

DPG packages and code development

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ALICE Offline week
CERN
2 October 2016

Packages

- **AliRoot**
online/offline reconstruction software
simulation software
- **AliPhysics**
data analysis software
QA and AOD filtering
- **AliDPG**
new package
production macros

ALiDPG repository

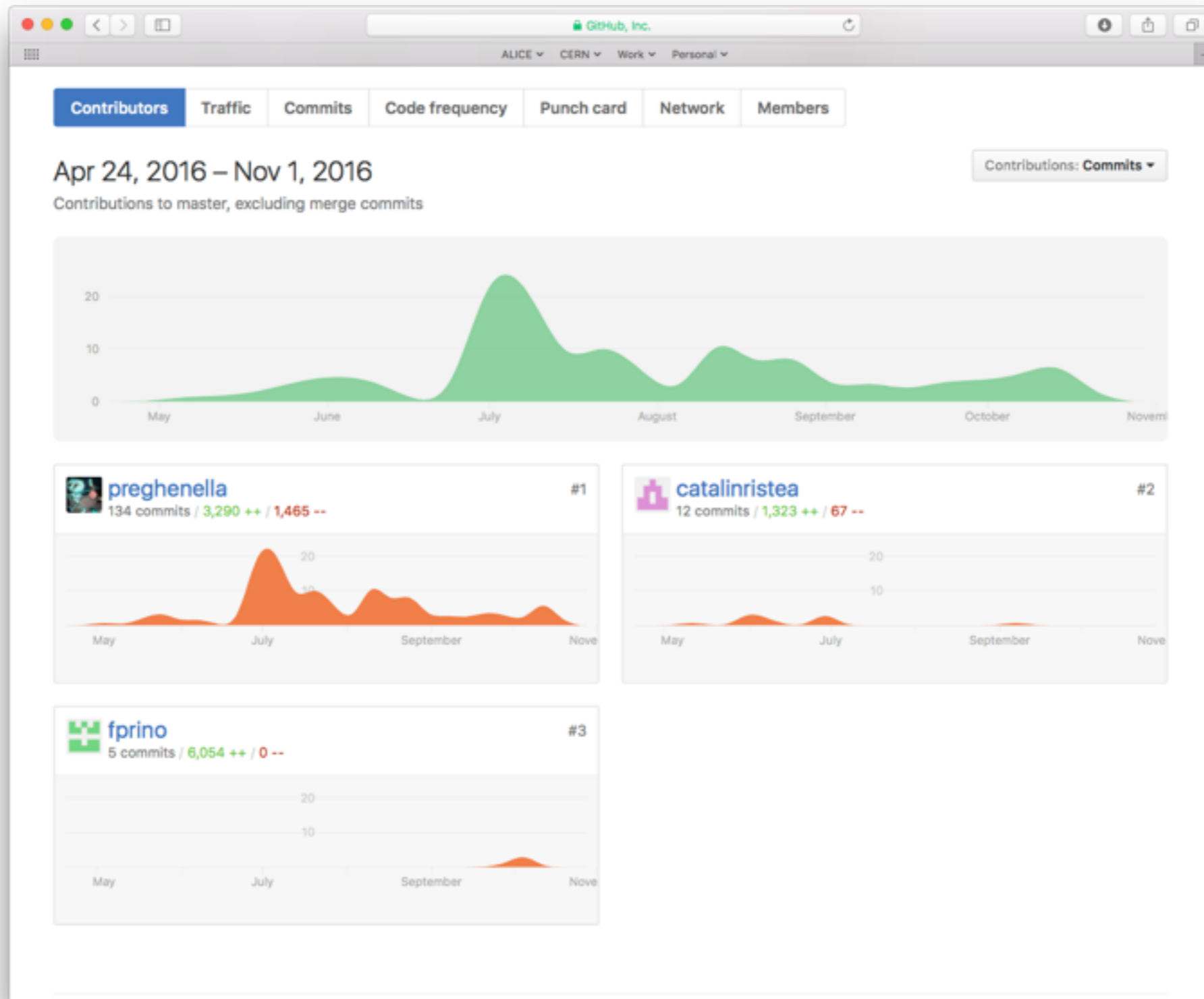
<https://github.com/alisw/ALiDPG>

The screenshot shows the GitHub repository page for 'ALiDPG' by user 'alisw'. The repository is titled 'ALICE DPG SW Repository' and has 203 commits, 6 branches, 10 releases, and 3 contributors. The current branch is 'master'. A recent commit by 'preghenella' is highlighted, with a description: 'Possible fix to inhibit AliEn connection in AODtrain macro, unless re...'. Below this, a list of folders is shown: 'AOD', 'DataProc', 'MC', 'QA', and 'bin', each with a brief description and a commit date. At the bottom, there is a prompt to 'Add a README'.

Folder	Description	Commit Date
AOD	Possible fix to inhibit AliEn connection in AODtrain macro, unless re...	8 days ago
DataProc	Macros and scripts for CPass1 and TPC SP calib	20 days ago
MC	Removed spurious printout	15 days ago
QA	Possible fix to inhibit AliEn connection in QATrain macro, unless req...	14 days ago
bin	Cleanup of main scripts	5 months ago

