Status of the AOD

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Thanks to Christian K.-B.

Overview

- Common base classes for AODs and ESDs
- Content of the standard AOD
- Overall size
- Outlook
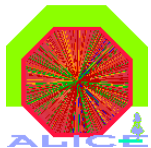
Common base classes for ESDs and AODs

AliVEvent

AliESDEvent **AliAODEvent**

AliVHeader

AliESDHeader **AliAODHeader**

AliVParticle

AliExternalTrackParam **AliAODTrack** **...**

AliESDtrack

- access to containers got standardized
- common getters and setters

Current content of the standard AOD

AliAODEvent   contains an (extendable) TList

AliAODHeader   event information

AliAODTrack   TClonesArray of tracks

AliAODVertex   TClones array of vertices

AliAODv0   TClonesArray of v0 information

AliAODJet   TClonesArray of jets

AliAODTracklets   Container for SPD tracklets

AliAODCaloCells   Container of EMCAL/PHOS cell information
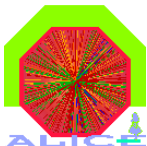
AliAODCaloCluster   TClonesArray of EMCAL/PHOS clusters

AliAODPmdCluster   TClonesArray of PMD clusters

AliAODFmdCluster   TClonesArray of FMD clusters

AliAODHeader

- Status: stable since several months

  AliAODHeader

- Size in memory: **132 bytes / event**
- Size on disk: **100 bytes / event**

- open requests:
  - add 5 numbers for the event plane (PWG2)
  - these numbers are only available after two loops over a large event sample
  - still under discussion

AliAODTrack

- Status: stable (only bitmap for filtering added)

- Size in memory: **364 bytes / track** (192+172 for cov. matrix)
- Size on disk: **159 bytes / track** (120+39 for cov. matrix)

- open requests:

  AliAODTrack

  – store primary momentum
  – momenta at secondary vertices are generally stored with/in the vertex itself
  – for tracks only connected to a secondary vertex, store momentum at secondary vertex
  – provide helix propagation and relation to vertex routines
  – add muon information (5 values)
  – re-evaluate how to store PID information

- recent developments:
  – don't store orphan tracks (tracks not connected to a primary or secondary vertex)

AliAODVertex

- Status: very stable

<div style="border:1px solid black;background:yellow">**AliAODVertex**</div>

- Size in memory: **164 bytes / vertex** (112+52 for cov. matrix)
- Size on disk: **111 bytes / vertex** (96+15 for cov. matrix)

- no open requests
- Number of vertices is very high! Filtering!

- Remark: AliAODVertex is mainly used for navigational purposes.

AliAODv0

- Status:
  - new class for the standard AOD
  - does not inherit from AliAODVertex but has a reference to it

- Size in memory: **224 bytes / V0** (72+152 internal arrays)
- Size on disk: **224 bytes/ V0 !!!**
     will be: **152 bytes / V0** (72+80 internal arrays)

- Current developments:
  - convert Double_t to Double32_t
  - replace AliAODVertex with TRef to AliAODVertex in vtx. array
  - store momentum at vertex of the daughter tracks here
    (not with the original tracks)
  - fill properly

AliAODVertex

AliAODv0
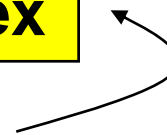
AliAODJet

- Status: stable after changes of PWG4 ~6 weeks ago

- Size in memory: **152 bytes / jet** (52+100 internal objects)
- Size on disk: **136 bytes / jet** (36+100 internal objects)

- no open requests   **AliAODJet**

- Remark: not filled within CreateAODfromESD.C

AliAODTracklets

- Status:
  - new class in the standard AOD
  - stable, except for some changes concerning compression

- Size in memory: **48 bytes / bare object**
- Size on disk: **36 bytes / bare object**
- Actual size depends on # of found SPD tracklets!
  - in memory: **28 bytes / tracklet**
  - on disk: **16 bytes / tracklet**

