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

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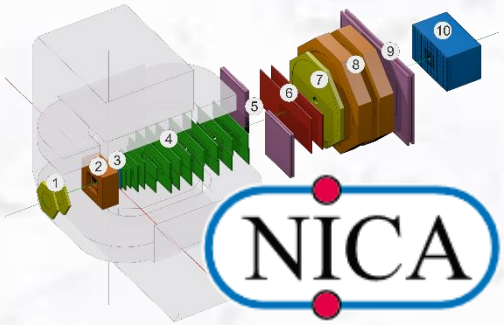

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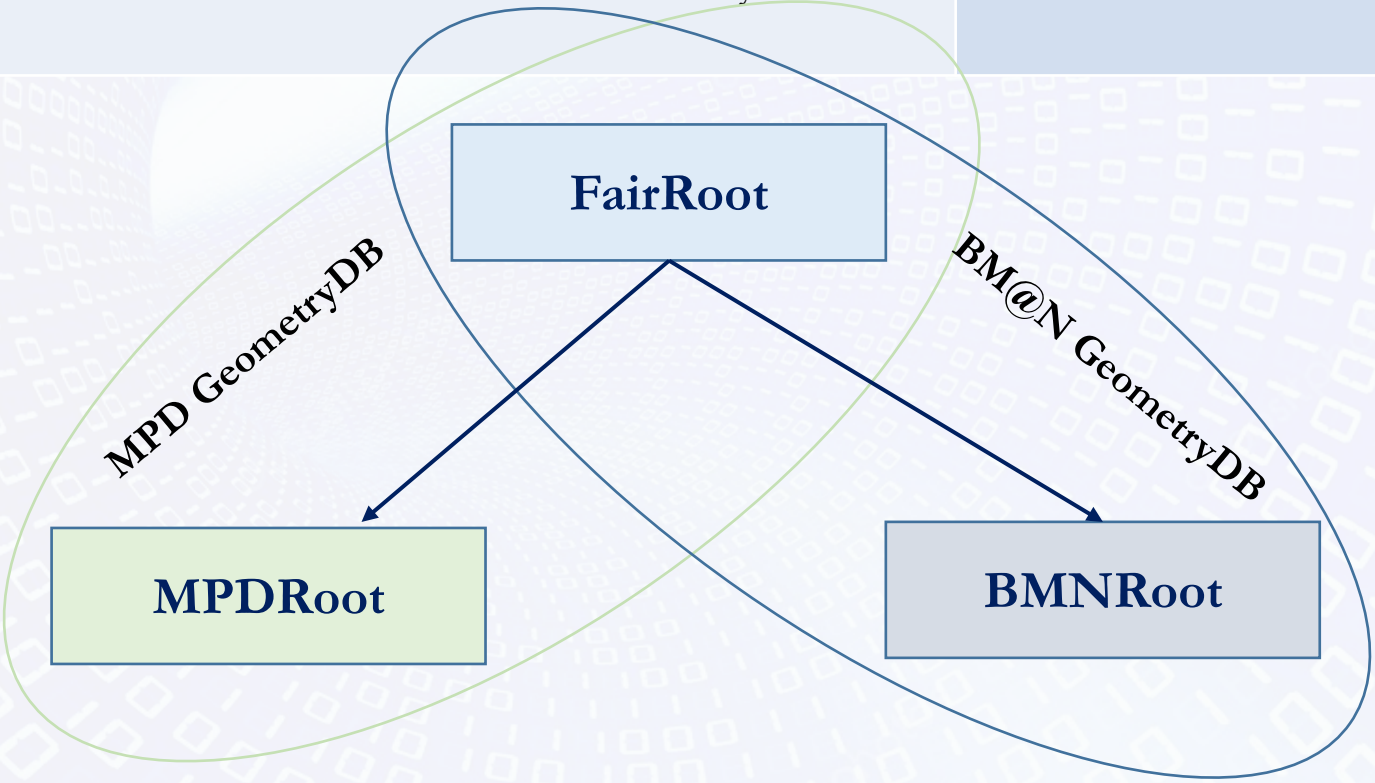
BM@N & MPD

