

DAQ activities: Streaming readout

Jan C. Bernauer

EIC UG meeting, virtual, August 2021



RBRC

RIKEN BNL Research Center



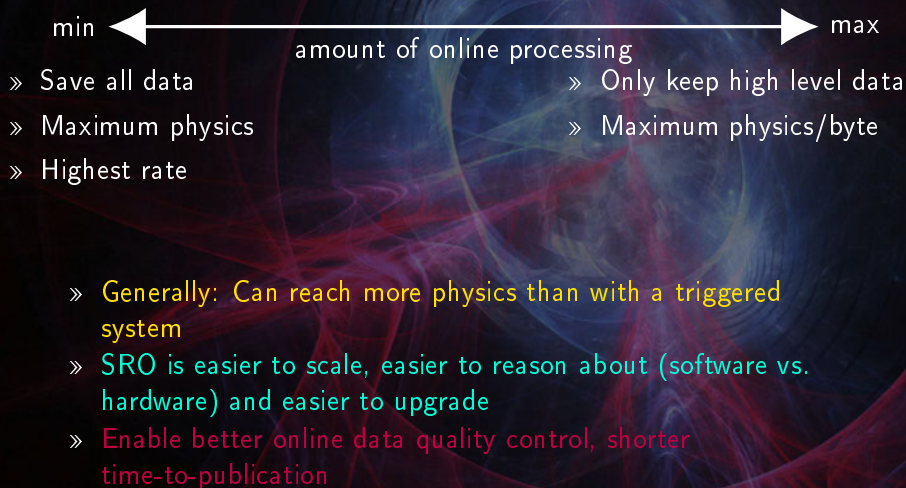
**Stony Brook
University**

What is streaming readout

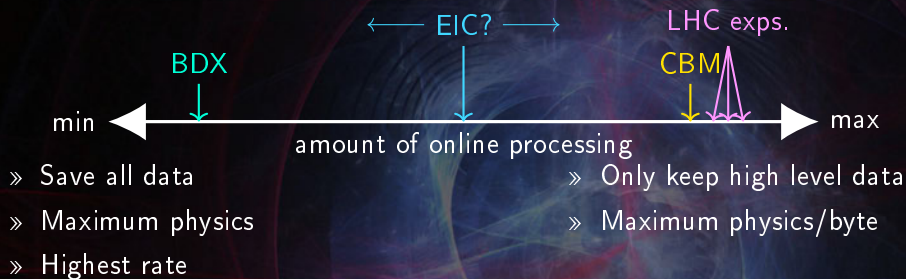
Forgo a hardware (fixed-latency) trigger signal.

Move data selection into software.

Spectrum of SRO

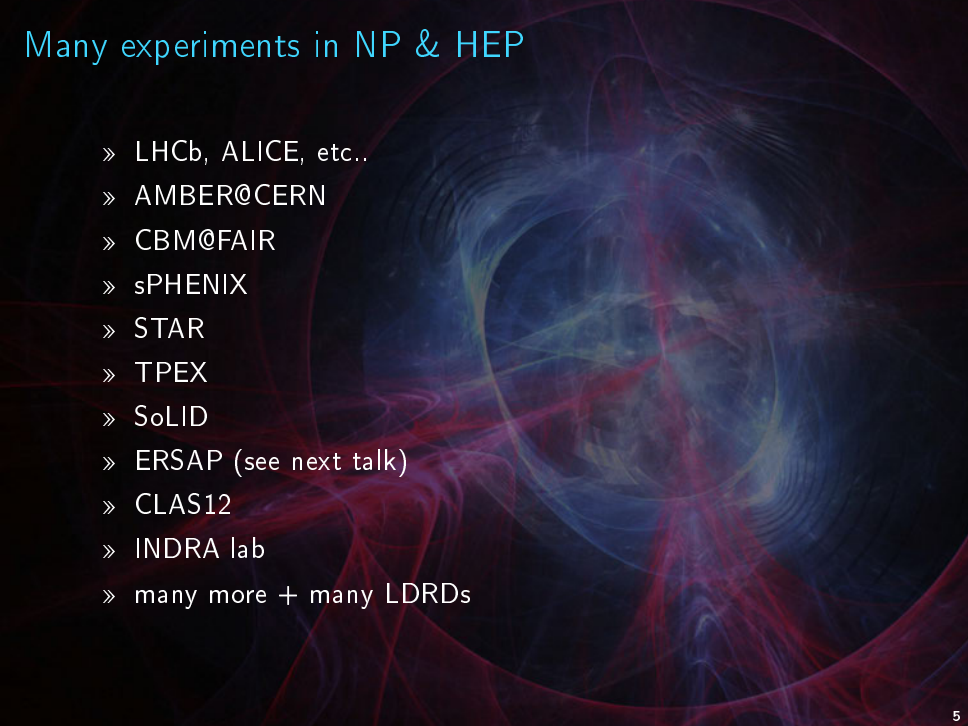


Spectrum of SRO



- » Generally: Can reach more physics than with a triggered system
- » SRO is easier to scale, easier to reason about (software vs. hardware) and easier to upgrade
- » Enable better online data quality control, shorter time-to-publication

Many experiments in NP & HEP



- » LHCb, ALICE, etc..
- » AMBER@CERN
- » CBM@FAIR
- » sPHENIX
- » STAR
- » TPEX
- » SoLID
- » ERSAP (see next talk)
- » CLAS12
- » INDRA lab
- » many more + many LDRDs

Current work

- » Much work on various aspects: From **low level interconnect** to **ML based feature extraction**
- » But many disconnected projects, many not directly aimed at EIC.
- » From our workshops: Most designs very similar. Differences in (inconsequential?) details.
- » Can we foster a more common platform to facilitate reuse of **idea** and **implementation**?

Who is we? eRD23: Streaming readout for EIC

- » Started as a workshop at MIT about streaming readout.
- » Series of workshops, 2 per year, SRO VII was in April 2021
 - » Ideal avenue to exchange ideas, progress etc. across projects.
 - » Contact with commercial enterprises: **What is in the pipeline? What should be in the pipeline?**
- » Monthly phone conference (First monday, 11 am eastern, <https://indico.mit.edu/category/1>)
- » Mailing list: eic_streaming_readout@mit.edu
- » Continues to be very general: We are not aligned with a particular proposal, and have many non-EIC participants.
- » **Not limited to DAQ people: Everyone welcome!**

Next workshop

- » Organized by ORNL
- » virtual, December 8-10 2021



More info

- » Yellow report, chapters 11.10 and 14.6
- » Last workshop: <https://indico.mit.edu/event/1>
- » Progress reports: <https://wiki.bnl.gov/conferences/index.php/EIC-Detector-Proposals> (look for eRD23)
- » phone meetings: <https://indico.mit.edu/category/1>
- » Mailing list: eic_streaming_readout@mit.edu