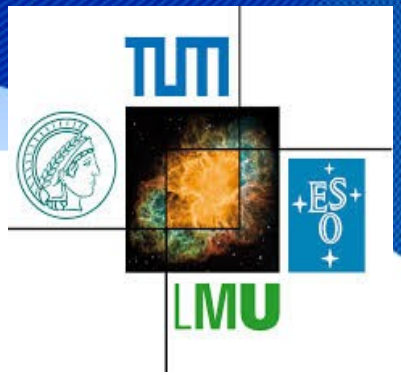

TPC Online Calibration in Run II Status and Plan

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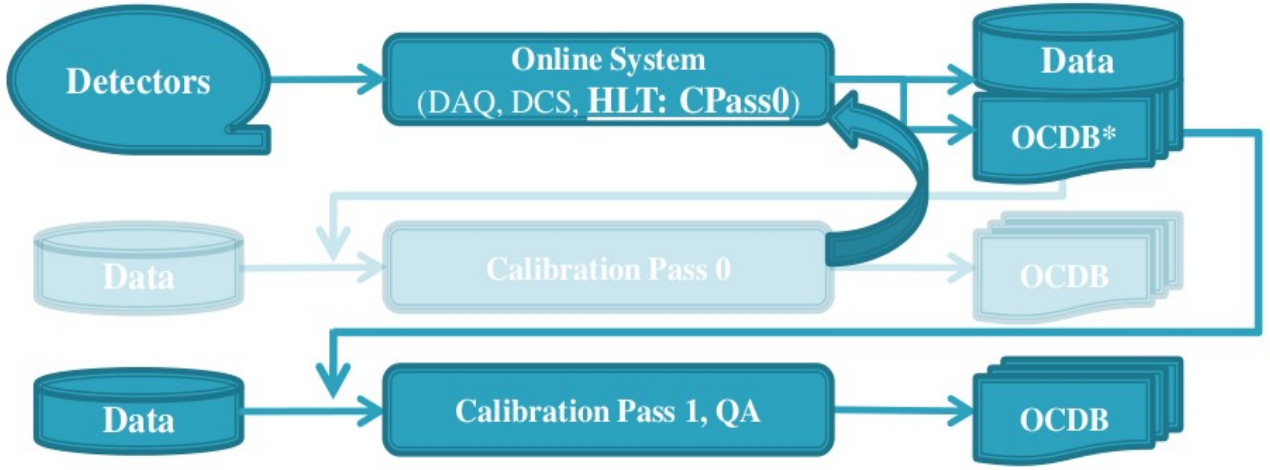
24/11/2015
ALICE OffLine Week

Plan

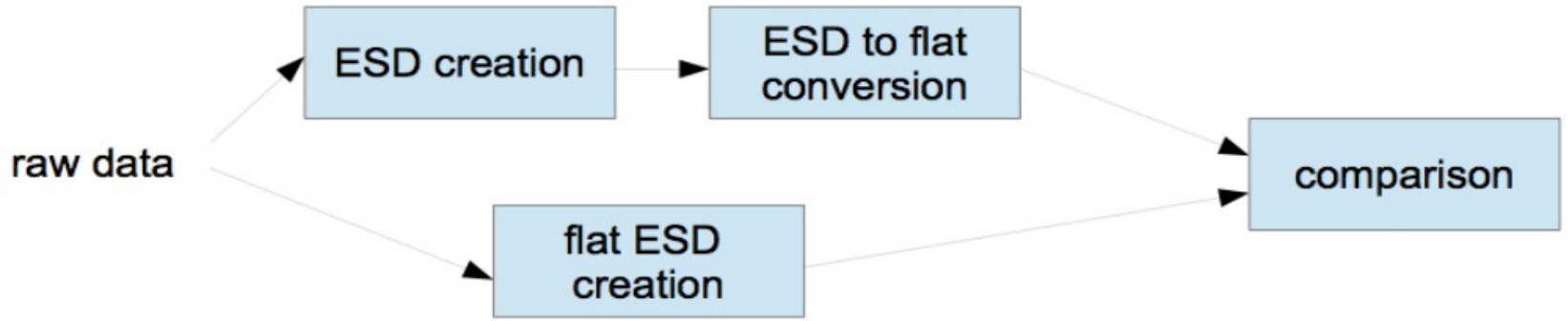
- Online Calibration Plan during run II:
  - Implementation of (at least) CPass0 selection in the HLT (alignment, vdrift, dE/dx)
  - Limit: ESD data format is too heavy and complex for HLT
- Need to use a new data format: FlatESD
  - Objects will now be stored in memory



- Main JIRA task: ATO-40 “Preparation for TPC online”
- TWiki page: https://twiki.cern.ch/twiki/bin/view/ALICE/TPC_Online