Common features	Differences
Approaches to the methods of simulations and reconstructions	The sets of Detectors
Software: FAIRSOFT, FAIRROOT **RunManager:** ➢ **FairRunSim** for the simulation runs ➢ **FairRunAna** for the reconstruction or analysis runs	



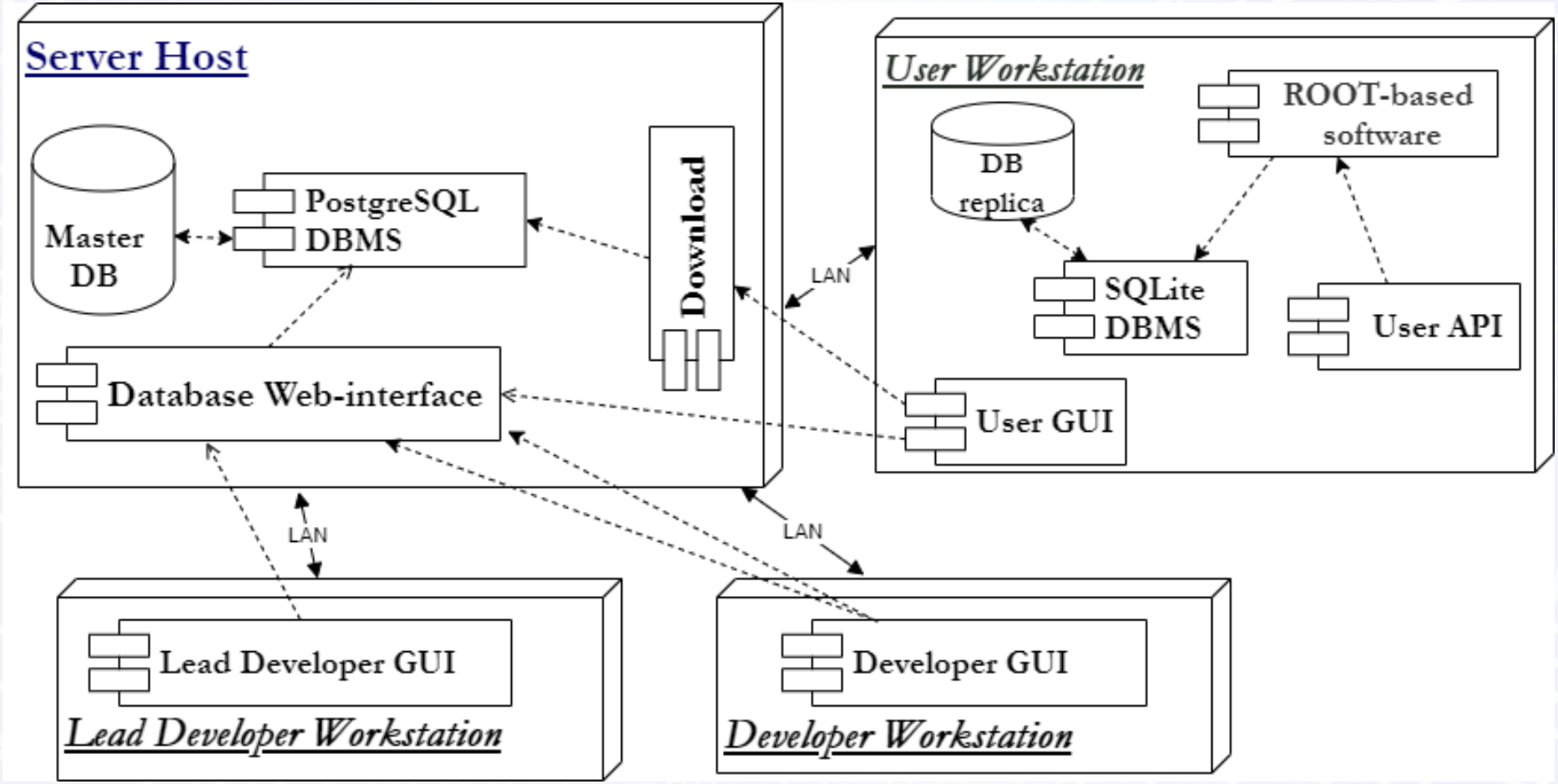
Guidelines

- **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**

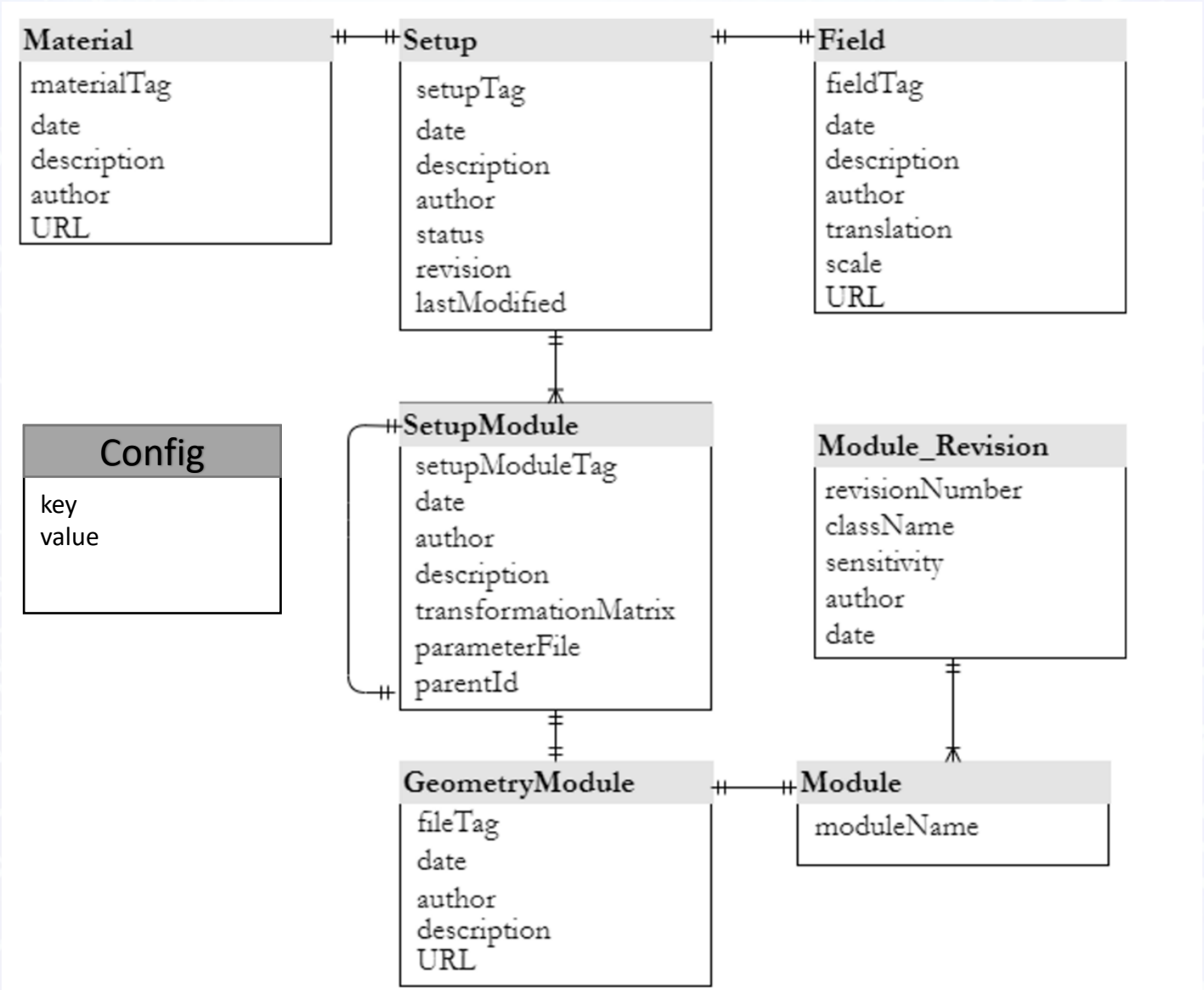
Tasks

