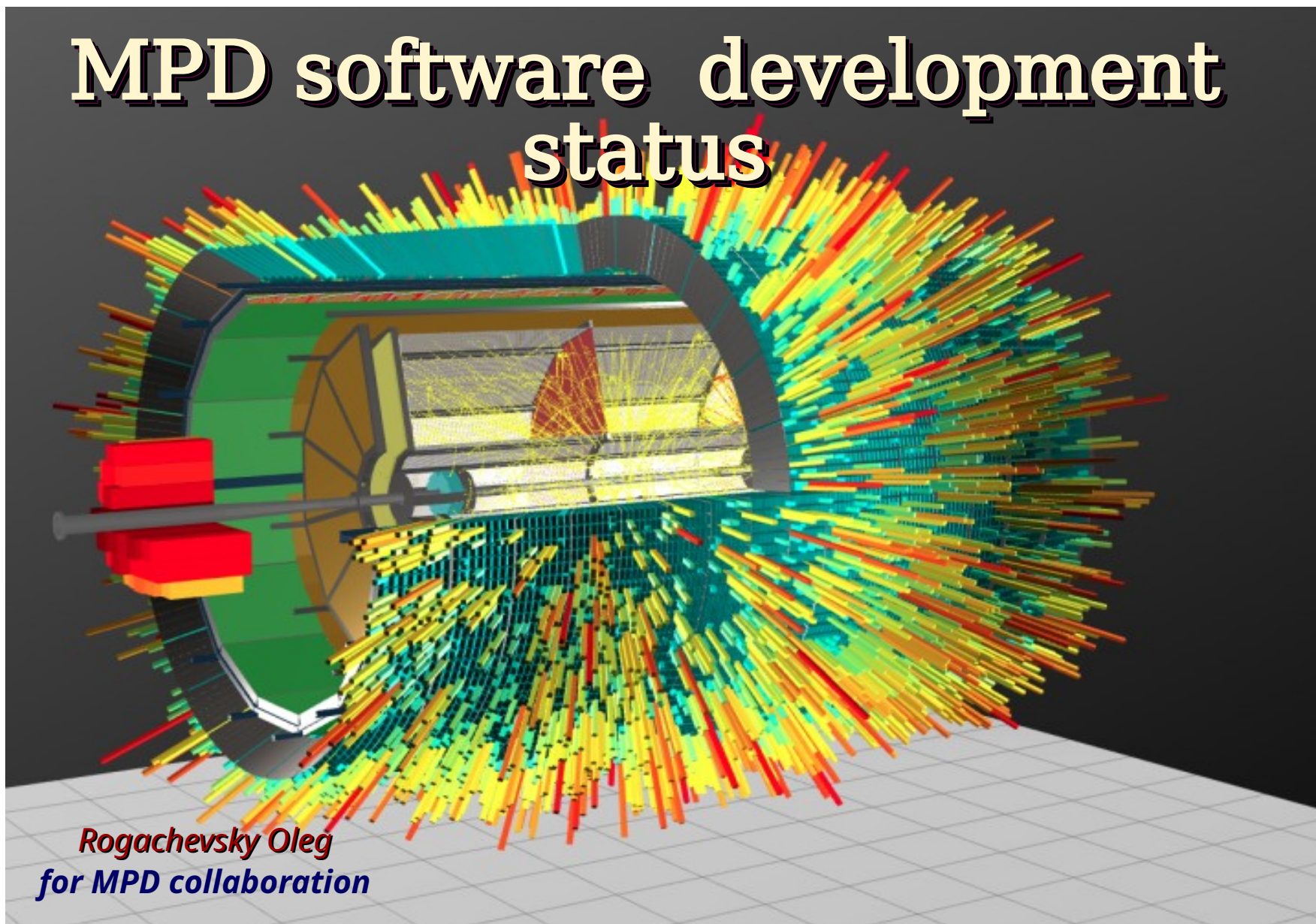


MPD software development status



*Rogachevsky Oleg
for MPD collaboration*

MpdRoot development

Software group:

