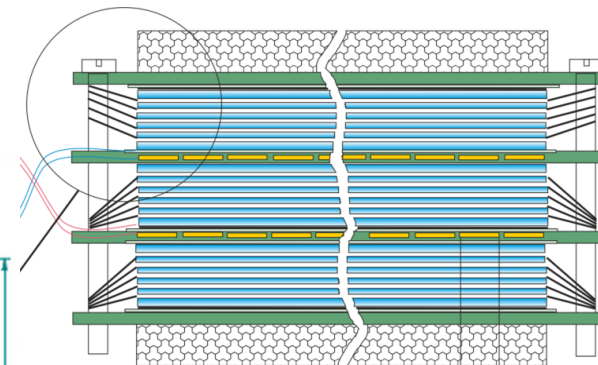
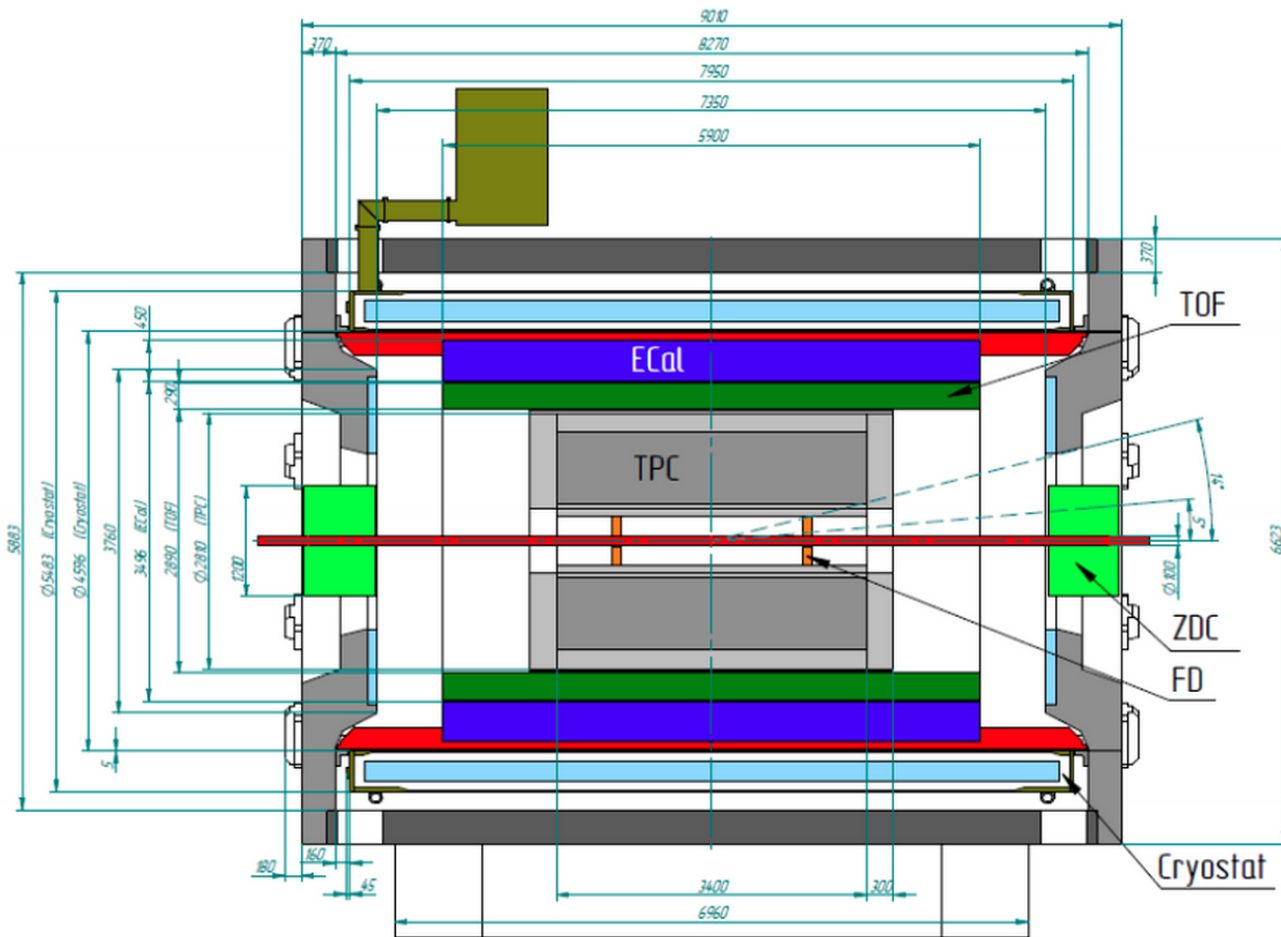


