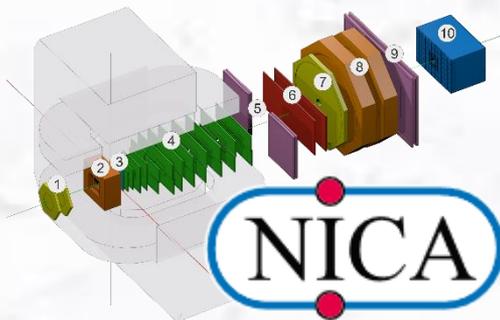


Status of the Geometry Database and steps to integrate into the BM@N experiment

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¹JINR, Dubna



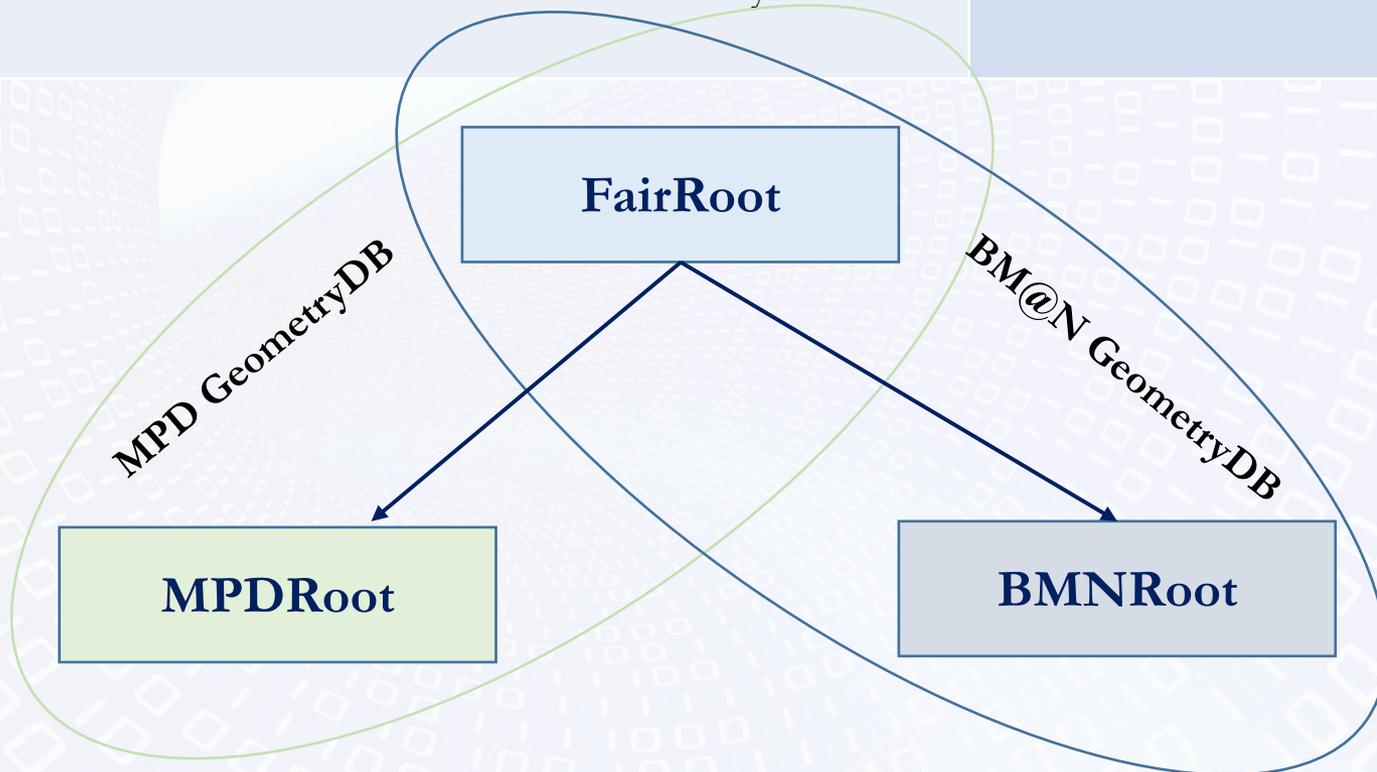
7th Collaboration Meeting of the BM@N,
19-20 April