- **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),

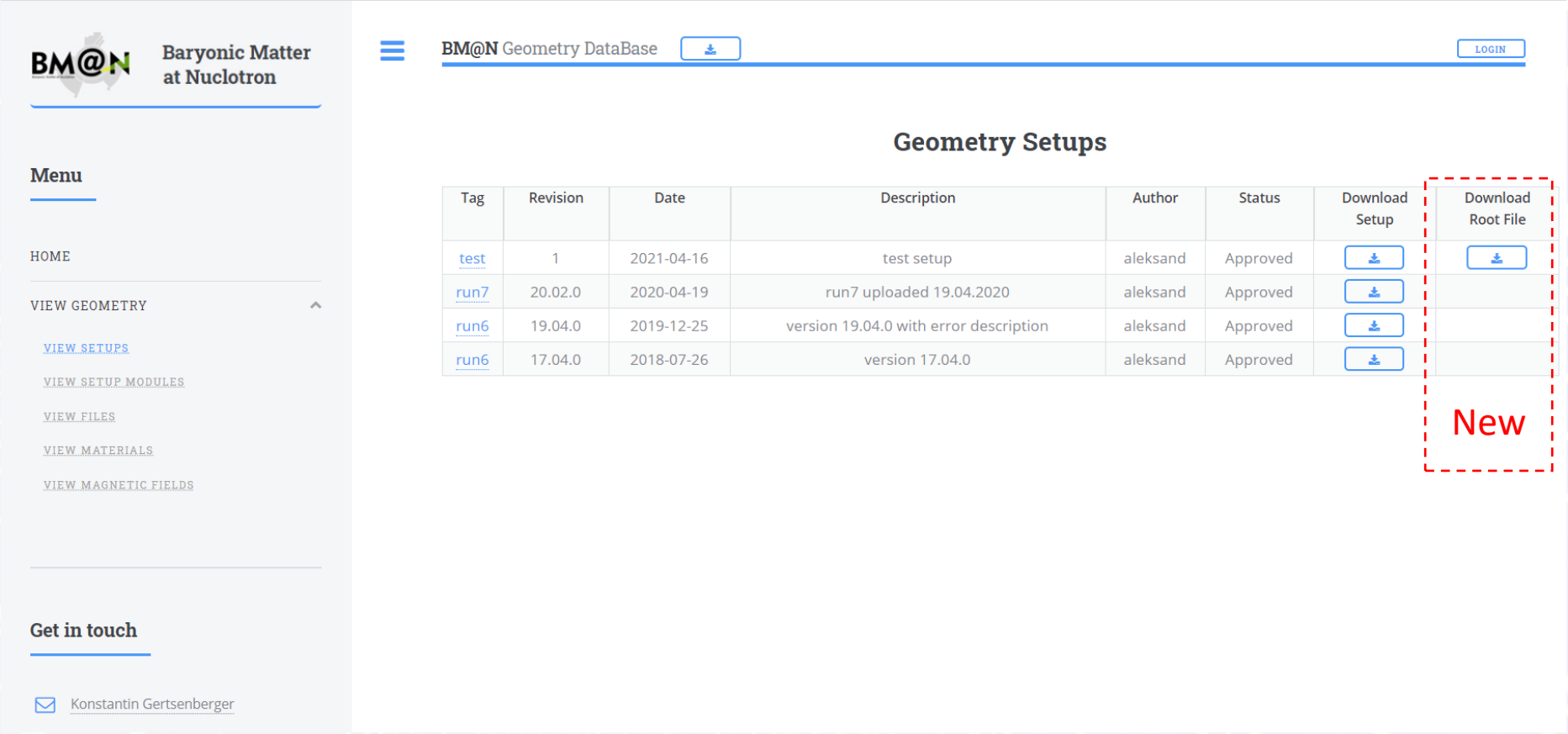
1 sub issue: update setups list (required only the version from BMNRoot 19.05.0, 19.10.0, 20.02.0, current)