Oleg Rogachevsky
This report

Slavomir Hnatic
Progress of ACTS implementation in MPDRoot

Alexander Krylov
MPD DST event viewer

Victor Krylov

Alexander Bychkov

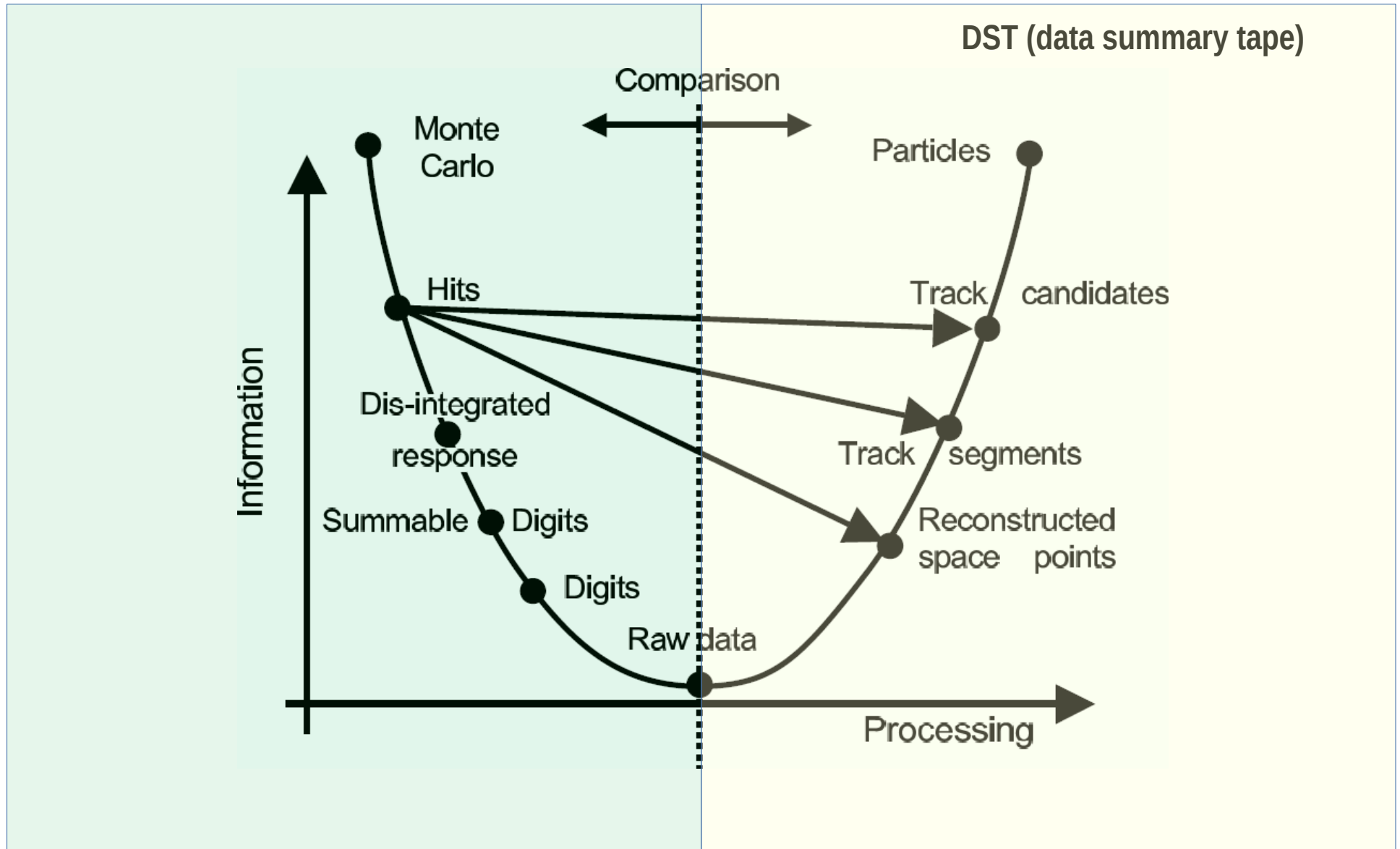
Jan Busa

Valentin Kuzmin

Standard HEP experiments software groups ~ several dozens of people

Simulation

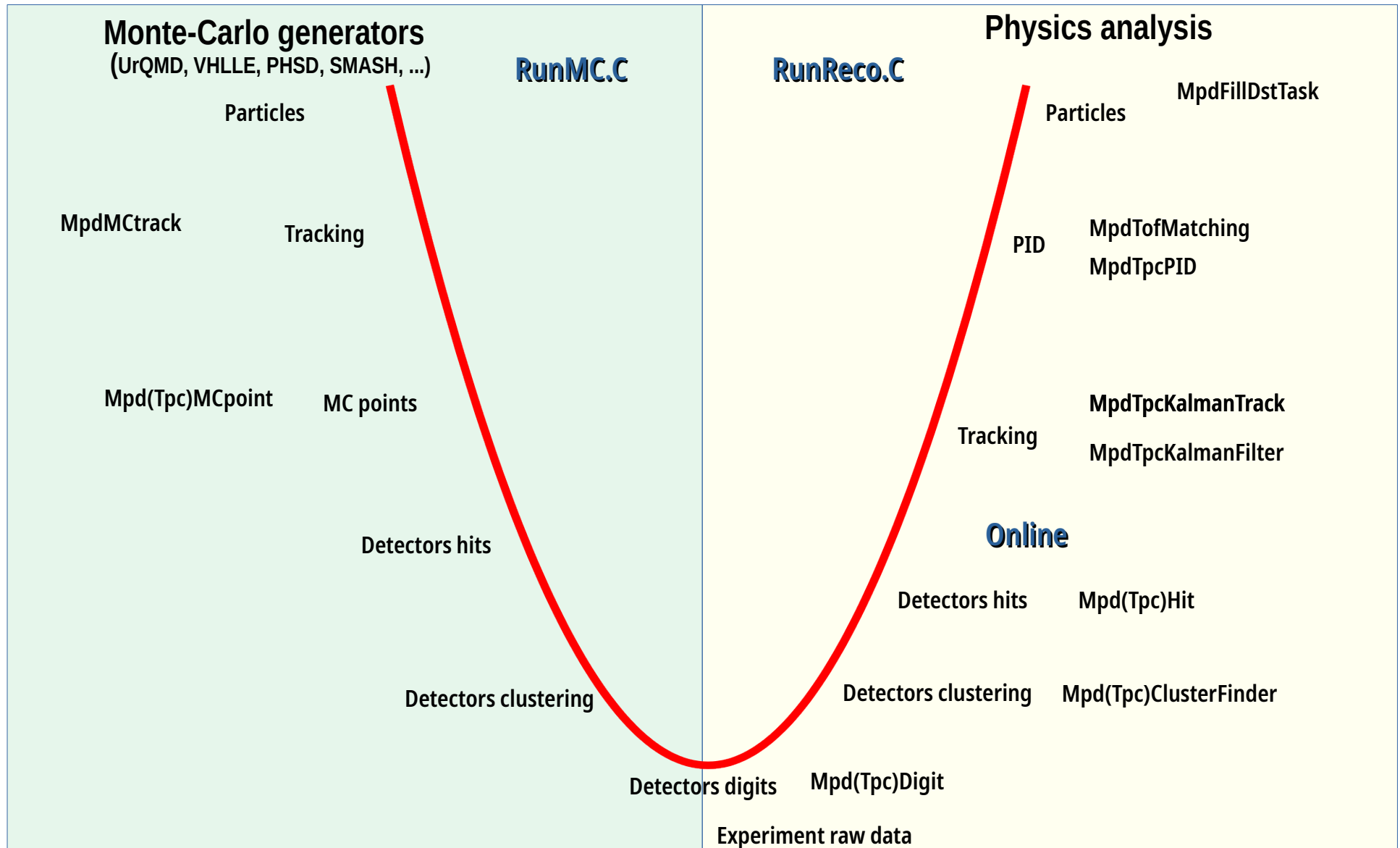
Experiment



Simulation @ Experiment chain

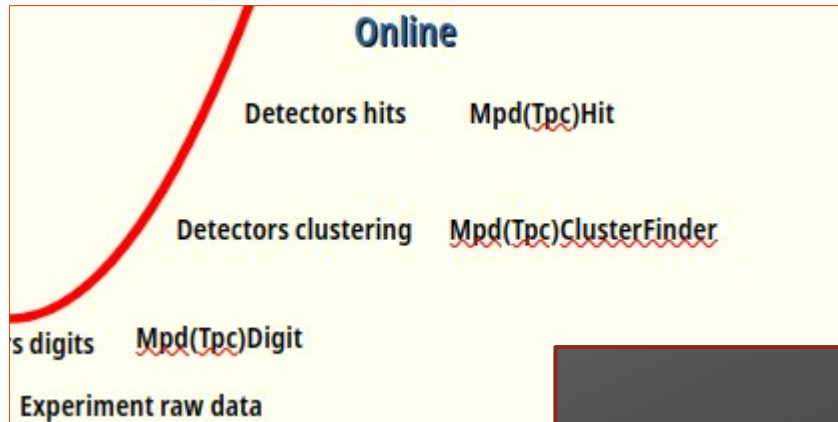
Simulation

Experiment

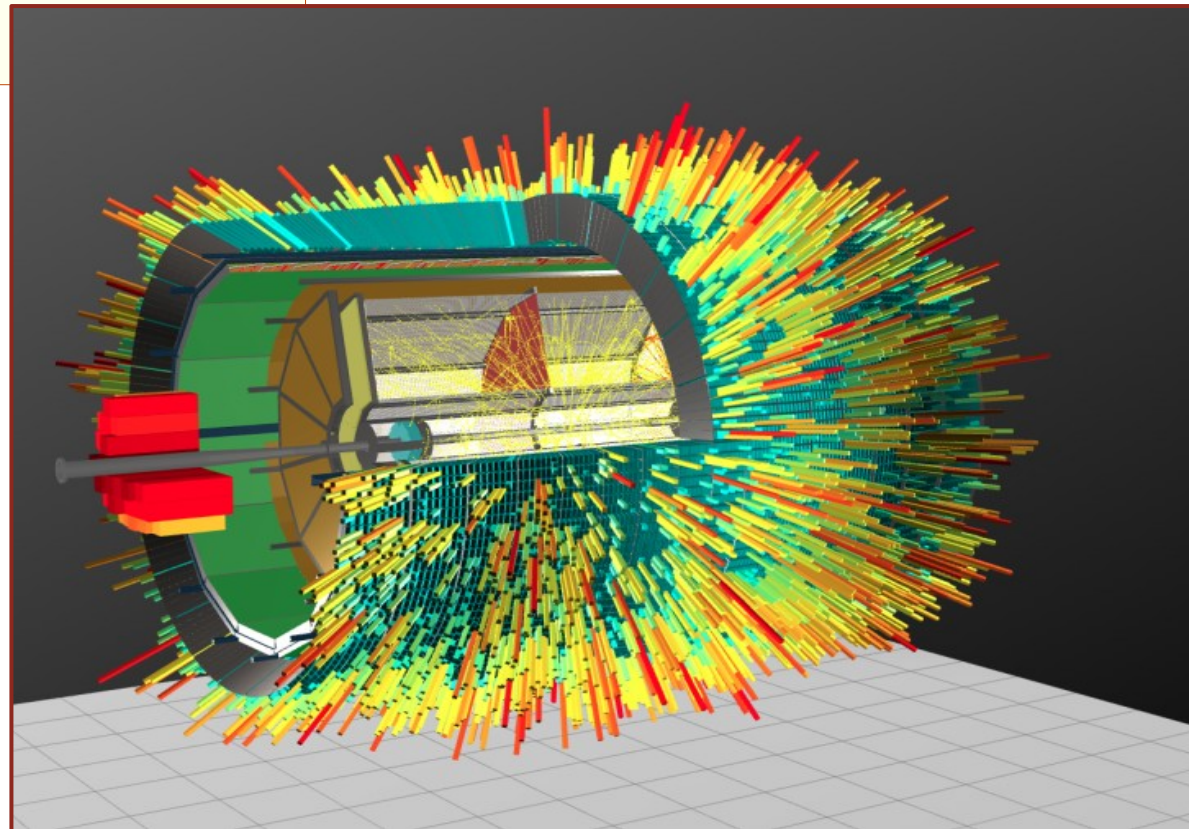


Event display for experiment

Alexander Krylov, Victor Krylov



Experiment raw data



Event viewer for offline analysis

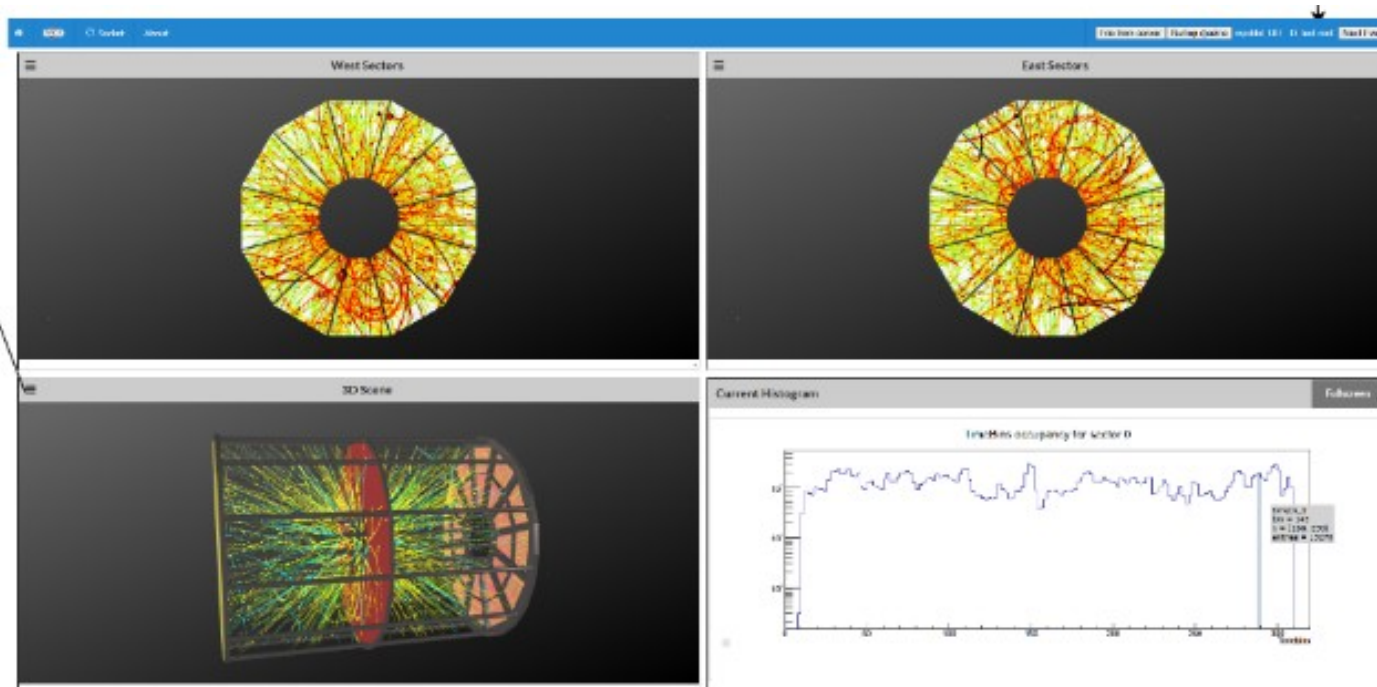
Alexander Krylov

Physics analysis

Particles

MpdFillDstTask

MonteCarlo (Experiment) dst data



Online QA hists for TPC

- Inner pads ADC distribution per sector – 24 histograms
- Outer pads ADC distribution per sector – 24 histograms
- Inner pads ADC distribution per timebucket – 24 histograms
(per each sector)
- Outer pads ADC distribution per timebucket – 24 histograms
(per each sector)
- Inner pads ADC distribution for current event – 24 histograms
(per each sector)
- Outer pads ADC distribution for current event – 24 histograms
(per each sector)
- General clusters information – 6 histograms

Total number of TPC QA histograms – 150

MPD DST output

runReco.C

```
MpdFillDstTask *fillDST = new MpdFillDstTask(qaObject, "MpdDst task");
```

```
MpdMiniDstFillTask *miniDst = new MpdMiniDstFillTask(*kalman, outFile);
```

 EventHeader.

 MpdTpcDigit

 TpcCluster

 TpcRecPoint

 TpcKalmanTrack

 Vertex

 FfdHit

 TOFHit

 TOFMatching

 ZdcDigi

 MCEventHeader.

 MCTrack

 MPDEvent.

