PWG4 Status

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ALICE

PWG4 analysis modules

- Jet Tasks: Christian Klein-Bösing et al.
- Photon conversions, GammaConv : From Ana Marin et al.
- JCORRAN: 2 particle correlations from Jan Rak et al.
- PartCorr: Particle identification (γ, π^0, η, e, ω, …) and correlation (with jets, hadrons …) package.
- Omega3pi: Boris Polichtchouk
- Et: Christine Nattrass, Oystein Djuvsland, David Silvermyr,…
- CaloCalib: Calorimeters (EMCAL) calibration, re-clusterization module.
- UserTasks: Simple user analysis tasks.

PWG4 analysis modules

- Photon conversions, GammaConv
  - Discussed in offline meeting: Store conversion photons in AOD with ESD filtering train if output not large
- UserTasks:
  - PHOS_pp_pi0 (used for paper) : Yuri Kharlov
  - CaloCellQA : Simplified (smaller?) task for calorimeter QA, Y. Kharlov, O. Driga
  - DiHadronCorrelations (used for paper): C. Loizides

"Train" Running

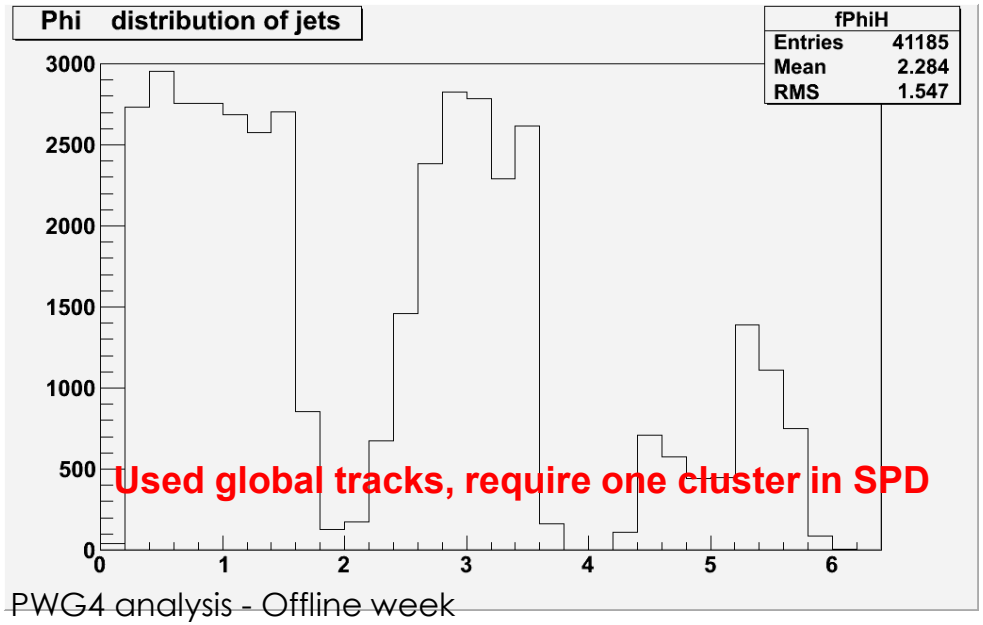
- No active "global" PWG4 train
- Jet train for analysis and code development
  - Pb+Pb (CKB)
  - p+p (Sidhart Kumar Prasad)
  - Current development with par-Files difficult
    - Unresolved dependence in ESD.par
      - AliTriggerConfiguration.h only in STEER not STEERBase
    - https://savannah.cern.ch/bugs/?83104

