

Status of Monitoring

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AIDA-2020 Annual Meeting
DESY

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DQM4HEP

- Developed for SDHCAL by Rémi Eté (IPNL) and Antoine Pingault (UGent)
 - Group page – <https://github.com/DQM4HEP>
- Currently used in combined ECAL-SDHCAL test beam in CERN
- Generic data structure, allowing compatibility with any input data type

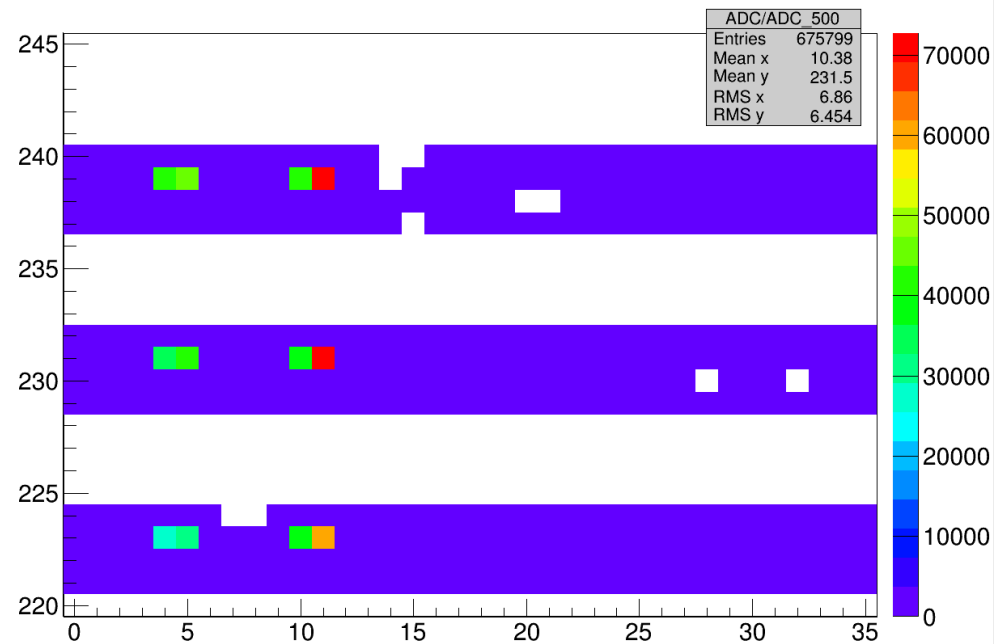
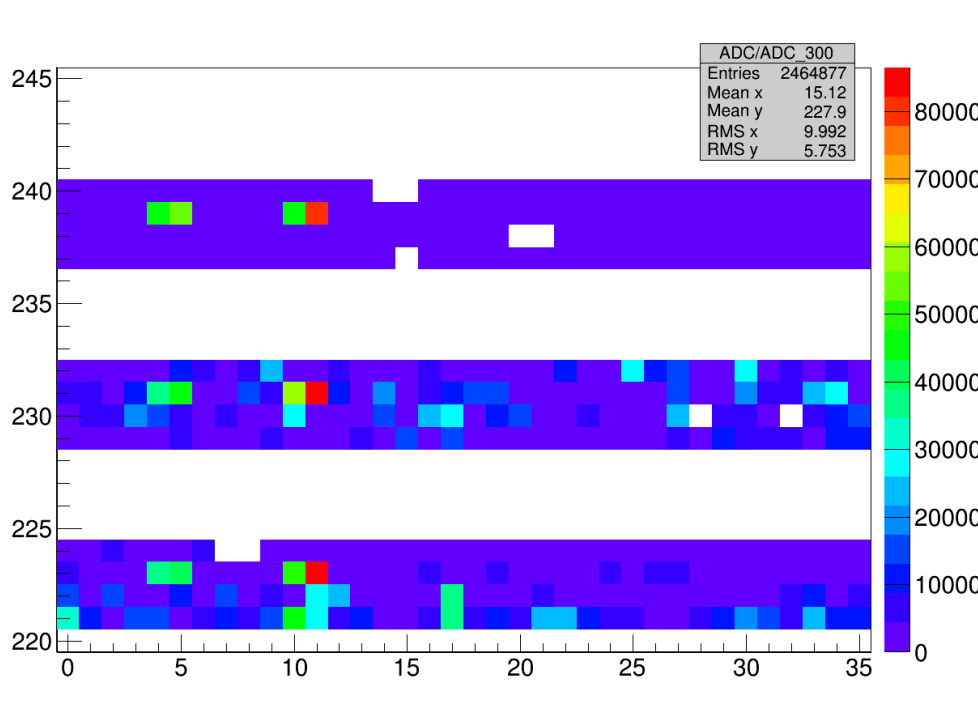


