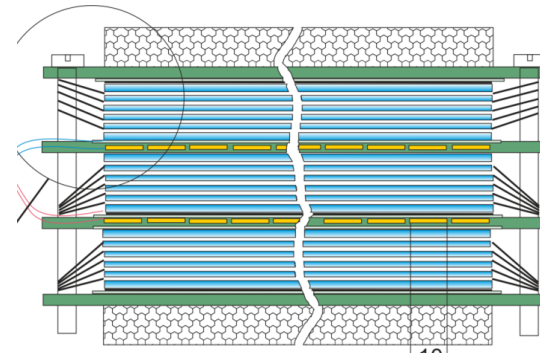
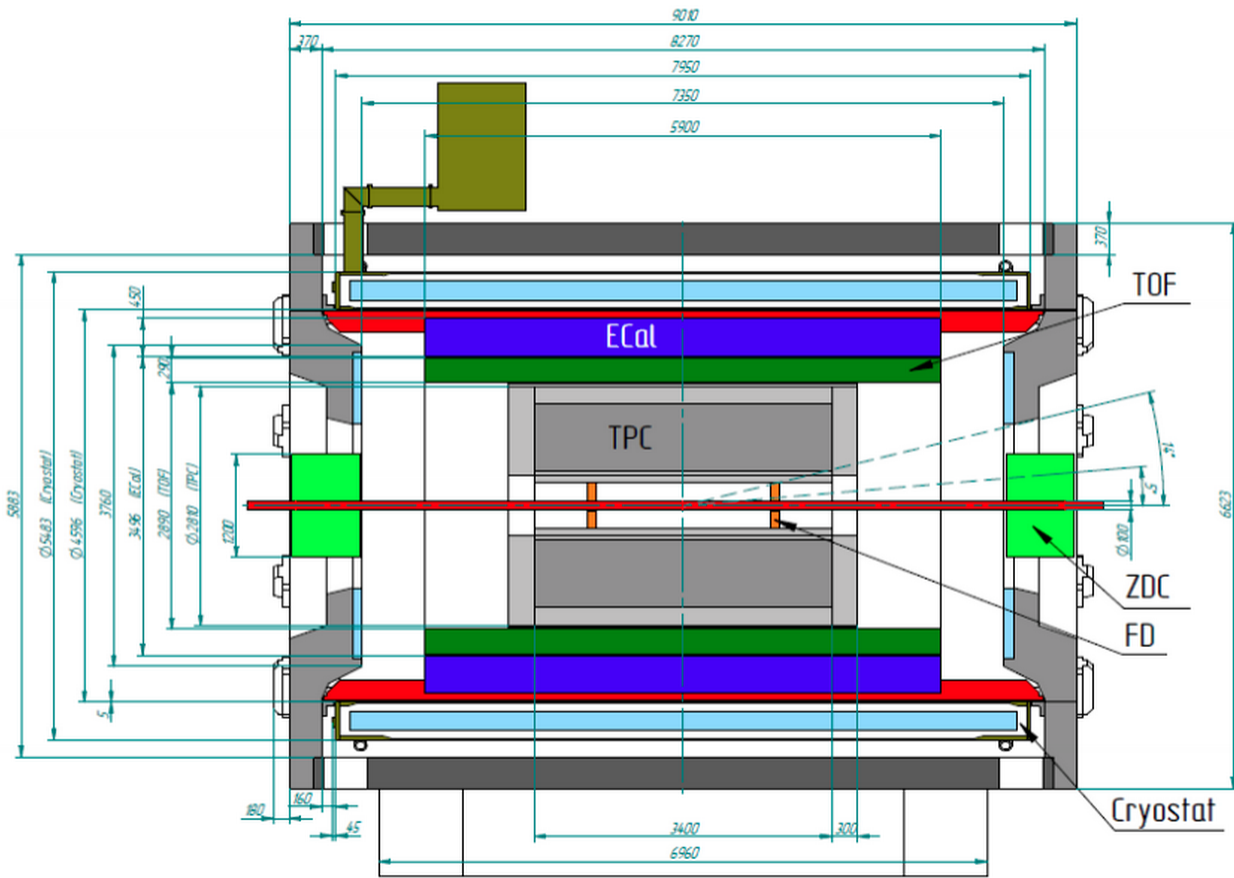


TOF Status

Contents

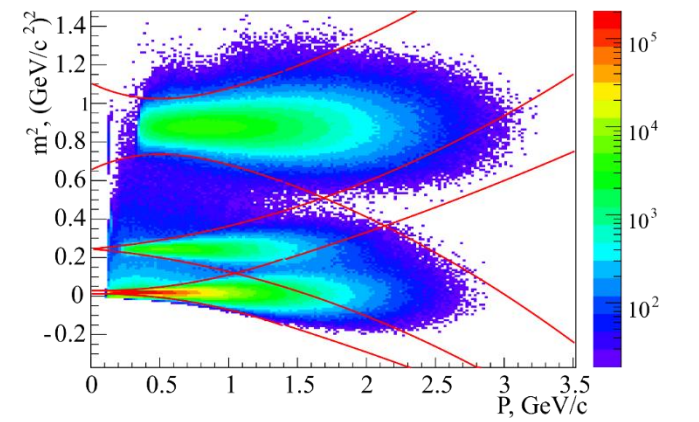
- 1) Brief description of the TOF system
- 2) Current situation of TOF production in accordance of time schedule
- 3) Development of the software for experimental data processing
- 4) Example of the results of the TOF modules cosmic test
- 5) TOF installation equipment status
- 6) The assembling of the gas system in the MPD Hall
- 7) Position of TOF VXS crates on the MPD yoke & cabling
- 8) Conclusions

Time-of-Flight system in the basic configuration of the MPD

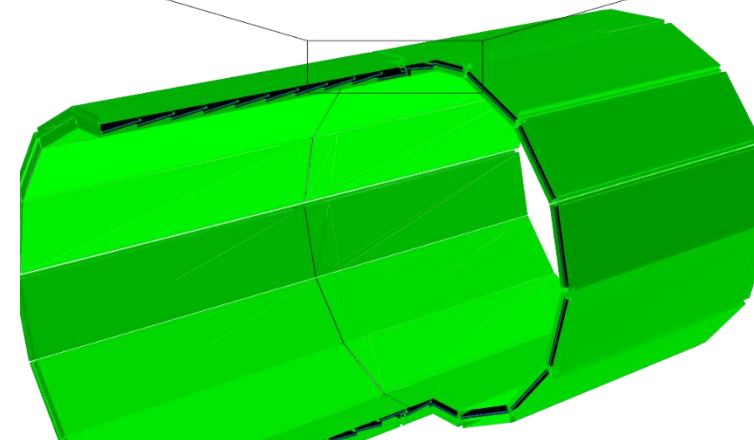
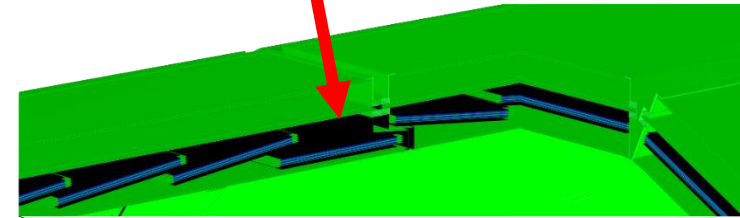