AliAODTracklets

- no open requests

AliAODCaloCells

- Status: new class in the standard AOD; one week old

- Size in memory: **44 bytes / bare object**
- Size on disk: **40 bytes / bare object**
- Actual size depends on # of fired calorimeter cells!
  - in memory: **10 bytes / cell**
  - on disk: **6 bytes / cell**

- no open requests so far
- testing still ongoing

AliAODCaloCells

AliAODCaloCluster

- Status:
  - new class in the standard AOD
  - inherits from AliAODCluster (base class)
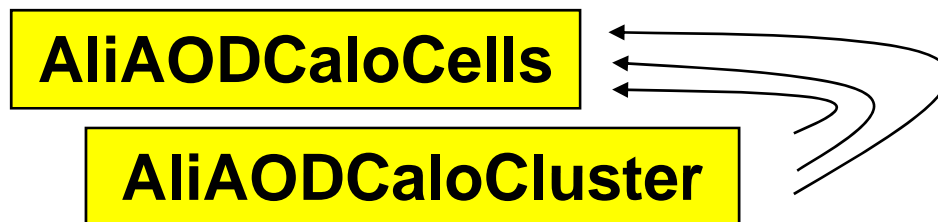 - under development

AliAODCluster

AliAODCaloCluster

- Size in memory: **> 152 bytes / cluster** (size of base class)
- Size on disk: **> 96 bytes / cluster** (size of base class)

- Requests:
  - merge the requirements by PHOS and EMCAL to produce a common class for both cluster types
  - add a TRefArray referring back to the AliAODCaloCells

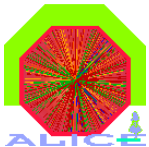**AliAODCaloCells**

AliAODCaloCluster

AliAODPmdCluster

- Status:
  - new class in the standard AOD
  - inherits now from AliAODCluster (base class)
  - content stable since about one year
  - some refinements/reductions due to new inheritance
  - not completely filled so far

- Size in memory: **168 bytes / cluster**
- Size on disk: **112 bytes / cluster**

- Current developments:
  - fill reference to associated cluster (on second layer) correctly

AliAODCluster

AliAODPmdCluster

AliAODFmdCluster

- Status:
  - new class in the standard AOD
  - inherits now from AliAODCluster (base class)
  - content stable since about one year
  - some refinements/reductions due to new inheritance
  - unclear (at least to me) how to fill from the ESD

- Size in memory: **184 bytes / cluster**
- Size on disk: **128 bytes / cluster**

- Current developments:
  - replace pointers to tracks and vertices with TRef's
  - implement filling procedure

AliAODCluster

AliAODFmdCluster

Overall Size (Preliminary!)

- **Pb+Pb** (0-5 fm)
- v4-06-Release
- 3.95 Mb / event
- with scaling to min. bias (12.5/40)
- **1.24 Mb / event**
- ~factor 5 reduction from ESD

- **p+p**
- v4-06-Release
- **2.6 kB / event**
- ~factor 13 reduction from ESD

- **Even though many things were added, the removal of orphan tracks reduced the overall size!**

Size overview

	Size in memory [bytes]	Size on disk [bytes]	relative size in PbPb (0-5 fm) [a.u.]	Remarks
AliAODHeader	132	100		
AliAODTrack	364	159	100	
AliAODVertex	164	111	46	
AliAODv0	224	224 (152)	4 (3)	not filled correctly
AliAODJet	152	136		not filled
AliAODTracklets	48+n*28	36+n*16	16	
AliAODCaloCells	44+n*10	40+n*6	<1	
AliAODCaloCluster	>152	>96		not fully implemented
AliAODPmdCluster	168	112		
AliAODFmdCluster	184	128		not filled
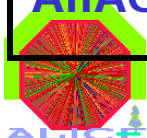
Outlook

- implement remaining requests of PWGs

- conclude discussions about different types of AODClusters

- fix/understand some 'bugs' concerning
  - adding/removing user objects to the TList
  - arbitrary objects showing up on file

- improve filtering