Approach

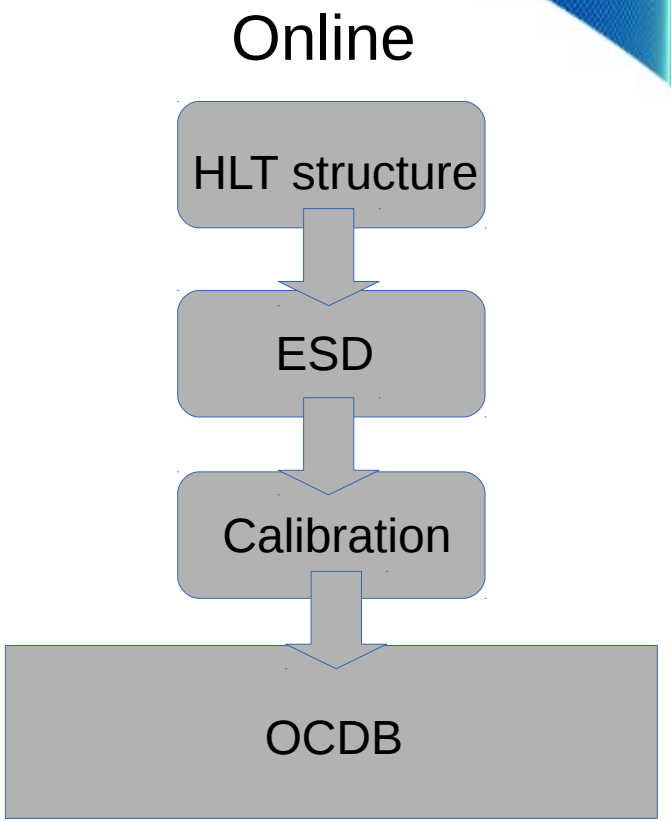
- Common Interface between ESD/FlatESD: virtual interface
  - Allows cross-check and to run the same code on/offline
- The preprocessors have also been updated for having the same functionality on and offline



- Check for non-information loss, CPU time and memory consumption

Calibration in Run II

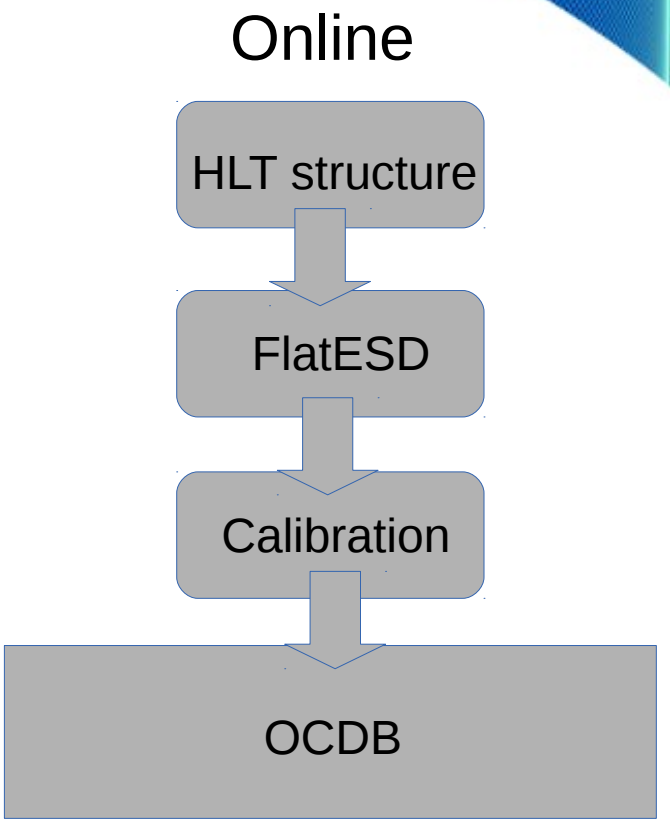
- Run the AnalysisManager in the HLT
- Run HLT components
- AliHLTGlobalESDConverter
  - Creates our ESD from raw data “on-the-fly”
  - Reconstruct: Tracks, vertices, V0s, ...
- Run the AliHLTTPCCalibManagerComponent:
  - Can contain TPC Calib tasks:
  - Vdrift calibration and Alignment