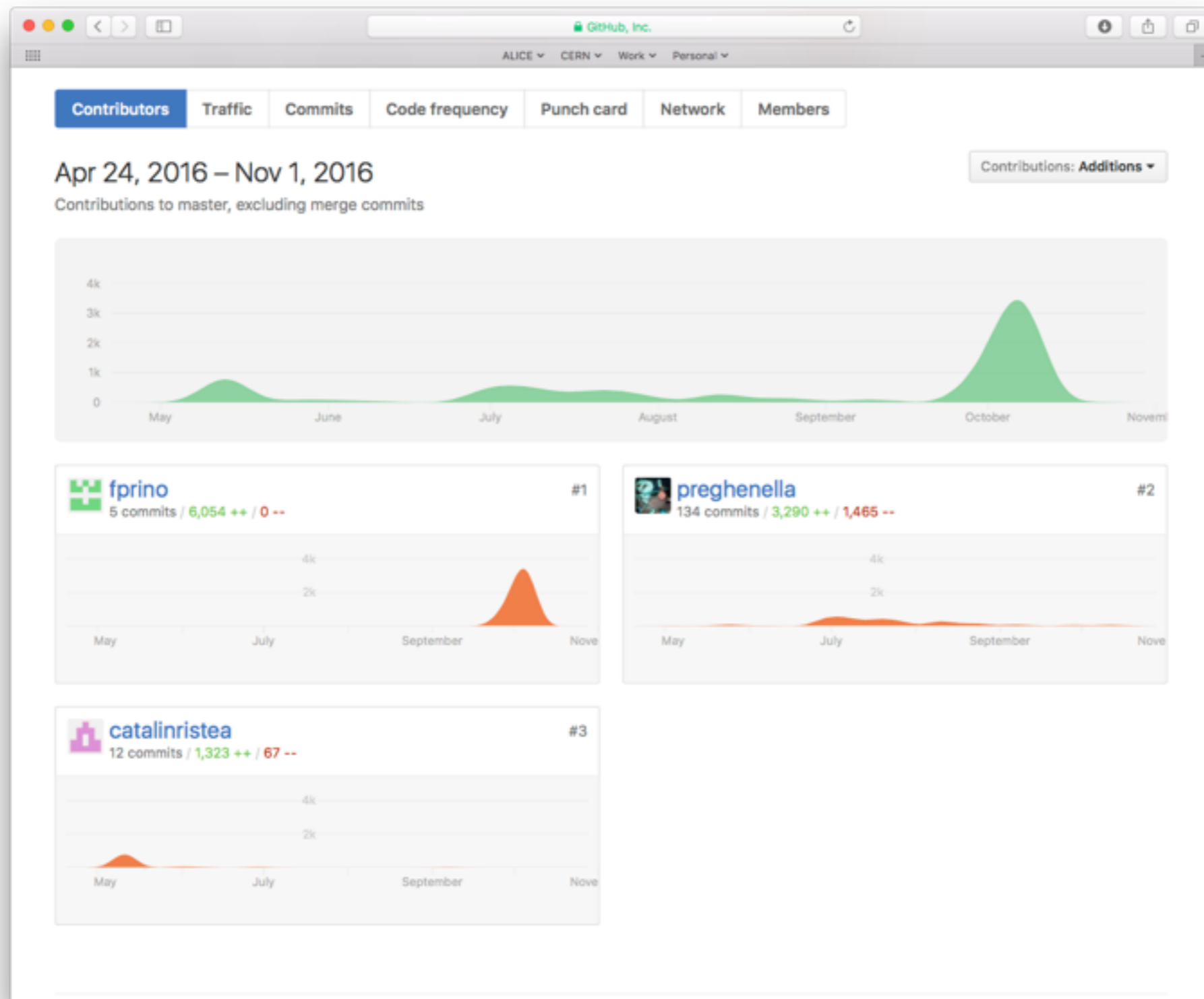
ALiDPG activity

high activity during the summer for MC preparation



ALiDPG activity

large additions recently to include Data Processing code



AliDPG repository

contains production macros

203 commits

6 branches

10 releases

3 contributors

Branch: master ▾







New pull request

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 preghenella	Possible fix to inhibit AliEn connection in AODtrain macro, unless re... ...	Latest commit f31c3a1 8 days ago
 AOD	Possible fix to inhibit AliEn connection in AODtrain macro, unless re...	8 days ago
 DataProc	Macros and scripts for CPass1 and TPC SP calib	20 days ago
 MC	Removed spurious printout	15 days ago
 QA	Possible fix to inhibit AliEn connection in QAttrain macro, unless req...	14 days ago
 bin	Cleanup of main scripts	5 months ago

AOD & **QA** train macros

Data Processing macros (CPass0, CPass1, ...)

Monte Carlo generation and processing macros

AliDPG: QA/AOD

Branch: master ▾


AliDPG / QA /

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History

 **preghenella** Possible fix to inhibit AliEn connection in QAtrain macro, unless req... ...

Latest commit b936fe6 14 days ago

..

 [QAtrain_duo.C](#)

Macros for AOD and QA by Catalin

23 days ago

 [QAtrainsim.C](#)

Possible fix to inhibit AliEn connection in QAtrain macro, unless req...

14 days ago

 [mergeQAgroups.C](#)

Macro from QA output merging

21 days ago

Branch: master ▾


AliDPG / AOD /

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History

 **preghenella** Possible fix to inhibit AliEn connection in AODtrain macro, unless re... ...


Latest commit f31c3a1 8 days ago

..

 [AODtrain.C](#)

Macros for AOD and QA by Catalin

23 days ago

 [AODtrainsim.C](#)

Possible fix to inhibit AliEn connection in AODtrain macro, unless re...

8 days ago

AliDPG: Data Processing

Branch: master ▾ AliDPG / DataProc /

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fprino Macros and scripts for CPass1 and TPC SP calib Latest commit 6c94f00 20 days ago

..

CPass0	script for cpass0 OCDB merging	21 days ago
CPass1	Macros and scripts for CPass1 and TPC SP calib	20 days ago
MergeOutputs	Macros and scripts for CPass1 and TPC SP calib	20 days ago
TPCSPCalibration	Macros and scripts for CPass1 and TPC SP calib	20 days ago

Branch: master ▾ AliDPG / DataProc / CPass0 /

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fprino script for cpass0 OCDB merging Latest commit 10496a4 21 days ago

..

makeOCDB.C	Script and macros for CPass0	25 days ago
mergeByComponent.C	Script and macros for CPass0	25 days ago
mergeMakeOCDB.byComponent.perStage.sh	script for cpass0 OCDB merging	21 days ago
raw2clust.C	Script and macros for CPass0	25 days ago
recCPass0.C	Script and macros for CPass0	25 days ago
runCPass0.sh	Script and macros for CPass0	25 days ago
runCalibTrain.C	Script and macros for CPass0	25 days ago

