

Report of the software coordinator

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JINR

SPD Collaboration Meeting
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- Offline computing system
- Offline software
 - SpdRoot
 - Gaudi-based framework
- Online data filter
- *Databases*

- Offline computing system (Artem Petrosyan)
- Offline software (Alexey Zhemchugov)
 - SpdRoot
 - Gaudi-based framework
- Online data filter (Danila Oleynik)
- *Databases* (Fedor Prokoshin)

Offline computing system

A prototype of SPD computing system exists, ready to test mass production

- First production (samples of D-meson decays and min. bias) will start in the coming days
- Production runs at JINR, the outcome is stored at JINR /eos
- Dataset metadata will be refined after first tests
- Production is managed by the production manager (Artem, for now)

If you need a large simulated sample, you may contact Artem and provide him the simulation scripts

For user's simulation DIRAC is available and running

Status of the online filter

- Another (much better!) emulator of raw data stream is prepared by the DAQ team. We can now test data unpacking and data handling. *Any volunteer?*
- The prototype of the online framework (Ondatre) didn't make a significant progress since last time :(
- A prototype of the computing system is being developed. *More details in Danila Oleynik's talk on Wednesday*
- Good progress with the deep learning track recognition
 - The required track finding speed is achieved for time slices with a reasonably good efficiency and purity
 - More realistic simulation of the tracker is needed. The first version is just developed by Samara team.
 - *More details in Daniil Rusov's talk on Wednesday*

New SpdRoot releases

v 4.1.5 [30.12.2022]

- The directory "macro/performance-tests" has been added
- ECal geomtry update/fix
- SpdPipe::SetPipeMaterial now works correctly
- Secondary vertex fitting code has been updated for SpdVertexFitPar. Now you can extract the secondary and primary vertex positions via SpdVertexFitPar2::GetProductionVertex() and SpdVertexFitPar2::GetDecayVertex()
- Correct track PDG ID for K0 decays
- Bug fixes for BBC and ZDC
- A couple of minor bugfix updates followed with the same version number

Git repository: <http://git.jinr.ru/nica/spdroot>

Containers: easy start with SpdRoot

- **Docker**

```
docker pull jemtchou/spdroot:4.1.5
```

```
docker run -it jemtchou/spdroot:4.1.5
```

- **Singularity**

```
singularity run -H /my/workdir spdroot-4.1.5.sif  
"run_spdroot_sim.C(10,\"run_555.root\", \"param  
_555.root\", 777777777)"
```

spdroot-4.1.5.sif is available at */cvmfs*

- Working on automatic image building at CI/CD

An alternative Gaudi-based framework

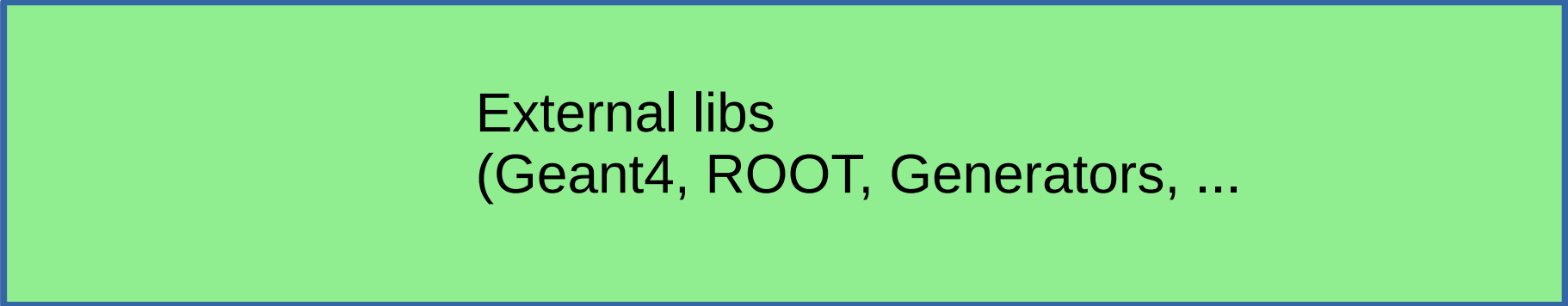
SpdRoot remains the main tool for the physics studies in the coming years. However, it requires significant developments before it can be used for the real data processing after SPD starts operation.

A new Gaudi-based framework is an alternative solution.

- **CentOS7, gcc-11.3.0, python-3.9.6**
- **Container with Gaudi installation is available**
- **Working on FW components:**
 - Building system — V.Onuchin
 - Detector description — A.Allakhverdieva
 - G4Svc, Algorithm example — A.Zhemchugov
 - Magnetic field — NOSU group

Gaudi route in SPD

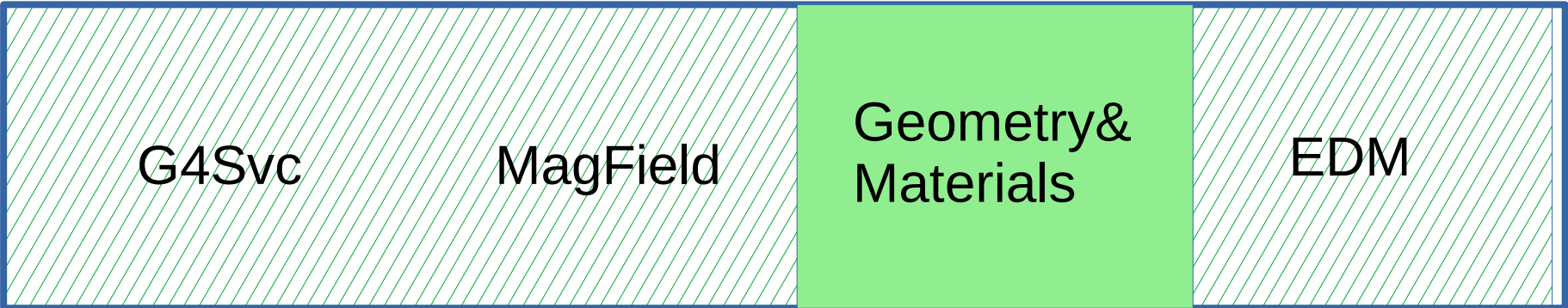
Stage 1



Stage 2



Stage 3



Stage 4

GenInterface

Simulation

McHitProducers

Stage 5

RecHitProducers

Tracking

Ecal
Clustering

Rs
Clustering

Stage 6

Vertex

Secondary T0
Vertex

PID

Database

What we desperately need from the detector subsystems

- More details about signal formation in the detectors, for MC hit production
- More details about detector calibration procedures and constants
- Details and naming convention for geometry description
- Input for the database design
 - Detector hardware database (detector elements, cabling etc)
 - Run database
 - Offline DB: Geometry versions, Calib&Align, Magnetic field, ...
 - We need all it rather early to have time for performance tests and tuning