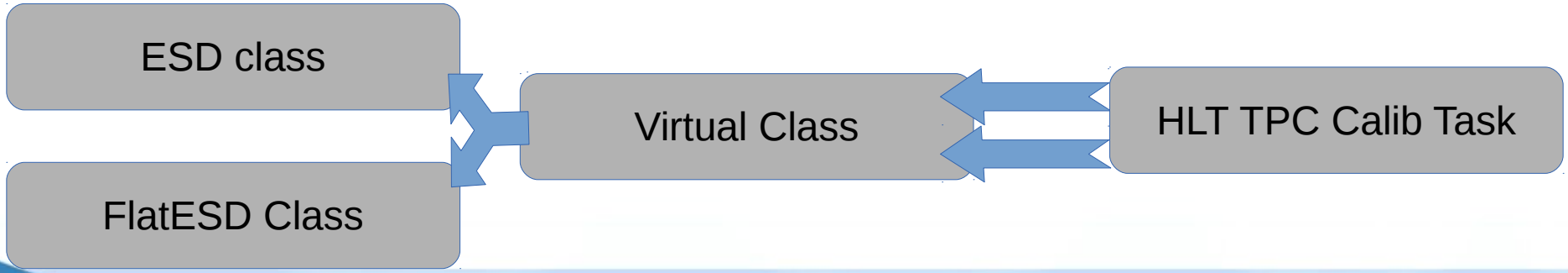


- The test of calibration tasks helps for being ready for Run III when online calibration will be required
- For Run III, need online calibration with FlatESD to compress online data by a factor ~ 20

Calibration in Run II

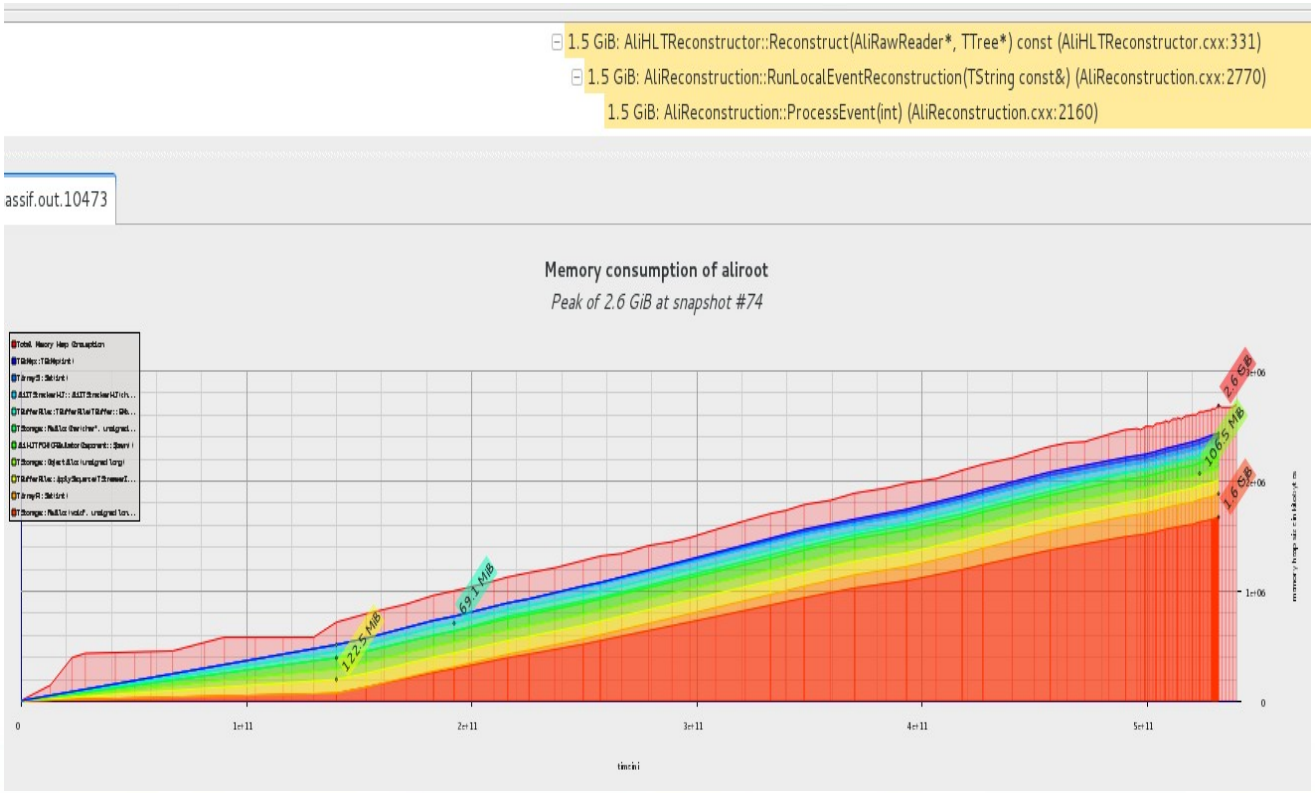
- ESD to heavy and complex for HLT
- Use FlatESD:
  - Similar content than ESD ⟶V interfaces
  - No loss of information, faster “load”
- Allows TPC Calibration Online:
  - Keep ESD events for cross check
  - Use Virtual components
- 2 Types of new classes: FlatESD + Virtual
  - Seed, Track, V0, ...