AliDPG: Monte Carlo

Branch: master ▾

AliDPG / MC /

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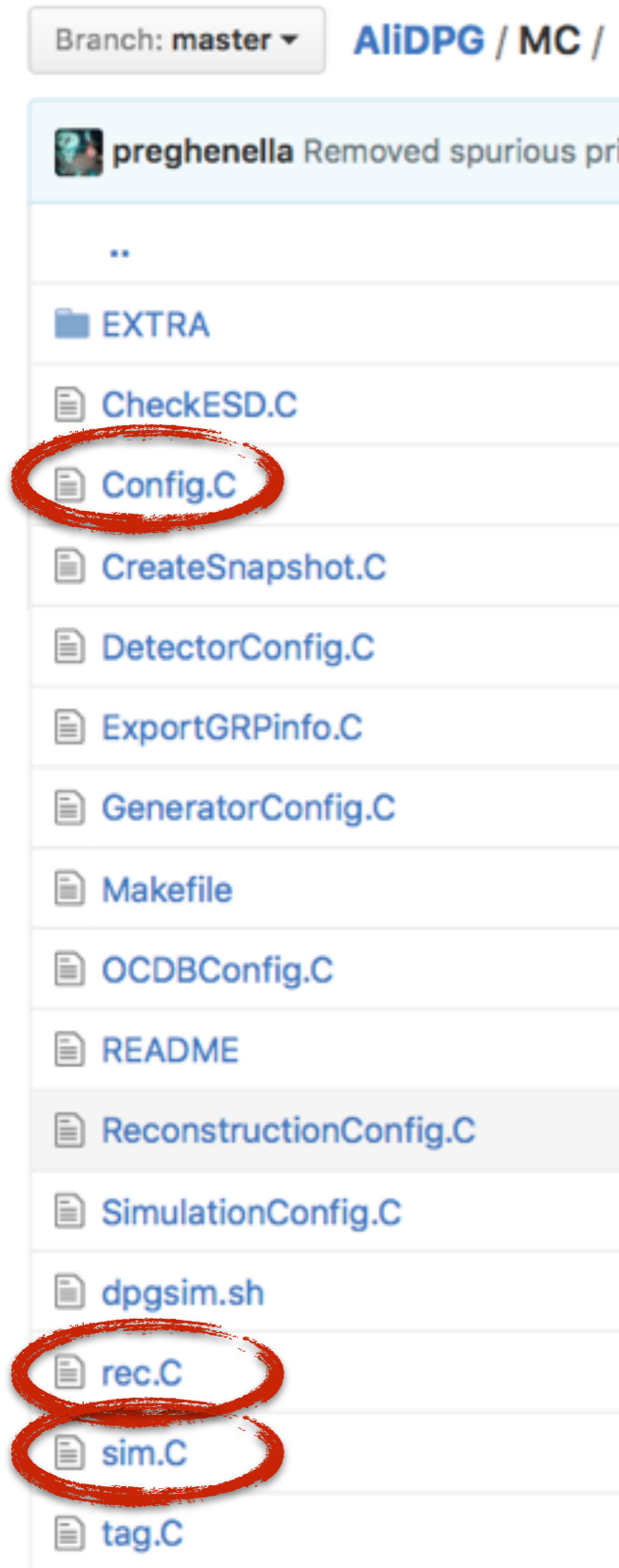
History

 **preghenella** Removed spurious printout

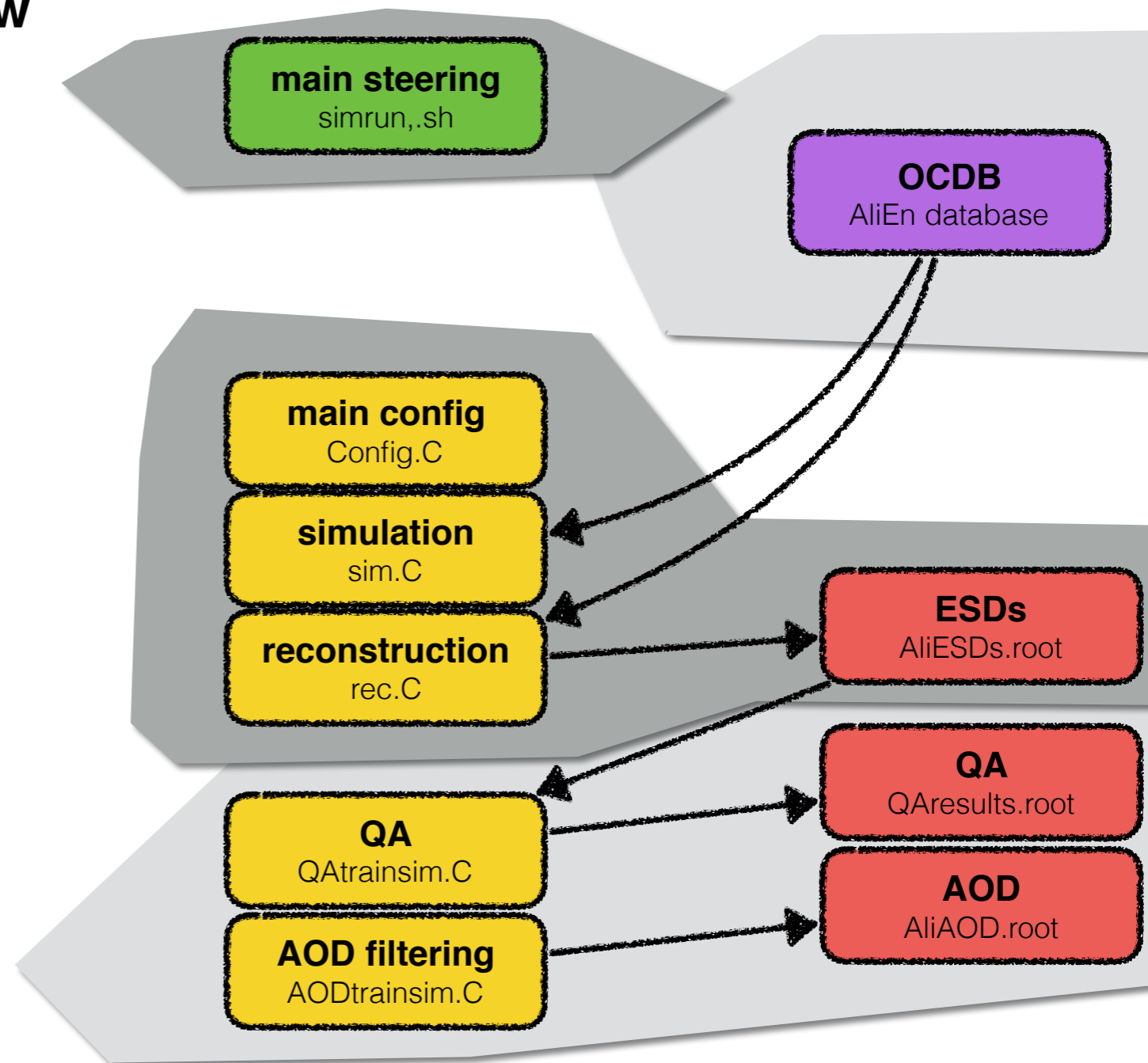
Latest commit a30600c 15 days ago

..		
EXTRA	EPOSLHC update: implemented generic generator, collision system/energ...	4 months ago
CheckESD.C	Avoid setting default storage to raw:// in CheckESD.C	3 months ago
Config.C	Fix to allow pthardmax == -1	3 months ago
CreateSnapshot.C	Start development for fully automatised setup of year/period/system.	4 months ago
DetectorConfig.C	Implementation of NoZDC detector configuration. Reduces pp simulation...	2 months ago
ExportGRPInfo.C	Added env variable DETECTORMASK from GRP, used to switch off ZDC geom...	2 months ago
GeneratorConfig.C	Implementation of Hijing_Nuclex004 configuration	26 days ago
Makefile	Makefile update	4 months ago
OCDBConfig.C	Removed spurious printout	15 days ago
README	README updated with correct information for MC workflow	4 months ago
ReconstructionConfig.C	Major bug fix in Reconstruction stage: now reading correct OCDB snaps...	3 months ago
SimulationConfig.C	Switch off PHOS non-linearity for Run-2	3 months ago
dpgsim.sh	Write to which file we log the output	2 months ago
rec.C	Start development for fully automatised setup of year/period/system.	4 months ago
sim.C	Start development for fully automatised setup of year/period/system.	4 months ago
tag.C	Added CheckESD.C and tag.C in MC directory	6 months ago