Web-interface. View Mode

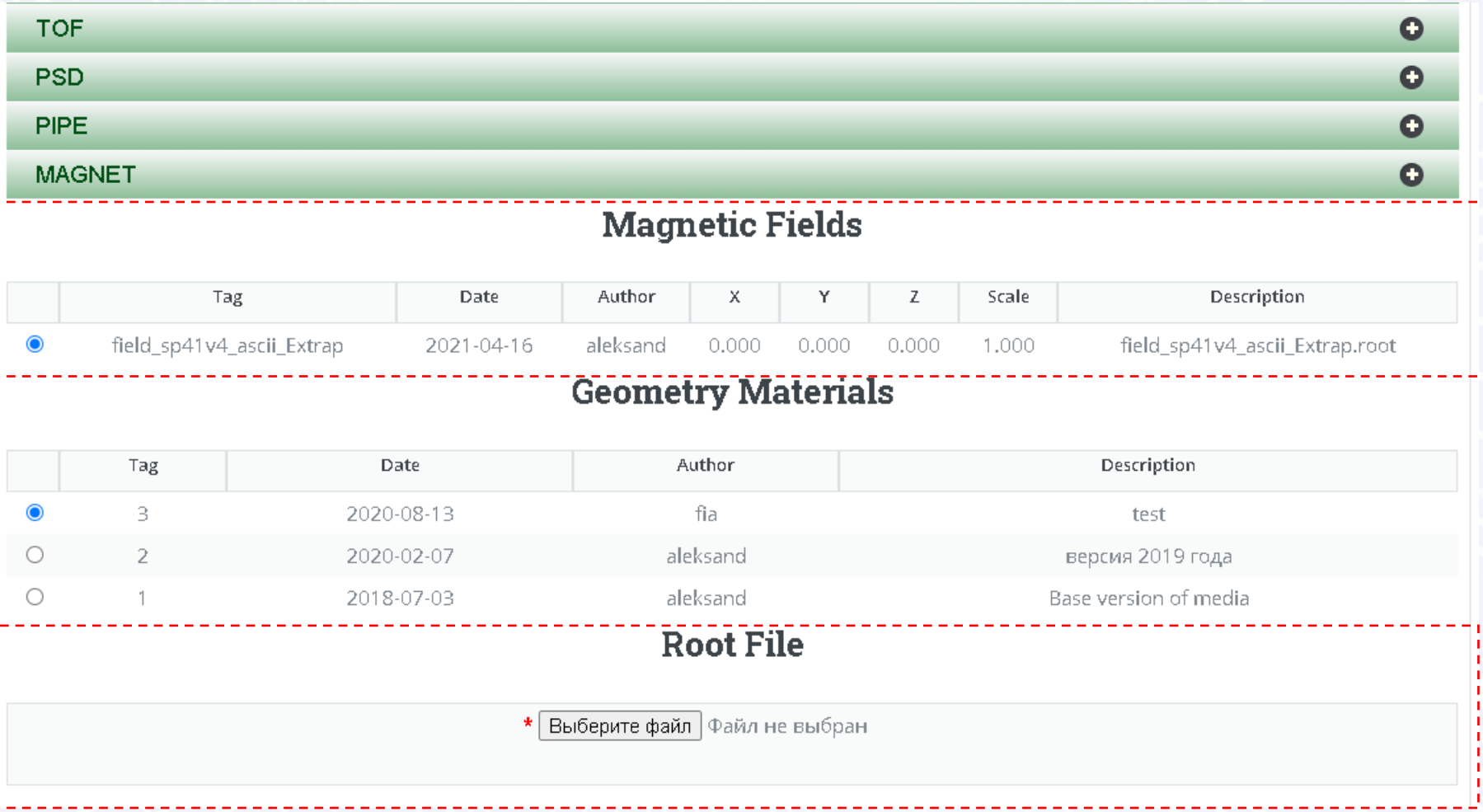
Geometry Files

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

Web-interface. View Mode



Web-interface. Add Setup



Macros

Signature	*Description*	*Call Example*	*Comment*
`void getSetupList();`	***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.	getSetupList.c();	Require set variable **DBL_FILE_PATH** before use.
bool loadSetup(const char* setupTag, const char* revision);	***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.	bool res = loadSetup("run6", "19.04.0");	Require set variable **DBL_FILE_PATH** before use.
void installLocalDB.C (const char* urlServer);	***Install local database from server to client.*** Download replica of central database to client computer.	**installLocalDB** ("http://cbmdb.jinr.ru/geometry_bmn");	Require set variable **DBL_FILE_PATH** before use.
void installServerDB.C ();	***Install new server instance***. Install and init PostgreSQL database server, install and init WEB part of Geometry DB to Apache server.	**installServerDB** ();	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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