Multigap RPC

Time resolution ~ 50 ps



Momentum dependence of m^2 distribution from the MPD TOF (red lines depict 3σ bands)



TOF Barrel

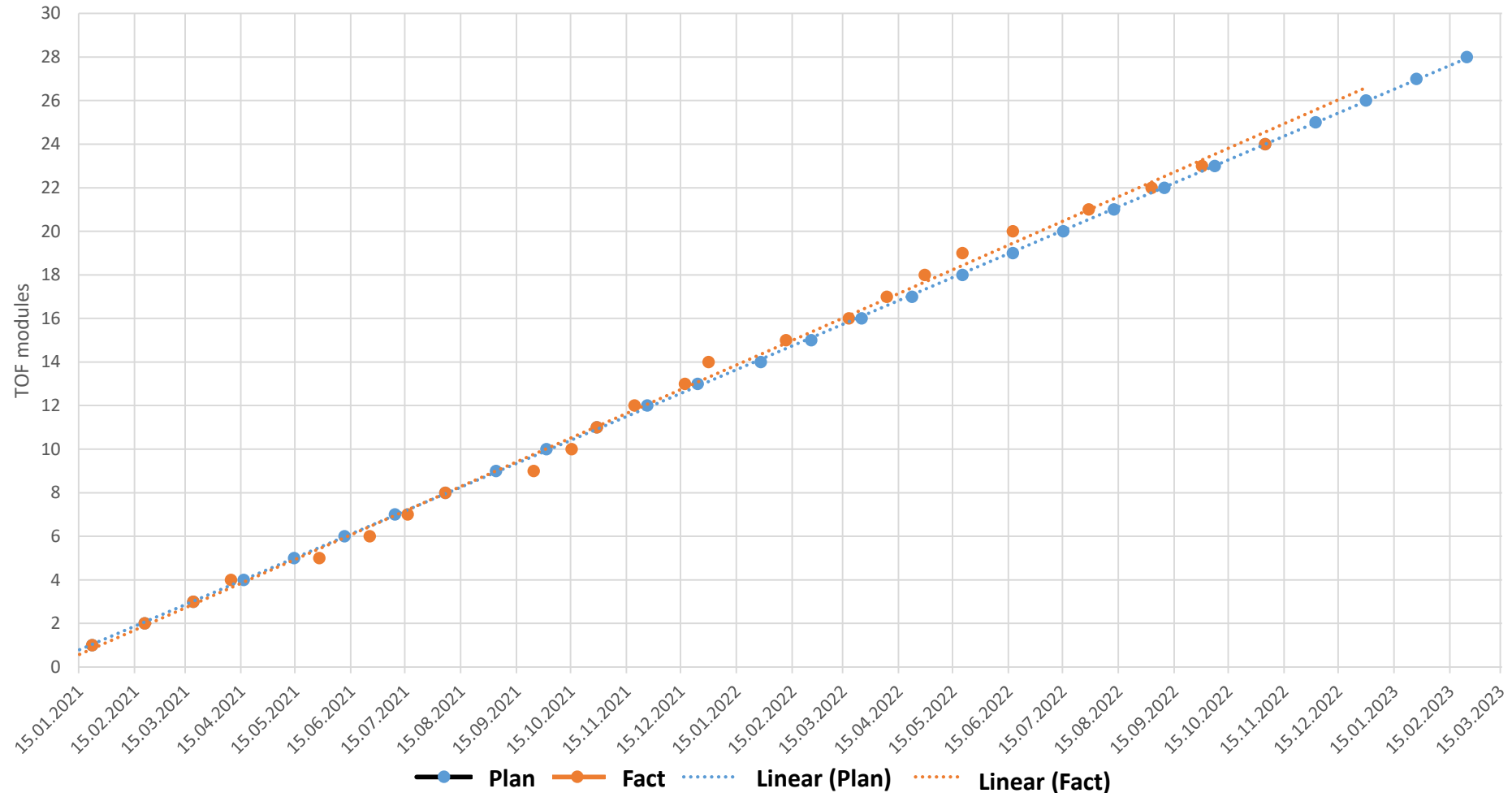
	Number of detectors	Number of readout strips	Sensitive area, m^2	Number of FEE cards	Number of FEE channels
MRPC	1	24	0.192	2	48
Module	10	240	1.848	20	480
Barrel (28 modules)	280	6720	51.8	560	13440

Progress of the TOF detectors and modules assembling

The production of MRPC detectors has been completed.
Totally, to date, **300 (107%)** MRPC detectors are produced.

24 of 28 (**86%**) TOF MPD modules are already assembled. The production and testing of the last TOF module out of 28 is scheduled for spring 2023.