Current Status

- DQM4HEP used successfully as monitor during AHCAL May testbeam
- “Quasi-offline” monitoring working as intended with real beam data
- No true online monitoring yet



Hitmaps

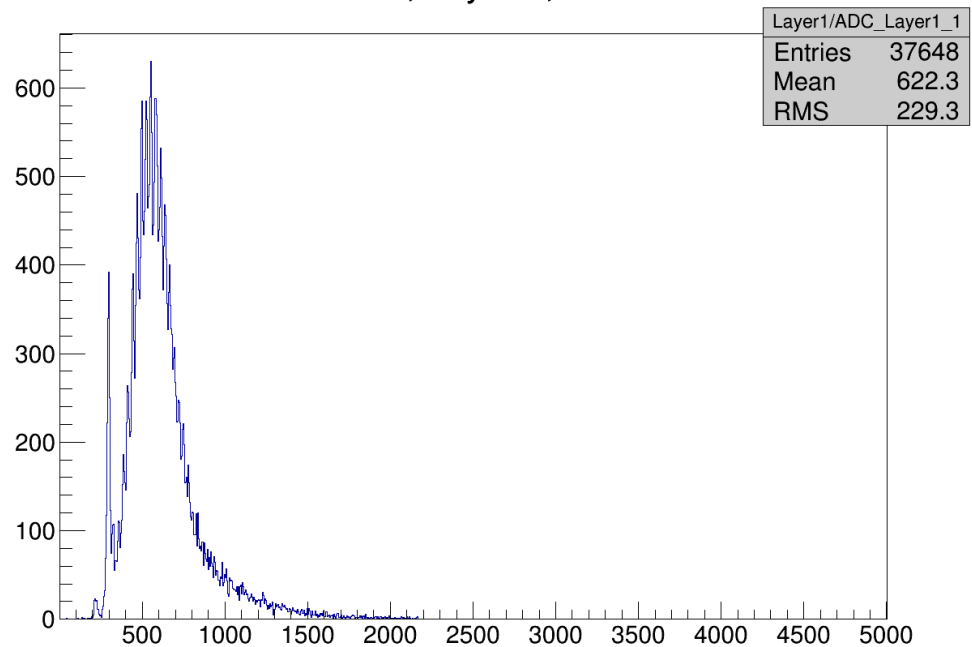


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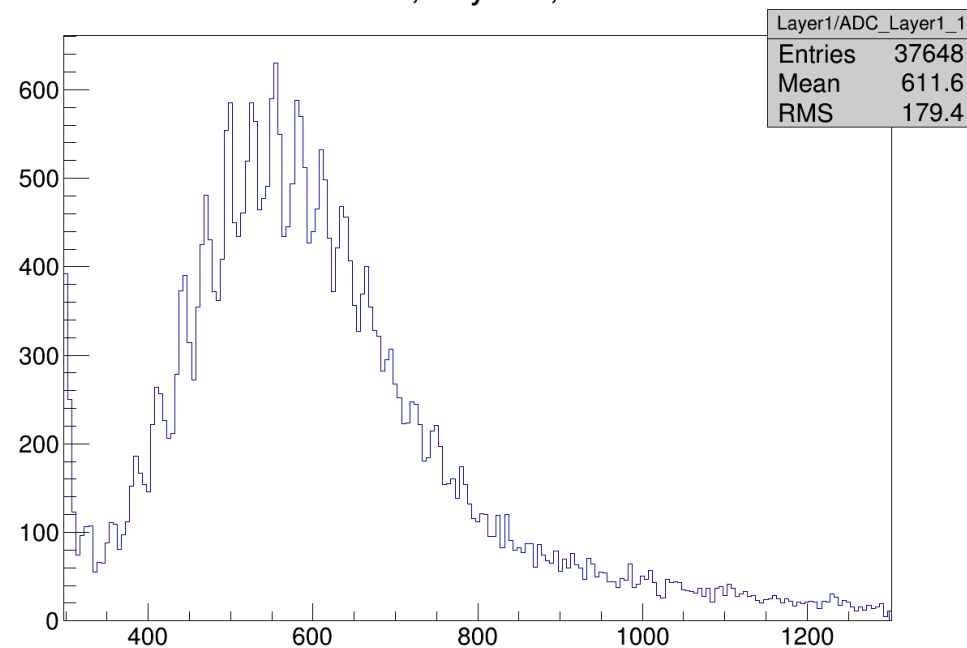
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MIP Spectra