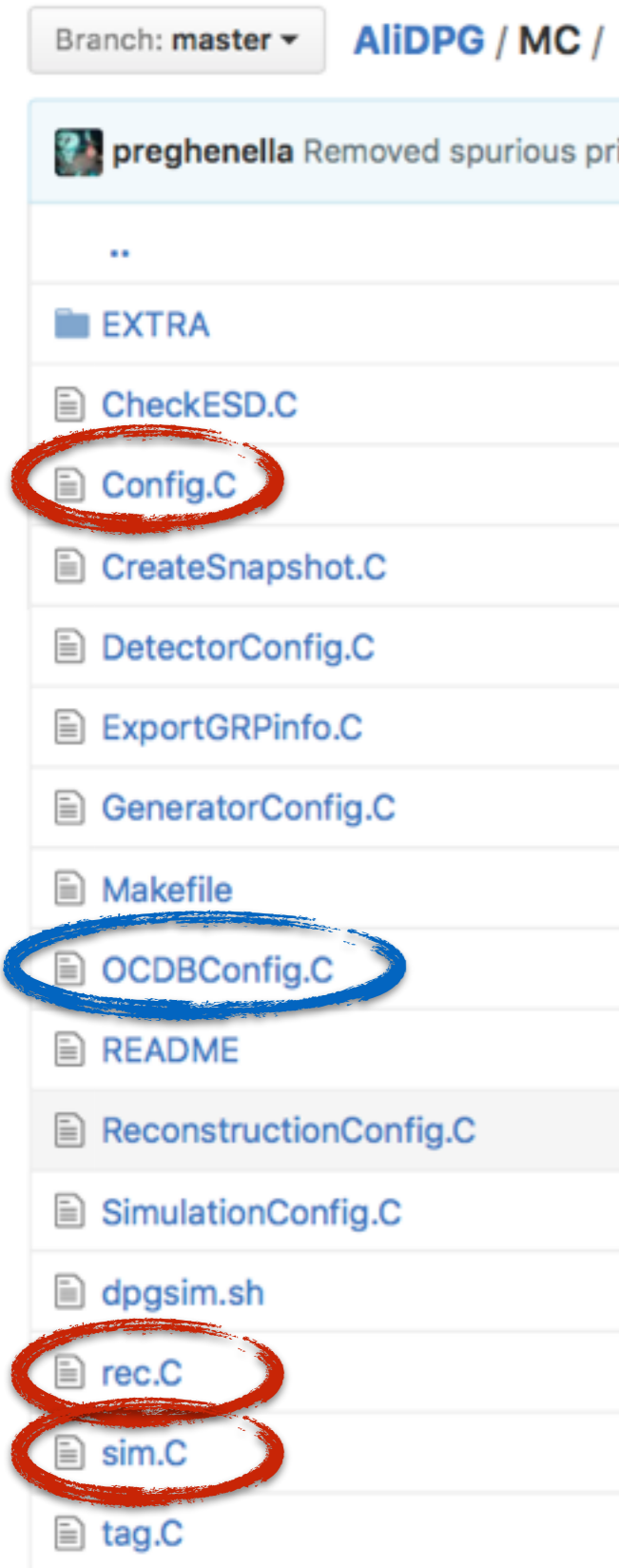
AliDPG: Monte Carlo



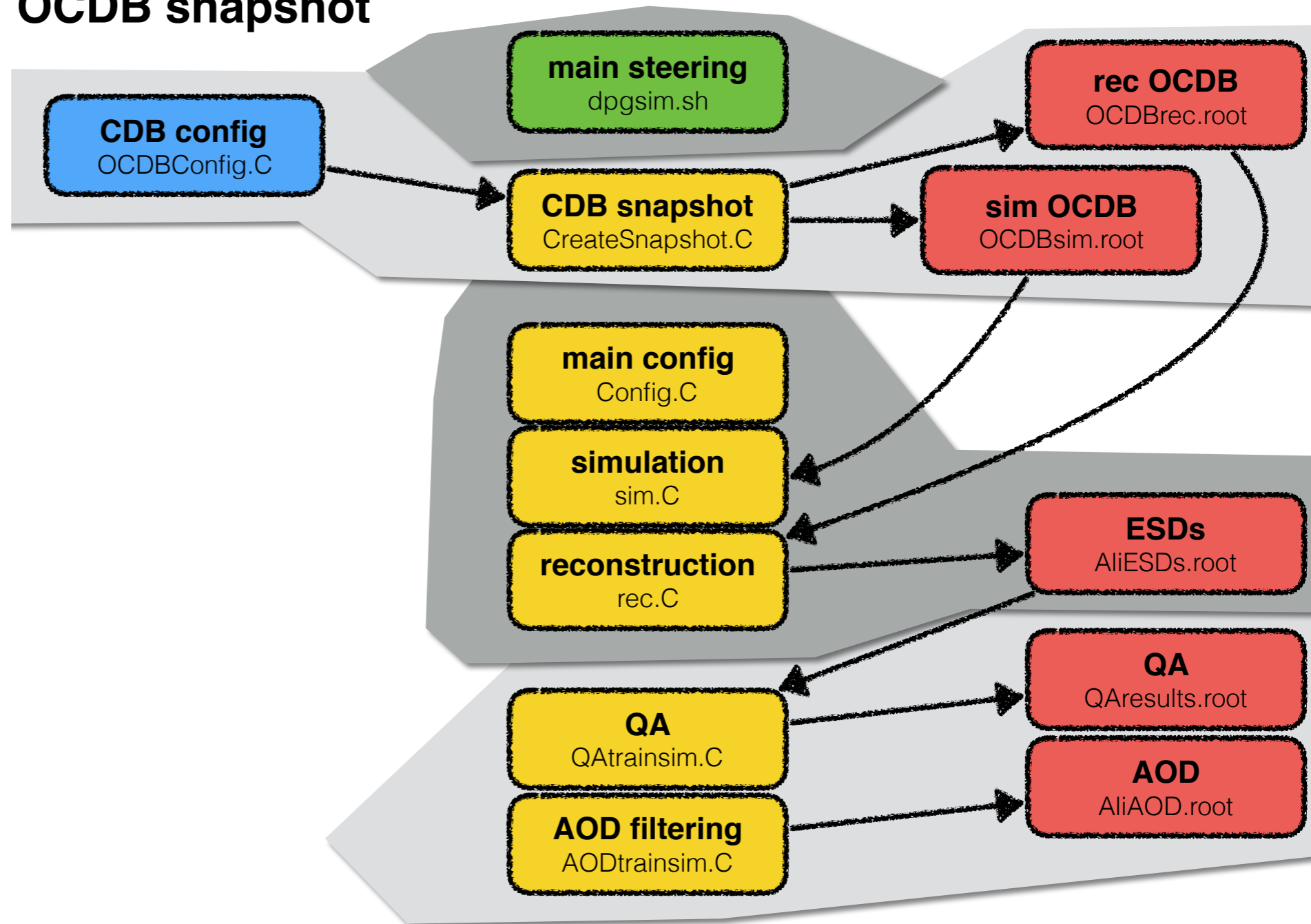
main workflow



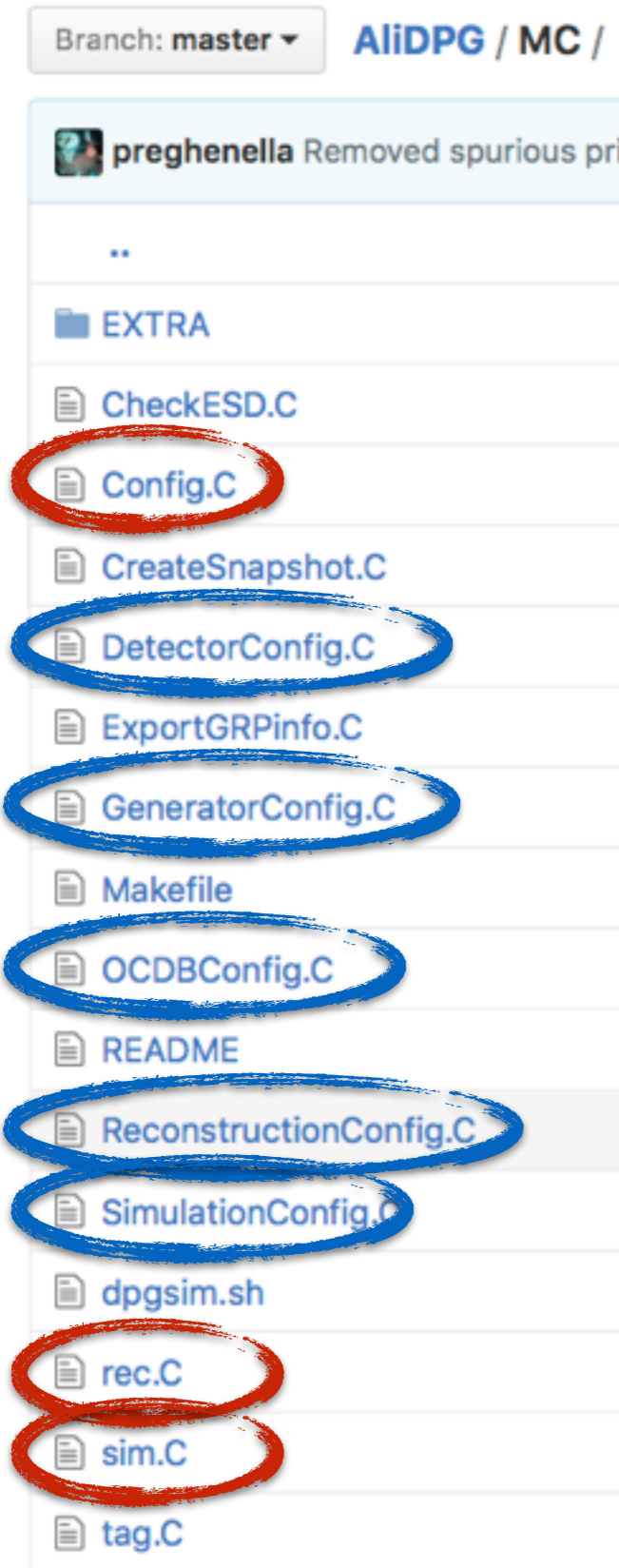
AliDPG: Monte Carlo



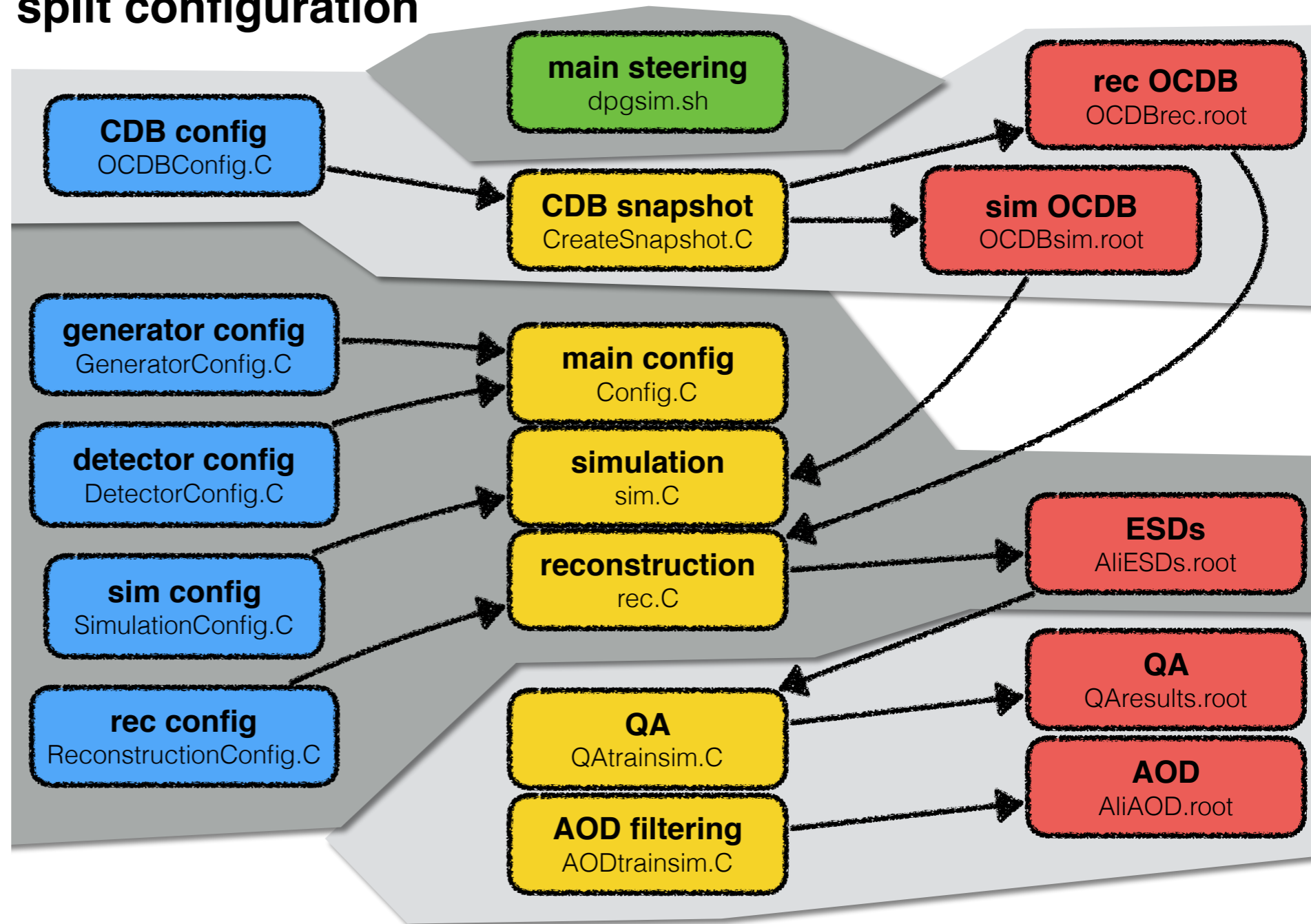
OCDB snapshot



AliDPG: Monte Carlo




split configuration






Automatic configurations

reduce the human intervention/error to zero (or close to)

preghenella Possible fix to inhibit AliEn connection in AODtrain macro, unless re... example f31c3a1 8 days ago

