PID Analysis
Status, Experience and Requests

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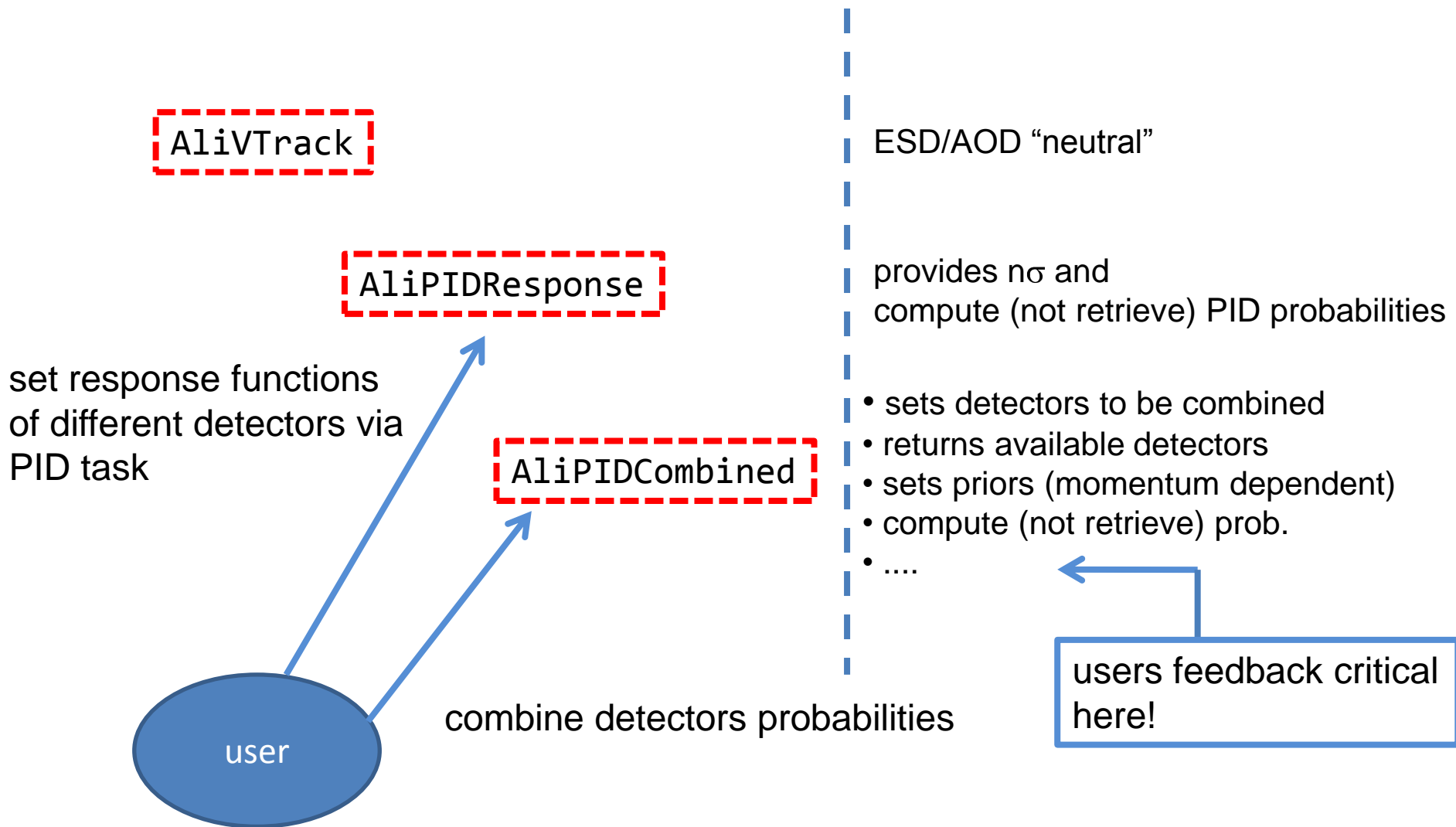on behalf of the PWG1 sub-group on combined PID