Christian Klein-Bösing

Tracks in the AOD

- Many analysis need a maximum uniformity in phi
- Not guaranteed with the usage/requirement of ITS information
- Usage of TPC only tracks
  - Uniform phi
  - additional constraint to SPD vertex

phi for jets above 50 GeV



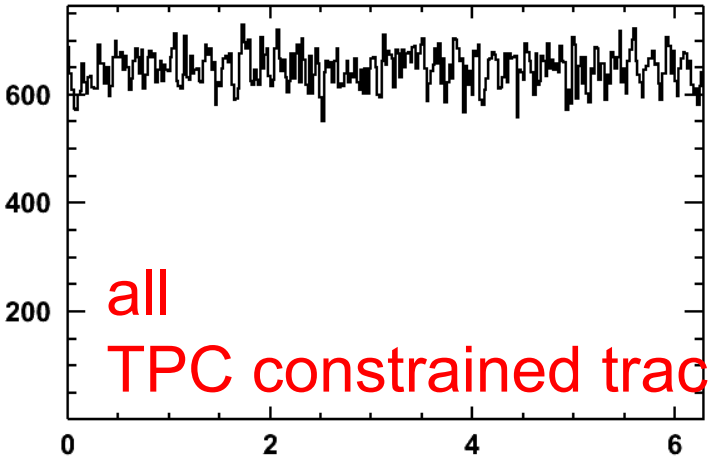
Implementation in the ESD Filter

Christian Klein-Bösing

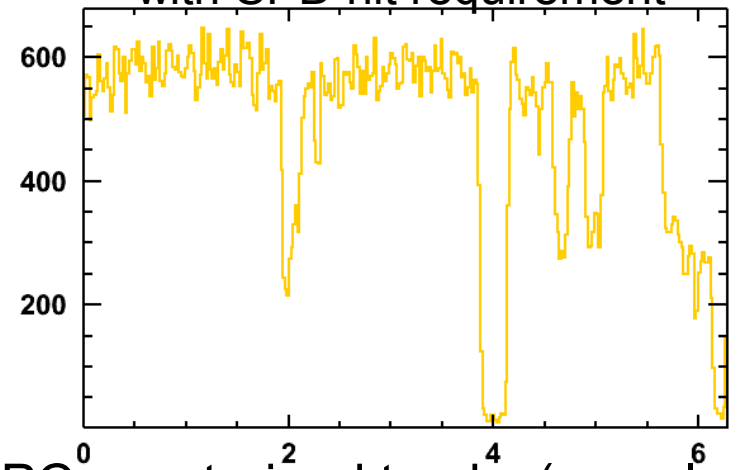
- Optional extra set of tracks in the track branch
- Selected with ESD filter/ESD track cuts as usual
  - For selected ESD tracks TPC only information is processed and copied to a new AODTrack
  - To avoid confusion filter maps of global and TPC constrained tracks are disjoint (a&b==0)
  - TPC constrained tracks have negative ID
  - AliAODTrack::IsTPCConstrained() is true (recent addition)
- Optional to store only the complementary tracks
  - I.e. without proper ITS information but good TPC (hybrids)

TPC Constrained and Hybrid Tracks

Christian Klein-Bösing



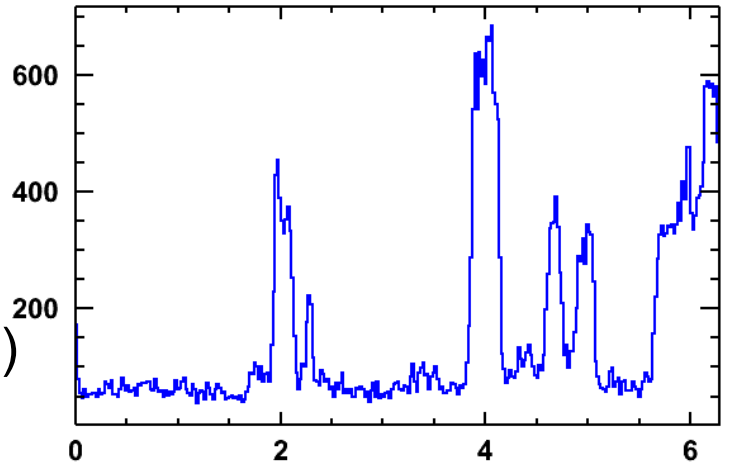
Global ITS/TPC tracks with SPD hit requirement



Achieved uniform phi but momentum resolution at high p_T (>50 GeV) not satisfactory for TPC only tracks