# TOF Status

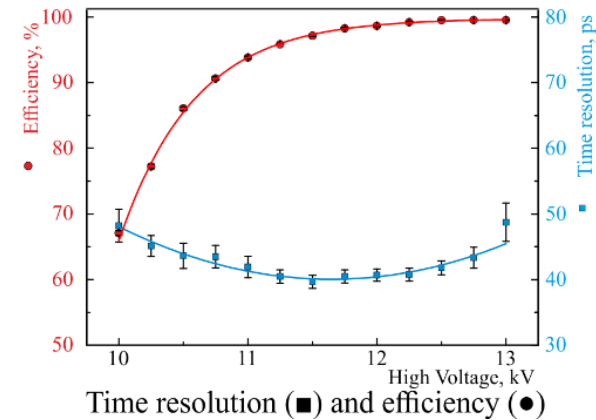
# Contents

- 1) TOF introduction
- 2) Current situation of TOF production in accordance of time schedule
- 3) TOF detectors and modules testing procedures
- 4) Installation equipment status
- 5) Position of VME crates (and related equipment) on the MPD yoke
- 6) Conclusions

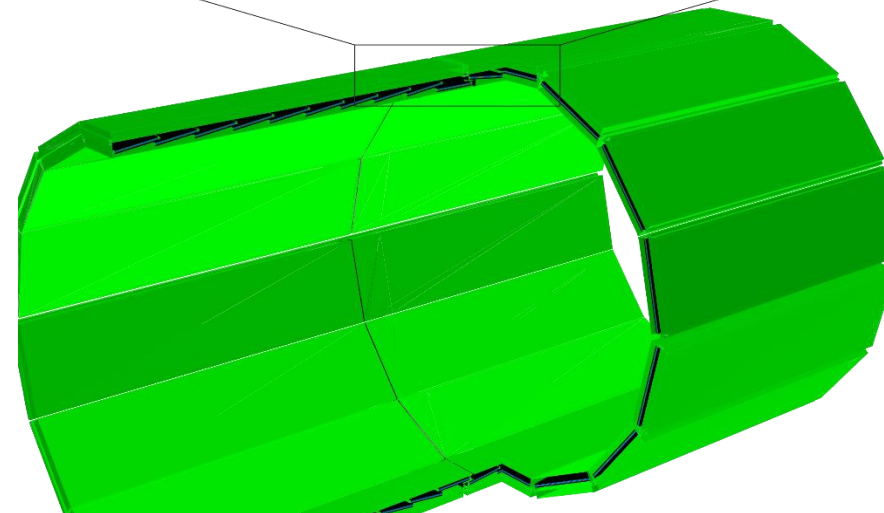
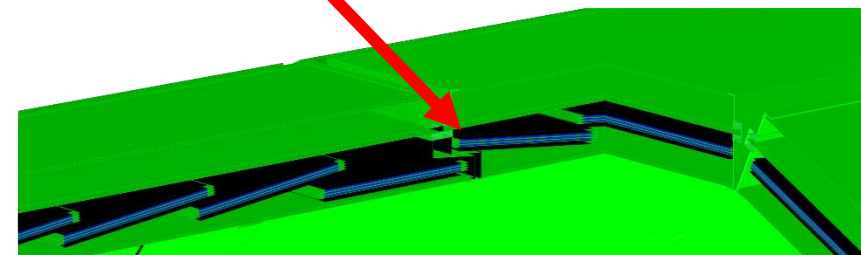
# Time-of-Flight system design



MRPC



Time resolution (■) and efficiency (●)



	Number of detectors	Number of readout strips	Sensitive area, m <sup>2</sup>	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)	<b>280</b>	6720	<b>51.8</b>	560	<b>13440</b> (1680 NINO)

