LS1 improvements of DQM

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- bug/glitch fixing of existing features → reliability

- improve/extend DQM framework with new functionality

- improve monitoring plots content

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and this is just a barbecue.

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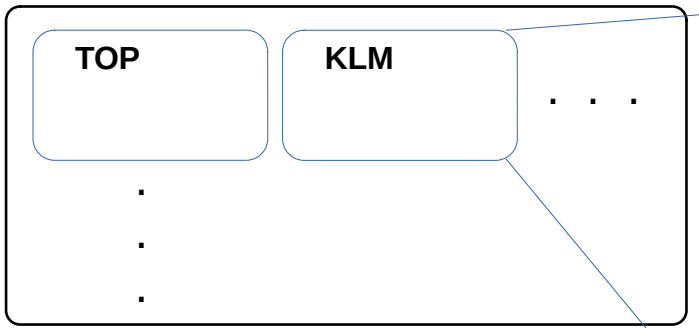
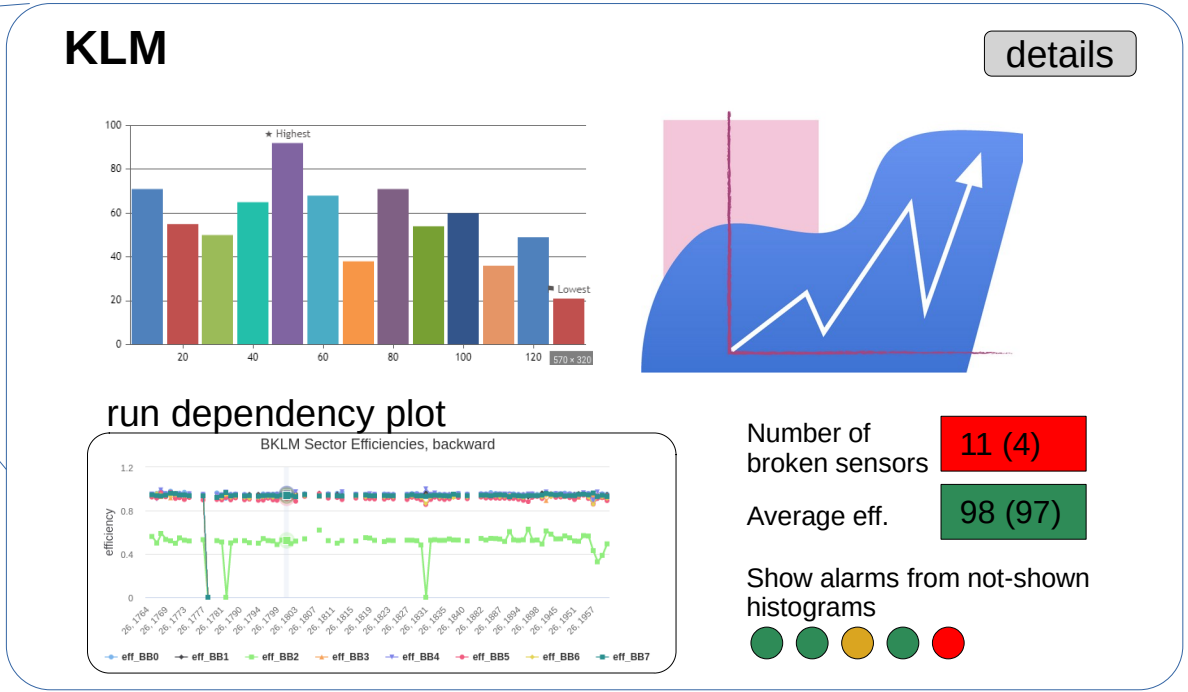
Plan for DQM improvements from the DQM group

- to enable shifters to effectively spot detector problems we plan to improve/rearrange the main DQM panel for shifters → two/three most relevant plots from each system displayed at all times





- include 2/3 main plots
- with “details” open detector dedicated page
- allow flexible size of histograms
- include run dependency plots from MiraBelle?
  (alt. make MiraBelle summary page and display it at all times on another display)
- display numbers
  (inc. default values, easy to change by exp. shifter)
- display alarms from not-shown histograms
- require active participation from the shifters

In discussion with detector groups other features can be implemented…

Guidelines for the content of the main plots

- the purpose of the main panel is solely to enable the CR shifters to spot that there is something wrong (not to identify what is wrong).

  → think of a minimal set of information that is able to reveal problems (as experienced so far or potentially expected)

- clear list of actions should be available to the shifters:
  If this happens → check this and this plot in “details” → if shows this → reconfigure
  → if shows that → call expert

- the content of the plots should be simple and clear
  (at least giving shifters the impression that they know what they are looking at)

- make good use of histogram features available : → delta histograms (time interval)
  → updated references
  → histogram coloring alarms (limits)

