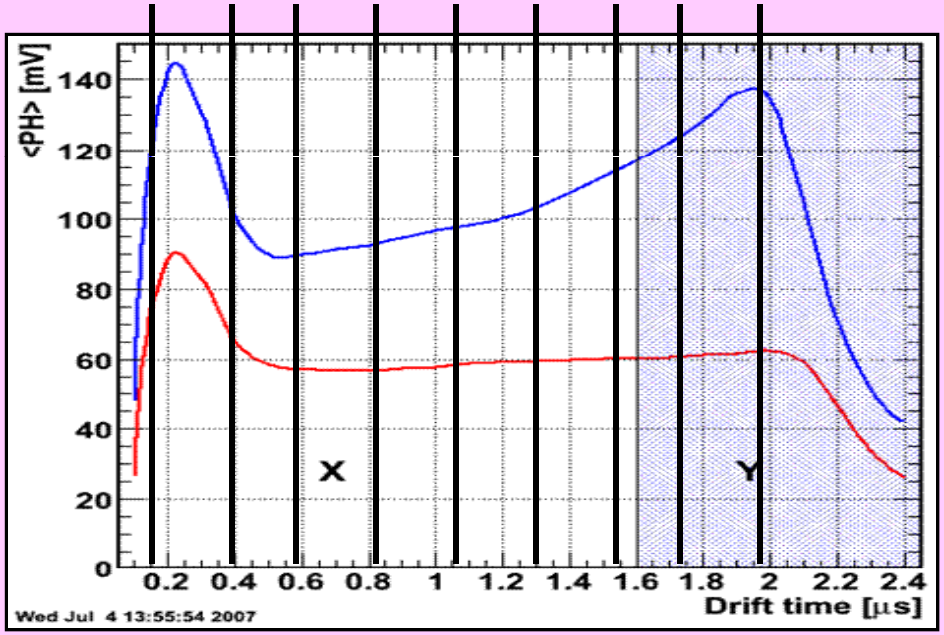
PID@AOD

(see also IB's talks at PWG1/PWG2 on 19.02.2008 and 07.03.2008)

- What is a "raw PID signal" ?
- What kind of the PID info do we keep in AOD ?

What is a "raw PID signal" ?

- Sometimes, this is not an easy question…
  The example of TRD:



The proposed "raw PID signal" is an array of charges registered in a sequence of drift-time slices.

What is the TRD "raw PID signal" ?

- Not an easy choice: the number of slices (disk space <-> PID performance)
- Where the optimum is – we don't know yet…
- However, the ESD/AOD development can go on, if the TRD PID signal is represented by something like TArrayF (well, six TArrayF's per a track ?)

Everything is fine, but this would be a backward incompatible change in ESD...

What is the TRD "raw PID signal" ?

A (separate ?) question of some additional data needed for PID with TRD (~6*20 fp numbers per track)

Needed for the V0 daughters only, and in ESD only.
Increase of the ESD size is ~ a few % (A. Wilk)

Does this info go to the ESD or ESD friends ?
The ESD seems to be better…

What kind of the PID info do we keep in AOD ?

- In ESD we have:
  - All the raw PID signals (to allow for "doing everything we'd like")
  - Single detector conditional probabilities (for the combining)
  - Combined conditional probabilities ("ESD's best")

Poor man's AOD solution:

Let's copy to AOD the "ESD's best",
the combined conditional probabilities (+ the status mask)

- Does not really work, because
  - We need also the a priory probabilities (especially, at high p)
  - Some quality checks of the combined conditional probabilities are also desirable.

What kind of the PID info do we keep in AOD ?

"Rich man's" AOD solution:

Let's keep all the raw PID signals for all the tracks

- Everything is fine, but…
  - An ideological problem: how about combining the PID info ?
  - A potential CPU problem: if combining like in ESD, then the response functions are a bit CPU expensive.
  - A potential disk space problem. The raw PID signals (currently):
    - ITS, HMPID: 1+1=2 fp numbers
    - TPC: 1+1=2 fp numbers
    - TRD: 6*3=18 fp numbers
    - TOF: 1+5=6 fp numbers
    - PHOS: ?
    - EMCAL: ?

  sizeof(AliAODTrack) ~ 200 bytes ~ 20 % increase ? Or more ?

What kind of the PID info do we keep in AOD ?

Compromising AOD solution (proposal):

- The combined conditional probabilities + status mask, for all the AOD tracks
- The raw PID signals, for a certain fraction of the AOD tracks (high p + a few % of low p)

- Everything should be fine, because
  - "ESD best" becomes "AOD best" (the combining is done in ESD)
  - The conditional probabilities are pre-calculated (no CPU problem)
  - The increase of the AOD size can be made ~1-2 % (no disk space problem)
  - The a priori probabilities can still be estimated using the raw PID signals
  - The cross-checking "raw <-> conditional" is still possible
- However, if a problem is spotted, the AOD will have to be regenerated again (from the ESD)