ADC, Layer 1, ch1



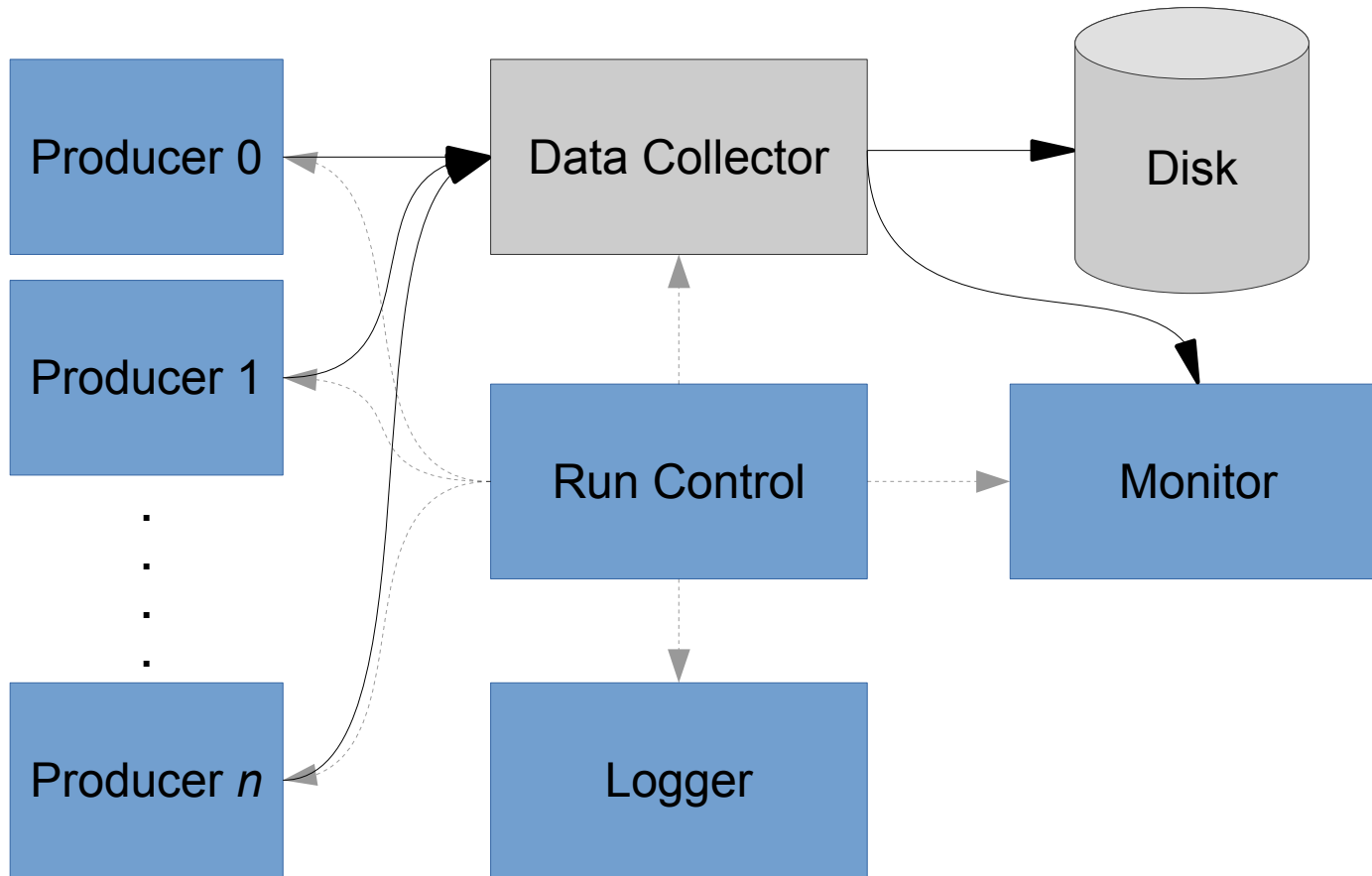
ADC, Layer 1, ch1