Calibration in Run II

- Our HLT output can be used as input to a Calibration Component (feedback loop)
- The HLT needs to pushback and serialize its output
  Problem: the serialization leads to memory leak



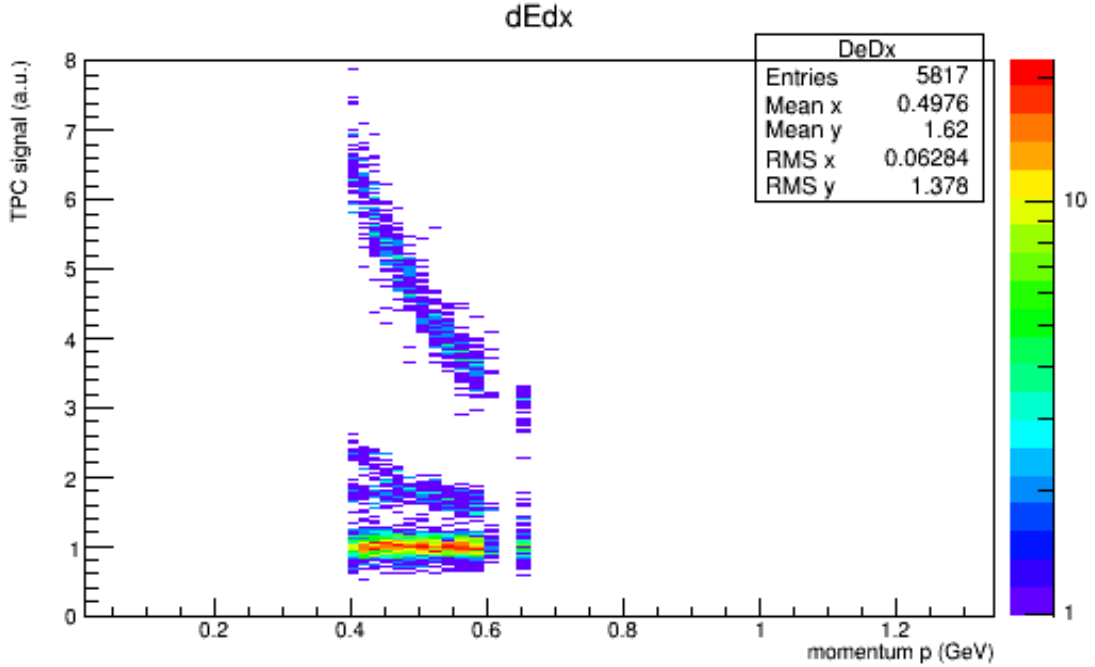
Development for Run III

- Include CPass0: Vdrift, Alignment, V0 and dE/dx
  - Investigate the serialization issue
  - Merge the memdev branch

- Development of dE/dx online
  - Calculation using proper time and pad coordinates
    - Need environment variables from external sensors (Jira 277):
  - Temperature, Pressure, DDL,...
  - Provided online by DCS services

Development for Run III

- **Running local HLT calibration** on 2010 p-p data (run: 126088)
- Using the HLT emulator with FlatESD data format and components