2 contributors 

564 lines (511 sloc) | 22.8 KB Raw Blame History   

```
1 // ### Settings that make sense when using the Alien plugin
2 //=====
3 Int_t      runOnData      = 0;      // Set to 1 if processing real data
4 Int_t      iCollision     = 0;      // 0=pp, 1=Pb-Pb
5 Int_t      run_flag      = 1500;   // year (1000, 2010 pp; 1100, 2011 pp; 1500, 2015)
6 Int_t      year          = 2015;
7 TString    periodName    = "LHC15f";
8 TString    train_name    = ".";
9 Int_t      run_numbers[10] = {255106};
10
11 //=====
12 Bool_t     doCDBconnect   = kTRUE;
13 Bool_t     usePhysicsSelection = kTRUE; // use physics selection
14 Bool_t     useTender      = kFALSE; // use tender wagon
15 Bool_t     useCentrality  = kFALSE; // centrality
16 Bool_t     useV0tender    = kFALSE; // use V0 correction in tender
17 Bool_t     useDBG         = kTRUE;  // activate debugging
18 Bool_t     useMC          = kTRUE;  // use MC info
19 Bool_t     useKFILTER     = kTRUE;  // use Kinematics filter
20 Bool_t     useTR          = kTRUE;  // use track references
21 Bool_t     useCORRFW      = kFALSE; // do not change
22 Bool_t     useAODTAGS     = kFALSE; // use AOD tags
23 Bool_t     useSysInfo     = kFALSE; // use sys info
24 Bool_t     isMuonCaloPass = kFALSE; // setting this to kTRUE will disable some not needed analysis tasks for a muon_calo pass
25
```

several hardcoded configs so far modified by hand before uploading to AliEn for production

for instance run_flag used by ESD filter to apply year-specific cuts

Automatic configurations

reduce the human intervention/error to zero (or close to)

the run number is known

retrieve all necessary information starting from run number
and derive all other quantities accordingly

```
//  
// Figure out the run_flag - still the "poor-man-solution" :)  
//  
run_flag = 1500;  
if (gSystem->Getenv("CONFIG_YEAR"))  
    year = atoi(gSystem->Getenv("CONFIG_YEAR"));  
if (gSystem->Getenv("CONFIG_PERIOD"))  
    periodName = gSystem->Getenv("CONFIG_PERIOD");  
if(year<2015) run_flag =1100;  
if(year<=2010) {  
    run_flag =1000;  
    if (periodName.EqualTo("LHC10h"))  
        run_flag = 1001;  
}
```

once coded correct
it will always execute correct

OCDB snapshots

OCDB snapshot



- OCDB objects **stored in two snapshots and saved** in the production directory on AliEn
 - possible to retrieve right information even if OCDB updated
 - OCDB updates are possible while in production
 - multiple productions with identical OCDB
 - repetition of future productions with very same OCDB

OCDB tagged releases

it would be even better if we could tag the OCDB

make the OCDB a versionable entity

snapshots resolve the problem of OCDB reproducibility and interference but they are still files residing on AliEn, **not really versioned**, can be lost...

- AliRoot software
- AliPhysics software
- AliDPG software
- OCDB data

software is versioned and tagged
if also OCDB is treated like that
4 tags can **uniquely identify
a production**

under development

Universal macros

AliDPG has been born as a standalone package

no compile-time dependencies on AliRoot/AliPhysics

with the goal of being a universal package

to be compatible with past/future AliRoot/AliPhysics versions

this is quite an ambitious goal...

AliDPG is a bunch of ROOT macros

dependencies on AliRoot/AliPhysics are there

sensitive to code development in AliRoot/AliPhysics

can be broken without notice by updates or new features

can the goal be achieved?

can we preserve backward/forward compatibility?

Transparent to macros

code development in AliRoot/AliPhysics done such that updates and new features are introduced in a way that is **transparent to AliDPG**

everything is handled within the main package

that is inside AliRoot/AliPhysics

using information available in the data or in the OCDB

no need for intervention on AliDPG code

what if this is not possible for some cases?

Enforced compatibility

when it is **not possible to avoid changes in AliDPG** macros following updates in AliRoot/AliPhysics or with the introduction of new features
AliDPG macros must be updated

but there is still a chance to update and at the same time
preserve the compatibility with older software

make use of ROOT capabilities to test the **existence and signature of class methods and functions** whenever any of these updates happen

Code signatures

this piece of code is used to **test whether TPC distortions are requested** to be simulated in the Monte Carlo (from OCDB RecoParam)
the code makes use of **new functions recently introduced** for the development of space-point distortion simulation
if the functions do not exist, namely we are running with an older AliRoot, a **fallback solution is chosen instead of triggering an error**

```
/******  
  
Bool_t  
RecoParamWithTPCDistortions(AliCDBManager *man) {  
  
    // check methods exist  
    if (!AliRecoParam::Class()->GetMethodAny("SuggestRunEventSpecie"))  
        return kFALSE;  
    if (!AliTPCRecoParam::Class()->GetMethodAny("GetUseCorrectionMap"))  
        return kFALSE;  
  
    // get event specie from GRP  
    AliCDBEntry *grpe = man->Get("GRP/GRP/Data");  
    if (!grpe) return kFALSE;  
    AliGRPObject *grp = (AliGRPObject *)grpe->GetObject();  
    AliRecoParam::EventSpecie_t evs = AliRecoParam::SuggestRunEventSpecie(grp->GetRunType(),  
                                                                              grp->GetBeamType(),  
                                                                              grp->GetLHCState());
```

