15 PM (10 minutes)*

**Presenter:** PASSERI, Antonio (BELLE (BELLE II Experiment))

**Session Classification:** Fast DAQ and Trigger #2

Contribution ID: 28

Type: **not specified**

## **Nanosecond anomaly detection with decision trees for high energy physics and real-time application to exotic Higgs decays (HEP L1 trigger)**

*Wednesday, April 10, 2024 4:00 PM (40 minutes)*

**Presenters:** HONG, Tae Min (U Pittsburgh); ROCHE, Steven (U Saint Louis); CARLSON, Ben (Westmont College)

**Session Classification:** Realtime ML #3

Contribution ID: 29

Type: **not specified**

## What is Versal?

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Realtime ML #4

Contribution ID: 30

Type: **not specified**

# The CBM Triggerless Readout: Concepts and Prototyping

*Monday, April 8, 2024 4:30 PM (30 minutes)*

**Presenter:** FRIESE, Volker (FAIR)

**Session Classification:** Fast DAQ and Trigger #3

Contribution ID: 31

Type: **not specified**

**Workshop Dinner, Restaurant Bootshaus,  
Bootshausstraße 12, 35390 Gießen,  
<https://bootshaus-giessen.com>**

*Tuesday, April 9, 2024 7:00 PM (3 hours)*

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))



Contribution ID: 32

Type: **not specified**

## CLOSEOUT

*Thursday, April 11, 2024 12:00 PM (10 minutes)*

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Realtime ML #4

Contribution ID: 33

Type: **not specified**

## **SUMMARY OF THE WORKSHOP (PRESSEERKLÄRUNG)**

**Presenter:** LANGE, Jens Soeren (BELLE (BELLE II Experiment))

**Session Classification:** Realtime ML #4