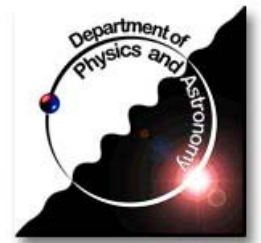# First attempt at MMTB migration of LArNoiseMonToolBase suite

- **LArNoiseMonBase on CVS**
- **ManagedMonitorToolBase issues**
- **Histogram level and interval**
- **Code**

Monitoring meeting
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LArNoiseMonToolBase on CVS

- **Updated wiki**
  - https://twiki.cern.ch/twiki/bin/view/Atlas/NoiseAndPedestalMonitoring#LAr_Noise_Pedestal_Monitoring
- **LArNoiseMonToolBase inherits from MonitorToolBase**
- **Three implementations**
  - LArDigitNoiseMonTool
  - LArRawChannelNoiseMonTool
  - LArDigitProjectNoiseMonTool (B. Trocme)
- **All histograms are booked on demand**
- **Classes of histograms**
  - histograms filled every event
    - available anytime for online use
    - in general, different for each event
  - histograms filled at checkHists (derived histograms)
    - available anytime for online use
    - in general, modified only after calls to checkHists
- **Which histogram gets filled is jobOption driven**

ManagedMonitorToolBase Migration issues

- **Histograms booked on demand**
  - cannot fill MonGroup's and then register them
  - need to use ManagedMonotorToolBase::regHist for each histos
    - internally creates a MonGroup each time
    - is this ok??

- **No ManagedMonotorToolBase::regTree**
  - needed in LArDigitProjectNoiseMonTool (B. Trocme)

- **jobOption-driven level and interval settings for directories**
  - needs enum-string methods
  - quickly implemented in LArNoiseMonToolBase to process jobO:
    - LevelOfDetail_t str_to_level(std::string stringLevel)
    - Interval_t str_to_interval(std::string stringInterval)
  - can such methods be implemented in ManagedMonitorToolbase?

ManagedMonitorToolBase Migration issues

- **m_path variable now orphan**
  - histoPathBase property not in ManagedMonitorToolBase
    - was in MonitorToolBase
  - now implemented in LArNoiseMonToolBase
    - many LArMonTools use m_path
  - a better solution is required for base path
- **for now want no extra directory in histogram paths**
  - use "all" interval
  - set ManagedMonitorToolBase property ProcessNEvents to the actual number of events for the job
  - I do not understand the path issues

ManagedMonitorToolBase Migration issues

■ **Important code modifications**

- bookHists() → bookHistograms()
  - stores isNewEventsBlock, isNewLumiBlock, isNewRun for possible later use
  - books one general histogram in directory allChannels

- fillHists() → fillHistograms()
  - fills histos per channel and per event
    - triggers histogram booking on demand
  - other histos filled at checkHists()

- initialize()
  - internally calls ManagedMonitorToolBase::initialize()

LArNoiseMonToolBase histograms level

- **Level and Interval**
  - not clear to me what to use
  - for now level and interval configurable in jobOptions
    - two jobOptions per histogram directory (27 directories)
- **"interval" proposal**
  - all
- **"level" proposal for histograms**
  - directory names with a * are produced by the default jobO
    - recall that most histogram directories are off by default
  - the meaning of these directory name are on the wiki
  - the jobOption registerExpertHistos still available
    - allows turning on/off the registration of expert histos
  - I consider the following levels
    - summary
    - shift
    - expert

LArNoiseMonToolBase histograms level

- ## **Histograms filled every event: shift**
    - ***allChannels**: currently only one histogram showing the data distribution for *all* channels.
    - ***perFeb**: the FEB context data profile histograms.
    - **perFebChannel**: the FEB context channel data distribution histograms.
    - **perFeedthrough**: the feedthrough context data profile histograms.
    - **perRegion**: the region context data profile histograms.
    - **perRegion2d**: the region2d context data profile histograms

- ## **Histograms filled every event, for experts only: expert**
    - **perFebSums(nnn)**: the FEB context integrated data profile histograms.
    - **perFeedthroughSums(nnn)**: the feedthrough context integrated data profile histograms.
    - **perRegionSums(nnn)**: the region context integrated data profile histograms.
    - **perFeedthroughNorm**: the feedthrough context profile histograms (see wiki).
    - **perRegionNorm**: the region context integrated profile histograms (see wiki).
    - **perCryostatEndSums**: the cryostatEnd context sum over all channels values.
    - **perFebSumsGroup/(N)channelGroup**: the FEB context profile histograms of the signal of groups of FEB channels.
    - **perFebSumsGroup2/(N)channelGroup**: the FEB context profile histograms of the signal square of groups of FEB channels.

LArNoiseMonToolBase histograms level

- ## *Derived* histograms, set in checkHists: shift

  - ***perFebRms**: the FEB context channel data rms histograms.
  - **perFeedthroughRms**: the feedthrough context effective channel data rms histograms.
  - **perRegionRms**: the region context effective channel data rms histograms.
  - **perRegion2dRms**: the region2d context channel data rms histograms.
  - **perFebTotalNoise(nnn)**: the FEB context integrated total/incoherent noise histograms.
  - **perFeedthroughTotalNoise(nnn)**: the feedthrough context integrated total/incoherent noise histograms.
  - **perRegionTotalNoise(nnn)**: the region context integrated total/incoherent noise histograms.
  - **perFebCorrCoef(nnn)**: the FEB context integrated effective correlation coefficient.
  - **perFeedthroughCorrCoef(nnn)**: the feedthrough context integrated effective correlation coefficient.
  - **perRegionCorrCoef(nnn)**: the region context integrated effective correlation coefficient.
  - ***perCryostatEndTotalNoise**: the cryostatEnd context total/incoherent noise histogram.
  - **perFeb2dCorrCoef/(N)channelGroup**: the 2d correlation coefficient histogram of groups of FEB channels.