Actual schedule of the TOF MPD modules production



Store of tested TOF modules



Cosmic rays test of TOF modules

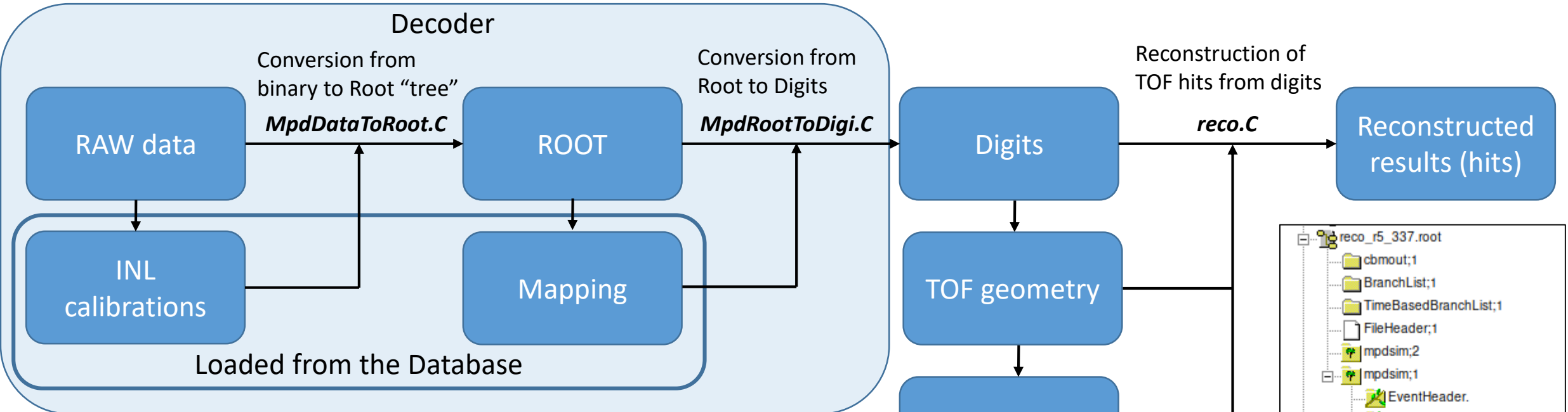


Laboratory stand for testing TOF modules on cosmic rays operate in full power in the buld.42 since beginning of August 2021

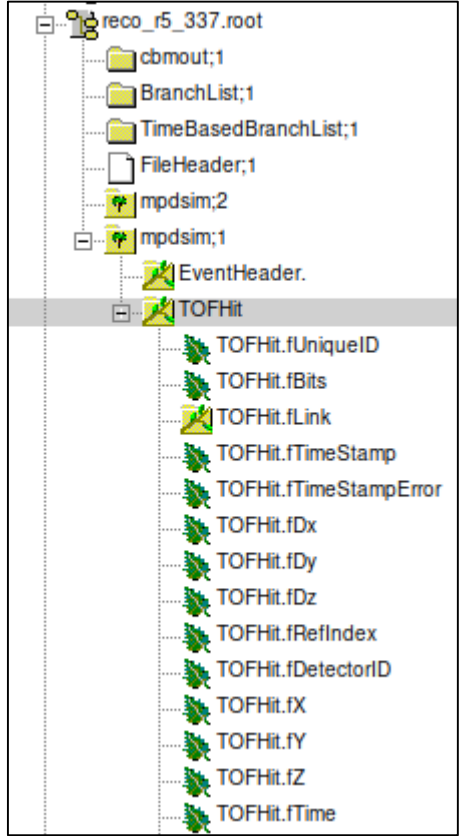
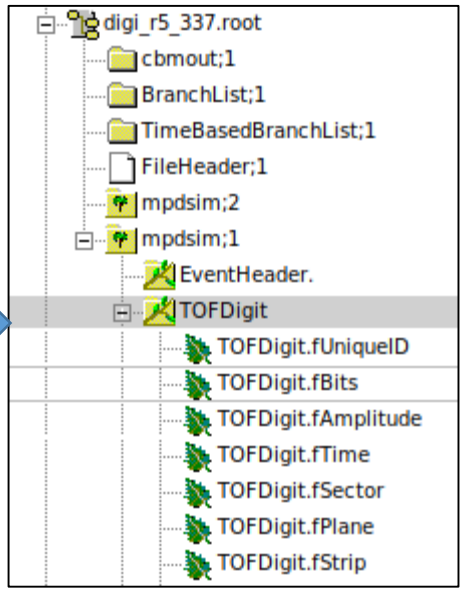
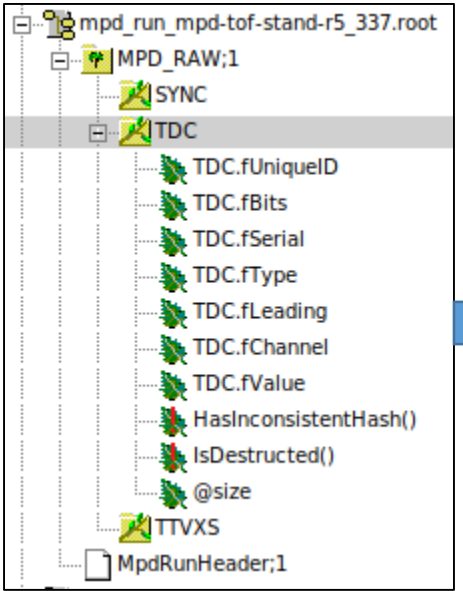
The main tasks of this testing:

- checking all channels for operability;
- long-term stability of operation parameters;
- measuring the efficiencies of all channels;
- preliminary calibration and measurement of some characteristics;

Development of MPDRoot based software for experimental data processing

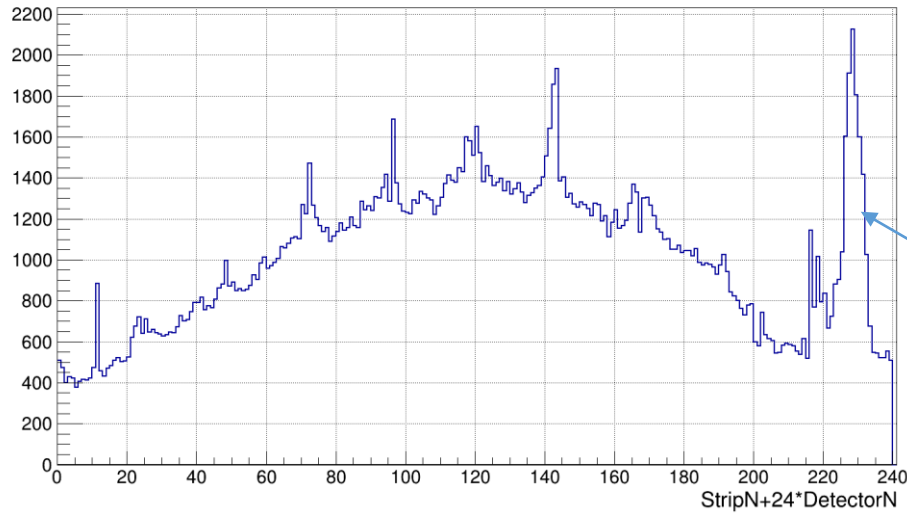


- decoder
- TDCMapCreat
- temp_macro
- CMakeLists.txt
- DecoderLinkDef.h
- MpdDataToDigi.C
- MpdRawDataDecoder.cxx
- MpdRawDataDecoder.h
- MpdRunHeader.cxx
- MpdRunHeader.h
- MpdSyncDigit.cxx
- MpdSyncDigit.h
- MpdTDCDigit.cxx
- MpdTDCDigit.h
- MpdTTVXSDigit.cxx
- MpdTTVXSDigit.h
- MpdTofContainer.cxx
- MpdTofContainer.h
- MpdTofDetector.bck_cxx
- MpdTofDetector.bk_h
- MpdTofDigit.cxx
- MpdTofDigit.h
- MpdTofDigitProducer.cxx
- MpdTofDigitProducer.h
- MpdTofRaw2Digit.cxx
- MpdTofRaw2Digit.h