MCEventHeader

MCTrack

MPDEvent

Monte-Carlo

EventHeader

TpcKalmanTrack

Vertex

reconstruction

MpdTpcDigit

tpc/

TpcCluster

tpc/

TpcRecPoint

tpc/

FfdHit

ffd/

TOFHit

tof/

TOFMatching

tof/

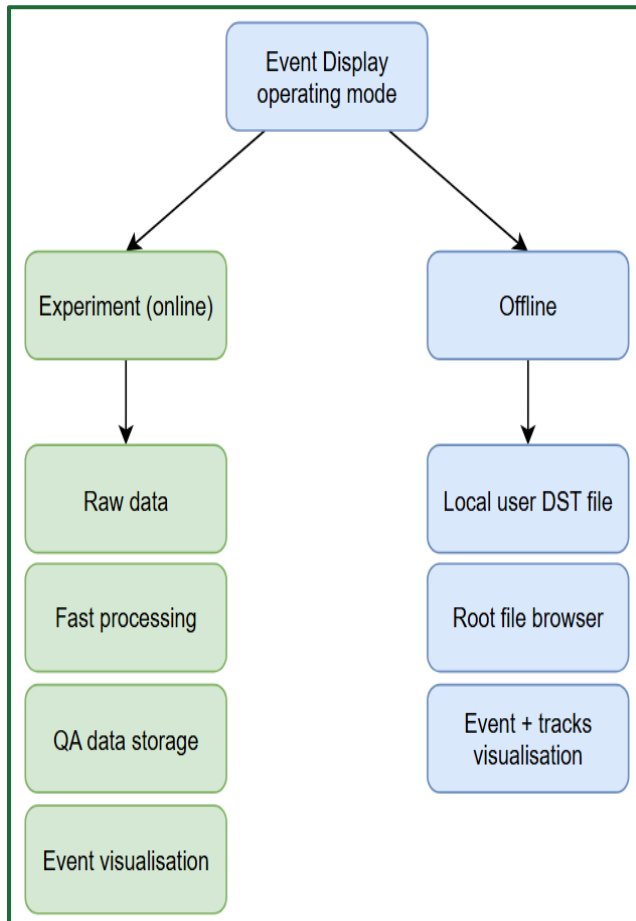
ZdcDigi

zdc/

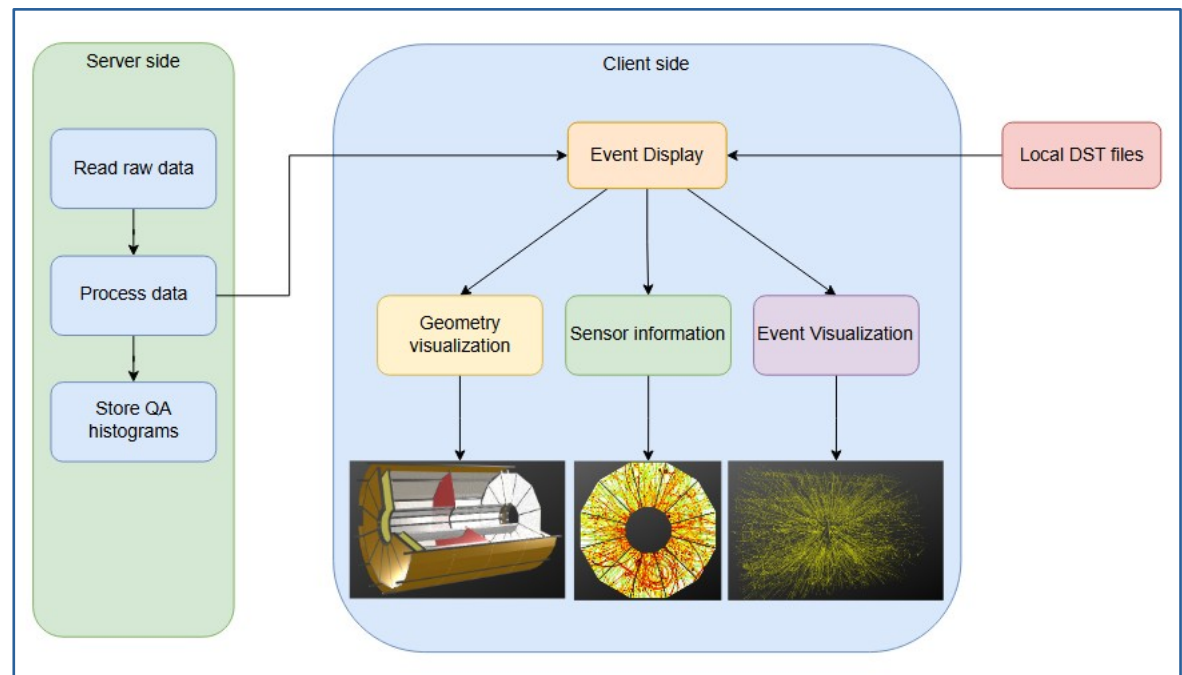
detectors

DST Event viewer vs event display

Features

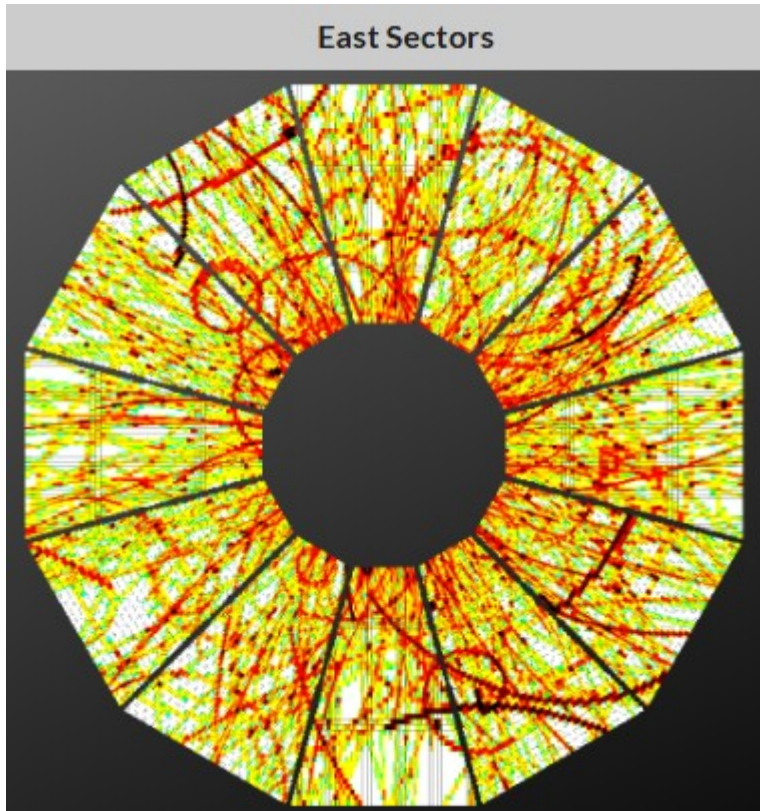


Advantages



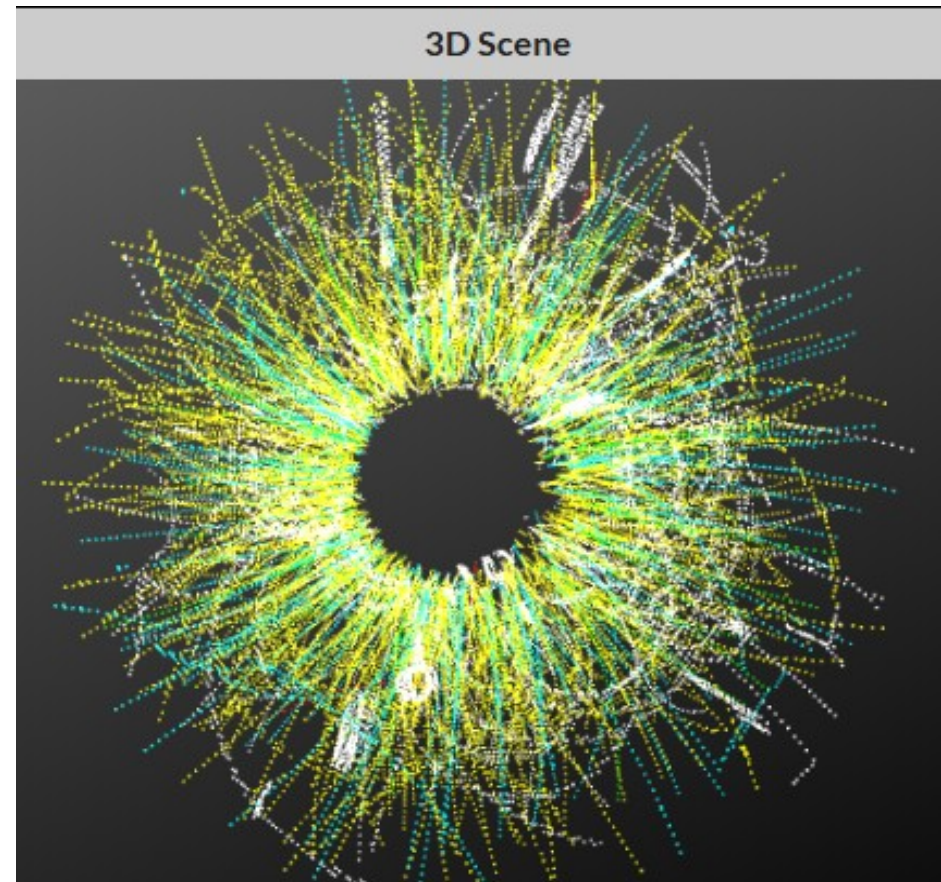
Event viewer TPC info

Alexander Krylov



TPC hits + ADC

TPC hits + MC tracks PID



Panel: lps				
Sector: 6				
Row: 52				
Pad: 96				
Value: 7773				

Updates in release v25.03.25

Hnatic S., Busa J.

MOST IMPORTANT CHANGES

New features

- Analysis updates (physicists)
- ACTS v40, v38.1, v38.1-ckf ports
- ACTS port refactorings, adjustments, fixes, custom patches

Latest dependencies

- ROOT 6.32.06
- GCC13.2.0
- Boost1.83.0
- FairRoot 18.6.10
- GEANT4 11.2.1
- Python 3.12.4
- GSL2.8
- Fedora 41

DETAILED INFO in RELEASE NOTES

git.jinr.ru/nica/mpdroot/-/releases

v25.03.25

100% complete

Milestone
v25.03.25 release

Assets 4

- Source code (zip) ↓
- Source code (tar.gz) ↓
- Source code (tar.bz2) ↓
- Source code (tar) ↓

Evidence collection

- v25.03.25-evidences-64.json ... f79b3c29
- Collected 2 weeks ago

Release notes

RELEASE NOTES v25.03.25

ACTS tracking implementation

Slavomir Hnatic, MLIT JINR



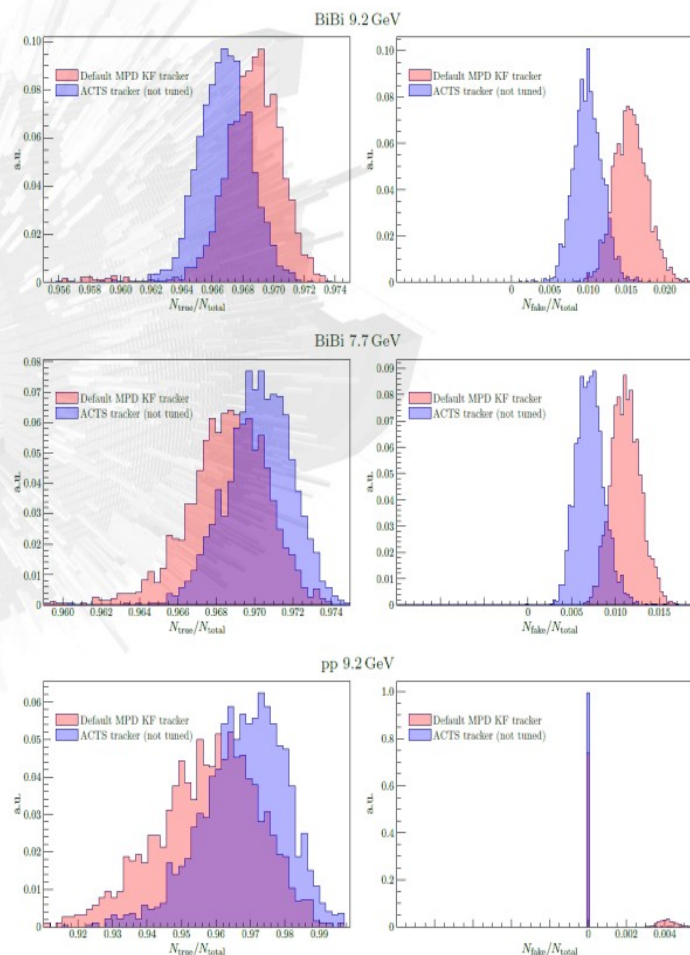
- MLEM clustering; ACTS v36.0.0
- 200000 events (2000 runs, 100 events per run)
- 9 minimum hits per track
- $P_t > 0.1$ GeV

	Default tracker		ACTS tracker	
	true rate	fake rate	true rate	fake rate
BiBi 9.2 GeV	$\mu = 0.9686$ $\sigma = 0.00212$	$\mu = 0.01544$ $\sigma = 0.002012$	$\mu = 0.9668$ $\sigma = 0.001724$	$\mu = 0.00999$ $\sigma = 0.00189$
BiBi 7.7 GeV	$\mu = 0.9686$ $\sigma = 0.002107$	$\mu = 0.01122$ $\sigma = 0.001664$	$\mu = 0.9702$ $\sigma = 0.001772$	$\mu = 0.00713$ $\sigma = 0.001612$
pp 9.2 GeV	$\mu = 0.958$ $\sigma = 0.01426$	$\mu = 0.00128$ $\sigma = 0.002337$	$\mu = 0.968$ $\sigma = 0.00212$	$\mu = 2.5 \cdot 10^{-5}$ $\sigma = 3.5 \cdot 10^{-4}$

“Implementation of ACTS into MPDRoot”

S. Hnatic, J. Busa Jr., A. Bychkov, A. Krylov, V. Krylov, A. Moshkin, O. Rogachevsky

MMCP '24 Proceedings, PEPAN

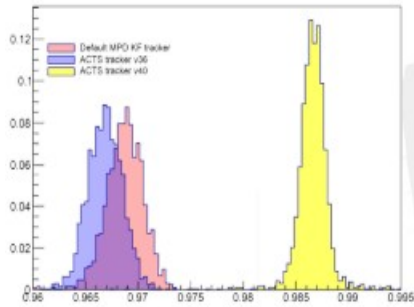


ACTS progress in MPD

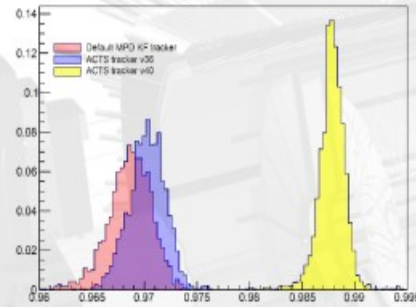
CKF enhancements: better efficiency, far less fakes

Efficiency

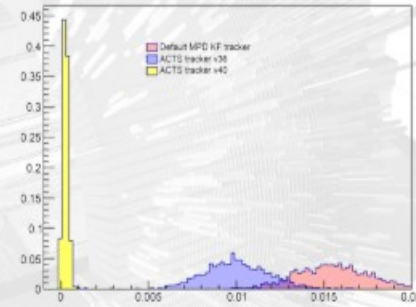
Fake rate



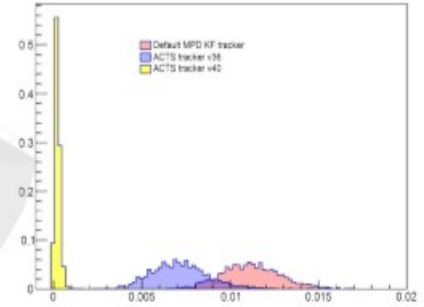
BiBi 9.2 GeV



BiBi 7.7 GeV



BiBi 9.2 GeV

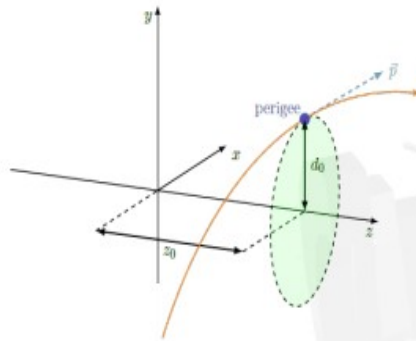


BiBi 7.7 GeV

	Default tracker		ACTS tracker v36.0.0		ACTS tracker v40.0.0	
	true rate	fake rate	true rate	fake rate	true rate	fake rate
BiBi 9.2 GeV	$\mu = 0.9686$ $\sigma = 0.00212$	$\mu = 0.01544$ $\sigma = 0.002012$	$\mu = 0.9668$ $\sigma = 0.001724$	$\mu = 0.00999$ $\sigma = 0.00189$	$\mu = 0.9866$ $\sigma = 0.001779$	$\mu = 0.00026$ $\sigma = 0.000172$
BiBi 7.7 GeV	$\mu = 0.9686$ $\sigma = 0.002107$	$\mu = 0.01122$ $\sigma = 0.001664$	$\mu = 0.9702$ $\sigma = 0.001772$	$\mu = 0.00713$ $\sigma = 0.001612$	$\mu = 0.9878$ $\sigma = 0.001427$	$\mu = 0.000225$ $\sigma = 0.000168$

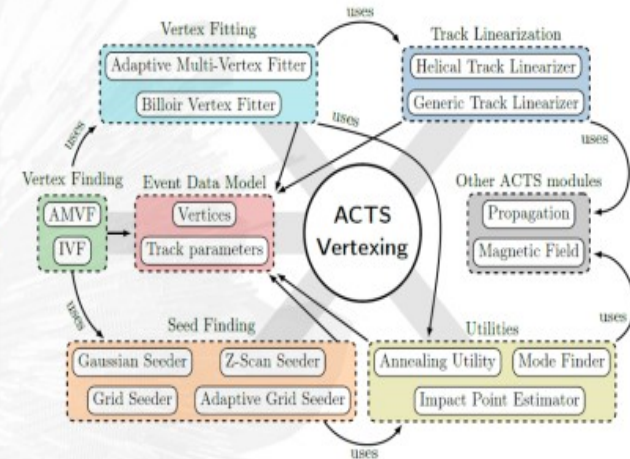
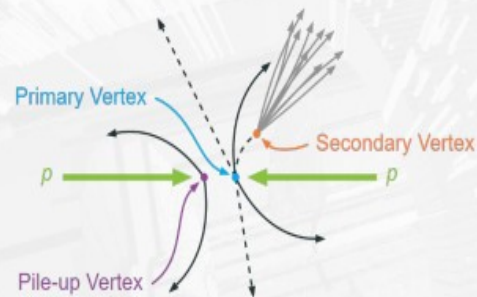
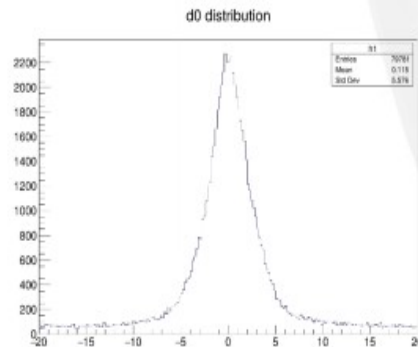
MPD Vertex with ACTS