Problem of high dark currents was solved using two ways

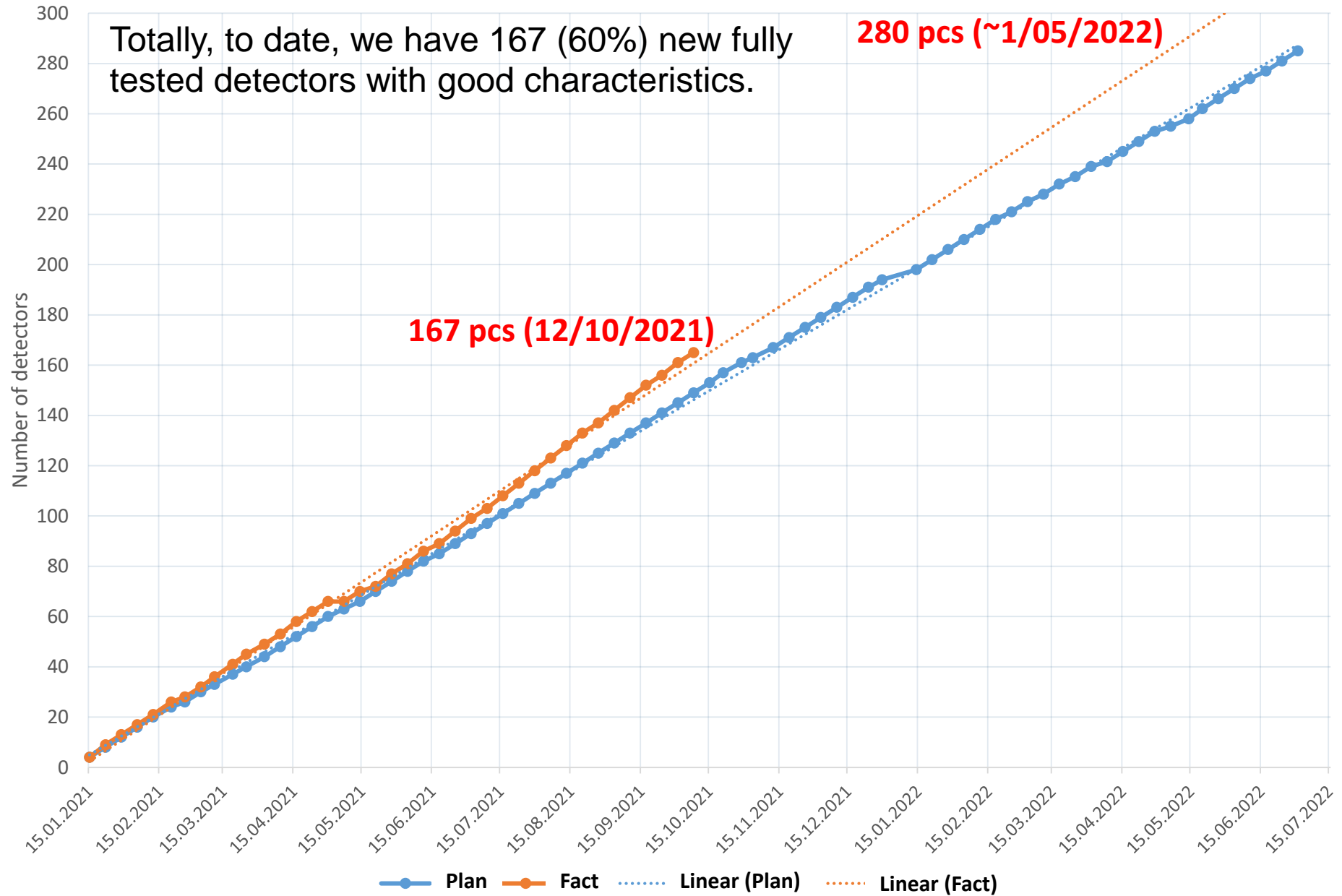


**New PCBs with smaller spacer