Improvement with expanding this method to Global Constrained tracks (more iterations compared to TPC only)

TPC constrained tracks (complement)



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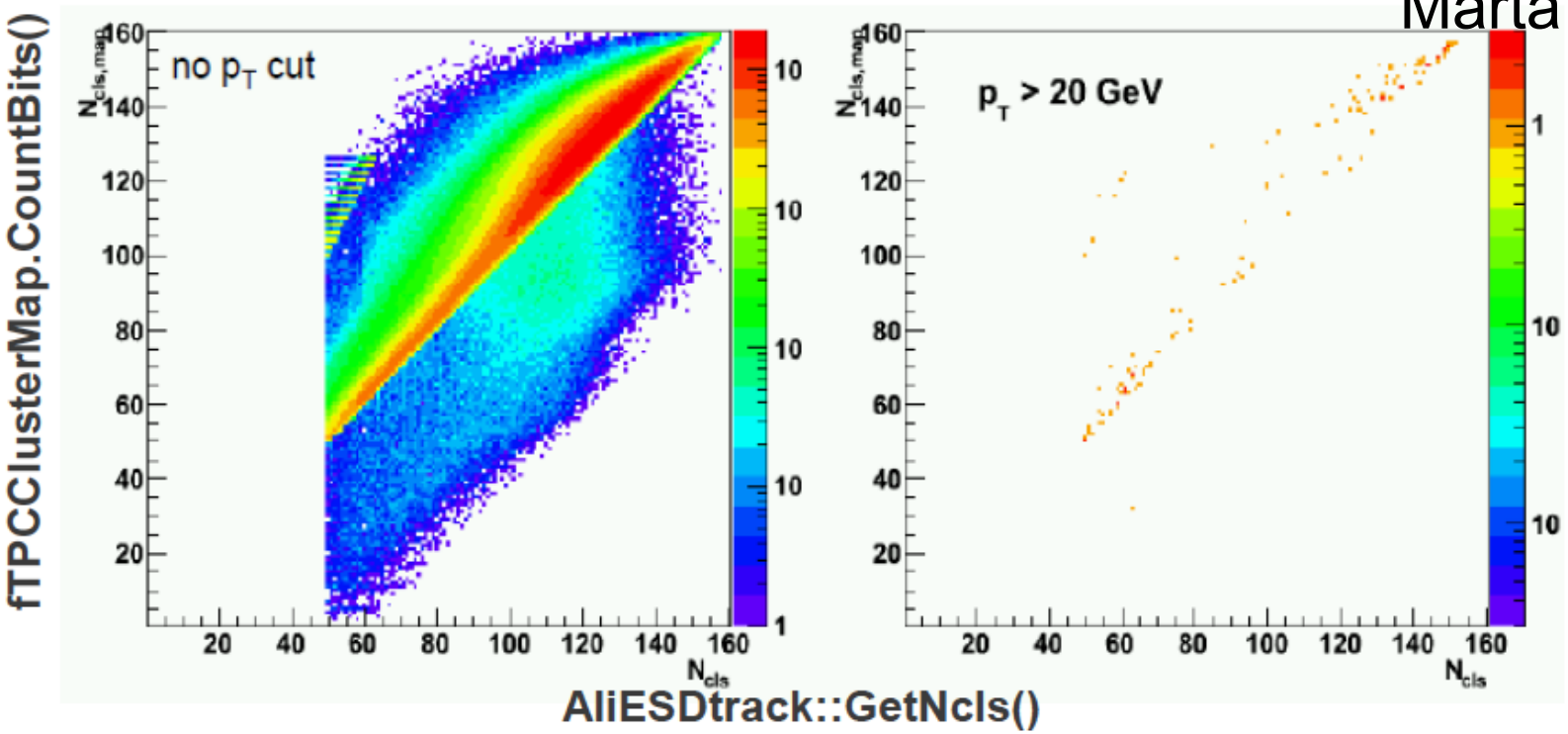
ALICE

Cutting on AOD Level

- Filter Bits i.e. test whether a certain set of ESDTrackCuts did accept the track
- Direct cutting on AOD variables
  - No common cut class
  - Matching of AOD variables

Ncls vs NclusterMap TPC

Marta Verwejj



Marco v L

Number of clusters from ESD track not the same as number of bits in the cluster map.
Only clustermap is stored in AOD.