ACTS VERTEXING SUITE



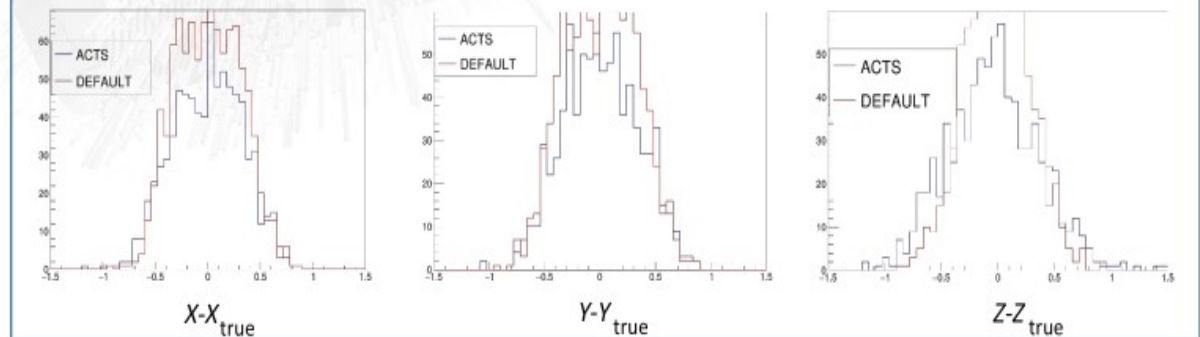
PERIGEE TRACK PARAMETRIZATION

Track selection: $|d_0| < 2\text{mm}$

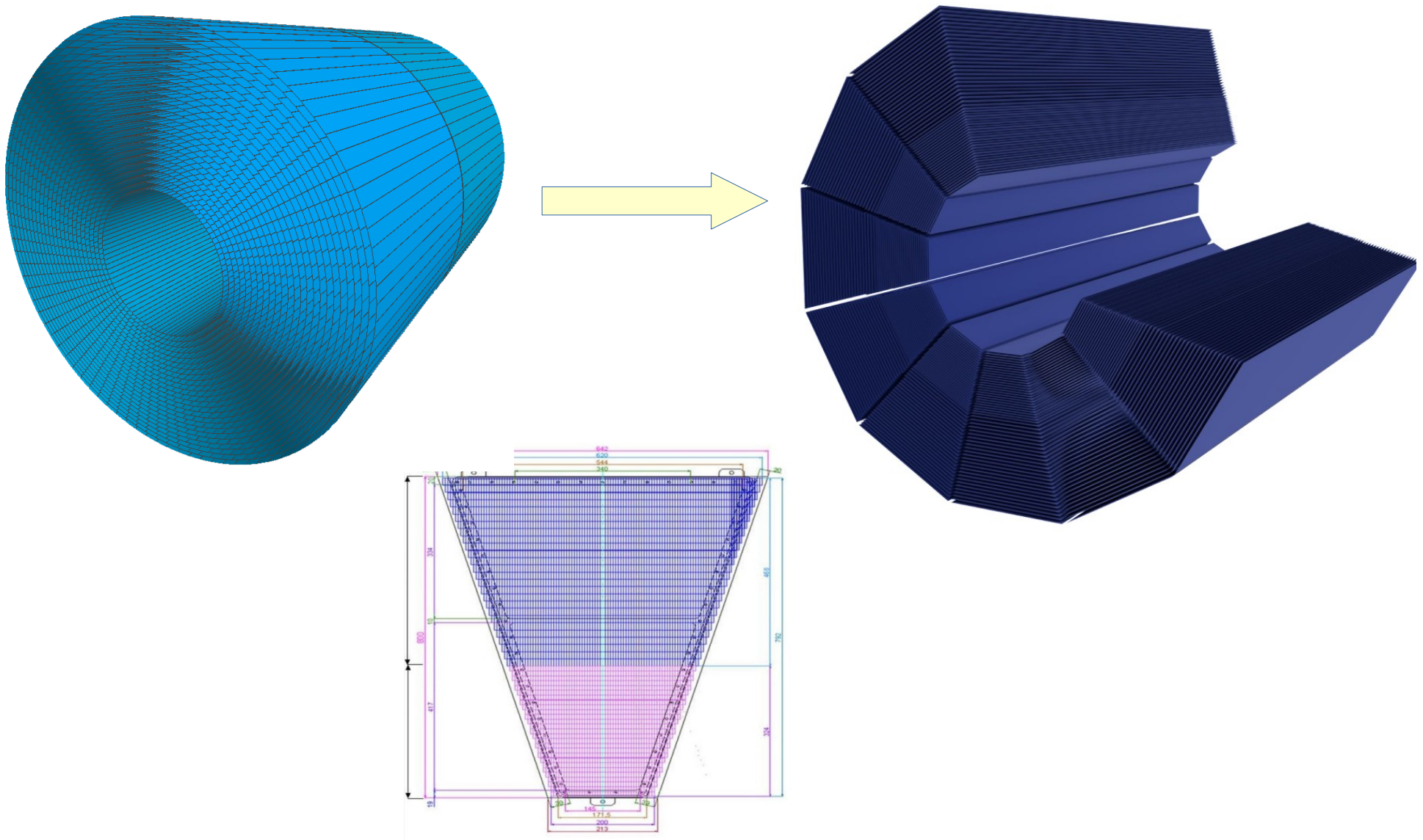


- many tunable parameters, to be fine tuned yet

1000 events, BOX generator

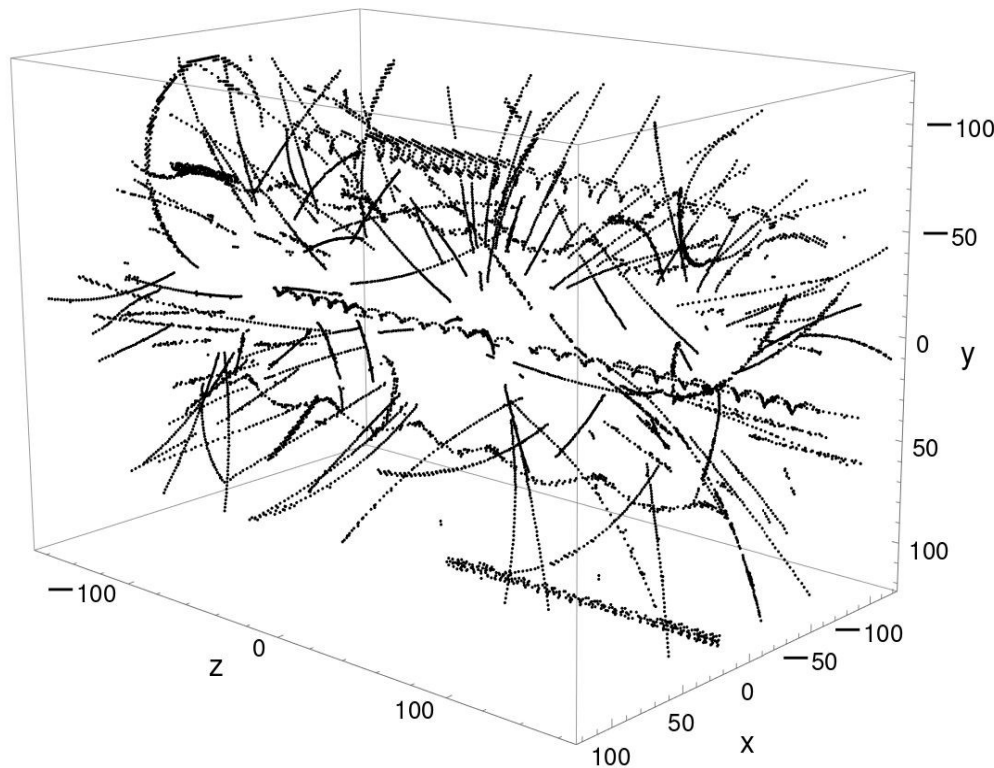


Adjust TPC geometry for ACTS

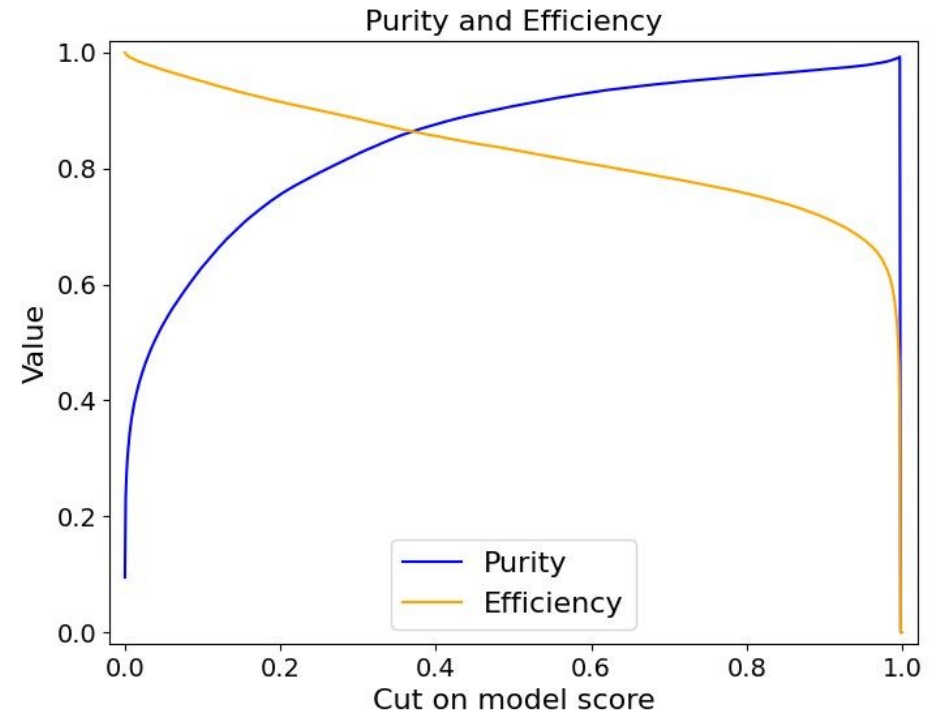


Tracking with Graph Neural Networks

Yauheni Talochka , MLIT JINR

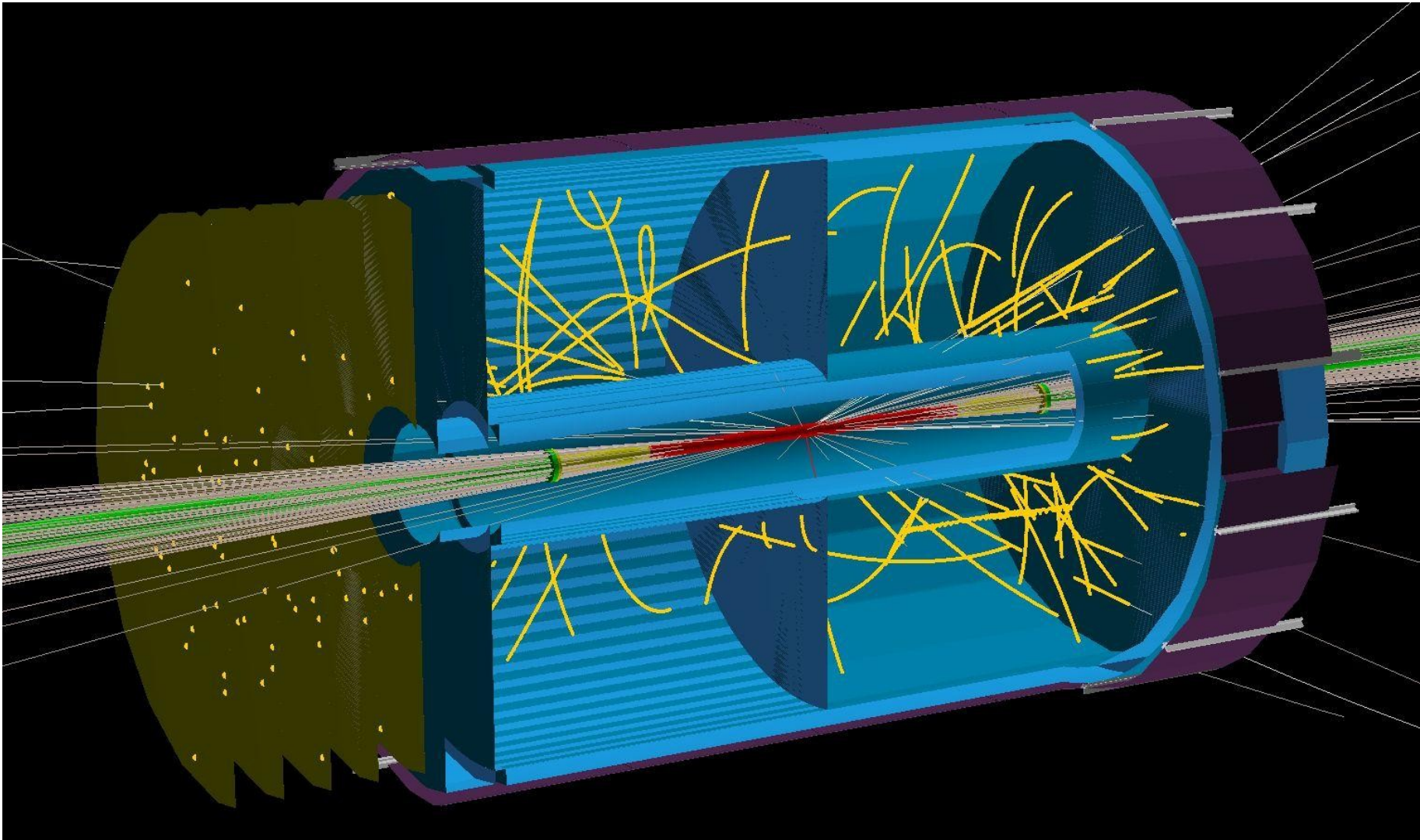


MPD AuAu $\sqrt{s} = 11$ GeV



Endcap tracking

Evgeny Kryshen, Nazar Burmasov,
PNPI



Refactoring

Refactoring is a disciplined technique for restructuring an existing body of code, altering its internal structure without changing its external behavior.

