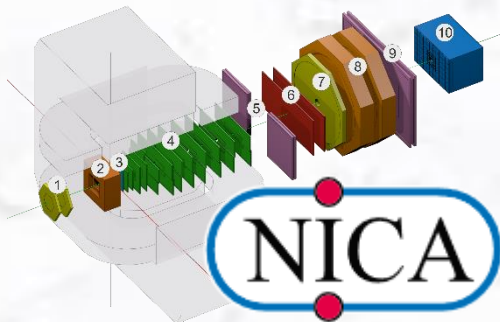


# Status of the Geometry Database and steps to integrate into the BM@N experiment

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<sup>1</sup>JINR, Dubna



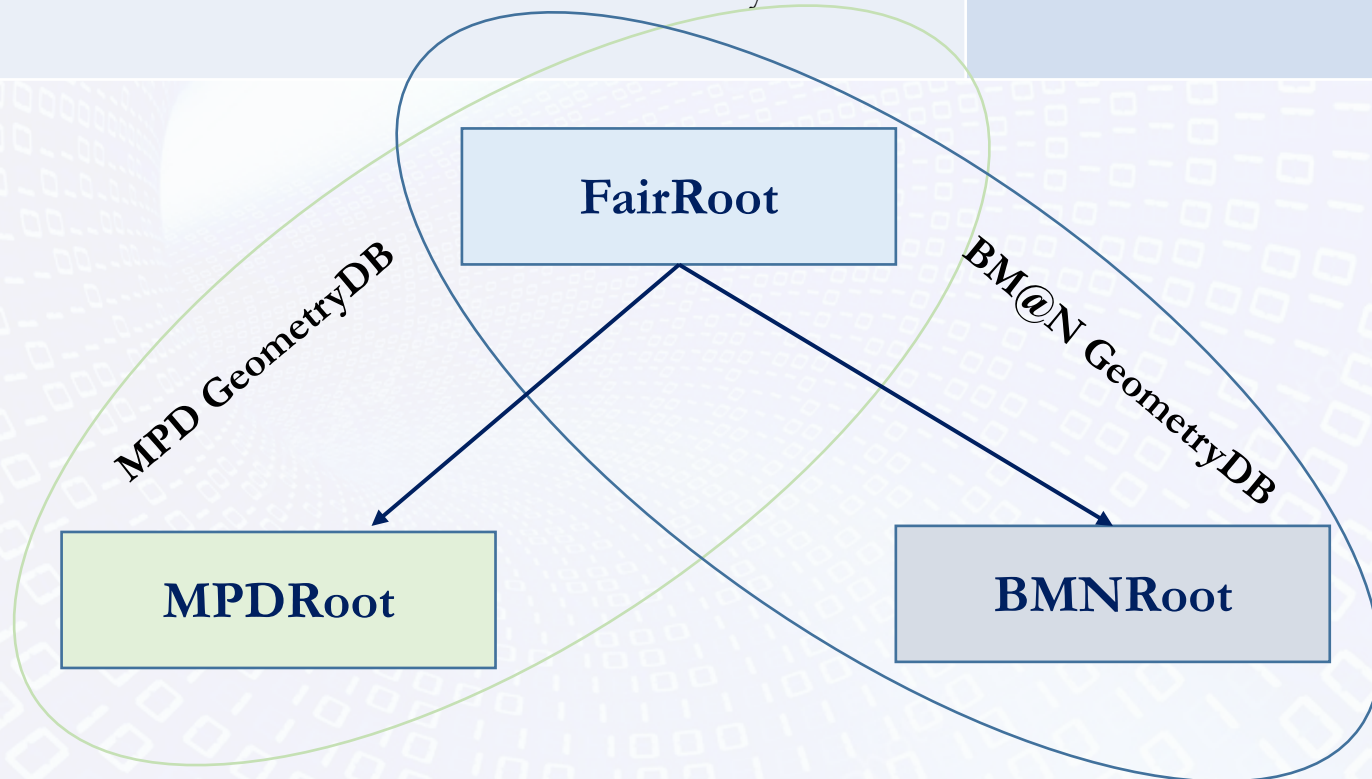
7th Collaboration Meeting of the BM@N,  
19-20 April



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 <b>RunManager:</b> <ul style="list-style-type: none"><li>➤ <b>FairRunSim</b> for the simulation runs</li><li>➤ <b>FairRunAna</b> for the reconstruction or analysis runs</li></ul>	