Overview

- PID Approaches relevant to offline:
  - AOD/ESD neutral
  - AOD PID information
  - handle centrally detector complexity
- Towards combined PID: align PID detector readiness
- QA PID task → PWG1 QA train
- Recent developments and requests
- Conclusions and outlook

PID approaches

- Push for AOD use:
construct AOD/ESD neutral interfaces using `AliVTrack`

- For PID, AOD combined probabilities proved not enough. Signals/sigmas needed at AOD level (es. D2H)

- Hide detector complexity to users:

    examples:

    (a)TPC: BB parametrization 'centralized' via OADB and general task to set PID Response

    (b)TOF: timeZero selection centrally managed producing AODs

- <u>Develop real cases</u> for combined PID. Released new class AliPIDCombined with basic functionalities (interfaced to AliPIDResponse) and we want then to build code on this following users needs/requests.

Towards combined PID

`AliVTrack`

ESD/AOD "neutral"

`AliPIDResponse`

provides $n\sigma$ and
compute (not retrieve) PID probabilities

set response functions
of different detectors via
PID task

`AliPIDCombined`

• sets detectors to be combined
• returns available detectors
• sets priors (momentum dependent)
• compute (not retrieve) prob.
• ....

combine detectors probabilities

user

users feedback critical here!

Detector readiness for ESD/AOD PID Analysis

	ITS	TPC	TRD	TOF	HMPID	EMCAL	PHOS
TWiki							
AliPIDResponse (nσ)	√	√	X	√	X		
AliPIDResponse (ComputeXXXProbability)	√	√	√	√	√		
AliPIDCombined	√	√	√	√	√	(dummy)	(dummy)
PID parametrizations in OADB		√	√		X		

Some pending issues especially relevant for offline:

(1) ITS: new Landau+Gauss params → requires new info on AOD track
(2) EMCAL/PHOS: both detectors currently trying to parametrize hadronic response in such a way to then provide <u>e/h separation</u>
(3) ITS/TOF/EMCAL/PHOS: in the time being no strong view/need about OADB use for PID.
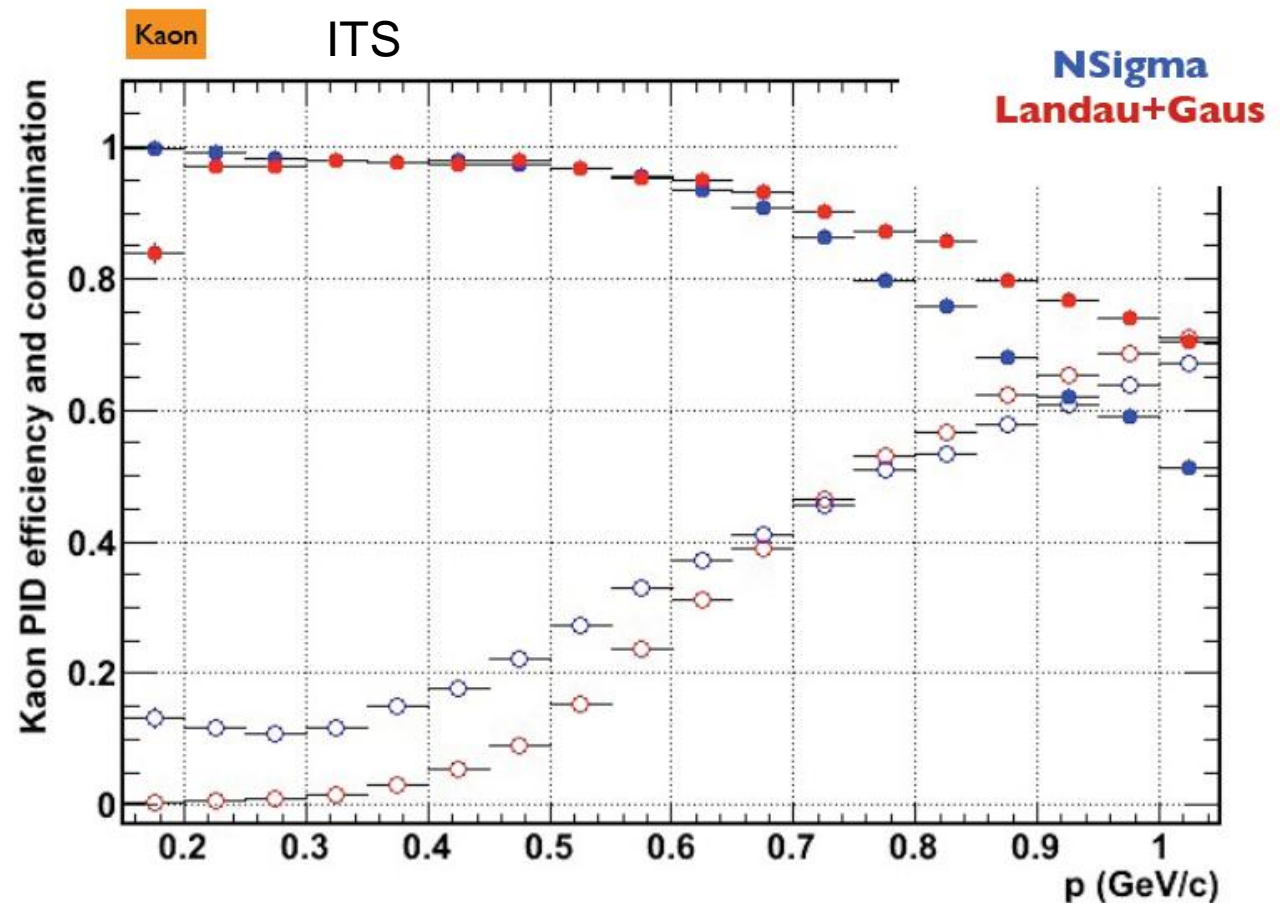
Landau/Gaus parametrization provides better PID:
move from truncated mean to use of four layers:
→ add 4 float to AOD