step**

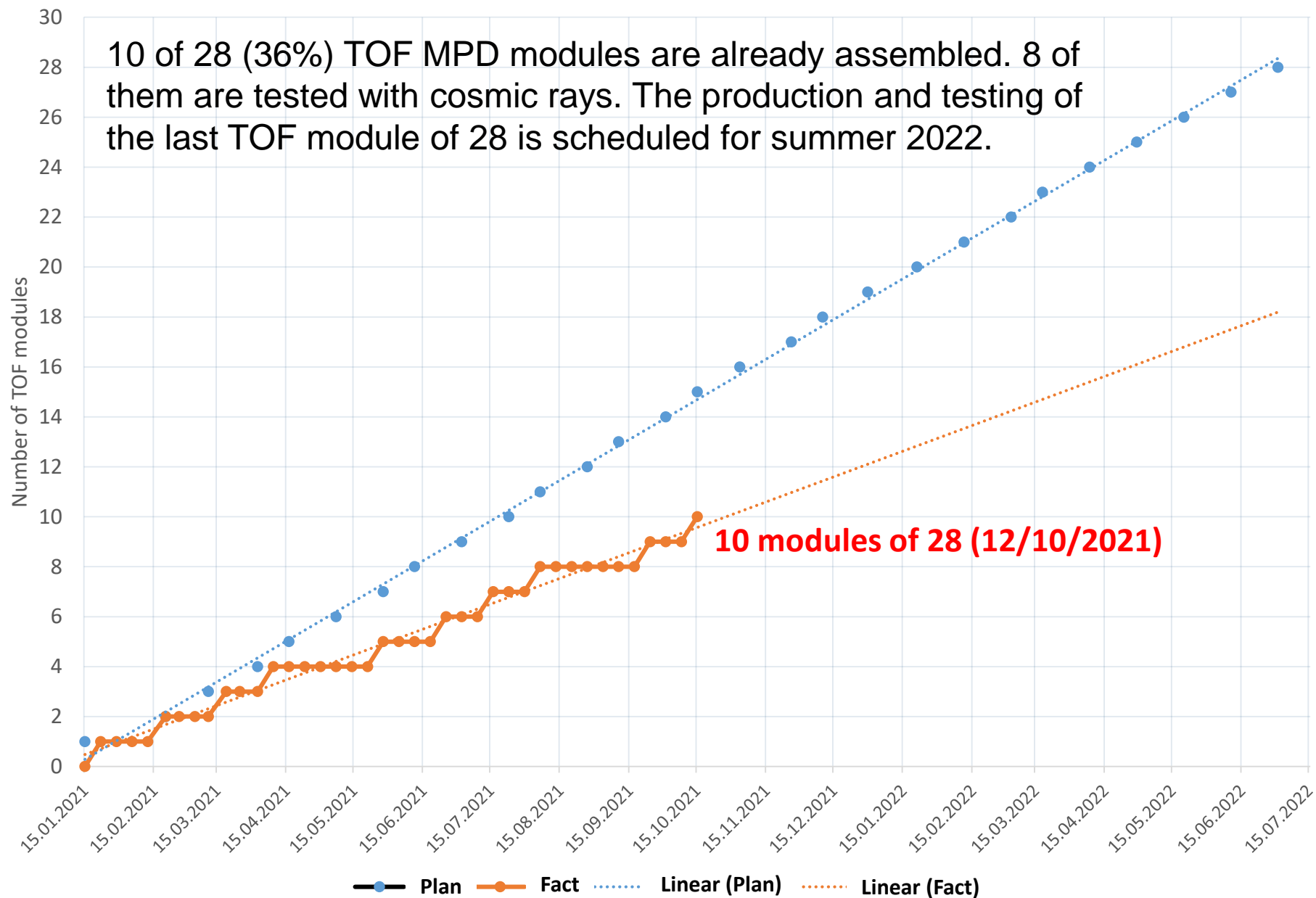


**Reassemble MRPCs with additional fishing line**

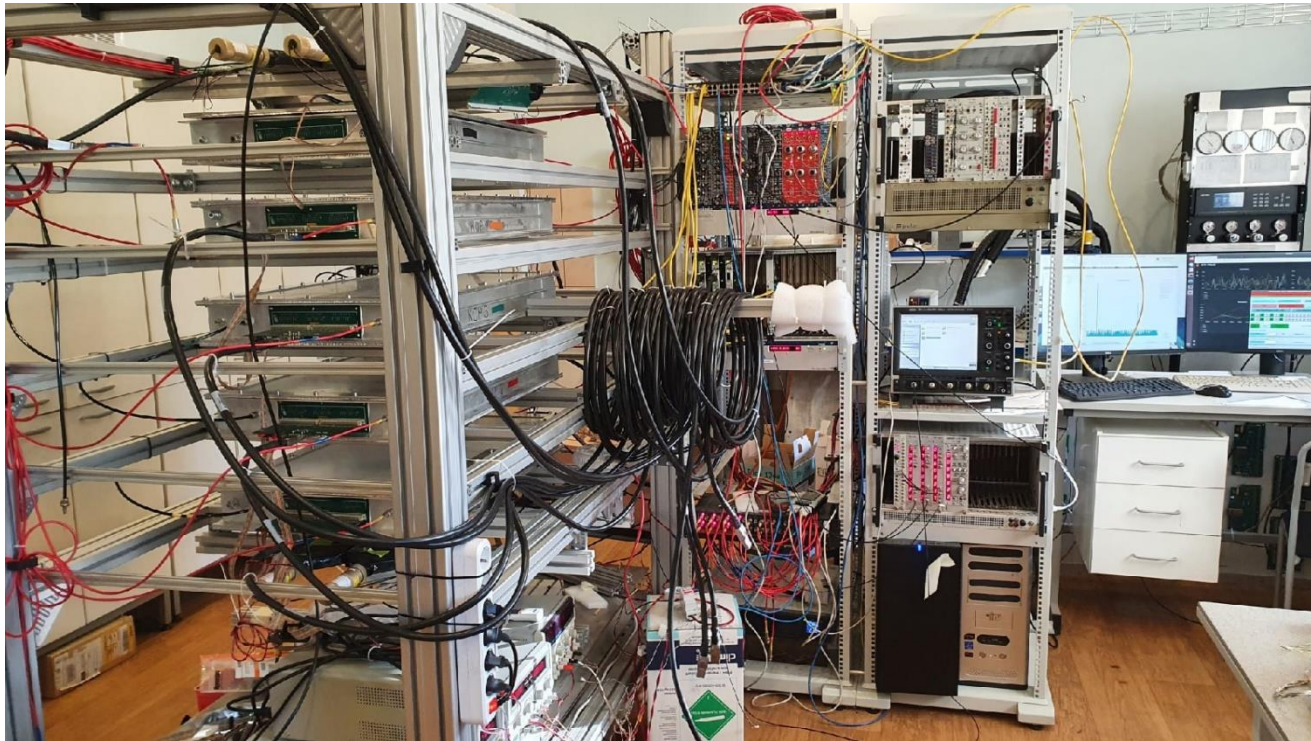