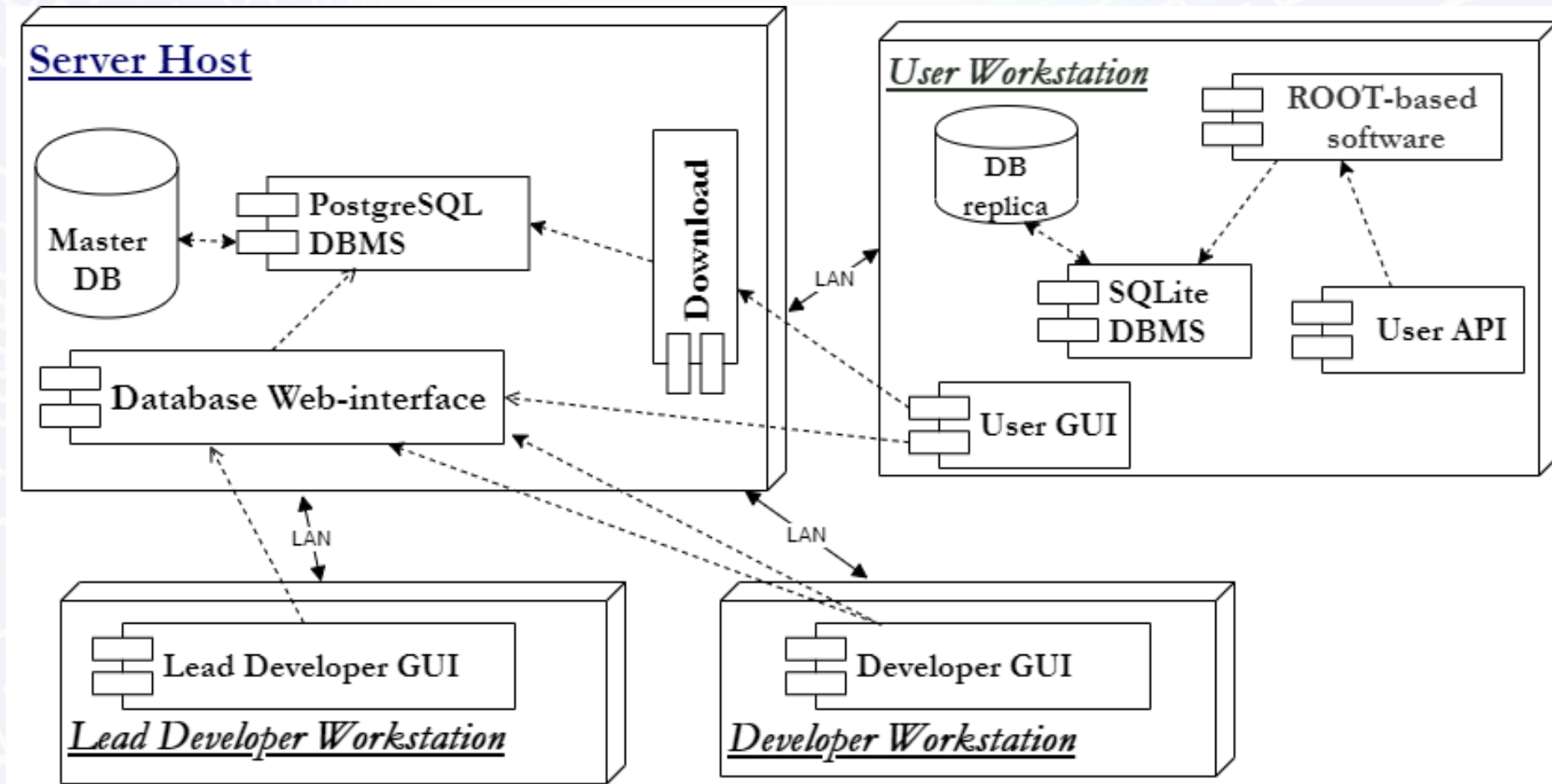
## *Guidelines*

- **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**

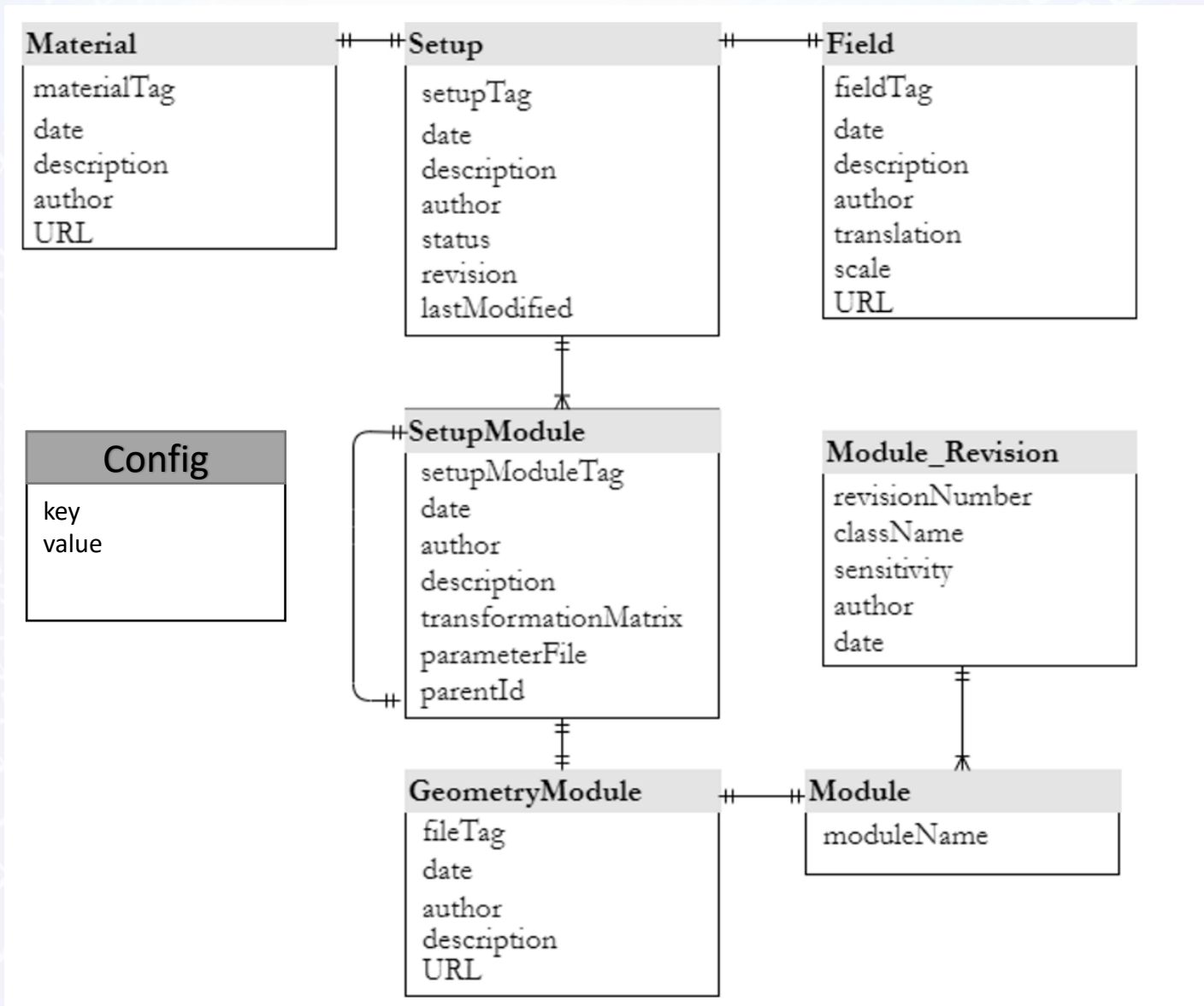
## *Tasks*

- **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](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	<a href="#">Download</a>
BD	BmnBd	bd_v1_run6	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2019-12-16		bd_v1_run6.geo	<a href="#">Download</a>
BD	BmnBd	v1	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-18	aleksand	bd_v1_0 for run6	<a href="#">Download</a>
CAVE	FairCave	cave	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-03	aleksand	init	<a href="#">Download</a>
CSC	BmnCSC	CSC_RunSpring2018	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2020-04-19	aleksand	CSC_RunSpring2018.root	<a href="#">Download</a>
DCH	BmnDch	DCH_RunSpring2018	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2019-12-23	aleksand	DCH_RunSpring2018	<a href="#">Download</a>
DCH	BmnDch	DCH_RunWinter2016	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2018-07-18	aleksand	DCH RunWinter2016	<a href="#">Download</a>
ECAL	BmnEcal	test7	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2021-04-13	aleksand	test	<a href="#">Download</a>
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	<a href="#">Download</a>
ECAL	BmnEcal	va_test	$\begin{bmatrix} 10 \\ 01 \end{bmatrix}$	2020-11-02	fia@jinr.ru	test test	<a href="#">Download</a>

# Web-interface. View Mode



Baryonic Matter  
at Nuclotron



BM@N Geometry DataBase



LOGIN

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## Get in touch



Konstantin Gertsenberger

