TOF Calib scheme

F. Noferini
INFN sez. Bologna
25/01/2024

Links

Software for async calibration is available in
https://github.com/alicetof/Commissioning →calibration/async

Spreadsheet with the status of TOF calibrations
https://docs.google.com/spreadsheets/d/1DS6oyScBMJdtKqZpeD8x64LZoKZBpkgCH8Sps91NRlo/edit?usp=sharing

TOF status Report (WP12/W13)
https://codimd.web.cern.ch/gd7dbsjnQYC730WxnqJjPQ?view

https://github.com/alicetof/Commissioning/tree/master/calibration/async

README

```
# Basic requirements: snapshot.root with channel calibs (starting point) in the working dir
# e.g. in alien -> /alice/cern.ch/user/f/fnoferin/calib/ChannelCalib/snapshot.root

# 1 step
# collecting calib info of one run
# Requirments: alien token
# scripts: collect.sh, mergerunSub.sh, doSplitting.sh, copy.sh, filterall.sh, filter.sh
# macro: DoMerge.C, filter.C
# note that: copy from alien will parallelize up to 40 concurrent files to speed up the process (be sure you have enough disk space)
# Assumption: DATA from 2023 (otherwise check the main scripts)
# output (in the run dir) skim*.root (usually multiple-files)

# chmod a+x collect.sh (if needed)
./collect.sh $period $run $pass
# e.g. ./collect.sh LHC23zzk 544454 apass1
# Requirments: full step1
# scripts: doPhase_TS.sh
# macros: calibPhase.C, accumulate.C

# 2 step (after 1 step is completed for the run)
# calculate LHC phases and prepare outputs for time-slewing (TS) correction (TS corr require the subtraction of the LHC phase)

# prepare output dirs (if needed)
# for cal objects
mkdir TOF
mkdir TOF/Calib
mkdir TOF/Calib/LHCphase
mkdir TOF/Calib/ChannelCalib
cp snapshot.root TOF/Calib/ChannelCalib/.
# for intermediate outputs (this will contain the outputs needed for time-slewing corrections)
mkdir accumulated

# run step 2
```

A *README* is provided with few instructions to run the calib chain

… but a tutorial is needed for sure :)

TOF calibrations

There are several (ccdb-)objects required to get good TOF performances:

- Time calibrations
  - TOF-LHCclock alignment (LHCphase -> one value every 5 minutes)
  - Single-channel calibrations (ChannelCalib -> one per run)
- TOF acceptance (mainly for MC)
  - TOF active map (FEELIGHT -> one per run)
  - Crate/TRM efficiencies (Diagnostic -> one every 5 minutes)

There are two calibration steps

- Sync →first calibrations (but time-slewing calibrations)
- Async →refined calibrations (Time calibrations + checking TOF active map)

Plan for the next weeks →preparation of 2024 data taking

The idea is to organize the work in order to trace systematically the status of TOF calibrations in parallel with the (A)QC

Sync

- We would like to have a QC to monitor the output of sync calibration during data taking

Async

- We are setting a procedure to extract calibration as soon as the first reco pass (cpass) is available [we expect to have O(2 weeks) between cpass0 and apass1 during pp Data Taking]

https://docs.google.com/spreadsheets/d/1DS6oyScBMJdtKqZpeD8x64LZoKZBpkgCH8Sps91NRIo/edit?usp=sharing

Current status

Diagnostic = decoding errors missing in 2022 (waiting for apass6)