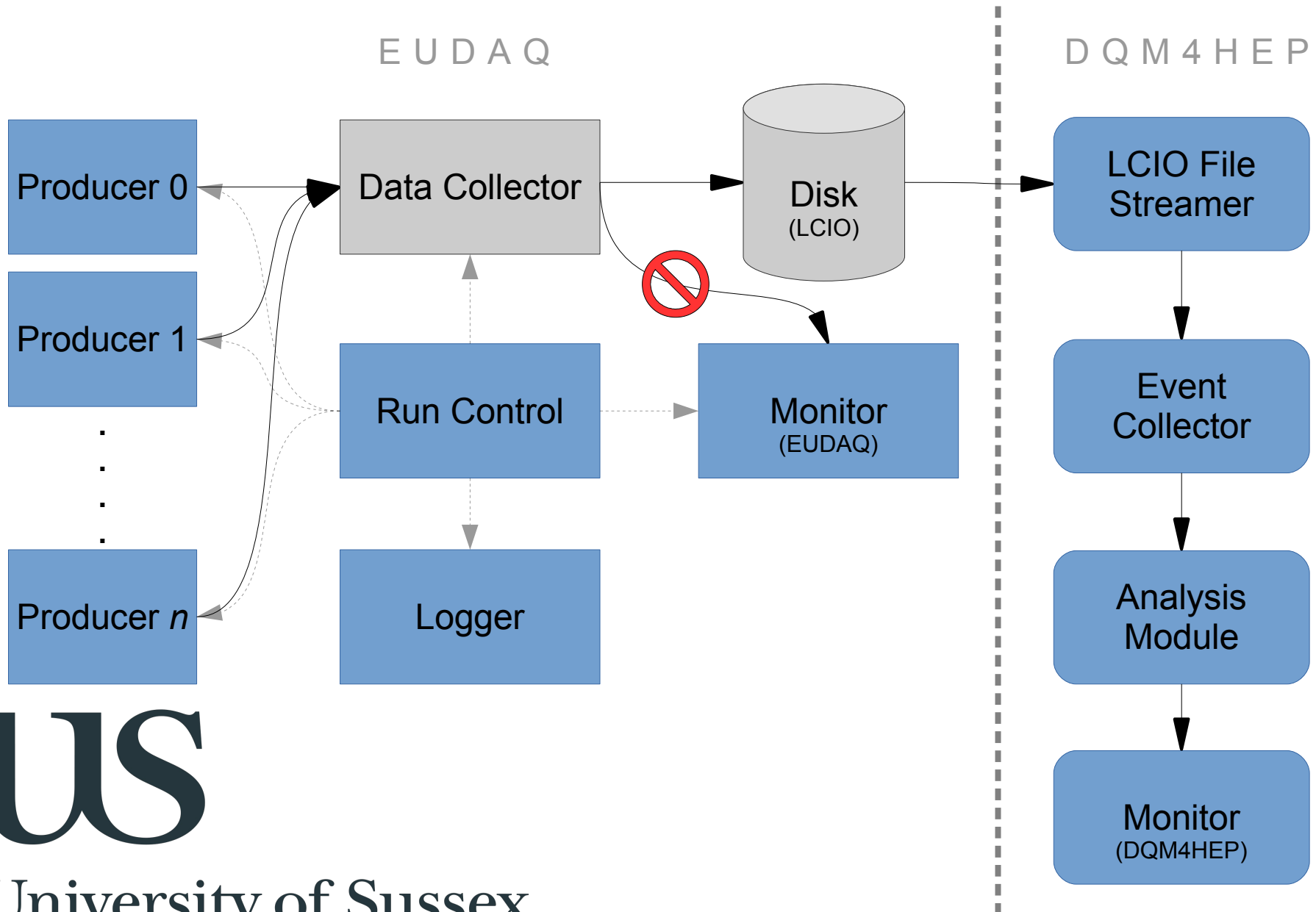
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EUDAQ Structure