Joint Institute for Nuclear Research

BM@N & MPD

Common features	Differences
Approaches to the methods of simulations and reconstructions	The sets of Detectors
Software: FAIRSOFT, FAIRROOT	
RunManager: <ul style="list-style-type: none">➤ FairRunSim for the simulation runs➤ FairRunAna for the reconstruction or analysis runs	



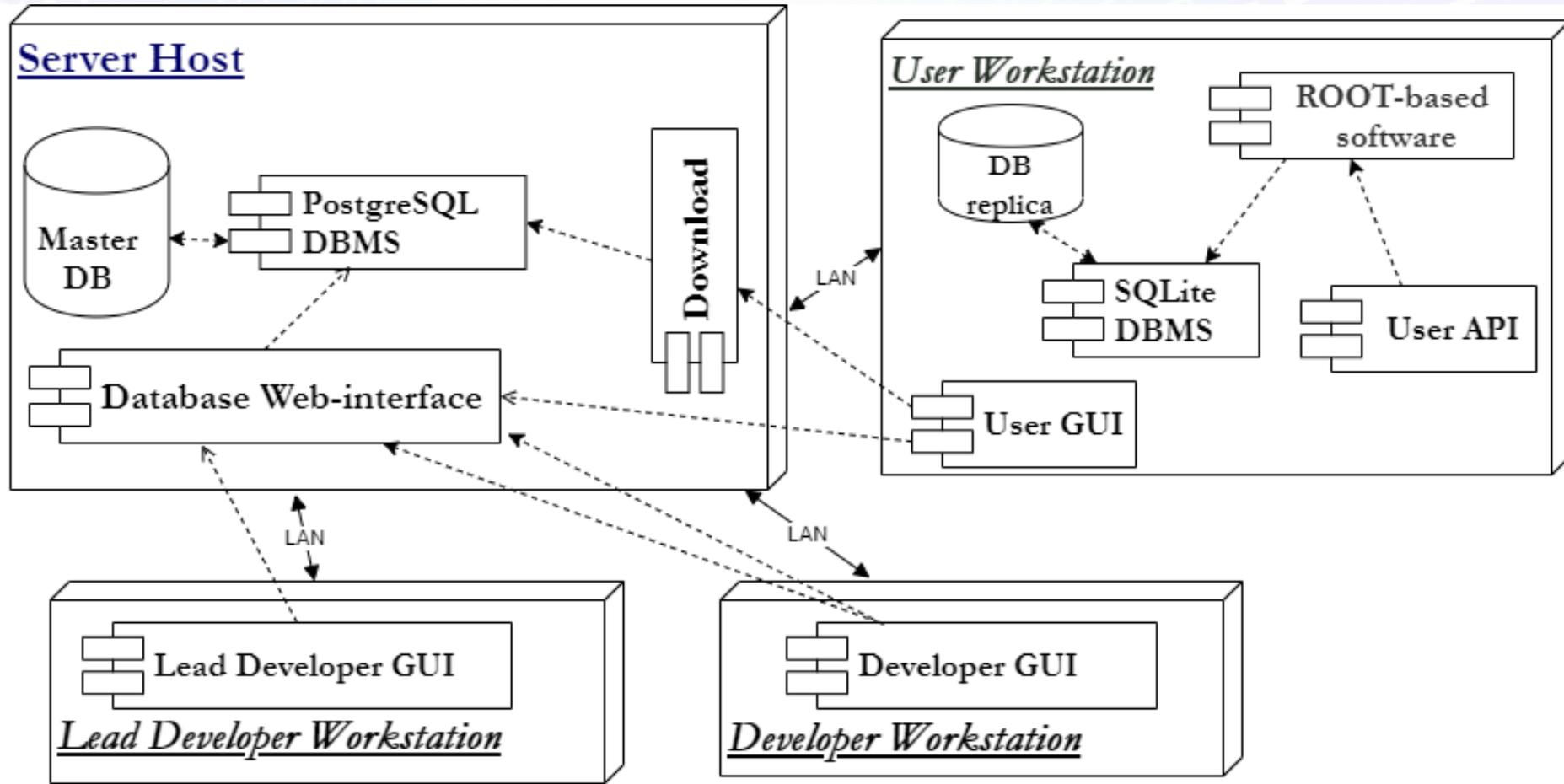
Guidelines

- **manage module geometries as ROOT binary objects**
- **for each module keep: tag, version, transformation matrix, mother module**
- **manage the pre-defined setups as combinations of module geometries**
- **manage module version**