Cluster map: contains all clusters in the road of the track
AliESDtrack::GetTPCncls(): all clusters used for updating the Kalman filter

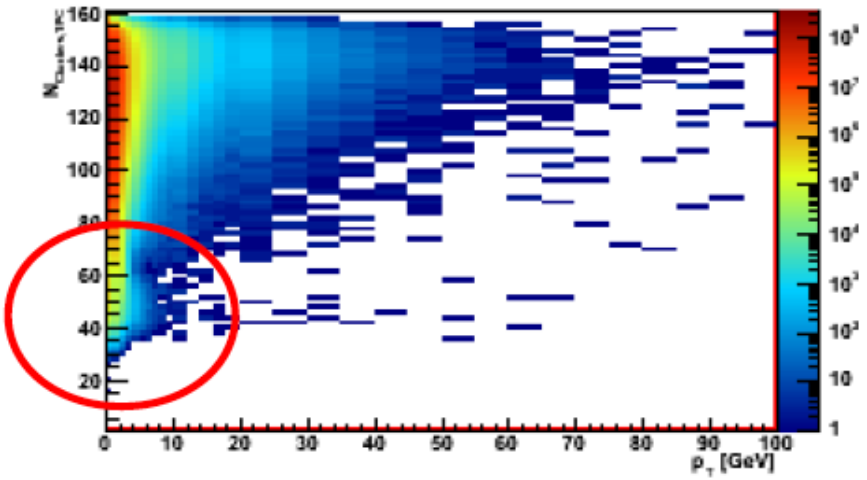
Why do we also see ClusterMap<NClusters for low pT (<20 GeV)?

#Crossed rows

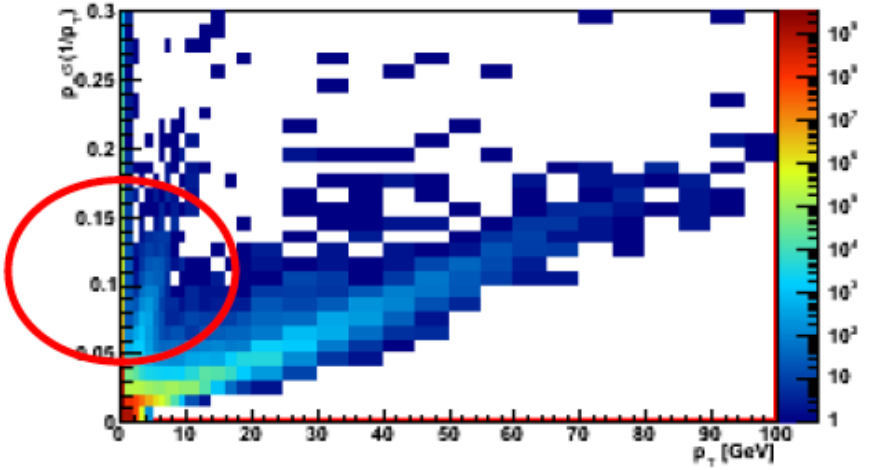
(Standard ESD level cut)

Marta Verwejj

Number of crossed rows is calculated from the cluster map.
A track with large number of crossed rows can have a low number of clusters used in the reconstruction.



#crossed rows > 120 but still tracks with small number of clusters left



Low number of clusters in fit → bad momentum reconstruction

The cut on the number of clusters in the fit is essential to remove badly reconstructed momenta.

Concerns

- AOD:
  - Number of clusters not accessible
    - Be aware that AOD and ESD provide different answers for GetTPCNCls()
  - Can be changed in future AOD production
- ESD
  - Only cluster map of all clusters on the road is store (#crossed rows cannot be calculated using the cluster map of Kalman filter)
  - New reconstruction required?

