Introduction to DPD

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DESY

Overview

- Aims of DPD
- Skimming, Thinning, Slimming
- D1/2/3PD in the FDR

Birth of the DPD

- In 2007, an Analysis Model Forum was set up to study strategies for data analysis
- Several open discussion and meetings, culminating in the Analysis Model Report:
  http://www.mppmu.mpg.de/~menke/draft_40.pdf
- Criticisms aimed at AOD format: large and unwieldy, too generic, cannot be customized by user
- Recommended use of new format: **D**erived **P**hysics **D**ata

Aims of the DPD

- Reduce the data size to 10% of AOD data (10KB/event) with little impact on physics
- Tailor the contents to the needs of the users
- Allow for user-generated content
- Allow for overlap removal
- Introduce alternative schemes for data access (AthenaROOTAccess, pure ROOT)

Size Reduction

- **Skimming:** removal of events

  e.g. Reject events based on TAG selection.

- **Slimming:** removal of details of object information

  e.g. Keep only 3 components of Lorentz vectors.

- **Thinning:** removal of container or object

  e.g. Only keep tracks near reconstructed object.

AOD Container Size

Trigger Container must be dropped to reach 10KB/ev target

Customization

- Instead of one AOD file, several flavours of DPD (typically for each Physics WG)
- Users (Groups) can define own set of contents and cuts
- Users can add inferred data to datafile (e.g. aplanarity, combined particles)
- Flat ROOT ntuple format tolerated

Format Hierarchy

- **D^{1}PD** Primary DPD, POOL format

  AOD Thinned, Skimmed and Slimmed to reduce size.

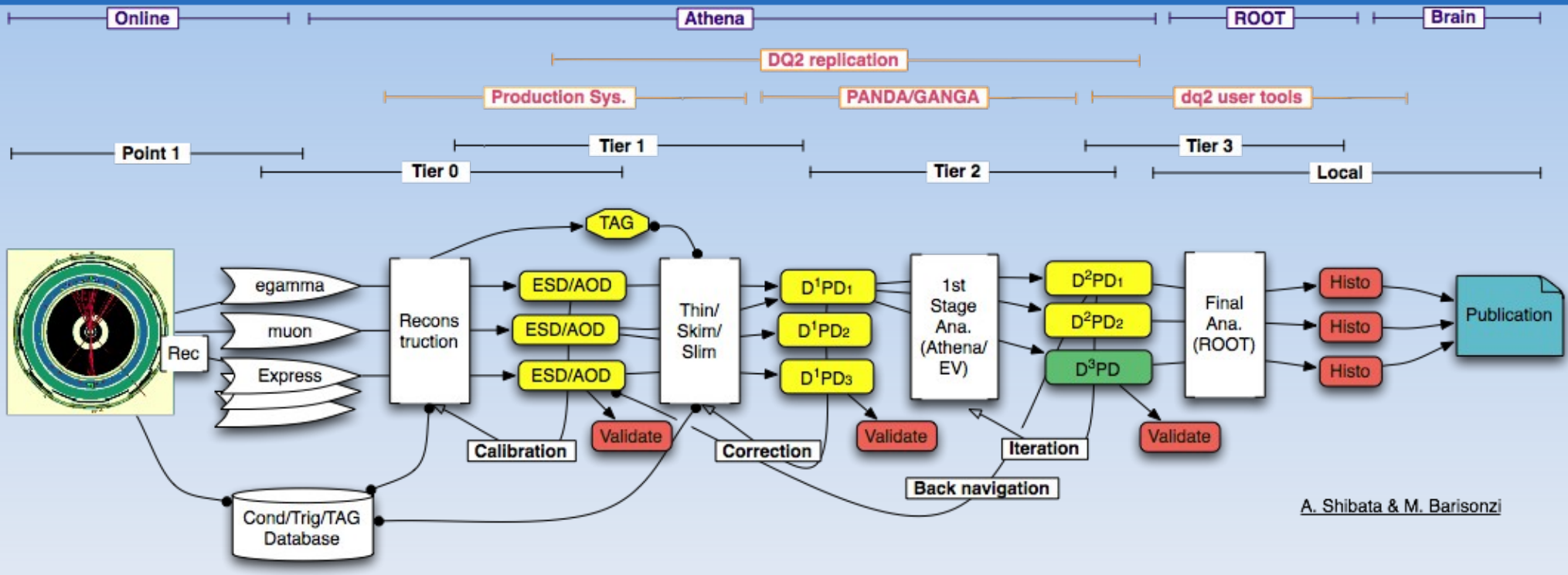
- **D^{2}PD** Secondary DPD, POOL format

  Output of framework analysis. Preselected/Overlap-removed objects and additional UserData

- **D^{3}PD** Tertiary DPD, Flat Ntuple

  The same content as D^{2}DP but in Flat Ntuple format

D^{n}PD production at FDR



A baseline model encompassing D^{1}PD, D^{2}PD and D^{3}PD/ntuple.

TauDPDMaker & TopPhysDPDMaker

- Both Tau WG and Top (plus EW) WG came up with their own DPDMakers
- Similar in concept: use default skimming, thinning & slimming tools for D1/2PD
- D3PD ntuple based on EventView

  https://twiki.cern.ch/twiki/bin/view/Atlas/EventView

Program for the day

- In the morning, David & Sylvie will teach you how to use TauDPDMaker to produce D2PD and D3PD
- In the afternoon, we'll analyze the ntuples produced in the morning session
- Optional for the afternoon (bored students) TopPhysDPDMaker + GRID