# Progress of the TOF detectors assembling



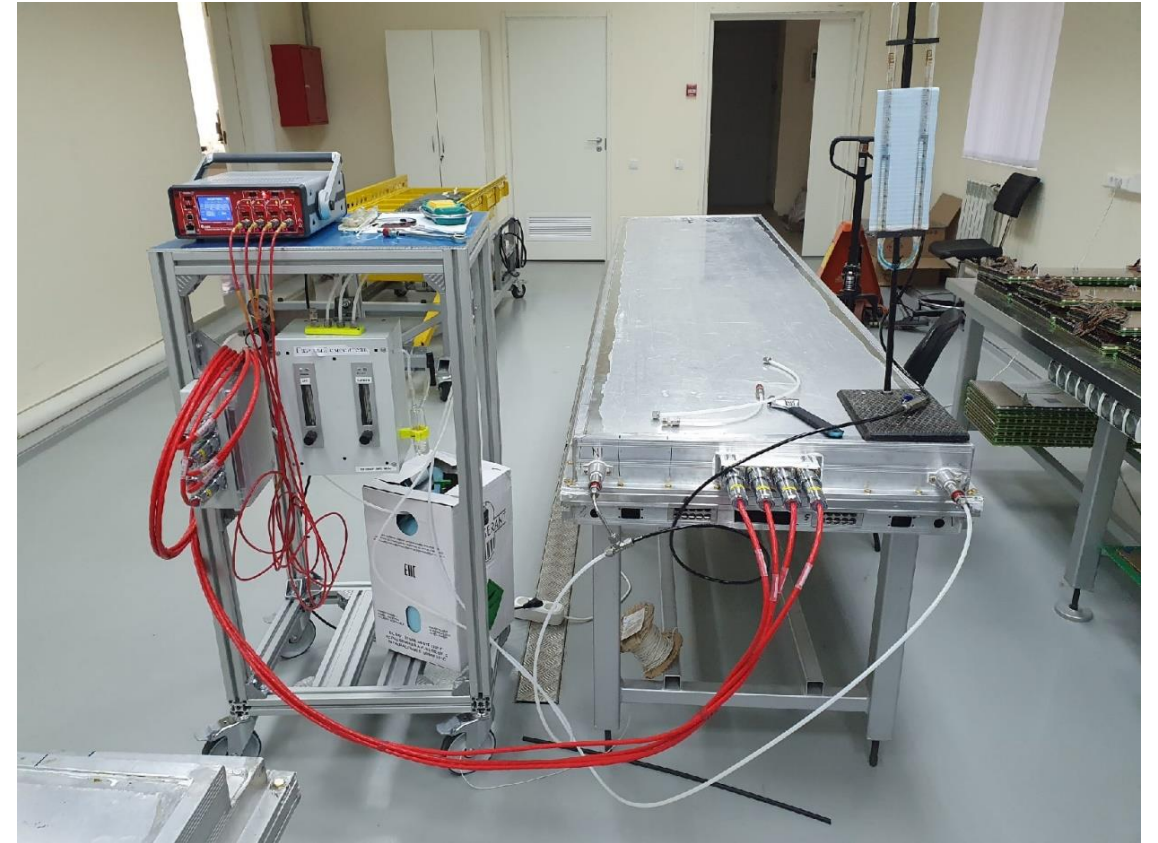
# Progress of the TOF modules assembling