Refactoring

J.Busa -- MpdRoot refactoring (Version 0.1 – 2025. 01. 24)

<https://indico.jinr.ru/event/5365/>

Contents

1. Libraries Renaming
2. Library Merging
3. Directory Structure Change
4. Examples and Macros
5. Classes Renaming
6. Virtual Classes
7. Guard Rails
8. Removing cout, cerr
9. ClassImp
10. mpdPassive
11. CMake + New Library Versioning
12. MpdGeneratorType
13. Remove Dead Detectors
14. Copyright Notice

GIT status: 20 branches

master protected	975.0			
f49c155 - Added execution parameter for CDash script - 7 years ago				
abychikov	703.1			
c0bc327c - updated pads count in rows and rows position on padplane for reconstruction - 4 years ago				
abychikov_test	697.2			
a128c16f - move macros to subfolder - 4 years ago				
MP92_0428020_B1B1_09_04	699.1			
79c30a59 - The second centralized production, BB@B G4 - 4 years ago				
pro protected	680.0			
7be4726b - Using local random number generator. - 4 years ago				
MP04_0728020_B1B1_09_03	668.0			
57712d26 - Unused data members removed - 4 years ago				
MP06_0728020_B1B1_09_5_03	664.0			
71ad8f94 - Update generators/MpD SmashGenerator.cxx, generators/MpD SmashGenerator.h files - 4 years ago				
MP05_0728020_B1B1_09_5_04	662.0			
a687080 - Using time-dependent random seed. - 4 years ago				
miniDST_toBeTested	638.0			
c1c30b2c - Done small files - 4 years ago				
tpc_split_sens_vols	615.1			
3a6f3a27 - added tpc geometry with sensitive volume splitted into individual sectors - 4 years ago				
tpcFastDigi	615.5			
f46c0261 - Some tuning of the fast digitizer. - 4 years ago				
newTpcCode	615.11			
e1c8880c - Use fast digitizer. - 4 years ago				
bnd_v02	609.1			
e1c97d1e - BMD branch update - 4 years ago				
geo_test	608.0			
50110a25 - Delete obsolete detectors and macros - 4 years ago				
rolog-dev-patch-11050	608.1			
b66c3a65 - Update README - 4 years ago				
narina_238321	600.1			
0b63f686 - MpD2dc.cxx - minor changing, MpD2dcDigi and MpD2dcDipProducer - new FHCAL digitizer - 4 years ago				
cosmic_ray_extended	596.3			
e113b2b9 - Some improvements in cosmic generator. - 3 years ago				
narina_04_06_21	582.0			
15294f42 - MpD2dc.cxx - minor changes in Bkt corrections including - 3 years ago				
MPParticle	551.15			
d5795f9b - Check whether input is a correct ROOT-file with all necessary info - 3 years ago				
rolog-dev-patch-58945	550.1			
b4823d78 - Update README.md - 3 years ago				

baranov_jobs	549.0			
b47d594c - CRAQLE for the MPD setup has been added as a passive module (ROOT geometry + source files) - 3 years ago				
dev_junc19p2	500.0			
f9a9705a - Replace evspec.png - 3 years ago				
cosmic_ray	437.1			
ce651d77 - Adaptation to radiation tests. - 3 years ago				
ncord_geometry	411.0			
e996d773 - Updated ncord geometry to avoid overlap with crane. - 3 years ago				
aLignKalan	411.2			
15f8ee14 - add clang formatting - 3 years ago				
origin/ffdc_test	384.0			
2f8aee9c - Code update to simulate correct trigger signal. - 2 years ago				
addTOTFHLTPProducer	281.1			
c1c0cf14 - add simple TO to MpDToFHLTPProducer - 2 years ago				
drift_velocity	281.1			
0b64a43a - drift velocity initial commit - 2 years ago				
nassprod	281.1			
09c5c168 - request 25 - 2 years ago				
ISS-clean-straw-frog-geometry-and-macro	253.0			
d379d4f1 - Fixed small typo in MpD KTrack.cxx - 2 years ago				
alignment_r	252.1			
c4a7d038 - initial commit of alignment. To use it, call root on file runTpcAlignment.C... - 2 years ago				
LaserRays	230.1			
dwa0f62c - Laser Rays alignment initial commit. - 2 years ago				
tpc_alignment_2022_08_17	306.2			
82c14274 - First version of tpc_alignment - 1 year ago				
akrylov_new	201.1			
993d1d14 - ClusterFinderFast now work with a BaseTpcSectorGeo - 1 year ago				
decoder_tot	183.1			
f93d1e68 - add decoder to tot - 1 year ago				
driftVelocityMap	170.1			
d4f5885c - added drift velocity calculation and corresponding fit adjustment, a few adds... - 1 year ago				
unigen-reader-fxt-macro	168.7			
6a6d39f5 - Formatting for MpDUnigenGenerator.h.cxx - 1 year ago				
215-improved-p10-mixing-2	145.0			
e75b4e47 - p10 Analysis update - 1 year ago				
narina_30_10_23	142.0			
0e5562a4 - FHCAL geometry WITH central module is added - 1 year ago				
narina_30_10_21.a	141.0			
82287334 - FHCAL WITH central module as option - 1 year ago				

227_copy-before-DI-hack	130.4			
19d563da - Decoupling MpD KalmFilter: get rid of Singleton - 1 year ago				
akrylov	122.1			
d70b93ab - Error in cmake - 1 year ago				
nbb_v23.12.23	128.19			
4a7d2e33 - Update CMakeLists.cmake - 11 months ago				
acts-v20.1-findz	204.153			
e5e7eeb2 - Acts tracker: Use findZ() from A. Zinchenko code - 9 months ago				
analysis_photon_update	84.10			
5c4e9f11 - do not reuse mc photons - 9 months ago				
baryshnikov	85.25			
ce3d9323 - add macros for rec - 9 months ago				
global_polarization	82.6			
4e3c039c - amend polarization transfer, add hyperon polarization to MpDHyPGenerator - 9 months ago				
dielectrons_march24_2024	80.10			
3d8e0bac - just some updates - 8 months ago				
EmcalParentFix	74.2			
bc595a02 - Acceptance fix, Common Parent fix - 8 months ago				
259-acts-tracker-integrate-into-global-reconstruction	61.3			
986cc1d4 - TOP Matching: Get rid of tight MpD TpcKalmTrack coupling by adhering to AbstractTpcTrack - 8 months ago				
compare-acts-az	61.1			
9194c08c - Trackers comparison: ACTS vs AZ - 8 months ago				
dielectrons_srode	61.18			
034a6d0 - commented out remaining prints - 8 months ago				
251-fast-clustering-memory-leak	59.0			
3a6892b0 - Fast ClusterHFinder: splitting into multiple source files (V.Krylov's scheme) - 8 months ago				
CRMCPosRootGenerator	47.1			
d013c41d - add interface to CRMC Epos 1.99 generator ROOT file - 6 months ago				
tpc-acts-tracking	204.156			
7d0dc31d - Acts tracker: read parameters from JSON file - 4 months ago				
performance_actsv36_az	47.1			
31fe65db - Trackers comparison: ACTSV36 vs AZ - 4 months ago				
vertexing_actsv372_az	26.1			
99404e75 - Primary Vertexing comparison: ACTS vs AZ - 3 months ago				
vertexing_actsv36_az	39.3			
4a2c2abc - Primary Vertexing comparison: ACTS vs AZ - 3 months ago				

GIT repository: too many root files

```
.....
3.1M ./input/field_sp41v1.root
7.5M ./input/TpcEDepParamsHeed.root
9.9M ./physics/dielectrons/macros/sim_Geo.root
9.9M ./physics/dielectrons/sim_Geo.root
9.9M ./physics/nuclei/macros/sim_Geo.root
9.9M ./physics/pairKK/macros/sim_Geo.root
```

Total root files size:
70 MB in 102 files from 347 MB

```
8.0K ./geometry/lusi_v1b.root
8.0K ./geometry/magnet_v5.root
8.0K ./geometry/pipe_v3.root
...
12K ./geometry/FFD_v6.root
12K ./geometry/pipe_v2.root
12K ./geometry/tof_v4.root
12K ./geometry/tof_v7.root
12K ./geometry/zdc_oldnames_7sect_v1_no_overlaps_w_pipe_magnet.root
12K ./geometry/zdc_oldnames_7sect_v1.root
12K ./geometry/zdc_oldnames_7sect_WITH_central_module_v1.root
12K ./physics/evPlaneFXT/macros/TrackRecEff_FXT.root
12K ./physics/pairKK/macros_FXT/TrackRecEff_FXT.root
16K ./geometry/FFD_v8.root
16K ./geometry/magnet_v6.root
16K ./geometry/magnet_v7.root
16K ./geometry/tpc_v7.root
20K ./geometry/tof_v8.root
...
2.2M ./geometry/emc_v2.root
2.8M ./geometry/emc_v3.root
2.9M ./geometry/emc_v4.root
```


Refactoring

Obsolete

```
— tdaq
  — BmnEventMonitor.cxx
  — BmnEventMonitor.h
  — BmnEventPull.cxx
  — BmnEventPull.h
  — BmnTdaqSource.cxx
  — BmnTdaqSource.h
  — EventDLinkDef.h
  — Readme.MD
  — readRootFile.C
  — setup.sh
```

```
lheTrack
— CMakeLists.txt
— legacy
  — lhe.h
  — MpdCellAutomat.cxx
  — MpdCellAutomat.h
  — MpdCellTrack.cxx
  — MpdCellTrack.h
  — MpdKFV0Fitter.cxx
  — MpdKFV0Fitter.h
  — MpdKinFitter.cxx
  — MpdKinFitter.h
  — MpdMotherFitterSimple.cxx
  — MpdMotherFitterSimple.h
  — MpdTpcTrackFollow2Sft.cxx
  — MpdTpcTrackFollow2Sft.h
  — MpdTrackFinderIts.cxx
  — MpdTrackFinderIts.h
  — MpdV0Cuts.cxx
  — MpdV0Cuts.h
  — MpdV0.cxx
  — MpdV0Finder.cxx
  — MpdV0Finder.h
  — MpdV0.h
  — README.md
  — TpcLheCMPoint.cxx
  — TpcLheCMPoint.h
  — TpcLheCMTrack.cxx
  — TpcLheCMTrack.h
  — TpcLheHit.cxx
  — TpcLheHit.h
  — TpcLheHitsMaker.cxx
  — TpcLheHitsMaker.h
  — TpcLhePoint.cxx
  — TpcLhePoint.h
  — TpcLheSegments.cxx
  — TpcLheSegments.h
  — TpcLheTrackCuts.cxx
  — TpcLheTrackCuts.h
  — TpcLheTrack.cxx
  — TpcLheTrackFinder.cxx
  — TpcLheTrackFinder.h
  — TpcLheTrackFitter.cxx
  — TpcLheTrackFitter.h
  — TpcLheTrack.h
```

Refactoring

```
eventDisplay
├── CMakeLists.txt
├── config
│   ├── coloring.xsd
│   ├── eventDisplay.xml
│   └── eventPic.png
├── EventDisplayLinkDef.h
├── mpd
│   ├── EventMDLinkDef.h
│   ├── EventMLinkDef.h
│   ├── MpdEmcTowerDraw.cxx
│   ├── MpdEmcTowerDraw.h
│   ├── MpdGlobalTrackDraw.cxx
│   ├── MpdGlobalTrackDraw.h
│   ├── MpdZdcTowerDraw.cxx
│   └── MpdZdcTowerDraw.h
├── MpdBoxSet.cxx
├── MpdBoxSetDraw.cxx
├── MpdBoxSetDraw.h
├── MpdBoxSetEditor.cxx
├── MpdBoxSetEditor.h
├── MpdBoxSet.h
├── MpdEventManager.cxx
├── MpdEventManagerEditor.cxx
├── MpdEventManagerEditor.h
├── MpdEventManager.h
├── MpdHitDraw.cxx
├── MpdHitDraw.h
├── MpdHitPointSetDraw.cxx
├── MpdHitPointSetDraw.h
├── MpdMCPointDraw.cxx
├── MpdMCPointDraw.h
├── MpdMCStack.cxx
├── MpdMCStack.h
├── MpdMCTracks.cxx
├── MpdMCTracksEditor.cxx
├── MpdMCTracksEditor.h
├── MpdMCTracks.h
├── MpdPointSetDraw.cxx
├── MpdPointSetDraw.h
├── MpdWebScreenshots.cxx
├── MpdWebScreenshots.h
├── MpdXMLNode.cxx
├── MpdXMLNode.h
└── README.md
```

unstructured

```
chargeCorrelations
dielectrons
ebye
evCentrality
evFlowEP
evPID
evPlane
evPlaneFXT
femto
globalObs
globalPolarization
hyperons
mpdHadronSpectra
mpdPhysics
nucfemto
nuclei
pairGG
pairGLambda
pairKK
pairPiK
pairPiKs
pairPiLambda
pairPiPi
pairPK
photons
```

?

?