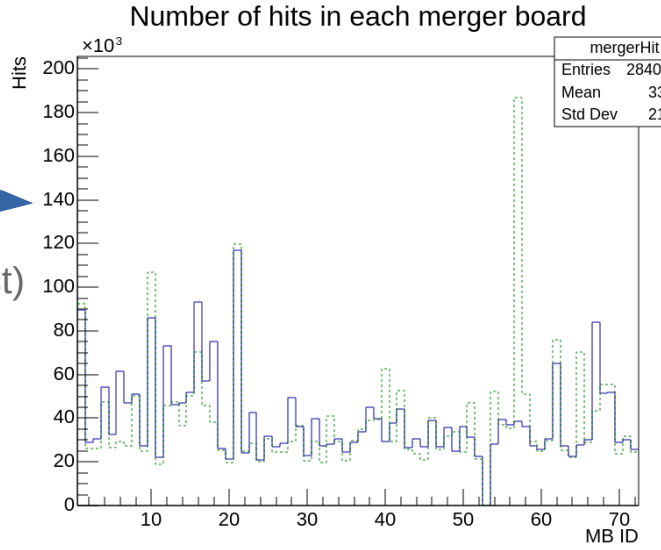
- try to display quantities independent of beam BG conditions
  (background subraction, etc.; unless the purpose is to show beam conditions)

- optimize the information displayed to make any problem obviously seen

Example from the ARICH

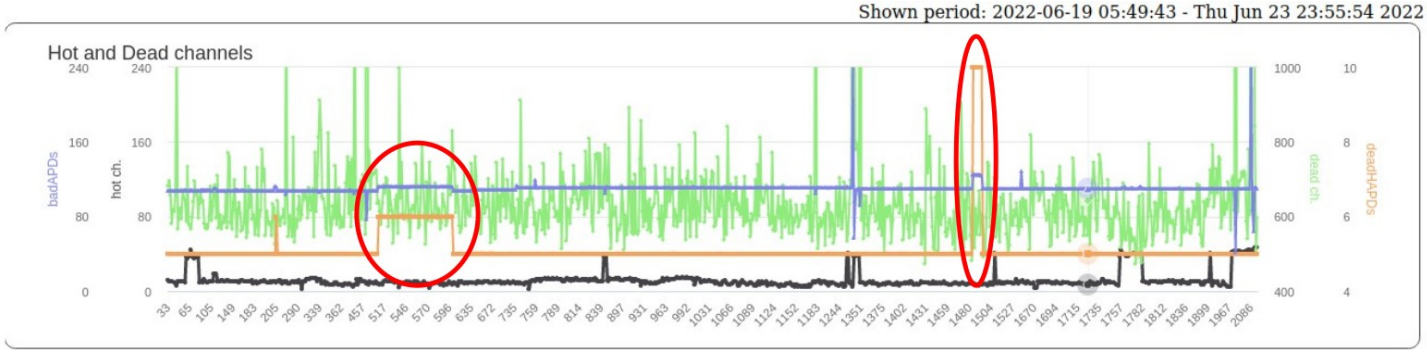
- occasionally individual/or a few HAPDs gets corrupted (e.g. SEU)

- CR shifter looks at number of hits in each merger (6 HAPDs),
  + a histogram with 420 bins!
  (in addition this numbers depend on the beam conditions → reference never perfect)



- issue rarely/never spotted by the CR shifter!
  (but it is easily solved by CR shifter by simple merger reconfigure)

- the issue is clearly seen in MiraBelle (where more thought was made what to show)

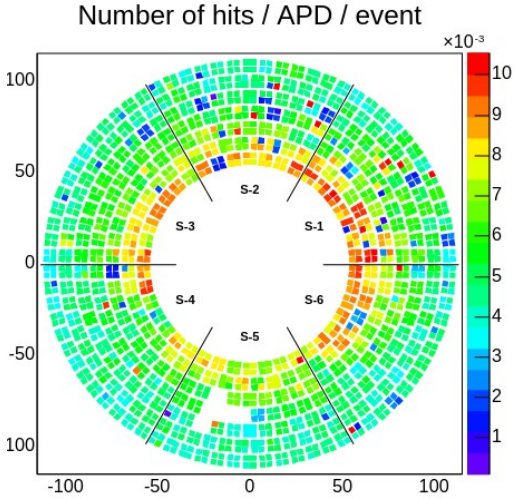


- after some period spotted by expert shifter → ask CR shifter to reconfigure merger

- for MiraBelle number of bad HAPDs is obtained as:

  in each HAPD ring we count HAPDs with occupancy 3 x lower/higher as average in that ring and sum them up

  → it is that single number that in >99% of cases reveals any possible kind of issue in the ARICH



- so lets display this number to the CR shifters and take care for the reference

Number of bad sensors	5 (5)

  + define actions: if number differs for 1 or 6 from reference → reconfigure, else call expert

- occupancy histogram with 420 has to be among detector “details” so that it can be checked which module has problem, but for the shifter to spot the problem a single number is much more effective!

Take away

- it is our responsibility to make the best out of our detectors

- we have been collecting data for 3+ years and gained much experience about our detectors (largely know what kind of issues happen and what is needed to observe them)

- LS1 and planed re-configuration of DQM panels for shifters is a great opportunity to reconsider the content of your main DQM plots, help to improve the data taking efficiency, and make life of shifters easier!

- to push for this we would like to request all sub-detector groups to provide a list of 2/3 plots or variables (along with limits) which are to be used on the main DQM panel
  (+ a short explanation of decision, based on the past data taking experience)