EUDAQ with DQM4HEP



Limitations

- Not truly online – run on LCIO files on disk
- LCIO service only sees events in the file that were there when reading began
- Code and memory limits on histograms – must be booked and filled before viewing, imposes limits on number of plots

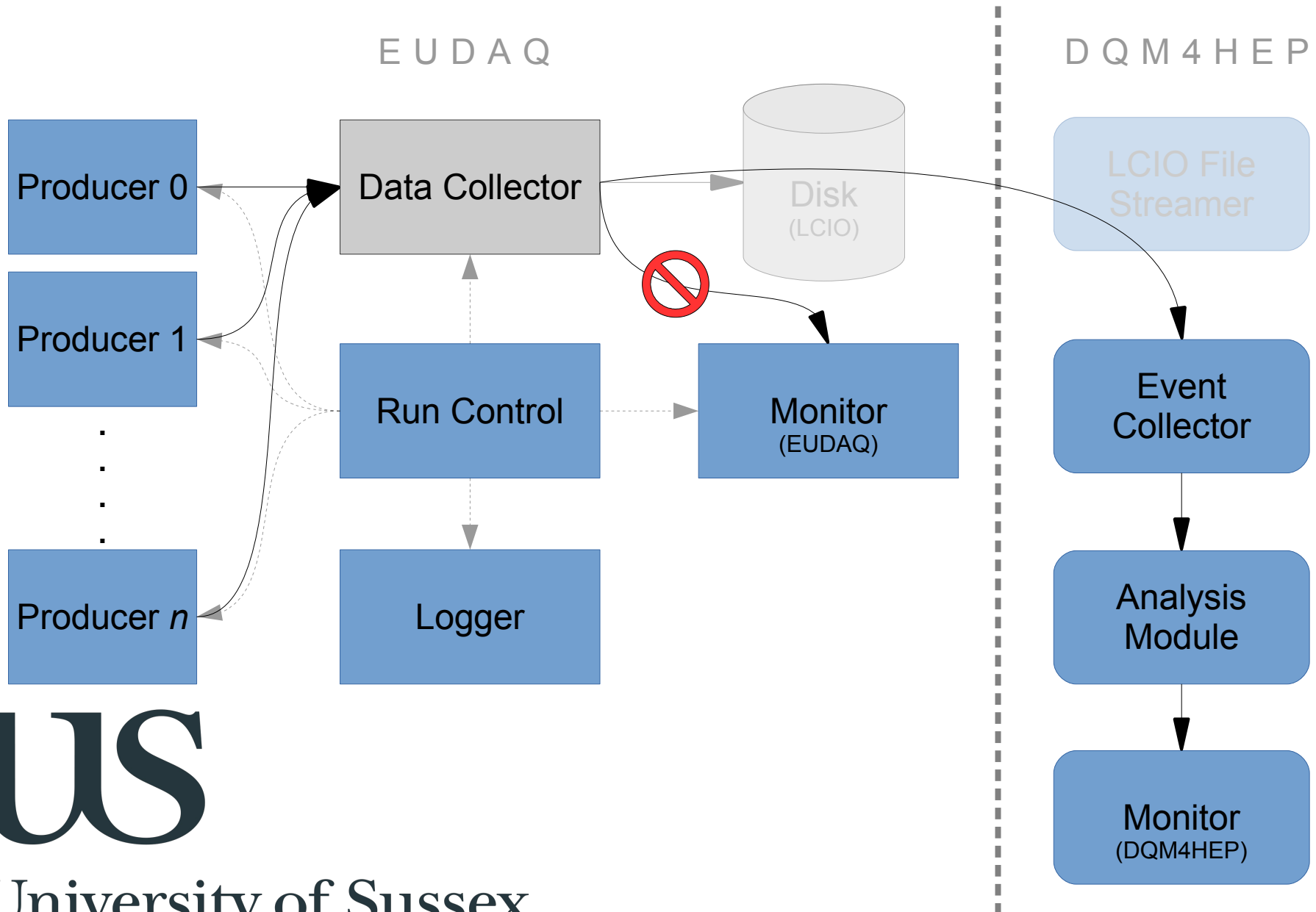


Next Steps