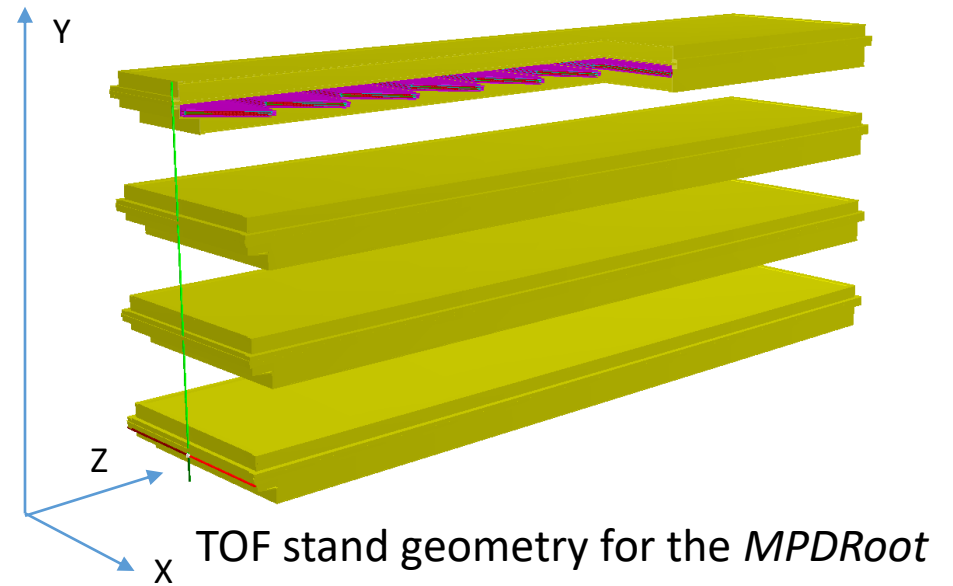


Data decoder made in close cooperation with **Belgorod National Research University**

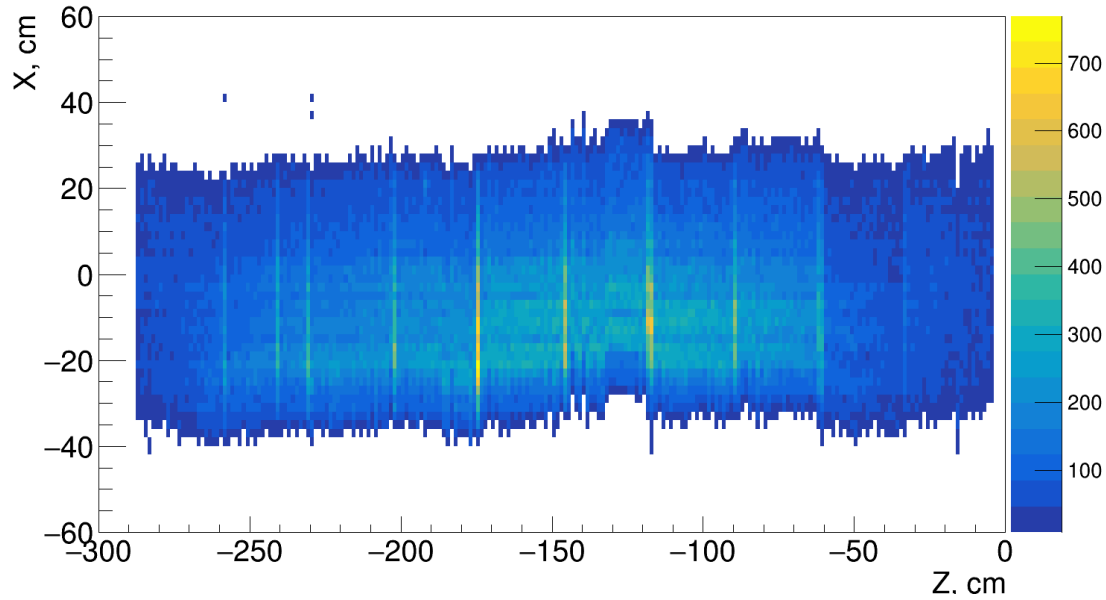
Results of processing data from the TOF modules test stand using MPDRoot



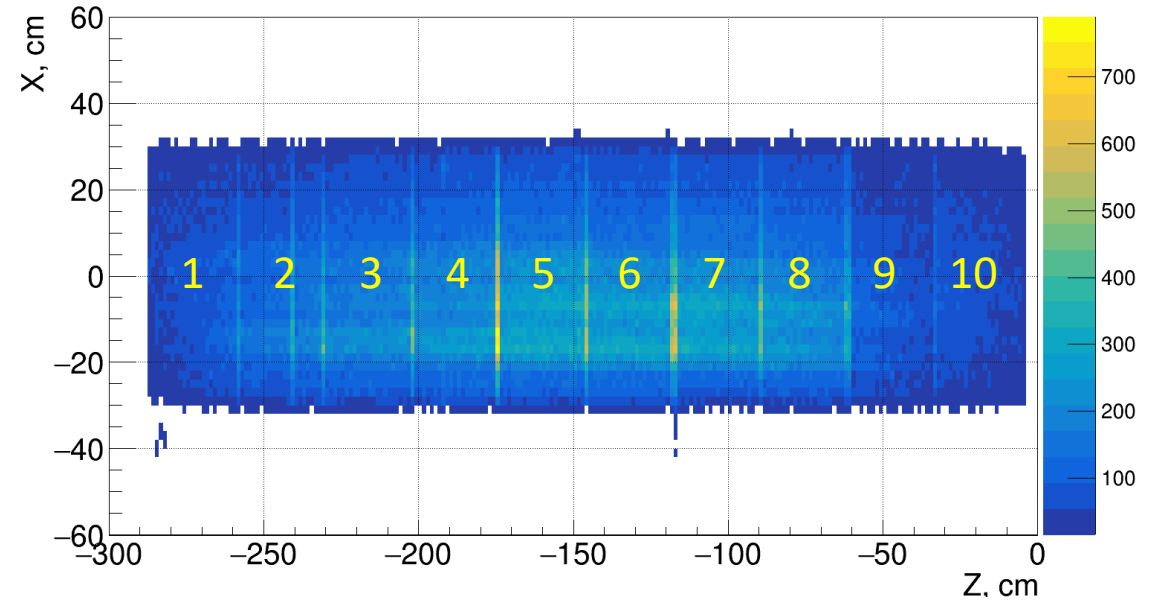
Noisy channels



Checking the readout channels in one module (from digits)