Code signatures

number of arguments for
AddTaskESDfilter function
changed from 12 to 13 at some
point

```
// switch number of arguments (R+compatibility)
switch (gROOT->GetGlobalFunction("AddTaskESDfilter")->GetNargs()) {

case 12:
    AliAnalysisTaskESDfilter *taskesdfilter =
        AddTaskESDfilter(useKFILTER,
                        iMUONcopyAOD,      // write Muon AOD
                        kFALSE,           // write dimuon AOD
                        kFALSE,           // usePhysicsSelection
                        kFALSE,           // centrality OBSOLETE
                        kTRUE,            // enable TPS only tracks
                        kFALSE,           // disable cascades
                        kFALSE,           // disable kinks
                        run_flag,         // run flag (YY00)
                        3,                // muonMCMode
                        kFALSE,           // useV0Filter
                        muonWithSPDTracklets);

    break;

case 13:
    AliAnalysisTaskESDfilter *taskesdfilter =
        AddTaskESDfilter(useKFILTER,
                        iMUONcopyAOD,      // write Muon AOD
                        kFALSE,           // write dimuon AOD
                        kFALSE,           // usePhysicsSelection
                        kFALSE,           // centrality OBSOLETE
                        kTRUE,            // enable TPS only tracks
                        kFALSE,           // disable cascades
                        kFALSE,           // disable kinks
                        run_flag,         // run flag (YY00)
                        3,                // muonMCMode
                        kFALSE,           // useV0Filter
                        muonWithSPDTracklets,
                        isMuonCaloPass);

    break;
}
```

Code signatures

another example where an extra parameter was added

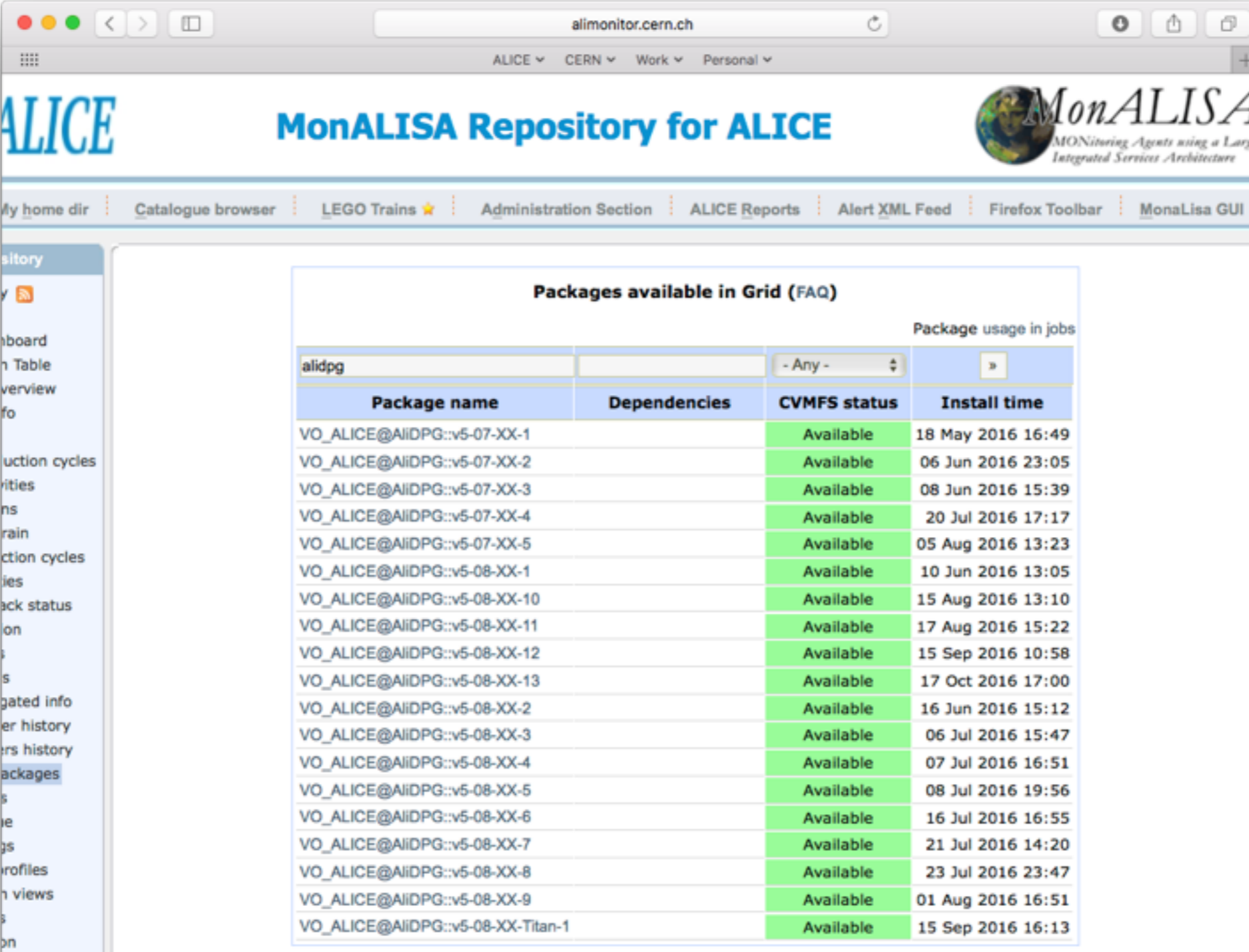
```
//PWGAgammaconv
if (iPWGGAgammaconv) {
    gROOT->LoadMacro("$ALICE_PHYSICS/PWGGA/GammaConv/macros/AddTask_ConversionAODProduction.C");

    // check function signature (R+compatibility)
    TFunction *function_ConversionAODProduction = gROOT->GetGlobalFunction("AddTask_ConversionAODProduction");
    TString signature_ConversionAODProduction = function_ConversionAODProduction->GetSignature();
    AliAnalysisTask *taskconv = NULL;
    if (signature_ConversionAODProduction.EqualTo("(Int_t dataset = 0, Bool_t isMC = kFALSE)"))
        taskconv = AddTask_ConversionAODProduction(iCollision, kFALSE);
    else
        taskconv = AddTask_ConversionAODProduction(iCollision, kFALSE, periodName);

    mgr->RegisterExtraFile("AliAODGammaConversion.root");
}
```

Production tags

two production branches, several tags from them



The screenshot shows the MonALISA Repository for ALICE website. The main content area displays a table titled "Packages available in Grid (FAQ)". The table lists various packages with their names, dependencies, CVMFS status, and install times. The status for all listed packages is "Available".