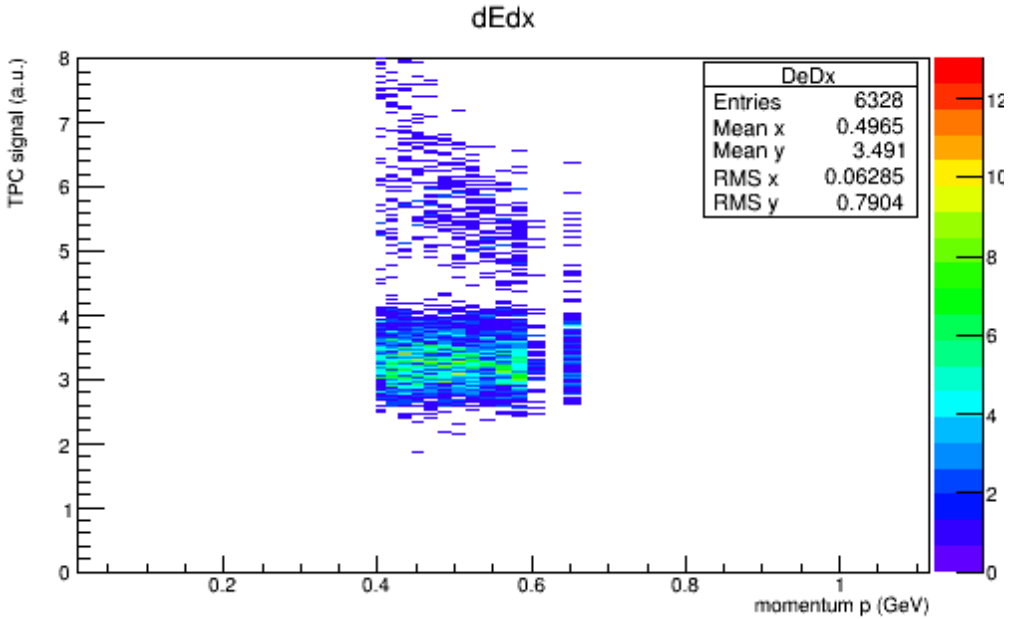


- Need to check consistency with offline reconstruction
- Keeping an eye on memory consumption, CPU time, size reduction (AliSysWatch)

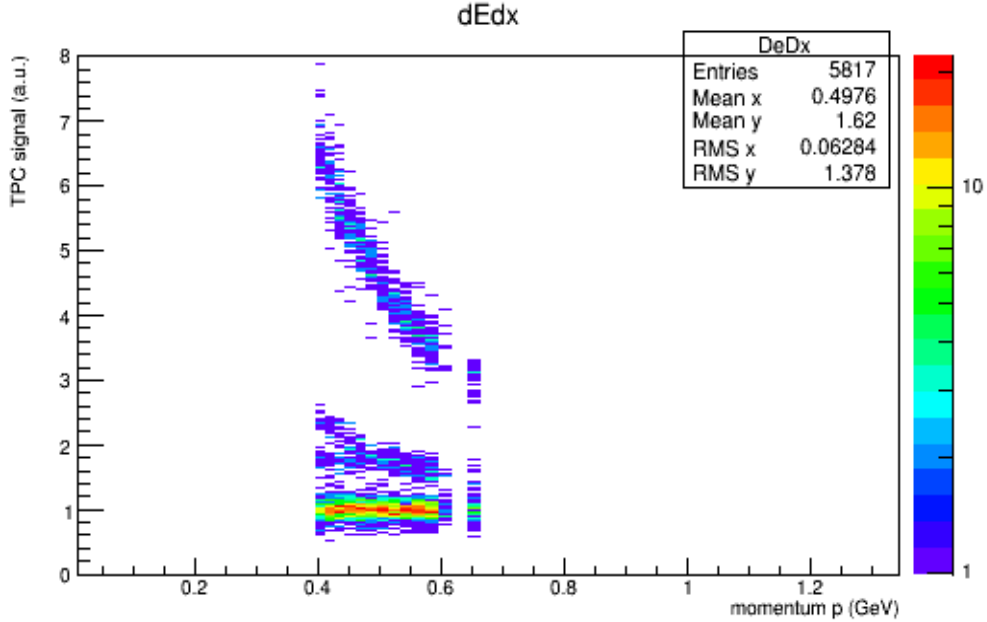
Development for Run III

- Need to check back for the proper calculation:

OffLine (ESD)



OnLine (FlatESD)



- Then perform cross-check ESD/FlatESD
- Compute different event sample

Summary

- New data format: FlatESD
- Virtual classes to deal with both data format
- Calibration Components ported to use virtual interfaces and preprocessor updates: same reconstruction on/offline

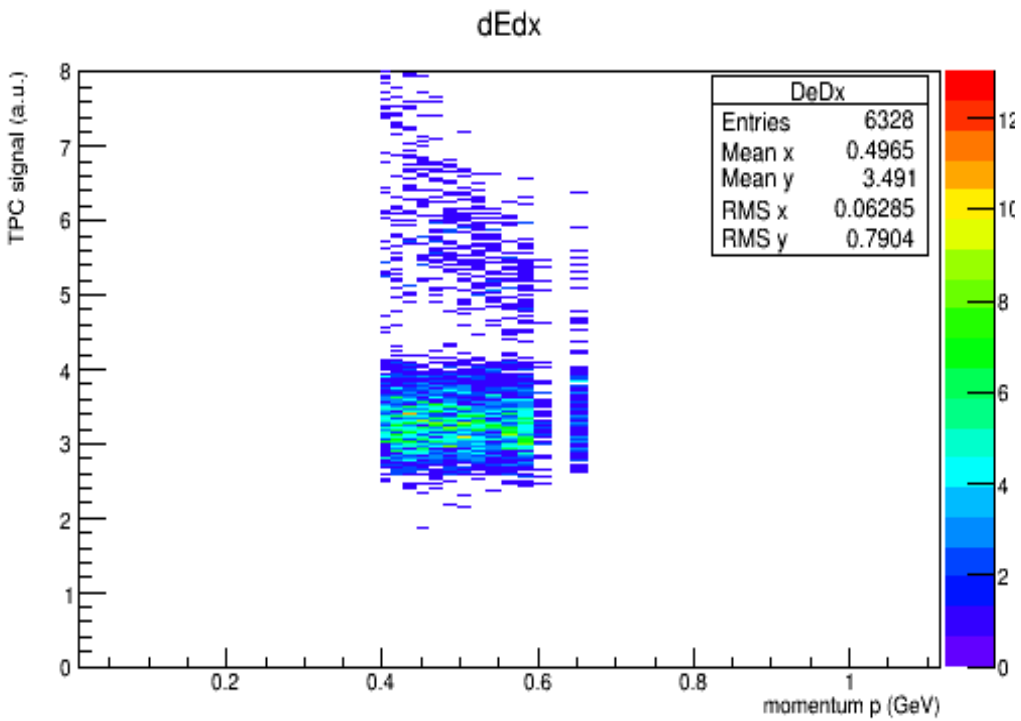
- TPC calibration Components in HLT
  - Vdrift, alignment, and feedback loop ready
- To do list:
  - Fix serialization issue
  - Check for dE/dx result consistency and benchmark
  - Real-live test