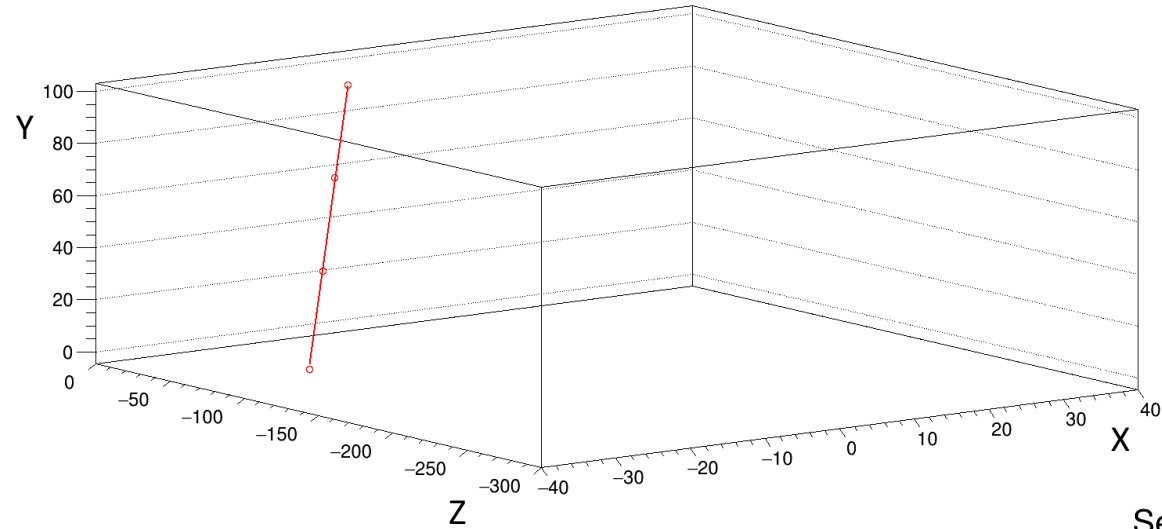
TOF Hits positions before "LR correction"



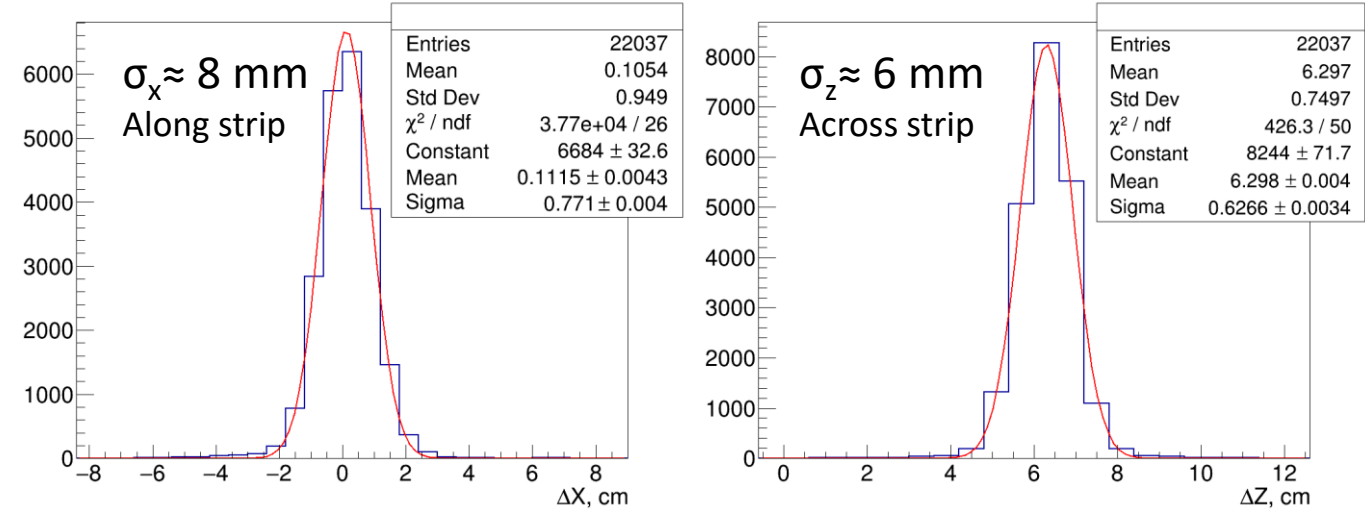
TOF Hits positions in module after "LR correction"

Results of processing data from the TOF modules test stand using MPDRoot

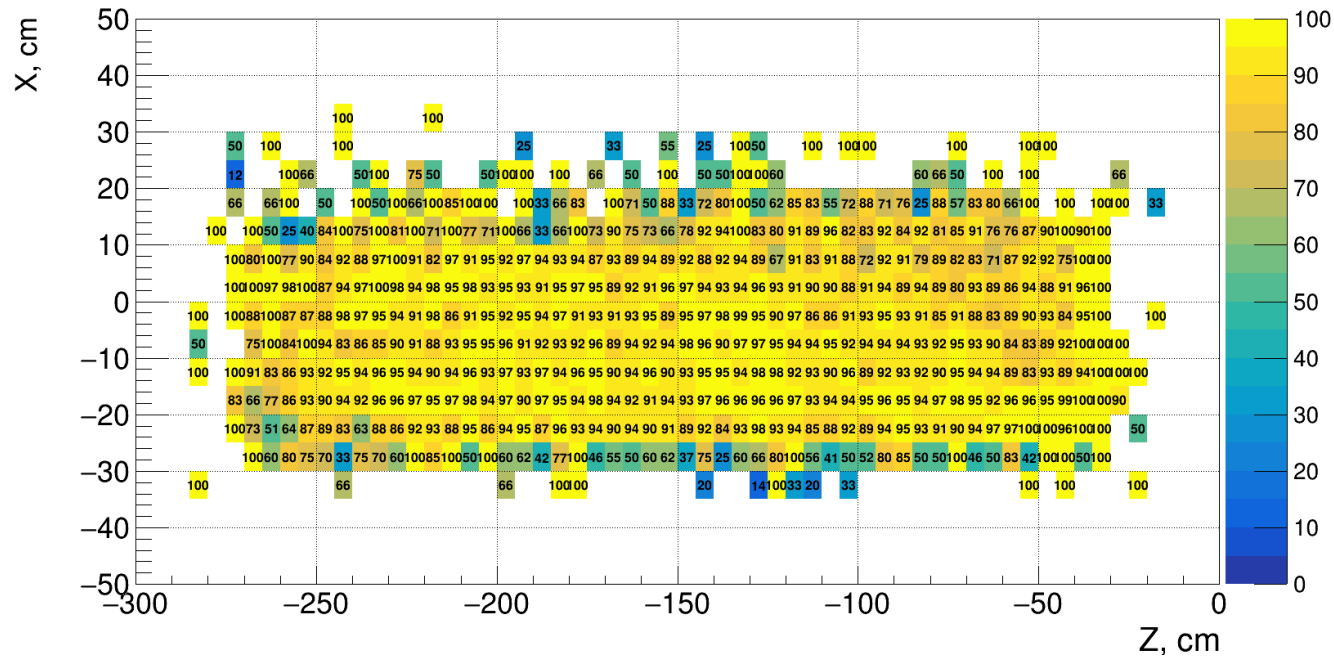
The track passed through single hits in 4 modules