Embedding in analysis

- Embed background (HI data, HIJING …) with some signal (simulated, p0, jets …)
- Analysis frame modified 2 years ago to do it
- Very first order way to do embedding if not done during reconstruction
- How it works:
  - AODs only (more events per file)
  - Merge normal collection of data and a external AOD file with signal. Embed event by event.
    - If signal file is larger than events in collections, a event shift number can be specified to not repeat the signal event.
  - Handled in AliAnalysisTaskSE and AliAODInputHandler.
  - Merged output is put in the AOD output
    - do not use with ESD filter!

Embedding in analysis

- What is merged
  - Arrays with tracks, calorimeter clusters, mcParticles, in both events are added to the same output list.
  - What is really merged are the calorimeter cells, 2 VCaloCells present in both events that come from same cell, have the energy added in the output AOD.
  - The header/vertex of the event coming from the collection is replicated in the output AOD.
- Recent changes:
  - PHOS clusters and cells now also merged (Hisa Torii)
  - Switch added to select what to merge or not clusters, cells and tracks
  - Open files not only in local node but somewhere else in alien.

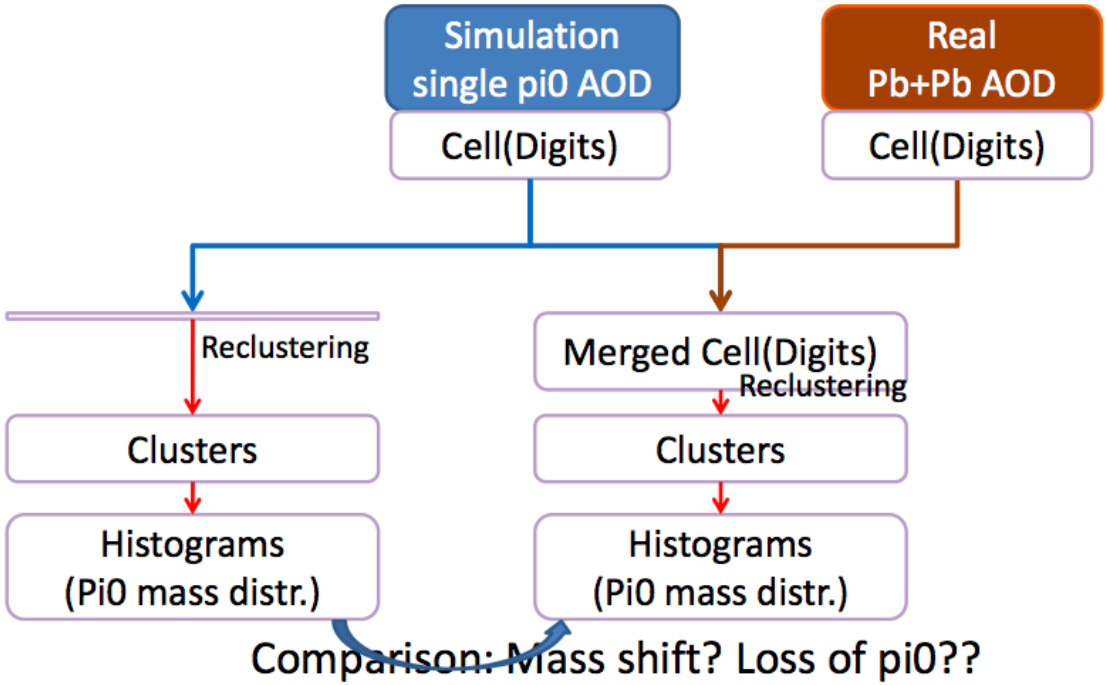
Embedding in analysis

- What has to be added to the macro
  - AliOutputAODHandler *outAodHandler …
    - outAodHandler->SetCreateNonStandardAOD();
  - AliInputAODHandler *aodHandler …
    - aodHandler->SetMergeEvents(kTRUE);
      - aodHandler->SetMergeTracks(kFALSE);
      - aodHandler->SetMergeEMCALClusters(kFALSE);
      - aodHandler->SetMergeEMCALCells(kTRUE);
      - aodHandler->SetMergePHOSClusters(kFALSE);
      - aodHandler->SetMergePHOSCells(kFALSE);
    - aodHandler->AddFriend("signal/AliAOD.root");
    - aodHandler->SetMergeOffset(event0); // start from event0 in signal file

Embedding in analysis

- Ongoing analysis to try to estimate PHOS and EMCAL performance in HI environments

Hisa Torii



- Tests on grid work but we hit some problems
  - Signal AOD file size cannot be too large.
  - Access to signal file located somewhere in the grid not easy.