Thank you for your attention

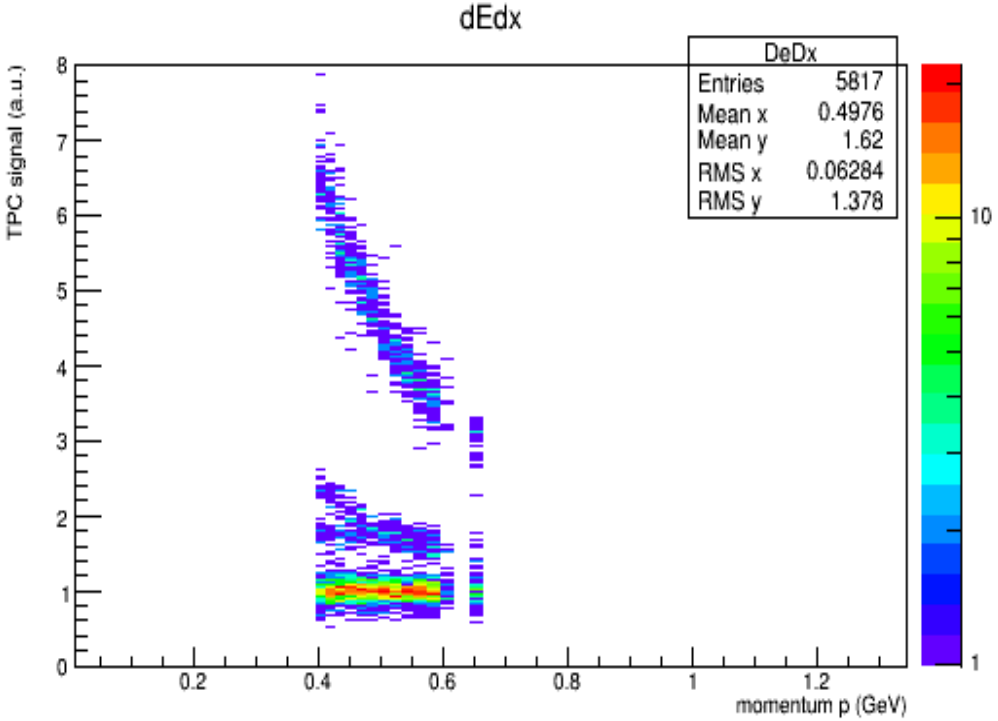
Back up

dE/dx calculation in the HLT

OffLine (ESD)



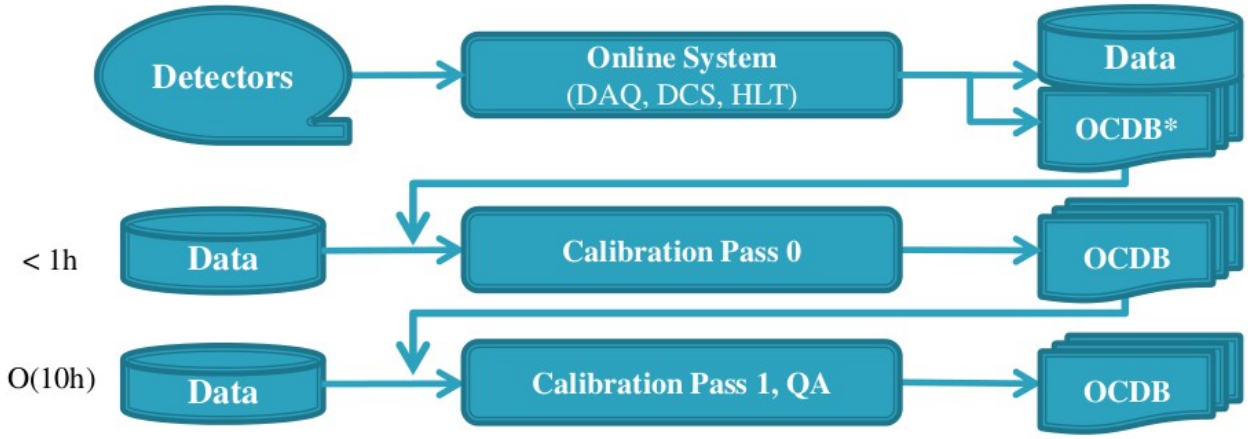
OnLine (FlatESD)