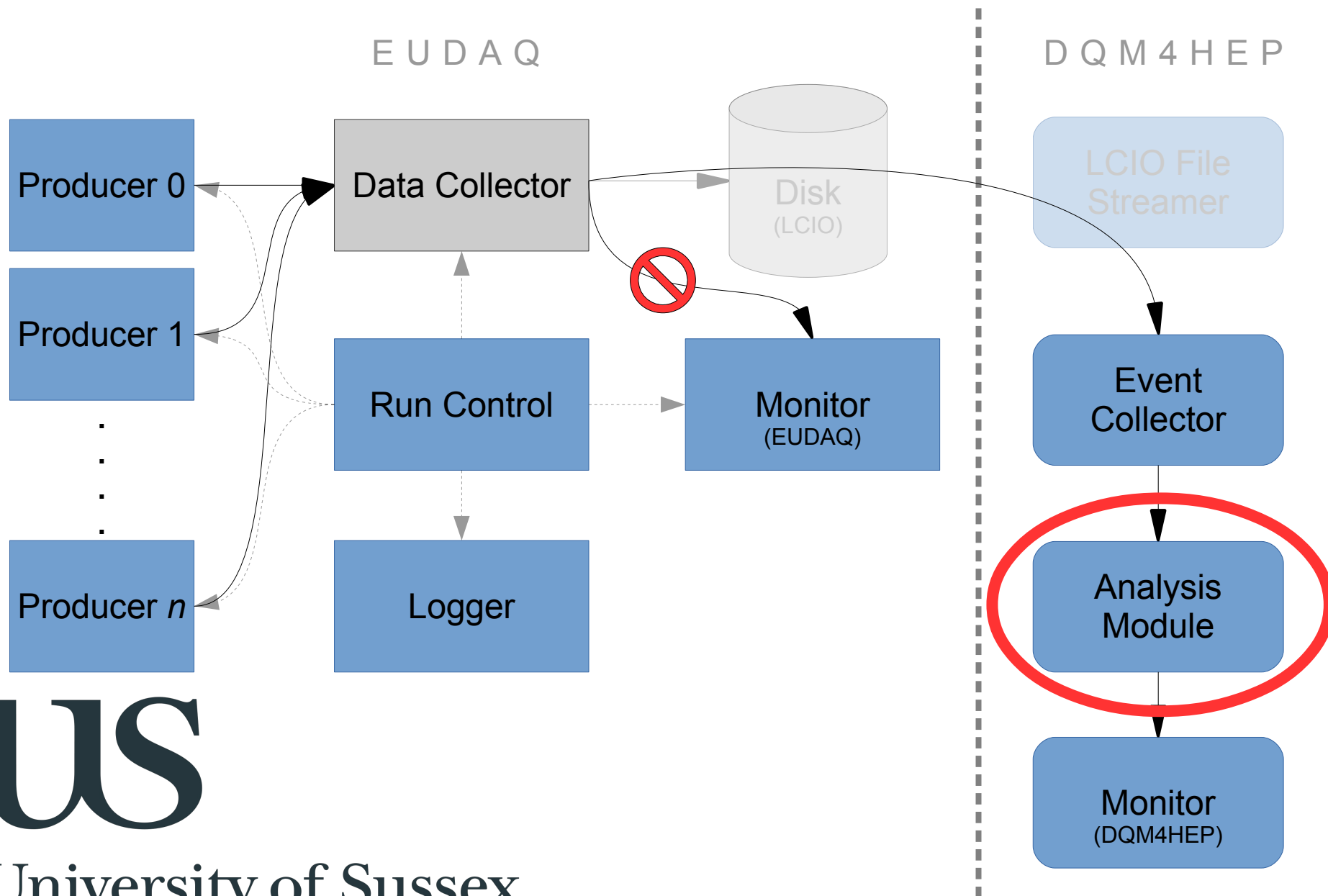
- An LCIO stream from EUDAQ to DQM4HEP's event collector makes the monitor online
- Must be done from within EUDAQ at the step LCIO events are written to disk
- With either a code chunk to insert into custom producers, or a separate producer, this can form a DAQ/monitor common interface