All channel maps checked
Jira ccdb upload done on 25/01/2024

#DIV/0! →we still miss reco pass

period	system	n runs TOF	Diagnostic	LHCphase	ch offsets	LHCphase	ch offsets	time slewing	FEE check	TRM eff	Crate eff	FEE adjust
LHC22m	pp skim	27	Open2-4588	yes	yes				Open2-4587	94.50%	98.77%	94.86%
LHC22o	pp skim	106	Open2-4588	yes	yes				Open2-4587	#DIV/0!	#DIV/0!	94.67%
LHC22o	pp MB	13	Open2-4588	yes	yes				Open2-4587	#DIV/0!	#DIV/0!	95.08%
LHC22o-test	pp skim	5	Open2-4588	yes	yes				Open2-4587	72.74%	99.42%	96.31%
LHC22p	pp skim	9	Open2-4588	yes	yes				Open2-4587	92.73%	98.99%	94.57%
LHC22q	pp MB lowIR	12	Open2-4588	yes	yes				Open2-4587	#DIV/0!	#DIV/0!	96.66%
LHC22r	pp skim	24	Open2-4588	yes	yes				Open2-4587	#DIV/0!	#DIV/0!	95.37%
LHC22t	pp skim	17	Open2-4588	yes	yes				Open2-4587	86.99%	99.68%	95.94%
LHC23f	pp MB	3	yes	yes	yes				Open2-4587			97.94%
LHC23g	pp MB	14	yes	yes	yes				Open2-4587			96.17%
LHC23h	pp MB	12	yes	yes	yes				Open2-4587			95.92%
LHC23i	pp MB	1	yes	yes	yes				Open2-4587			96.03%
LHC23j	pp MB	3	yes	yes	yes				Open2-4587			97.03%
LHC23k	pp MB	4	yes	yes	yes				Open2-4587			96.90%
LHC23l	pp MB	5	yes	yes	yes				Open2-4587			96.61%
LHC23zt	pp MB	11	yes	yes	yes				Open2-4587			95.93%
LHC23zzf	PbPb Gold	1	yes	yes	yes	O2-4546	O2-4546	O2-4546	Open2-4587			96.99%
LHC23zzg	PbPb Gold	2	yes	yes	yes	O2-4546	O2-4546	O2-4546	Open2-4587			95.86%
LHC23zzh	PbPb Gold	5	yes	yes	yes	O2-4546	O2-4546	O2-4546	Open2-4587			95.95%
LHC23zzi	PbPb Gold	7	yes	yes	yes	O2-4546	O2-4546	O2-4546	Open2-4587			95.59%
LHC23zzk	PbPb Gold	10	yes	yes	yes	O2-4546	O2-4546	O2-4546	Open2-4587			95.87%
LHC23zzk	PbPb remain	6	yes	yes	yes				Open2-4587			95.12%