Package name	Dependencies	CVMFS status	Install time
VO_ALICE@Alidpg::v5-07-XX-1		Available	18 May 2016 16:49
VO_ALICE@Alidpg::v5-07-XX-2		Available	06 Jun 2016 23:05
VO_ALICE@Alidpg::v5-07-XX-3		Available	08 Jun 2016 15:39
VO_ALICE@Alidpg::v5-07-XX-4		Available	20 Jul 2016 17:17
VO_ALICE@Alidpg::v5-07-XX-5		Available	05 Aug 2016 13:23
VO_ALICE@Alidpg::v5-08-XX-1		Available	10 Jun 2016 13:05
VO_ALICE@Alidpg::v5-08-XX-10		Available	15 Aug 2016 13:10
VO_ALICE@Alidpg::v5-08-XX-11		Available	17 Aug 2016 15:22
VO_ALICE@Alidpg::v5-08-XX-12		Available	15 Sep 2016 10:58
VO_ALICE@Alidpg::v5-08-XX-13		Available	17 Oct 2016 17:00
VO_ALICE@Alidpg::v5-08-XX-2		Available	16 Jun 2016 15:12
VO_ALICE@Alidpg::v5-08-XX-3		Available	06 Jul 2016 15:47
VO_ALICE@Alidpg::v5-08-XX-4		Available	07 Jul 2016 16:51
VO_ALICE@Alidpg::v5-08-XX-5		Available	08 Jul 2016 19:56
VO_ALICE@Alidpg::v5-08-XX-6		Available	16 Jul 2016 16:55
VO_ALICE@Alidpg::v5-08-XX-7		Available	21 Jul 2016 14:20
VO_ALICE@Alidpg::v5-08-XX-8		Available	23 Jul 2016 23:47
VO_ALICE@Alidpg::v5-08-XX-9		Available	01 Aug 2016 16:51
VO_ALICE@Alidpg::v5-08-XX-Titan-1		Available	15 Sep 2016 16:13

AliDPG on lxplus

```
Downloads — ssh -l rpreghen lxplus.cern.ch — 80x24
~/Downloads — -bash
[-bash-4.1$ alienv q | grep -i alidpg
VO_ALICE@AliDPG::v5-07-XX-1
VO_ALICE@AliDPG::v5-07-XX-2
VO_ALICE@AliDPG::v5-07-XX-3
VO_ALICE@AliDPG::v5-07-XX-4
VO_ALICE@AliDPG::v5-07-XX-5
VO_ALICE@AliDPG::v5-08-XX-1
VO_ALICE@AliDPG::v5-08-XX-10
VO_ALICE@AliDPG::v5-08-XX-11
VO_ALICE@AliDPG::v5-08-XX-12
VO_ALICE@AliDPG::v5-08-XX-2
VO_ALICE@AliDPG::v5-08-XX-3
VO_ALICE@AliDPG::v5-08-XX-4
VO_ALICE@AliDPG::v5-08-XX-5
VO_ALICE@AliDPG::v5-08-XX-6
VO_ALICE@AliDPG::v5-08-XX-7
VO_ALICE@AliDPG::v5-08-XX-8
VO_ALICE@AliDPG::v5-08-XX-9
VO_ALICE@AliDPG::v5-08-XX-Titan-1
[-bash-4.1$ alienv enter VO_ALICE@AliDPG::v5-08-XX-12
[AliDPG/v5-08-XX-12] ~ > ls $ALIDPG_ROOT/bin/aliroot_dpgsim.sh
/cvmfs/alice.cern.ch/x86_64-2.6-gnu-4.1.2/Packages/AliDPG/v5-08-XX-12/bin/aliroot_dpgsim.sh
[AliDPG/v5-08-XX-12] ~ >
```


AliDPG on AliEn

```
Packages = {  
  "VO_ALICE@AliDPG::v5-08-XX-11",  
  "VO_ALICE@AliPhysics::v5-08-13h-01-1",  
  "VO_ALICE@jemalloc::v3.6.0"  
};  
Executable = "/alice/cern.ch/user/a/aliprod/bin/aliproduct_dpgsim.sh";  
InputFile = {  
  "LF:/alice/sim/2016/LHC16g1/OCDB/245064/OCDBsim.root",  
  "LF:/alice/sim/2016/LHC16g1/OCDB/245064/OCDBrec.root"  
};  
Split = "production:1-1100";  
SplitArguments = "--run 245064 --mode full --uid #alien_counter# --nevents 12 --generator Hijing";
```

notice this JDL takes OCDB snapshot files as input files
OCDB snapshot was created by a separate preceding job

AliRoot tagging

good experience with the **v5-08-13-patches** approach
releases used in production exclusively tagged from there

only vital commits are ported

there are of course some pros and cons
wrt. the tag-from-master approach

- **pros**
 - software is more stable by definition
 - the patching process converges
 - easy to keep track of changes in code
 - optimal to study the results of changes (good or bad)
- **cons**
 - time consuming
 - requires that patches apply smoothly
 - needs human intervention (margin of error)

AliRoot tracking

TWiki > ALICE Web > AliceDPG > AliRoot_tags (2016-10-24, ChiaraZampolli)

[Edit](#) [Attach](#) [PDF](#)

AliRoot tags used for Production

[Link to Release Validation](#)

- ⚙: in preparation
- ✅: done

AliRoot tag	Status	Main Issues that are <i>fixed</i> in the tag	Productions that use the tag	Related JIRA	Comments
v5-08-13q-cookdedx	✅	Same as v5-08-13-q, but including the "cookdedx" fix	LHC16p		
v5-08-13q	✅	update of AliTRDrawStream ; D meson filtering (CORRECT HASH)	MC for HF	ALIROOT-6955 , ALIROOT-6934	
v5-08-13p	✅	D meson filtering; fix in AliGenPythia for DQ (needed for 2016 data); minor fix in vdrift calibration	n/a	ALIROOT-6934 , ALIROOT-6943 , ALIROOT-6951	NOT TO BE USED: the fix in ALIROOT-6934 was applying the wrong hash
v5-08-13m-cookdedx	✅	Fix for bug in tracking ("cookdedx")	LHC16l, LHC16k (CPass)	ALIROOT-6930	
v5-08-13o	✅	Fix for STARLIGHT; generation of timestamps in TPC simulation; T0Digitizer ; memory allocation issue in HLT ; Event species for TOF simulation; Protection against usage of invalid TPC seeds	Large Scale tests for TPC SP dist in MC	ALIROOT-6881 , ALIROOT-6914 , ALIROOT-6924 , ALIROOT-6926 , ALIROOT-6932 , ALIROOT-6936	
v5-08-13n	✅	MeanVertex task fitting in pp; Simulation of TPC SP distortions; RecoParam aware of event species; CDBManager creates Map/List aware of snapshot sources, used for bookkeeping	n/a	ALIROOT-6890 , ALIROOT-6888 , ALIROOT-6902 , ALIROOT-6913	
v5-08-13m	✅	Histograms for PID in tracking; floating point exception in geant3; virtual interface in AliFastGaluber	n/a	ALIROOT-6884 , ALIROOT-6837 , ALIROOT-6886	

Summary

- **new software package: AliDPG**
used in production for Monte Carlo data processing being populated
some experience on macros/software interaction
- **OCDB snapshots**
fully in production also for Monte Carlo
work in progress for versioning approach
- **AliRoot tagging & tracking**
positive experience with the cherry-pick approach
not obviously the best, but a controlled approach