L. Milano

QA PID task

- `$ALICE_ROOT/ANALYSIS/AliAnalysisTaskQApid.cxx`
- `$ALICE_ROOT/ANALYSIS/macros/AddTaskPIDqa.cxx`
- ❑ Provides (currently) basics checks for ITS/TPC/TOF PID plots (nσ). Ideas to further add some plots.
- ➤ Request: add to PWG1 QA train (*or to reconstruction QA as said this morning?*)
- ➤ Request: add to selected AOD production during filtering

Example plots

J. Wiechula
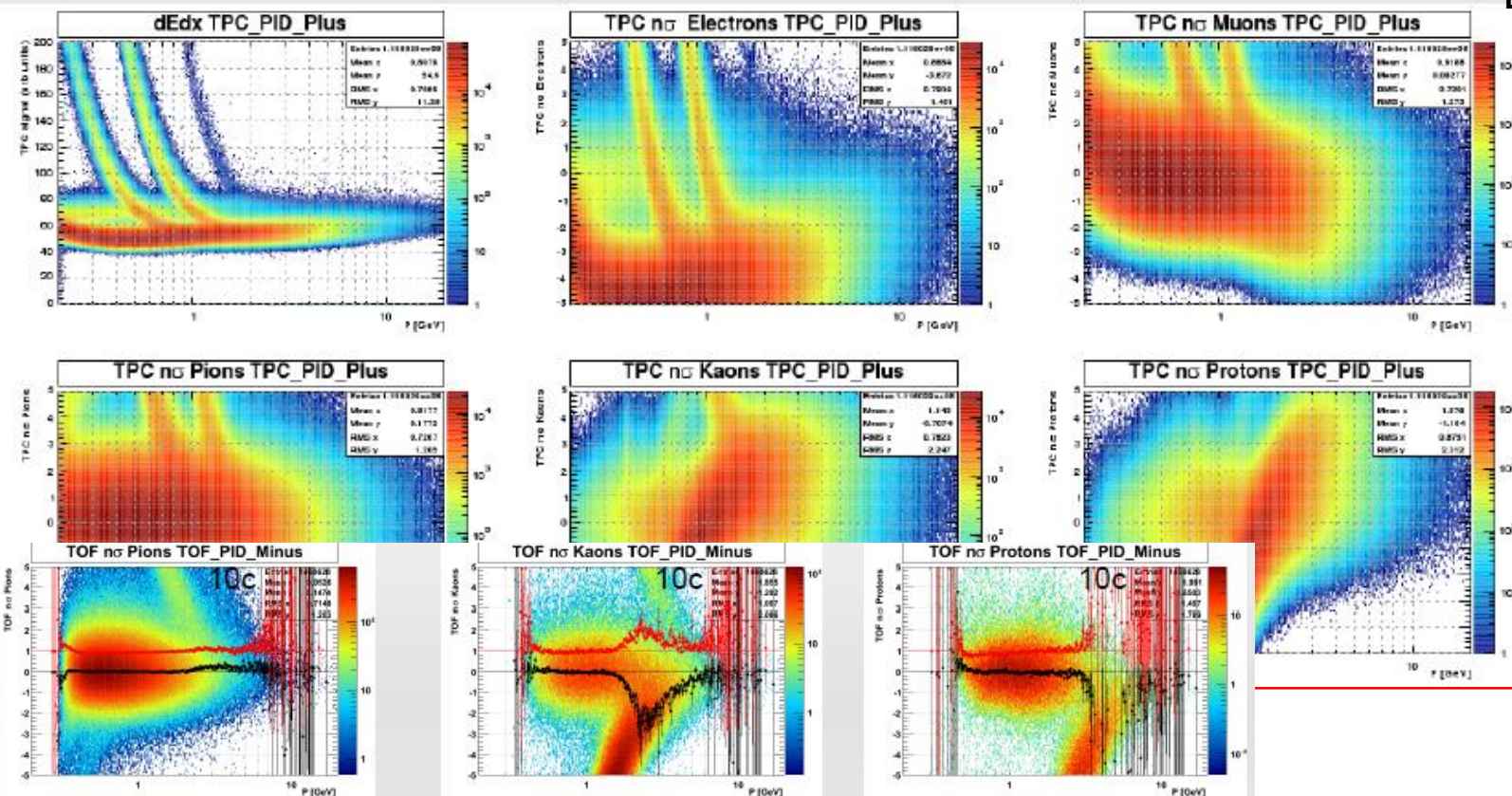
Some feedback from users/experience

- availability of proper PID parametrisation for users is key

  Tags <->OADB <-> productions support could be presented more clearly? [TPC issue]

  (new params inserted 24/06 but users still have problems for 2011MC)

- not yet enough feedback about TRD to understand if recently added support is satisfactory

- For TOF, handling of timeZero not yet completely satisfactory (MC in particular). Discussions on-going.

- In the foreseeable future we want to keep calibrated signals for all tracks (in `AliAODpid`). Note getters in `AliVTrack` provides uniform interface for ESD/AOD)

- ITS provided new params for dE/dx (support for electron PID at very low momentum). It looks stable so perhaps no need to use OADB (TBC).

Miscellanea

- Plans to enable support for light nuclei:
  but be sure we want to keep AOD small ....

- Having aliroot&reco pass in ESD/AOD (requested on Savannah): it would be certainly useful for handling some PID complexities we experienced

- PID 'particle numbering' inside AliRoot a looks a little bit inconsistent (`AliPID` and `AODTrkPID_t` for example): perhaps substantive reshuffling needed at some point, we will be back with a proposal (`AliVTrack` would be a natural place)! Similarly we introduced in `AliPIDResponse` detector numbering.

- EVO meetings every two weeks: Friday @ 14:30

- TWiki: https://twiki.cern.ch/twiki/bin/view/ALICE/AlicePIDTaskForce