## Geometry Setups

Tag	Revision	Date	Description	Author	Status	Download Setup	Download Root File
<a href="#">test</a>	1	2021-04-16	test setup	aleksand	Approved		
<a href="#">run7</a>	20.02.0	2020-04-19	run7 uploaded 19.04.2020	aleksand	Approved		
<a href="#">run6</a>	19.04.0	2019-12-25	version 19.04.0 with error description	aleksand	Approved		
<a href="#">run6</a>	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>
<b>void</b> <code>getSetupList()</code> ;	<b>Get the list of available setups.</b> 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 <b>DBL_FILE_PATH</b> before use.
<b>bool</b> <code>loadSetup(const char* setupTag, const char* revision);</code>	<b>Load setup into the Fair framework.</b> The Geometry can be used in ROOT framework afterwards. Return FALSE if setup is not loaded, and TRUE if the loading is successful.	<b>bool</b> res = <code>loadSetup("run6", "19.04.0");</code>	Require set variable <b>DBL_FILE_PATH</b> before use.
<b>void</b> <code>installLocalDB.C(const char* urlServer);</code>	<b>Install local database from server to client.</b> Download replica of central database to client computer.	<code>installLocalDB("http://cbmdb.jinr.ru/geometry_bmn");</code>	Require set variable <b>DBL_FILE_PATH</b> before use.
<b>void</b> <code>installServerDB.C();</code>	<b>Install new server instance.</b> 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 <b>geodb.config.xml</b>

## 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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**The authors are grateful to A. Prihodko for help in the development of the Web interface.**