Calorimeter Tenders

- AliPHOSTenderSupply by Dmitri Peressounko
  - Used for recalibration
- AliEMCALTenderSupply by Deepa Thomas
  - Cluster recalibration
  - Clusters with bad channel rejection
  - Recalculation of cluster position
  - Recalculation of cluster-track matching
- Not used yet to produce AODs with the train.
- Correction parameters stored in private files in alien
  - Transform into OADB format
    - EMCAL alignment matrices already in OADB/PWG4/JetReconstruction
    - Where to put the other parameters (recalibration, bad channel map …)

Back-up

Jan Fiete Grosse-Oetringhaus
Shown in offline weekly meeting

Analysis Train: Idea

- Setting up and operating analysis trains is a lot of work
  - Specific settings for each wagon
  - Wagons have bugs, leaks etc.

  → Automatic configuration needed

  → Automatic testing needed (on a subset of the same data the train will run on)
- We have collected some ideas which we want to give a try
  - using at the beginning the PWG4 train

Jan Fiete Grosse-Oetringhaus
Shown in offline weekly meeting

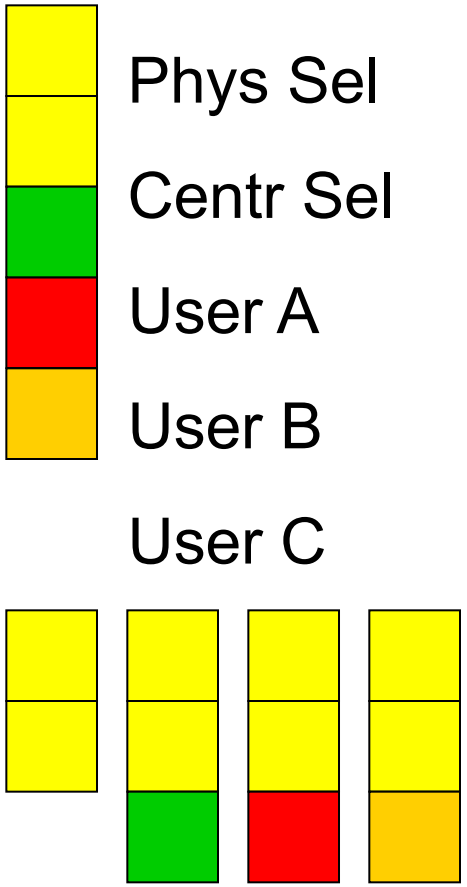
High Level Description

- Train runs on analysis tag (no modifications allowed)
- User registers task
- Train operator triggers train test
- Test results are fed back to Monalisa where the user & operator can see them
- Operator starts train with tasks that succeeded and have no (significant) leaks
- These steps are operated from MonaLisa

Jan Fiete Grosse-Oetringhaus
Shown in offline weekly meeting

Some Technical Details

- Container that contains task configuration (already shown by Andrei)
  - Currently identified configuration items
    - Location of AddTask macro + parameters
    - Required libraries
    - Tasks that have to run before
- Train testing
  - Tasks are tested one by one
    - On subset of data on which the train will run
    - CPU/Real time, memory extracted w.r.t baseline
    - Baseline from test with just PhysSel + Centrality
- Train macro generation
  - By analysis framework using the wagons selected by the operator
  - Macros for testing (wagon by wagon)
  - Macros for full train (all wagons)
- Overall train submission
  - Using the already existing ML submission framework (including merging jobs)



Some tests running, not operational yet