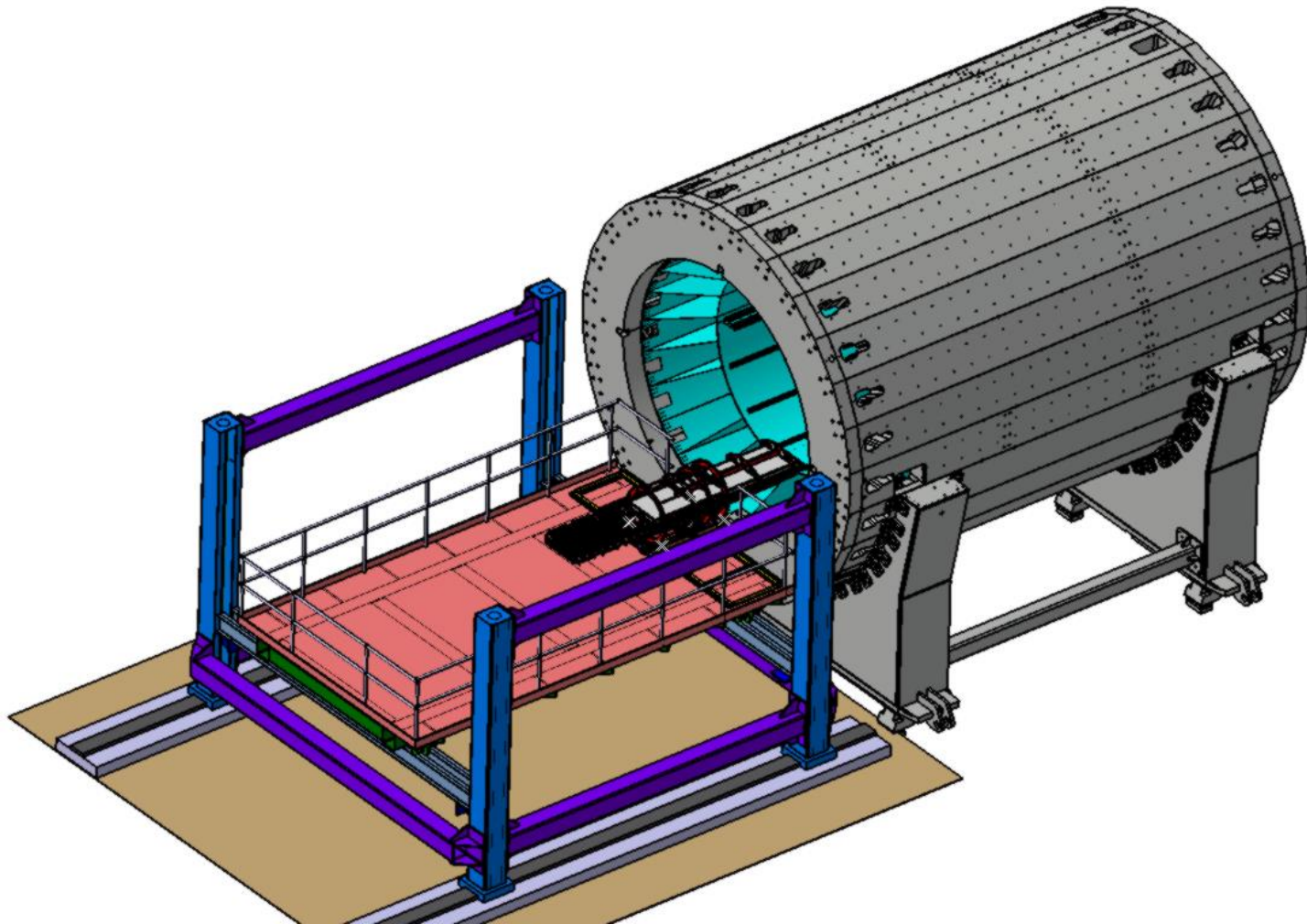
Difference distributions between “tracks” and “hits” after alignment



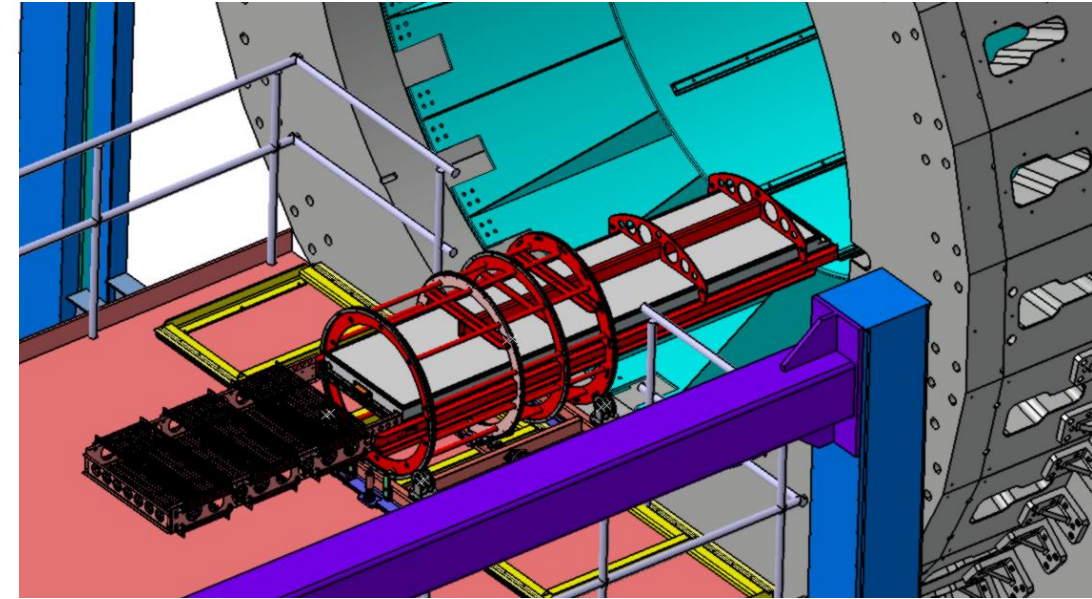
Sector Efficiency



Equipment for TOF installation



The platform has been assembled and should be delivered to JINR by the end of 2022