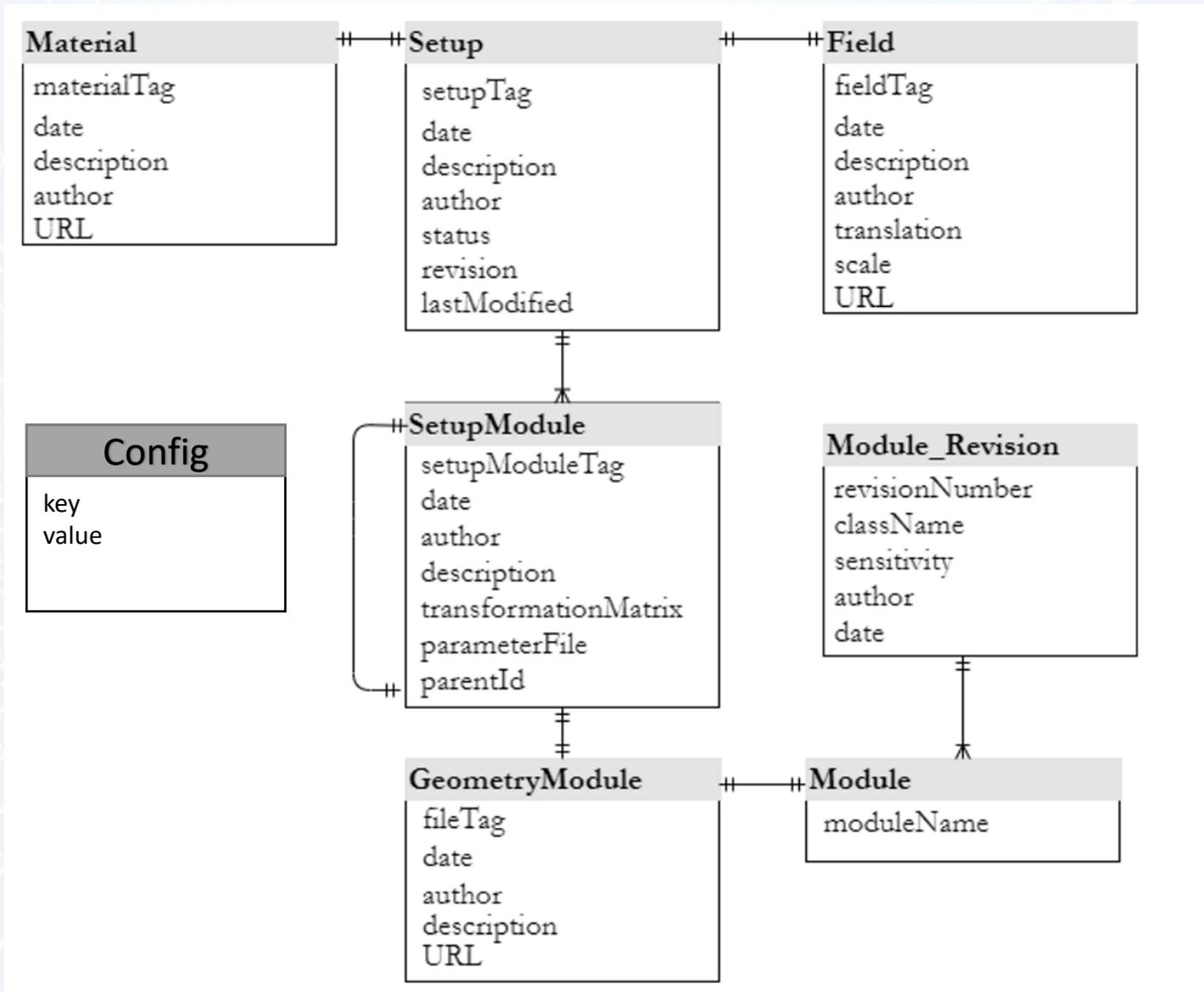
Tasks

- **Store the modules of experiment**
- **Construct setup from the stored modules**
- **Present the setup via WEB**
- **Support different versions of module**
- **Unified approach to Geometry DB**

General architecture of the Geometry Information System



Object model of the Geometry DB



Web-interface. Git.