- ## *Derived* histograms, set in checkHists: summary

  - ***summary**: summary histograms, cryostatEnd context.

ManagedMonitorToolBase Migration code

- **LArNoiseMonToolBase:first attempt MMTB migrated code**
  - jobOptions mildly "hacked" to make it work for me. Seems to work
- **/afs/cern.ch/user/l/lefebvre/public/MMTB-migration-20070731**
  - modified LArNoiseMonToolBase code
    - LArNoiseMonToolBase.h
    - LArNoiseMonToolBase.cxx
    - LArDigitProjectNoiseMonTool.cxx (hack to make it compile)
    - LArNoiseMonitoring.C (many thanks to Tayfun for making this work!!!)
  - modified LArNoiseMonToolBase jobOptions
    - LArDigitNoiseMonTool_jobOptions.py
    - LArRawChannelNoiseMonTool_jobOptions.py
  - other modified jobOption
    - LArMonTools_jobOptions.py
  - top jobOption used on 13.0.10 commissioning data
    - EP3C_Pedestal_Monitoring.py (thanks to Walter, Hong,..)

- **What is the plan to commit MMTB-migrated code?**
  - needs coordination!

ManagedMonitorToolBase Migration code

- **LArDigitNoiseMonTool_jobOptions.py**
  - before MMTB migration

    ```
    if not 'LArDigitKey' in dir():
        LArDigitKey="HIGH"
    if not 'online' in dir():
        online = False

    #-------------- LArDigit Noise Monitoring ------------------------
    LArMon1.AthenaMonTools += ["LArDigitNoiseMonTool<LArDigitContainer>/digitNoiseMon"]
    # ToolSvc.digitNoiseMon.OutputLevel = DEBUG
    # MonitorToolBase properties
    ToolSvc.digitNoiseMon.histoPathBase            = "/LArDigit0Noise"
    ToolSvc.digitNoiseMon.THistSvc_OutStream       = "/SHIFT"
    # LArNoiseMonToolBase properties
    ToolSvc.digitNoiseMon.dataNameBase             = "LArDigit0"
    ```

  - after MMTB migration

    ```
    if not 'LArDigitKey' in dir():
        LArDigitKey="HIGH"
    if not 'online' in dir():
        online = False
    if not 'EvtNo' in dir():
        EvtNo=999999

    #-------------- LArDigit Noise Monitoring ------------------------
    LArMon1.AthenaMonTools += ["LArDigitNoiseMonTool<LArDigitContainer>/digitNoiseMon"]
    # ToolSvc.digitNoiseMon.OutputLevel = DEBUG
    # ManagedMonitorToolBase properties
    ToolSvc.digitNoiseMon.ProcessNEvents           = EvtNo
    # LArNoiseMonToolBase properties
    ToolSvc.digitNoiseMon.histoPathBase            = "LArDigit0Noise"
    ToolSvc.digitNoiseMon.dataNameBase             = "LArDigit0"
    ```

  - similar changes for LArRawChannelNoiseMonTool_jobOptions.py

ManagedMonitorToolBase Migration code

- **LArMonTools_jobOptions.py**

  - before MMTB migration

```
# most of them should be initialized already in RecExCommission
ToolSvc = Service( "ToolSvc" )

if not 'CheckEveryNoEvents' in dir():
    CheckEveryNoEvents=100

#--------------------------------------------------------
theApp.Dlls += [ "AthenaMonitoring"]
theApp.Dlls += [ "LArMonTools"]
theApp.TopAlg += ["AthenaMon/LArMon1"]
LArMon1 = Algorithm( "LArMon1" )
LArMon1.CheckEveryNoEvents=CheckEveryNoEvents

# include all monitoring tools
# include ("LArMonTools/LAr2DNoiseMonTool_jobOptions.py" )
include ("LArMonTools/LArDigitNoiseMonTool_jobOptions.py" )
# include ("LArMonTools/LArDigitSimpleMonTool_jobOptions.py" )
#include ("LArMonTools/LArDigMonTool_jobOptions.py" )
# include ("LArMonTools/LArFEBMon_jobOptions.py" )
#include ("LArMonTools/LArRawChannelMonTool_jobOptions.py" )
include ("LArMonTools/LArRawChannelNoiseMonTool_jobOptions.py" )
# include ("LArMonTools/LArScaNoiseMonTool_jobOptions.py" )
# include ("LArMonTools/LArEventInfoMonTool_jobOptions.py" )
#include ("LArMonTools/LArAccumDigMonTool_jobOptions.py")
#include ("LArMonTools/LArFebNoiseMonTool_jobOptions.py")
```

  - after MMTB migration

```
theApp.Dlls += [ "AthenaMonitoring"]
theApp.Dlls += [ "LArMonTools"]
theApp.TopAlg += ["AthenaMonManager/LArMon1"]
LArMon1 = Algorithm( "LArMon1" )
LArMon1.CheckEveryNoEvents = CheckEveryNoEvents
LArMon1.FileKey = "SHIFT"
```