One directory

MPDroot deployment

Running MPDRoot locally using CVMFS

Questions? [Click here](#)

INSTALL CVMFS AND TOOLBOX (Users and Developers)

Supported OS: Fedora, CentOS, AlmaLinux, Ubuntu 22.04, 20.04, Debian 11, 12, Manjaro 21

NOTE: If your OS is based on any of those, then pass it to nica-init script, for example
./nica-init.sh -d Ubuntu -v 20.04

```
[user@fedora ~]$ wget -N https://git.jinr.ru/nica/nicadist/-/raw/master/scripts/nica-init.sh --no-check-certificate
--2021-12-02 00:00:00-- https://git.jinr.ru/nica/nicadist/-/raw/master/scripts/nica-init.sh
.....
2021-12-02 00:00:02 (87.9 MB/s) - 'nica-init.sh' saved [10794/10794]

[user@fedora ~]$ chmod +x nica-init.sh && ./nica-init.sh
Installing toolbox on Fedora 39
[sudo] password for user:
.....
Creating container a9-nica-dev ...
.....
Installing cvmfs service as container ...
.....
=====
INSTALLATION SUCCESSFUL

How to use:

1. Enter toolbox container by:
   toolbox enter a9-nica-dev

2. Load MPDroot environment as a user by:
   [user@toolbox]$ module add mpdroot

   or MPDroot environment as a developer by:
   [user@toolbox]$ module add mpddev

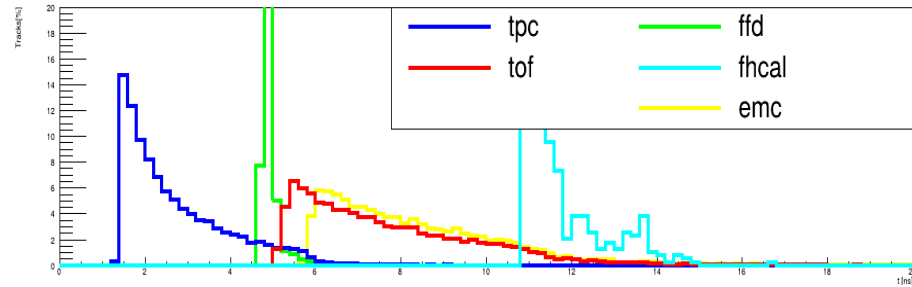
=====
[user@fedora ~]$
```

USERS

NOTE: If you are using CentOS 7 instead of "toolbox enter a9-nica-dev" command, type:
"source /cvmfs/nica.jinr.ru/sw/os/login.sh"

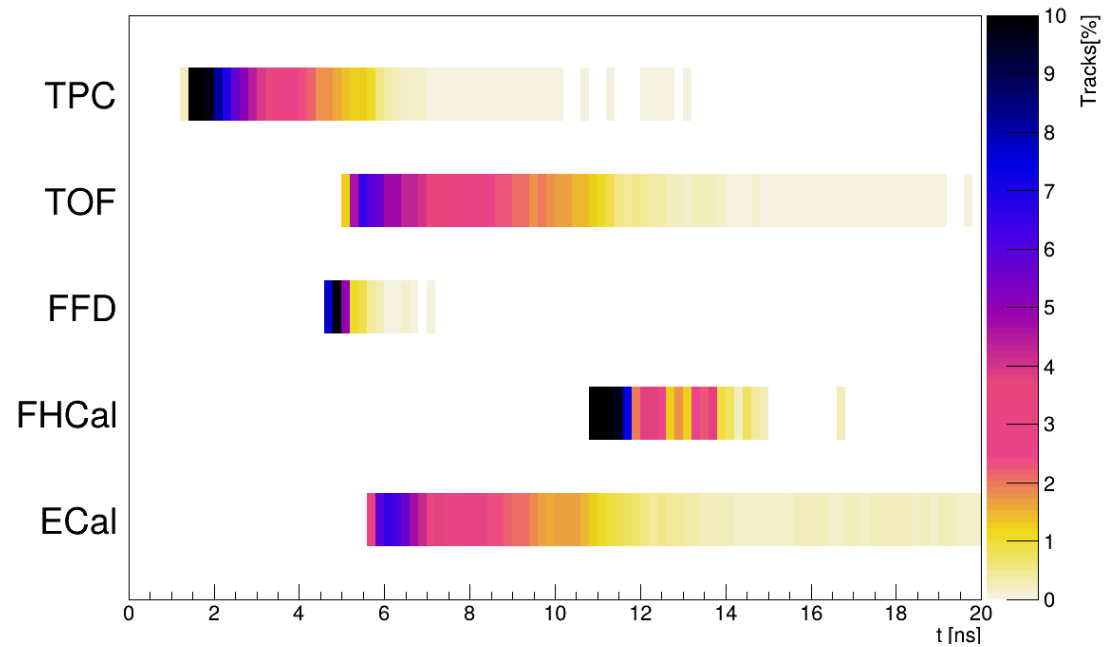
Trigger latency for data taking for MPD detectors

Alexander
Bychkov



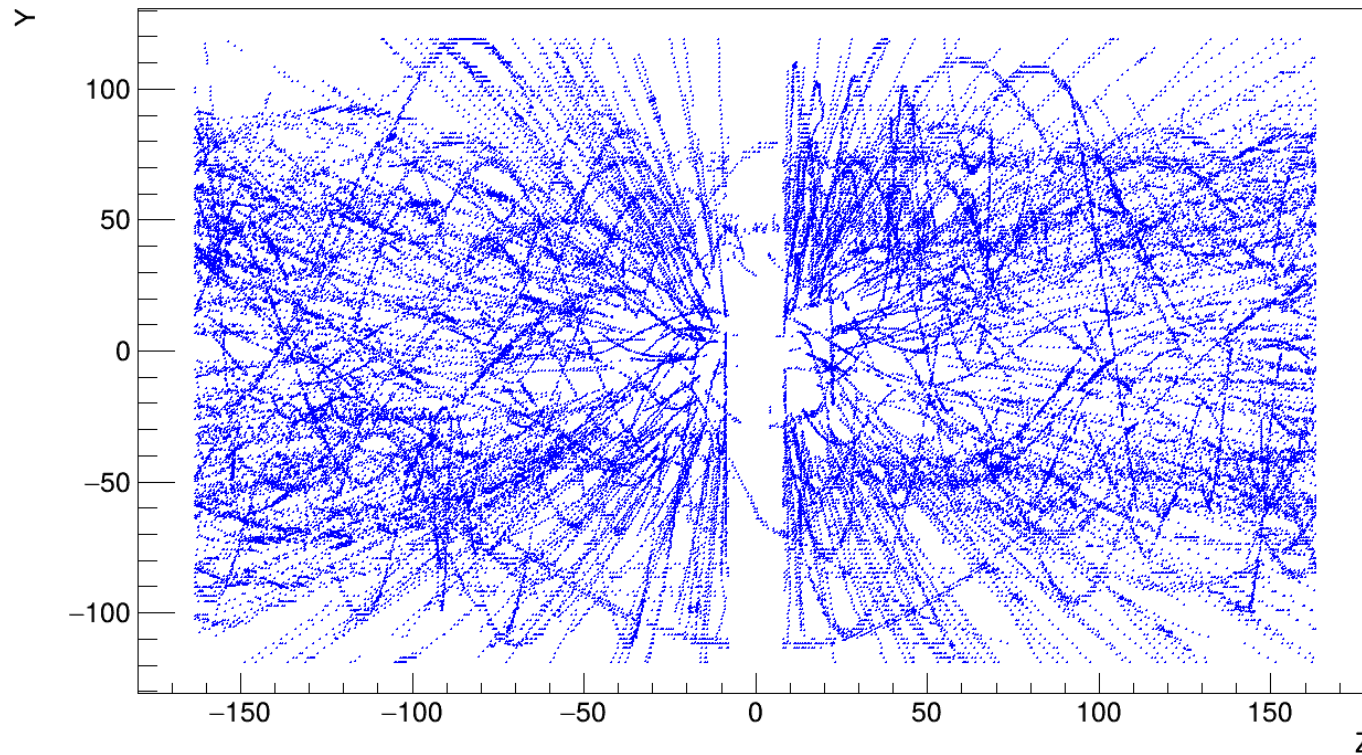
Collision point (0, 0, 0)

- 100 events from PHSD generator
- Reaching time for
 - Primary particles
 - π^0 gammas