Async calib -> missing and waiting for the next apass

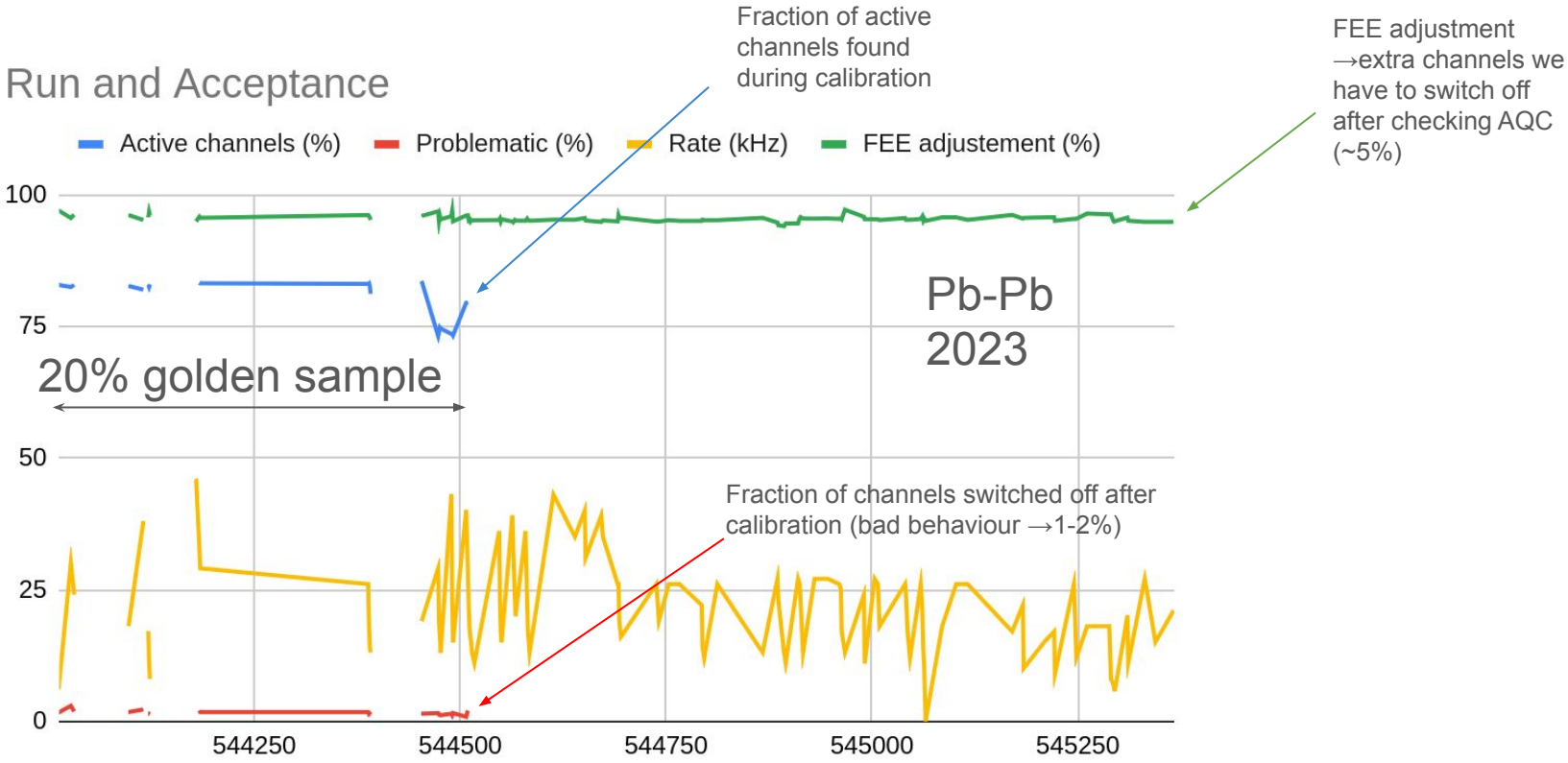
pp 2022

pp 2023

Pb-Pb 2023

https://docs.google.com/spreadsheets/d/1DS6oyScBMJdtKqZpeD8x64LZoKZBpkgCH8Sps91NRIo/edit?usp=sharing

Example of quantities to be monitored



PRs requested for Pb-Pb apass3

TOF matching window at 3 cm for Pb-Pb (in TOF pid AnalysisQA)

Starting tags when stable-async was rebased to dev/master for apass1:

- O2: async-20231204.4
- O2DPG: async-20231204.4-1
- O2Physics: O2Physics::async-20231204.1-4
- QualityControl: v1.126.1
- alidist: O2PDPSuite-daily-20231204-0100

apass3

Latest requested changes:

Date of next tag	Requestor	Package	PR	Data or MC	Comment	JIRA (if it exists)	Accepted	In production	Validated by requestor
	F. Schlepper	O2	PR	Data	Add GloQC Efficiency Plots				
	F. Noferini, N. Jacazio	O2Physics	PR-4287,PR-4387	Data	TOF pid QA	AQC report			
	F. Noferini, N. Jacazio	O2DPG	PR-1417	Data	TOF pid QA	AQC report			

https://gitlab.cern.ch/bvolkel/o2dpgdocs/-/blob/main/docs/software/requests/2023pbpb_apass.md?ref_type=heads

As presented at the last AQC
https://indico.cern.ch/event/1371938/contributions/5768192/attachments/2785835/4857205/TOFQC_23_01_2024.pdf