- 2010 p-p data (run: 126088)
- **Running HLT calibration** on SL7, I7 4500U

Motivations

Run 1:
Two step calibration:
- CPass 0 : mainly TPC calibration
- CPass 1: TPC dependent detectors calibration



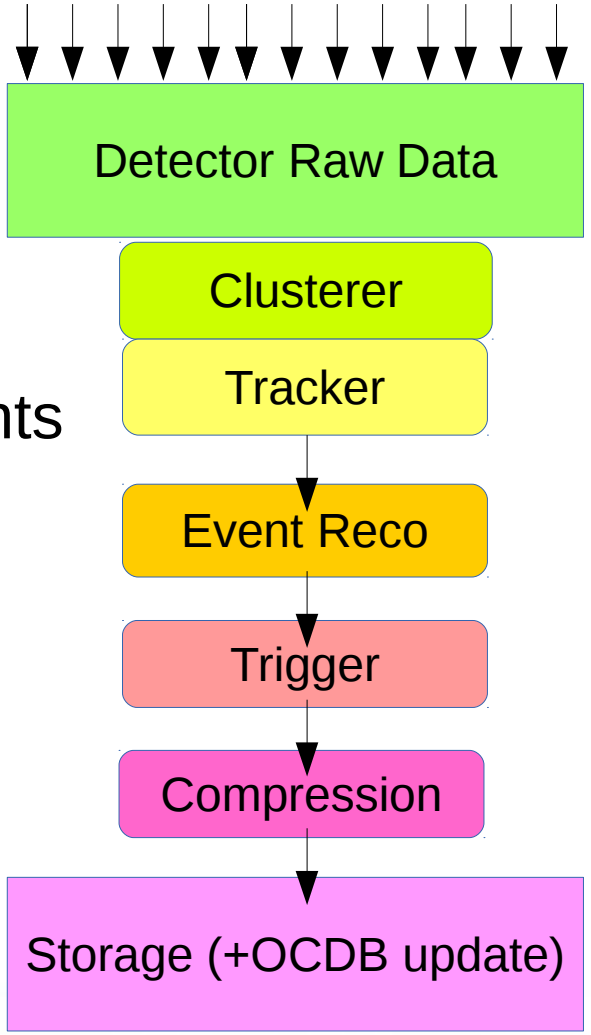
- New conditions during run 3 ~2020-2022
- Must compress the online data by a factor 20
  - Ex.: reject clusters not connected to track
  - Requires online calibration

The High Level Trigger

- Not a basic Trigger:
  - Powerfull Computing clustering having access to full event information
  - Used as a clever trigger, compressor, without information loss

- Can proceed data triggering using specific HLT components
- Calibration can be performed using Components

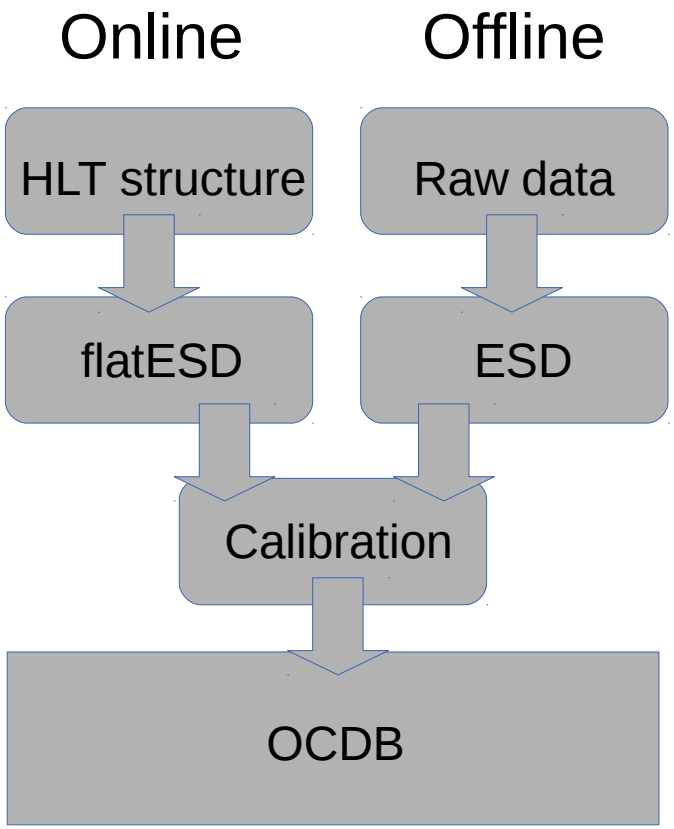
- Problem: ESD too heavy and complex to be dealt by the HLT ⟶ FlatESD