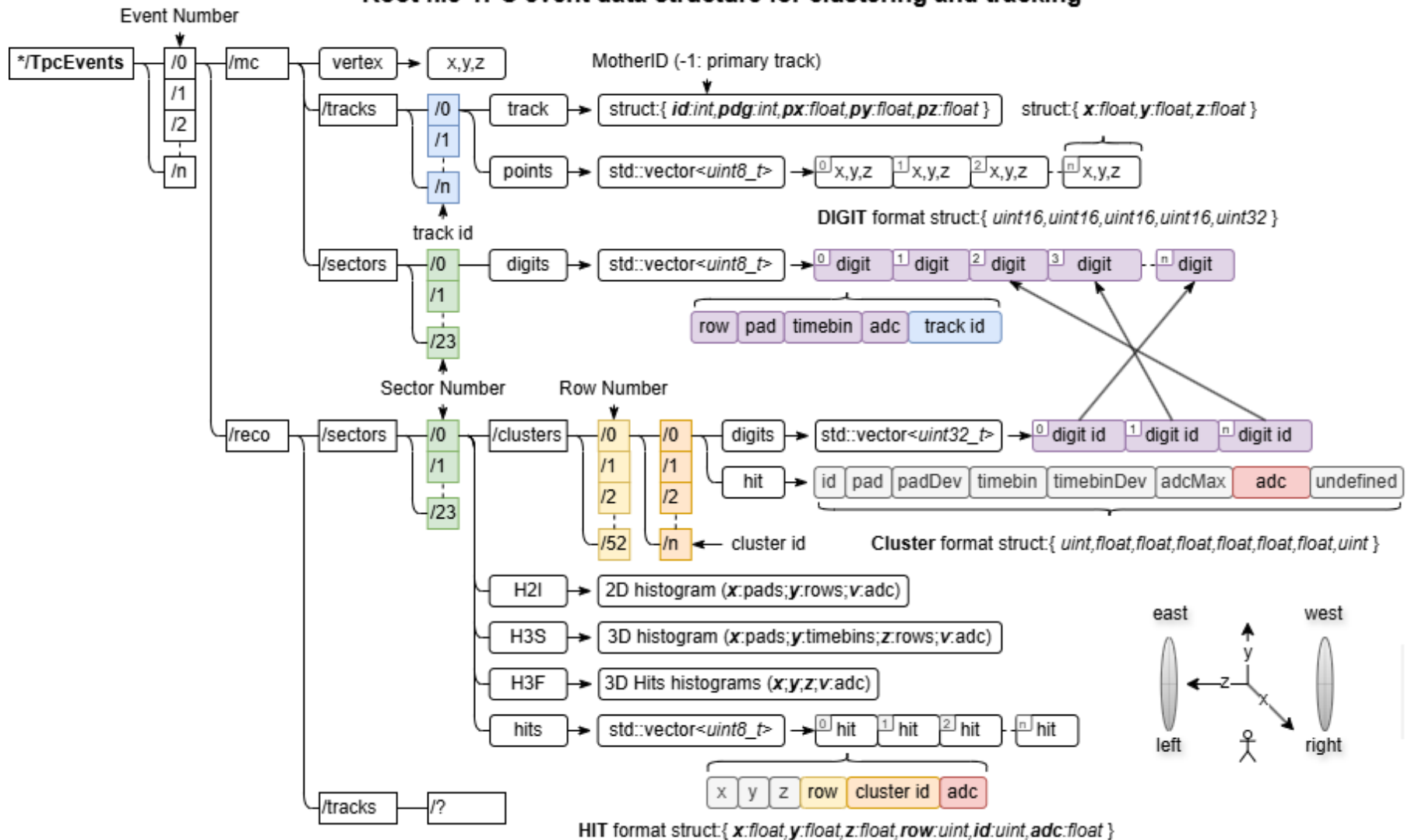
TPC data taking of events

- Collision point at (0, 0, 0)
- PHSD generator



Data file structure

Root file TPC event data structure for clustering and tracking



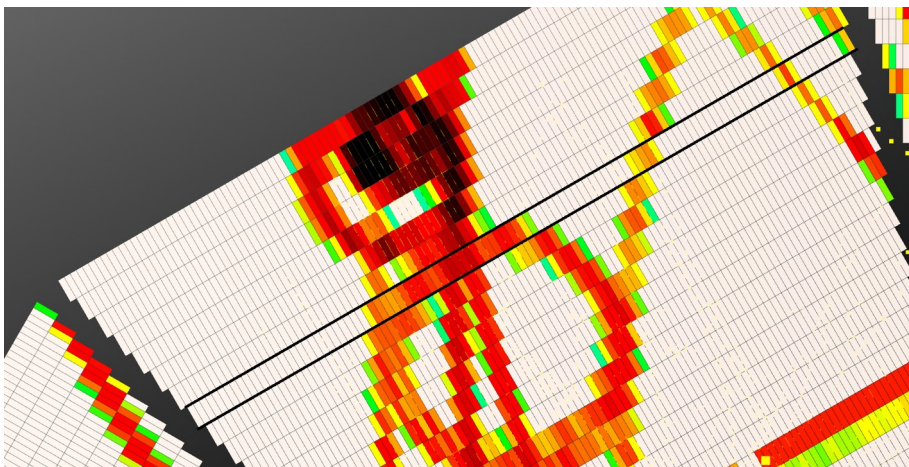
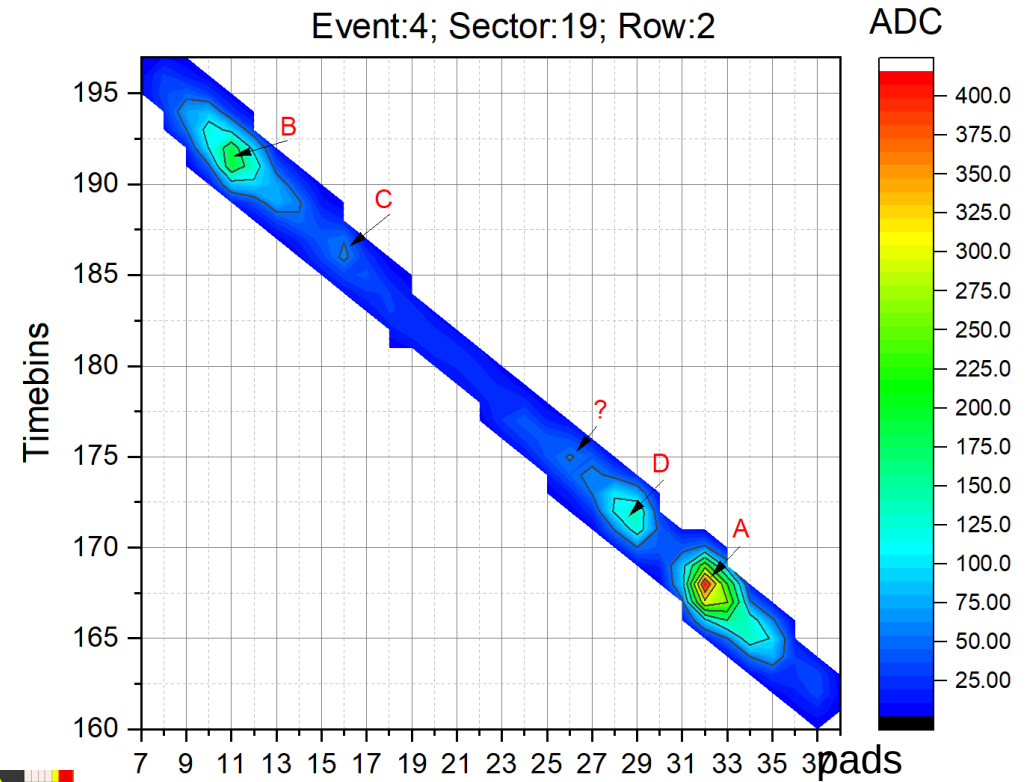
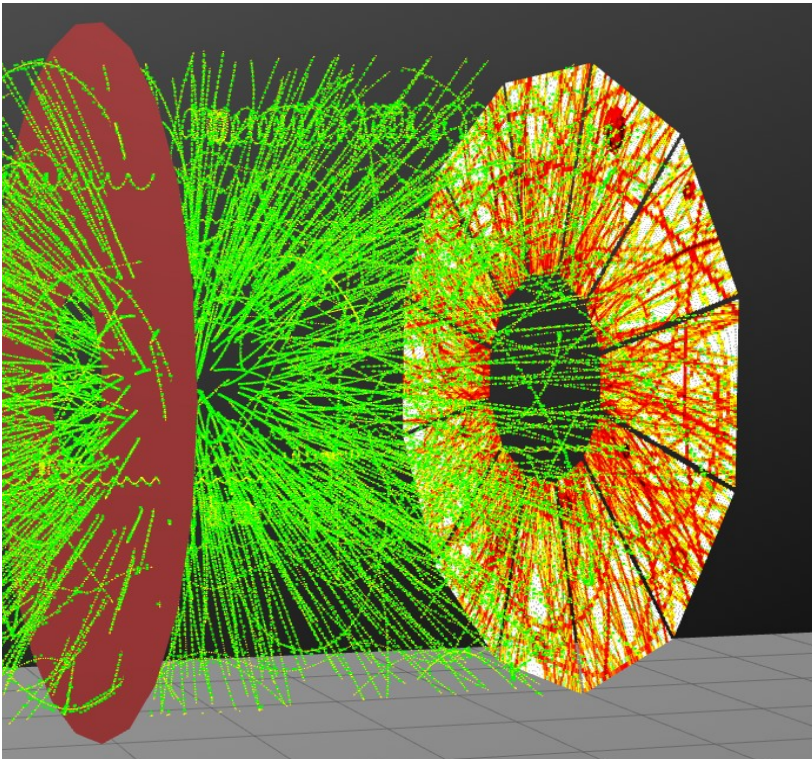
DAQ file structure for online clustering

Tasks:

- Make the TPC clustering online and prepare it for 3D visualize by Event Display;
- Read input stream in the real experiment with data in SAMPA format;
- Parallelize TPC event processing;
- Decrease time for TPC clustering for event processing and rendering: <1 sec at the moment:
- Average time for TPC event processing: ~ 100 ms
- Maximum TPC event processing time: ~500 ms
(depends on track multiplicity)

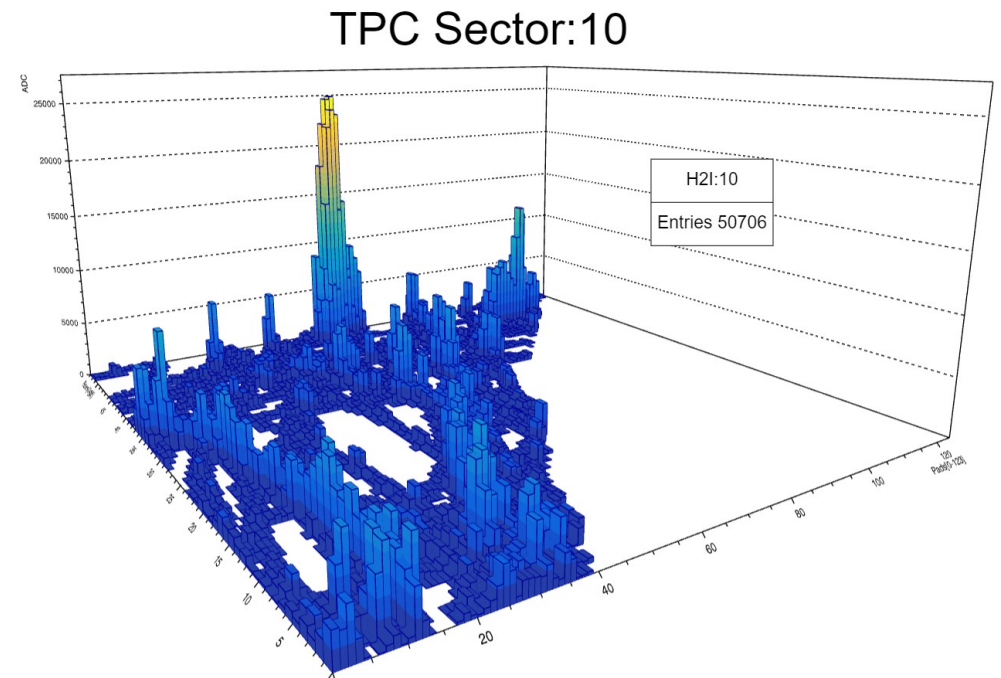
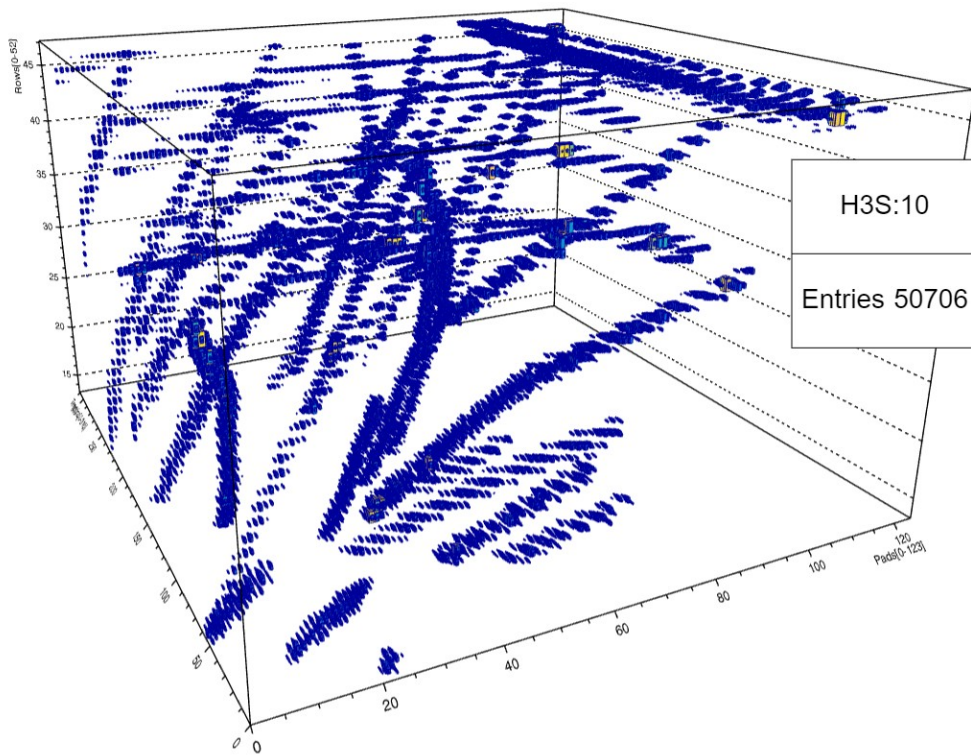
Online TPC clustering

Krylov V.



Data structure

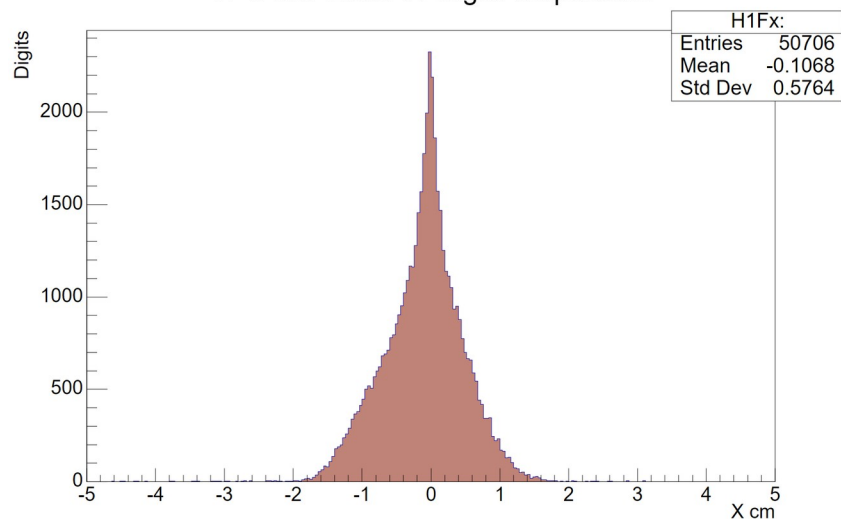
Sector digits



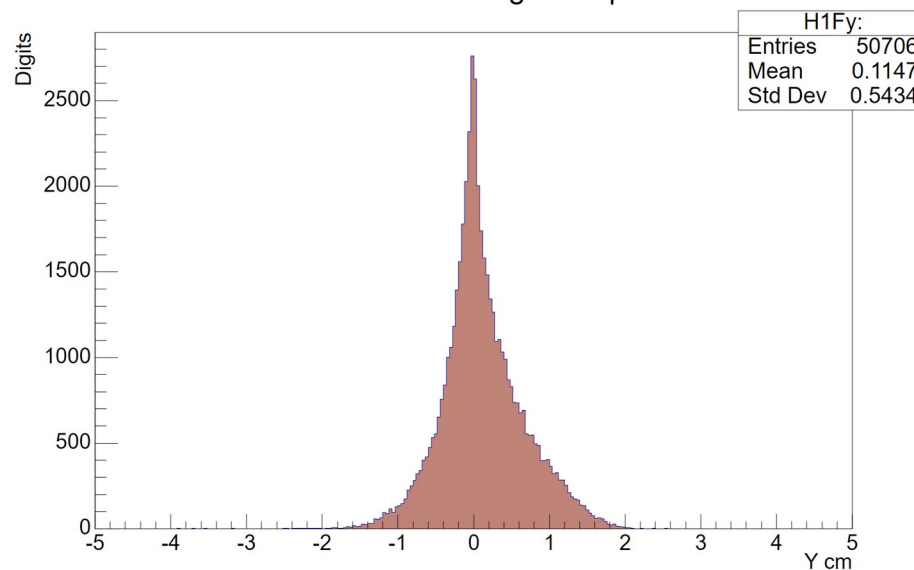
Data structure

Sector digits distribution

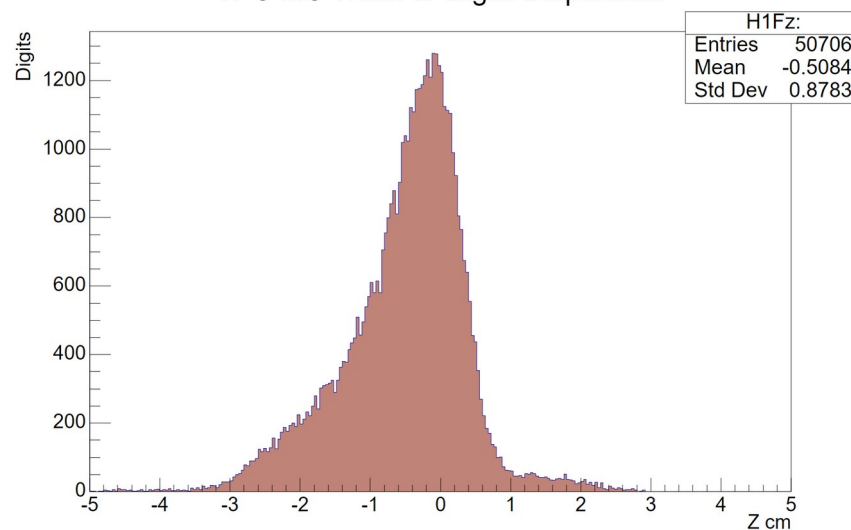
TPC MC Track 'X' Digits Dispersion:



TPC MC Track 'Y' Digits Dispersion:



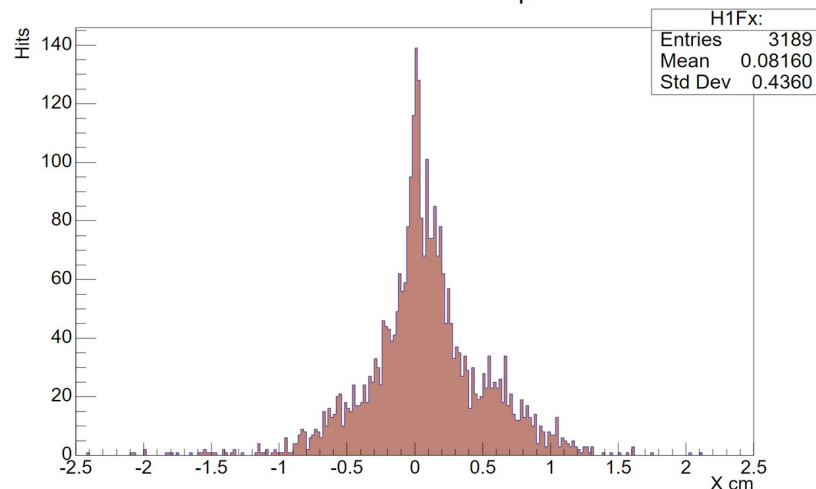
TPC MC Track 'Z' Digits Dispersion:



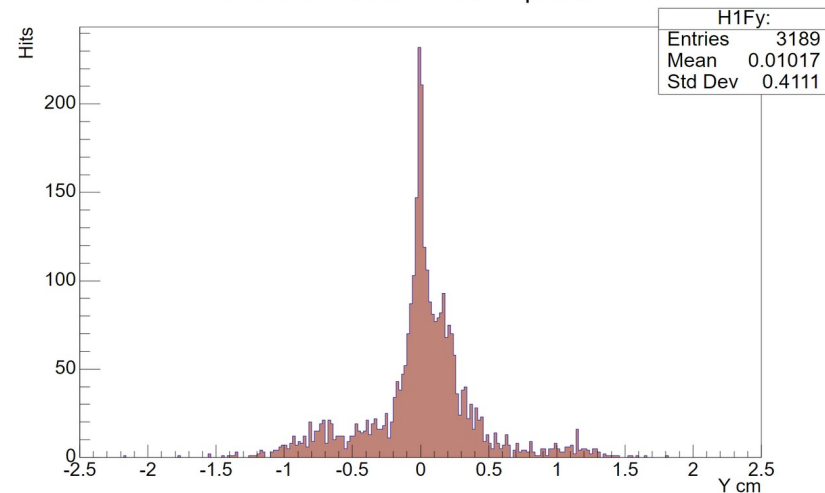
Data structure

Sector hits distribution

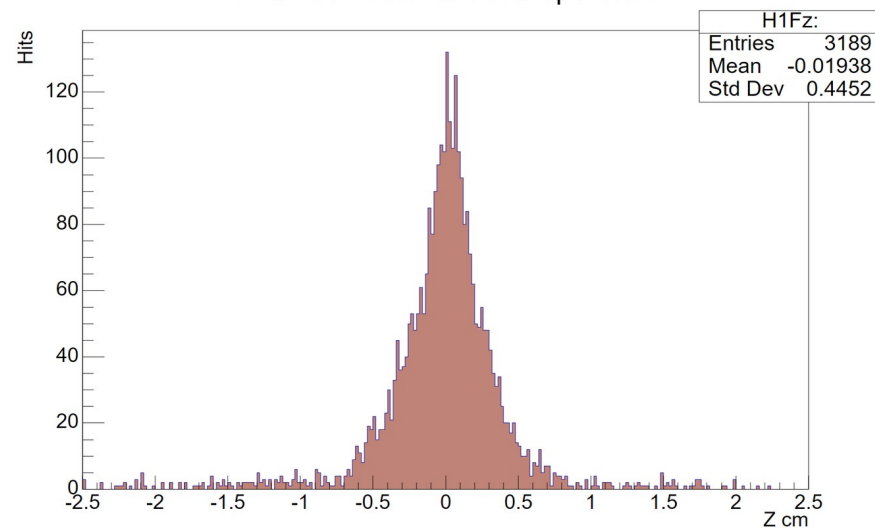
TPC MC Track 'X' Hit Dispersion:



TPC MC Track 'Y' Hit Dispersion:



TPC MC Track 'Z' Hit Dispersion:



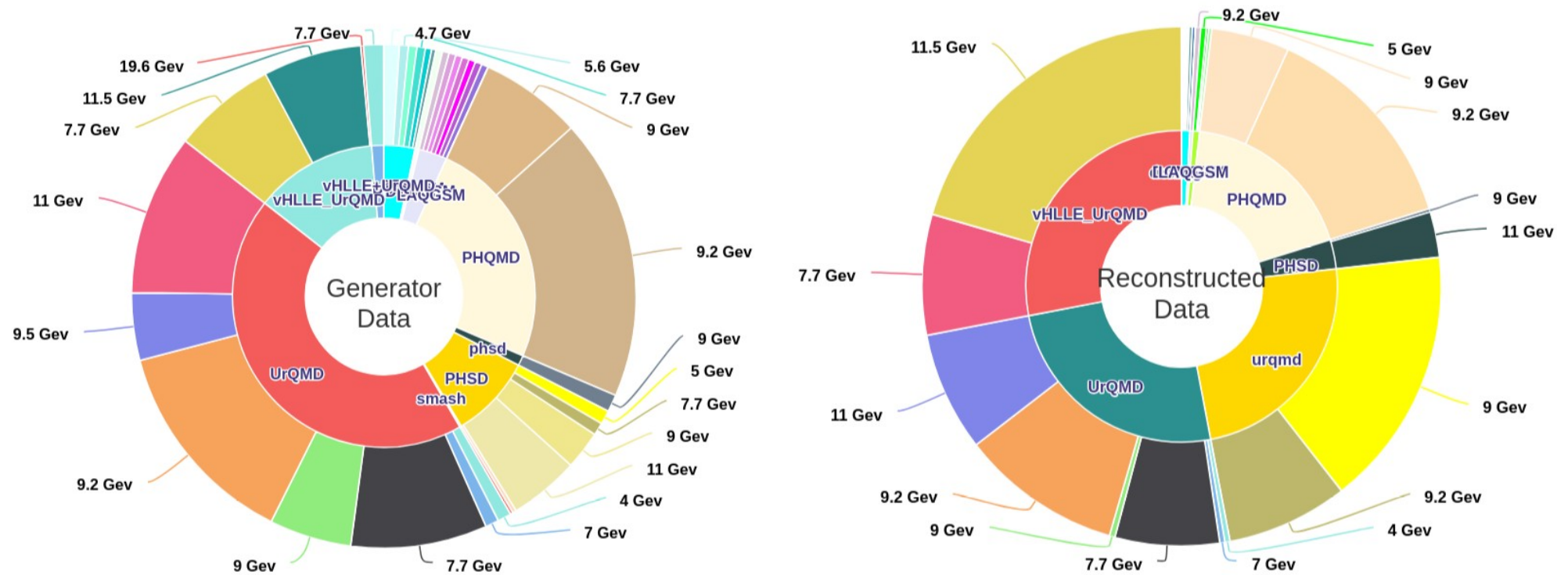
MC data for MPD physics group

Generator	PWG	Coll.		# of events()	Reco
UrQMD	PWG4	AuAu	11	15	+
		BiBi	9	10	+
			9.46	10	+
			9.2	95	+
	PWG2	AuAu	11	10	+
	PWG3	AuAu	7.7	10	+
		BiBi	7.7	10	+
			9	15	+
		pp	9	10	+
		BiBi fix target	2.5	12	+
		BiBi fix target	3.0	12	+
		BiBi fix target	3.5	12	+
DCM-SMM PHQMD		XeW fix target	2.5	15	+
		XeXe fix target	2.5	15	+
	PWG1	BiBi	9.2	76	+
	PWG1	BiBi	9.2	1	+
	PWG2	BiBi	8.8	15	+
			9.2	61	+
			2.4/3.0/4.5	10/10/2	-
	vHLLE-UrQMD	BiBi	11.5	15	+
		AuAu	11.5	15	+
		AuAu	7.7	20	+
Smash		BiBi	9.2	48	+
	PWG1	BiBi	9.46	10	+
		ArAr	4/7/9/11	20/20/20/20	-
		AuAu	4/7/9/11	20/20/20/22	-
		XeXe	4/7/9/11	20/20/20/20	-
		CC	4/7/9/11	20/20/20/20	-
		pp	4/7/9/11	50/50/50/50	-
	JAM	AuAu	3/3.3/3.5/3.8/4.0/4.2/4.5/5	40/40/40/40/40/40/40/40	
	DCM-QGSM-SMM	AuAu	4/9.2	5/5	+
		AgAg	4/9.2	5/5	+
PHSD		BiBi	4/9.2	5/6	+
			9/9.2	25	+
	Total			1412	568

1.7 PB

MPD mass production database

<http://db-nica.jinr.ru/mpdmc/stat.php>



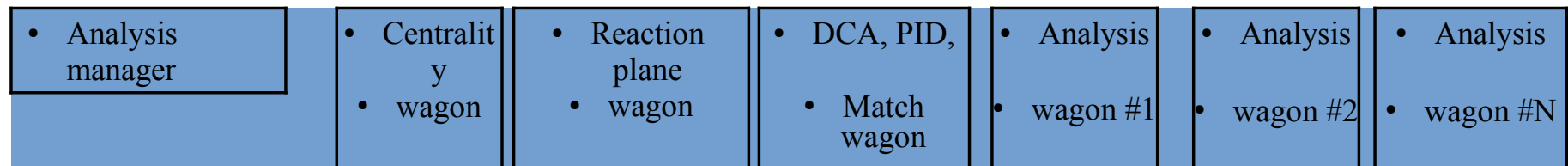
All production data stored in Dirac File Catalog

Mass production data

Adding wagon for hadron spectra analysis

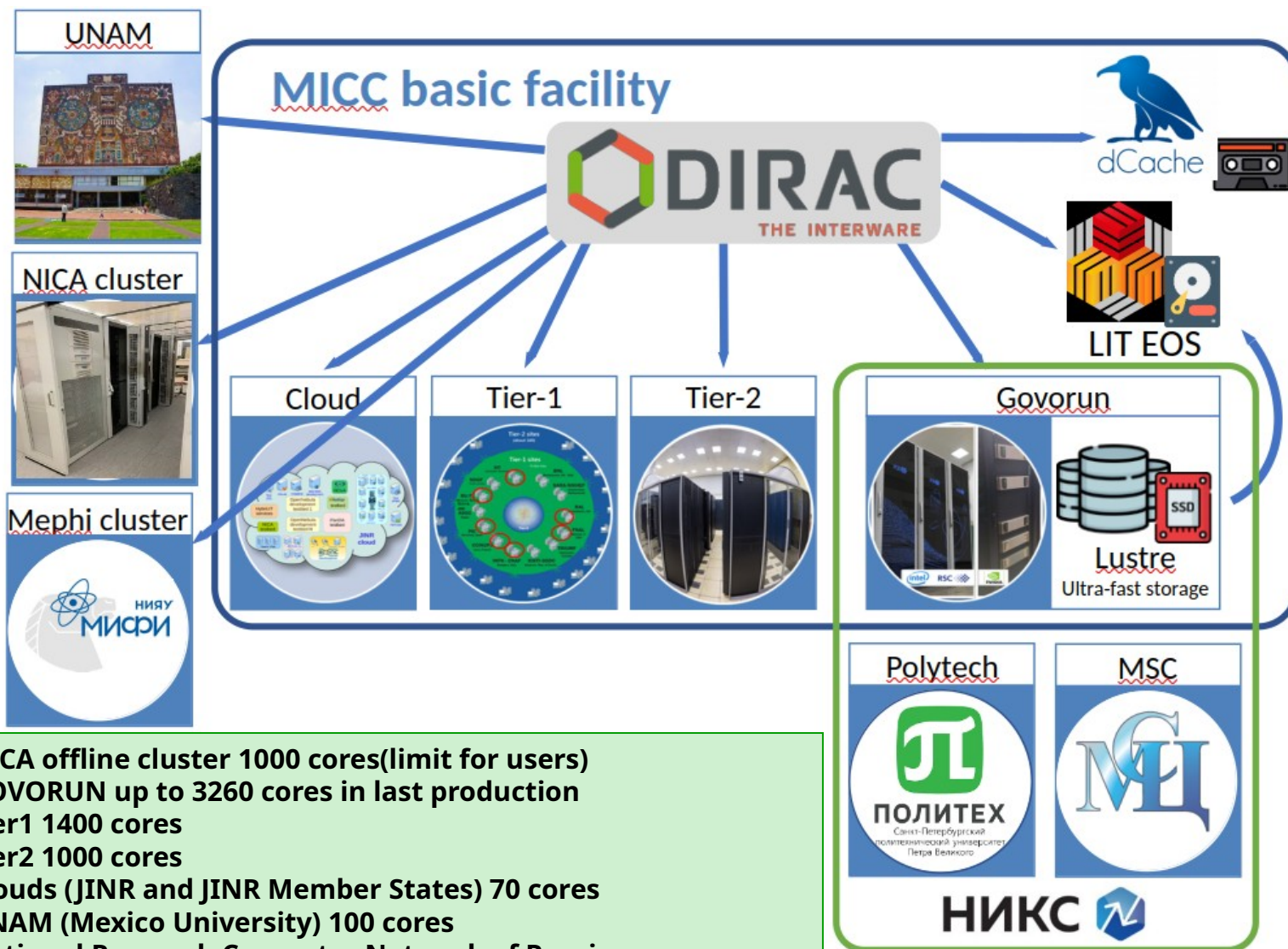
Natalia
kolomojets

- ❖ Centralized Analysis Framework for access and analysis of data:
 - ✓ consistent approaches and results across collaboration, easier storage and sharing of codes and methods
 - ✓ reduced number of input/output operations for disks and databases, easier data storage on tapes
- ❖ Analysis manager reads event into memory and calls wagons one-by-one to modify and/or analyze data:



- ❖ All productions for physical analyses of simulated data already have been done.

Computing resources for MPD



- NICA offline cluster 1000 cores(limit for users)
- GOVORUN up to 3260 cores in last production
- Tier1 1400 cores
- Tier2 1000 cores
- Clouds (JINR and JINR Member States) 70 cores
- UNAM (Mexico University) 100 cores
- National Research Computer Network of Russia (now resources from SPbTU and JSCC) 672 cores

Mass production storages integrated in Dirac File Catalog have size 9,2 PB.

Thanks for your attention