## Preliminary quality control of MRPCs and TOF modules



Each MRPC is individually tested with cosmic rays before being installed in the module. This testing includes checking for current stability, efficiency, and output signal quality.



A preliminary check of the TOF module at a high voltage is carried out after assembling MRPCs into the detectors volume without readout electronics.

## Cosmic rays test of TOF modules



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

The main tasks of this testing:

- long-term stability of operation parameters;
- measuring the efficiencies of all channels;
- time-over-threshold preliminary calibration;
- determination of the time resolution of the TOF detectors. It is not yet implemented due to lack of scintillation trigger system (MCORD).



# MCORD prototype for triggering at the TOF cosmic stand

Two modules of MCORD prototype are already in the VBLHEP

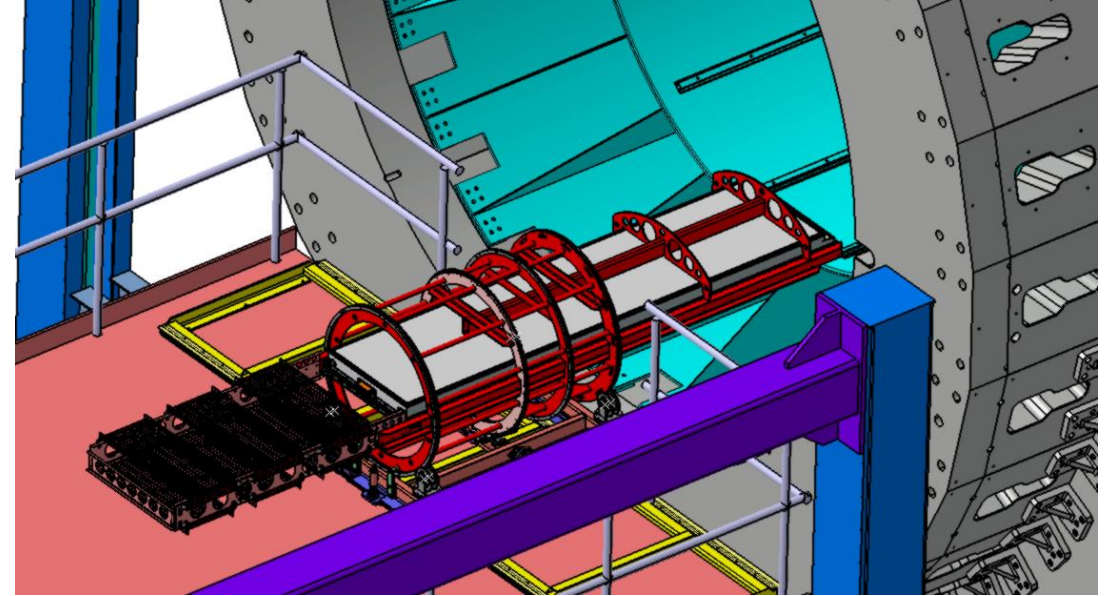


Details about MCORD detectors in the talk of *Marcin Bielewicz* "MCORD - status of the project" (Wed 13/10/2021 12:20)