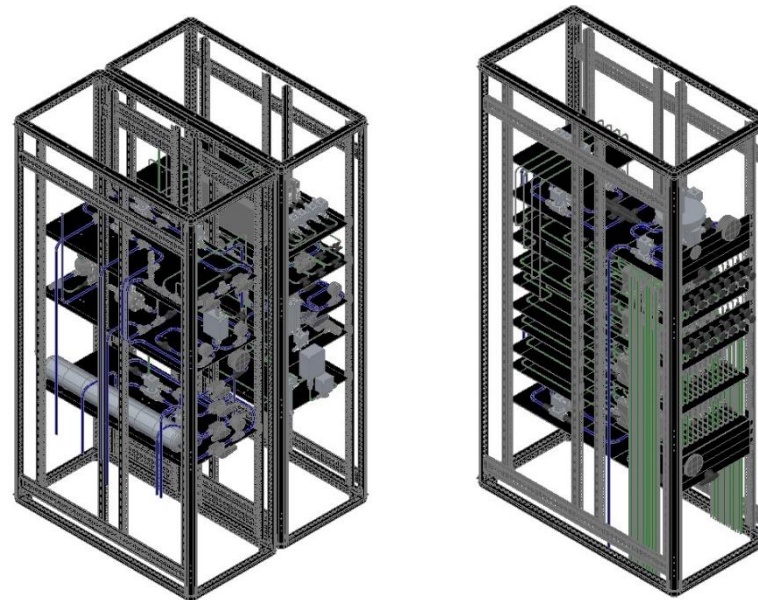


The TOF installation bench is fully assembled and stored in the VBLHEP

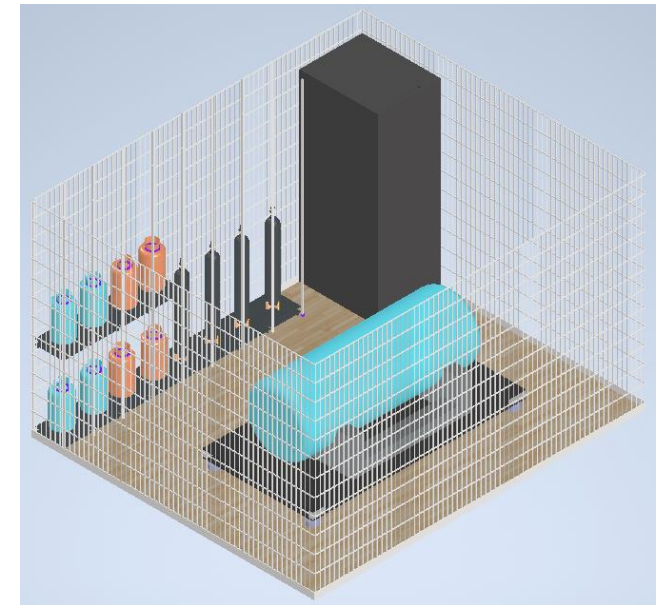
Gas system for the TOF in the MPD hall



Scheme of gas systems position in the MPD hall



Model of mixer (left) and distributor (right) of TOF gas systems



Gas supply area in the MPD hall

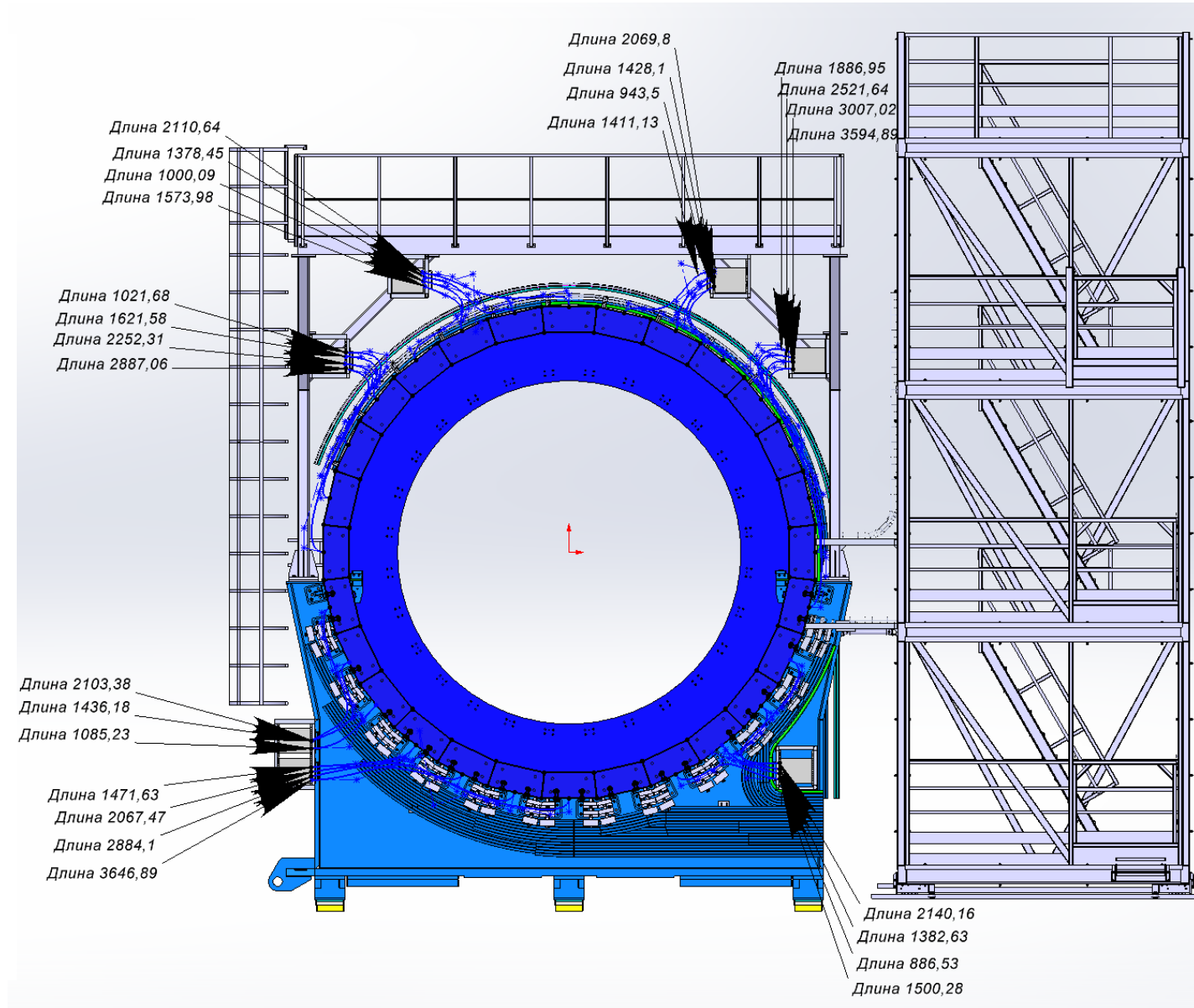
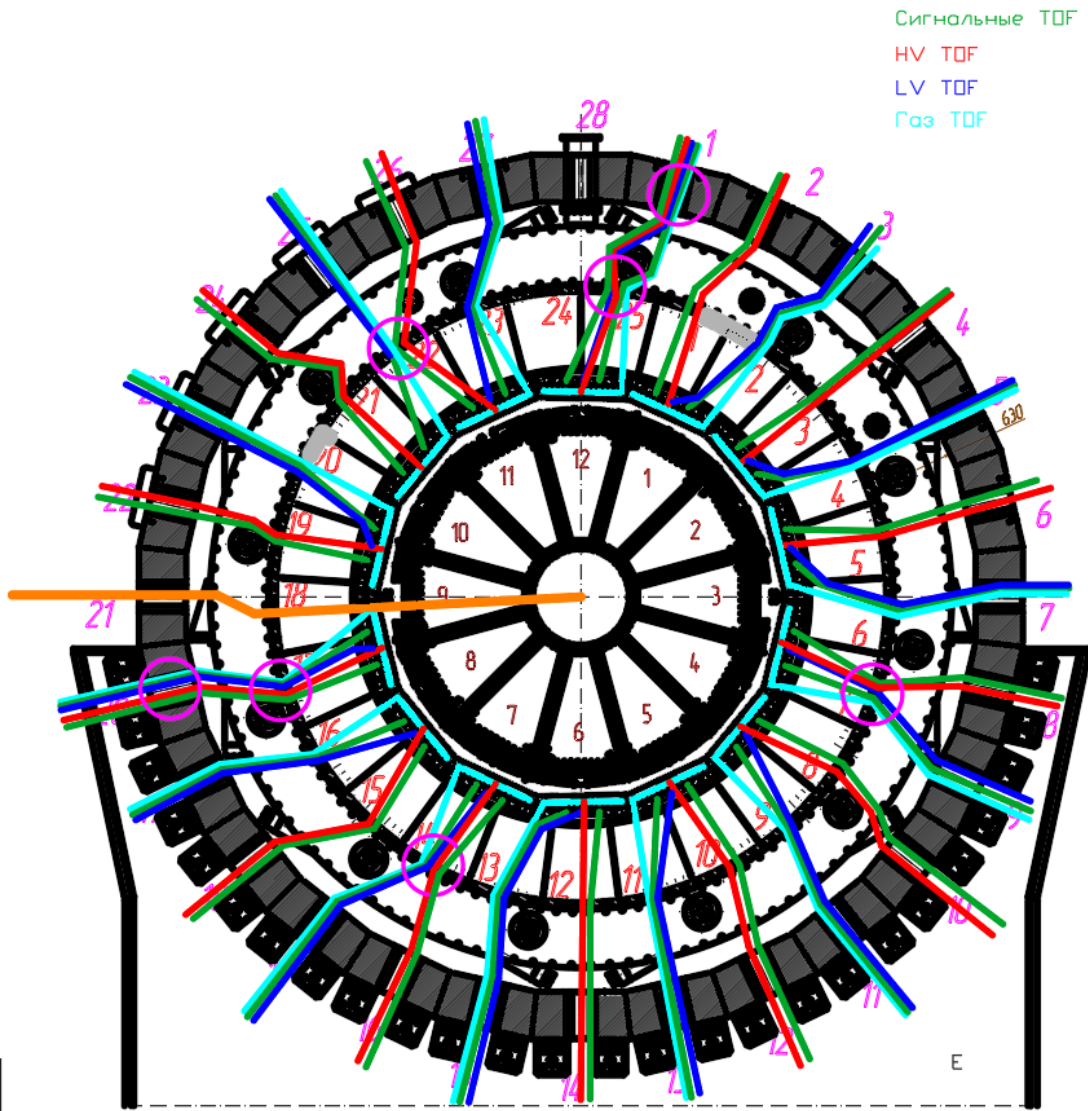


"Tent" for assembling gas system in the MPD hall

08.11.2022



VME crates on the yoke. Cabling.



Current status of production and equipment purchasing

Task	Current status	Readiness
TOF modules		
Materials for detectors	Purchased all the materials and components.	100%
TOF module box	In stock – 28 pcs.	100%
TOF cosmic test stand	In operation.	100%
TOF front-end electronics	In stock – ~600 (560 needed).	100%
DAQ sysytem		
Signal cables	In stock – 680 pcs (560 needed).	100%
VME64x VXS crates	In stock – 16 pcs (14 needed).	100%
TDC72VHL modules	In stock – 210 pcs (v4) (196 needed).	100%
Gas system	Gas system for building 17 is in assembling.	80%
TOF integration	The installation bench for the TOF is in stock.	100%
HV & LV systems		
Mpod LV+HV power crate	In stock – 8 pcs (6 needed).	100%
LV modules	In stock – 16 pcs (14 needed).	100%
HV modules	In stock – 32 pcs (28 needed).	100%
HV&LV cables	All new HV and LV cables are in stock.	100%
HV distribution modules	In stock – 25 pcs (28 needed). 5 – in production.	83%

Conclusions

- 1) Mass production of MRPCs – 300 of 280 are ready (~107%)
- 2) Mass production of TOF modules – 24 of 28 are ready (~86%)
- 3) Integration equipment – completed
- 4) Gas supply and storage for the gas system in building 17 – in the assembly
- 5) VME crates, cables, and HV distributors on the MPD yoke – in development

The TOF modules should be ready for installation to the MPD in the beginning of summer 2023
The TOF system can be put into operation in autumn 2023.

Thank you for the attention!