Implementation

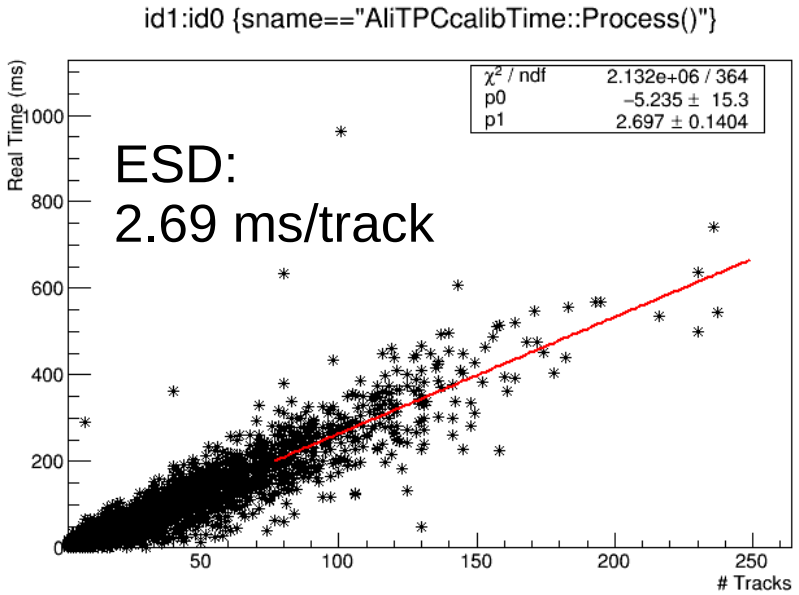
- HLT components to perform analysis
  - Ported to use Virtual interfaces
  - Runs using Analysis Manager
- AliHLTGlobal(Flat)ESDConverter
  - Convert raw data to FlatESDs
  - Similar for ESD component,

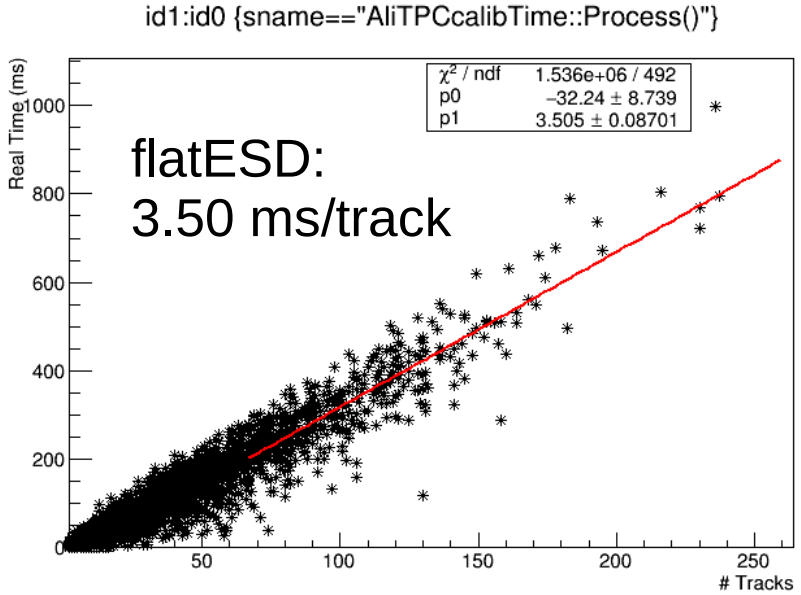
    no loss of information
- AliHLTTPCCalibManagerComponent
  - Configurable: can contain TPC Calib tasks
  - Vdrift calibration, Alignment, gain



ESD / flatESD comparison

- 2010 p-p data (run: 126088)
- **Running HLT calibration** on SL7, I7 4500U
- Considering events with Real Time > 200 ms





- Data calibration using ESD faster than for flatESD

Work in Progress