Git repositories: https://git.jinr.ru/nica_db/geodb_web.git

Number of opened sub issues for improves: 57

Number of fixed sub issues: 55

Not fixed (in progress): 2

- 1 sub issue: improve view (problem with reproduce),

- 1 sub issue: update setups list (required only the version from BMNRoot 19.05.0, 19.10.0, 20.02.0, current)

Web-interface. View Mode

Geometry Files

Module	Class Name	File Tag	Transformation	Date	Author	Description	Download
BD	BmnBd	geom_BD_det_v2	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2020-04-19	aleksand	geom_BD_det_v2.root	Download
BD	BmnBd	bd_v1_run6	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2019-12-16		bd_v1_run6.geo	Download
BD	BmnBd	v1	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-18	aleksand	bd_v1_0 for run6	Download
CAVE	FairCave	cave	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-03	aleksand	init	Download
CSC	BmnCSC	CSC_RunSpring2018	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2020-04-19	aleksand	CSC_RunSpring2018.root	Download
DCH	BmnDch	DCH_RunSpring2018	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2019-12-23	aleksand	DCH_RunSpring2018	Download
DCH	BmnDch	DCH_RunWinter2016	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-18	aleksand	DCH RunWinter2016	Download
ECAL	BmnEcal	test7	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2021-04-13	aleksand	test	Download
ECAL	BmnEcal	test6	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	0.984808 -0 -0.173648 -55 0 1 -0 12.4 0.173648 0 0.984808 283.1	aleksand	test	Download
ECAL	BmnEcal	va_test	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2020-11-02	fia@jinr.ru	test test	Download

Web-interface. View Mode



Baryonic Matter
at Nuclotron



BM@N Geometry DataBase



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[HOME](#)

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[VIEW SETUP MODULES](#)

[VIEW FILES](#)

[VIEW MATERIALS](#)

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[Konstantin Gertsenberger](#)

Geometry Setups

Tag	Revision	Date	Description	Author	Status	Download Setup	Download Root File
test	1	2021-04-16	test setup	aleksand	Approved		
run7	20.02.0	2020-04-19	run7 uploaded 19.04.2020	aleksand	Approved		
run6	19.04.0	2019-12-25	version 19.04.0 with error description	aleksand	Approved		
run6	17.04.0	2018-07-26	version 17.04.0	aleksand	Approved		

New

Web-interface. Add Setup

TOF	+
PSD	+
PIPE	+
MAGNET	+

Magnetic Fields

	Tag	Date	Author	X	Y	Z	Scale	Description
<input checked="" type="radio"/>	field_sp41v4_ascii_Extrap	2021-04-16	aleksand	0.000	0.000	0.000	1.000	field_sp41v4_ascii_Extrap.root

Geometry Materials

	Tag	Date	Author	Description
<input checked="" type="radio"/>	3	2020-08-13	fia	test
<input type="radio"/>	2	2020-02-07	aleksand	версия 2019 года
<input type="radio"/>	1	2018-07-03	aleksand	Base version of media

Root File

* Файл не выбран

Macros

<i>Signature</i>	<i>Description</i>	<i>Call Example</i>	<i>Comment</i>
<code>void getSetupList();</code>	Get the list of available setups. Print the list of available setups including tag, date of creation, author and description parameters for each approved setup.	<code>getSetupList.c();</code>	Require set variable DBL_FILE_PATH before use.
<code>bool loadSetup(const char* setupTag, const char* revision);</code>	Load setup into the Fair framework. The Geometry can be used in ROOT framework afterwards. Return FALSE if setup is not loaded, and TRUE if the loading is successful.	<code>bool res = loadSetup("run6 ", "19.04.0");</code>	Require set variable DBL_FILE_PATH before use.
<code>void installLocalDB.C (const char* urlServer);</code>	Install local database from server to client. Download replica of central database to client computer.	<code>installLocalDB ("http://cbmdb.j inr.ru/geometry_ bmn");</code>	Require set variable DBL_FILE_PATH before use.
<code>void installServerDB.C ();</code>	Install new server instance. Install and init PostgreSQL database server, install and init WEB part of Geometry DB to Apache server.	<code>installServerDB ();</code>	Required config file with name geodb.config.xml

Steps to integrate into the BM@N

- Create production DB with only required data
- Test and verify all new setups
- Update run* macros in BMNRoot (current, old tags?)

Conclusion

Geometry DB for storing and retrieving the geometry has been developed:

- **DB (DBMS PostgreSQL, SQLite) in use**
- **GUI (Graphical User Interface) tools implemented**
- **API (Application Programming Interface) tools as a set of ROOT macros done**
- **Unified approach is implemented**

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