EUDAQ with DQM4HEP



EUDAQ with DQM4HEP



Documentation

- Documentation critical for use at common testbeams; current DQM4HEP documentation is light to non-existent
- Plan to collaborate with Adrian, Rémi and Antoine to provide documentation suitable for combined testbeams



Documentation

- Currently maintaining a page on the FLC/AHCAL wiki detailing our use case
 - http://flcwiki.desy.de/AHCALMonitoring_DQM4HEP
- Covers installation, configuration and running
- Comprehensive and direct instructions with samples for copy-pasting into terminal, bash scripts or CMake files



Future Plans – AHCAL

- Use, learn, then document electronics mapping for hitmap geometry correction
- More flexible selection of chip/channel in Channel module; on-going investigation with regard to memory issues
- Further refinements and improvements



Future Plans – AIDA-2020

- Direct interface with EUDAQ – an LCIO stream from data converter provides a common interface
- Steering from EUDAQ – allow EUDAQ to change settings in DQM4HEP's XML steering file
- Documentation/guide/examples for writing own analysis modules
- Deliverable for M15 – interface specification, defining software interface for DAQ/monitor



Thank you

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Analysis Module

- Analysis module does work of reading steering file, pulling data from SLCIO file, processing events, filling ROOT histograms, etc.
- Three elements:
 - MyModule.cc – readSettings and processEvent
 - MyModule.h – Header file
 - MyModule.xml – Steering: histograms, process names, etc.



Analysis Module

- Current module files:
 - AHCALRawModuleGlobal
 - Monitors global properties (hits for all chip/channels)
 - AHCALRawModuleChannel
 - Monitors a selection of individual chip and channel combinations (specified in XML file at runtime)
 - AHCALRawModuleT0
 - Monitors the T0 channels to discriminate between true event and noise/background



Long-Term Plans

- DQM4HEP as...
 - ...an external framework for CALICE testbeams?
 - ...a core component of EUDAQ?
 - ...a model for a generic EUDAQ monitor?
- Future-proofing for EUDAQ2 – do changes in data storage structure affect efficiency/speed of AHCAL online monitoring and event sorting?



Lorem ipsum dolor

- Maecenas et elit ac dui tristique egestas vitae at ante.
- Donec et augue nec dui interdum laoreet.
- Nullam sollicitudin nunc et eleifend ultrices.
- Aliquam in est fermentum, sagittis nisl vel, condimentum dui.
- Aliquam nec est sit amet velit lacinia vehicula.