# Shelving for TOF modules with cartridges



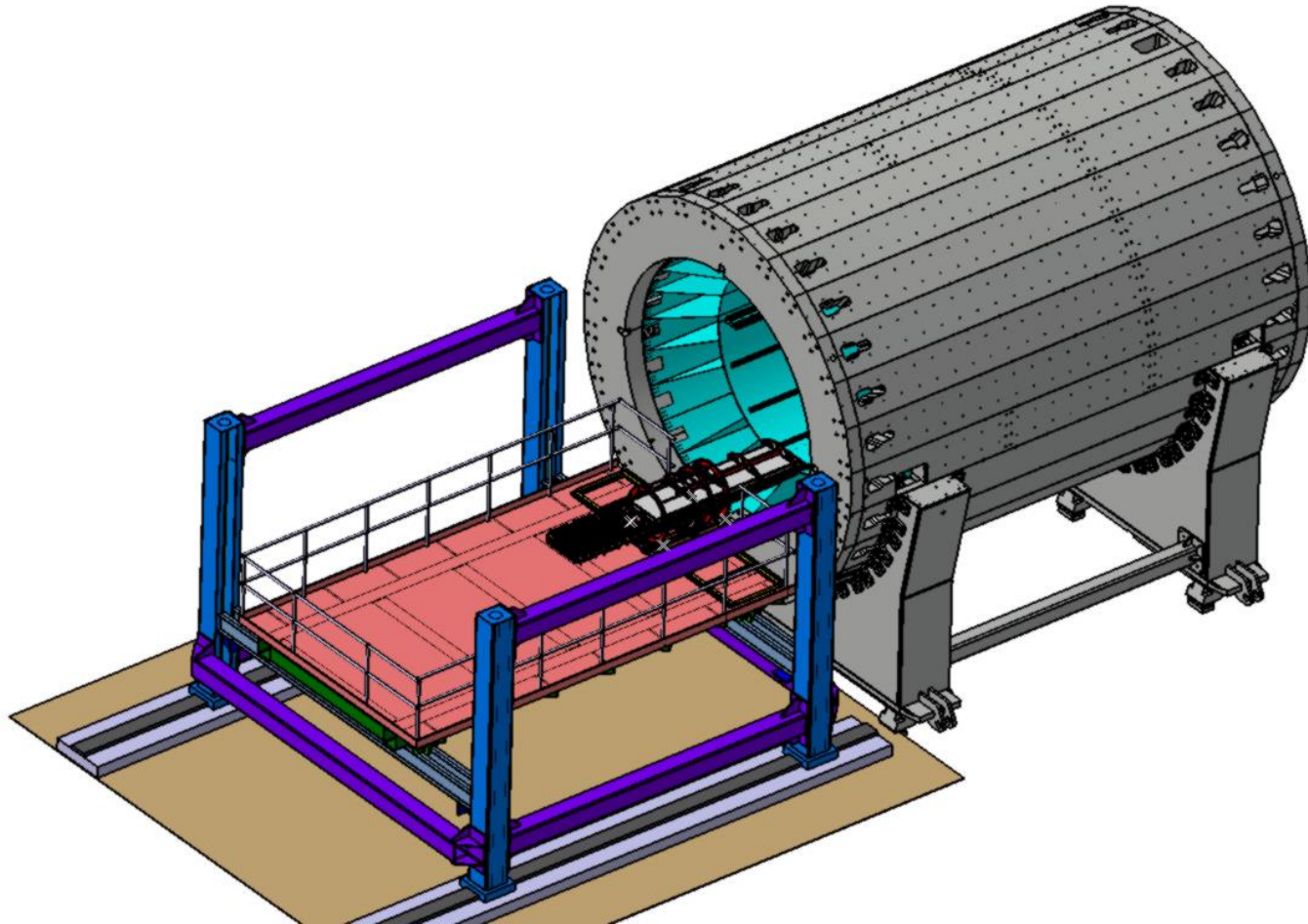
# Equipment for installation



The TOF installation bench is under construction and should be delivered to JINR in November 2021.



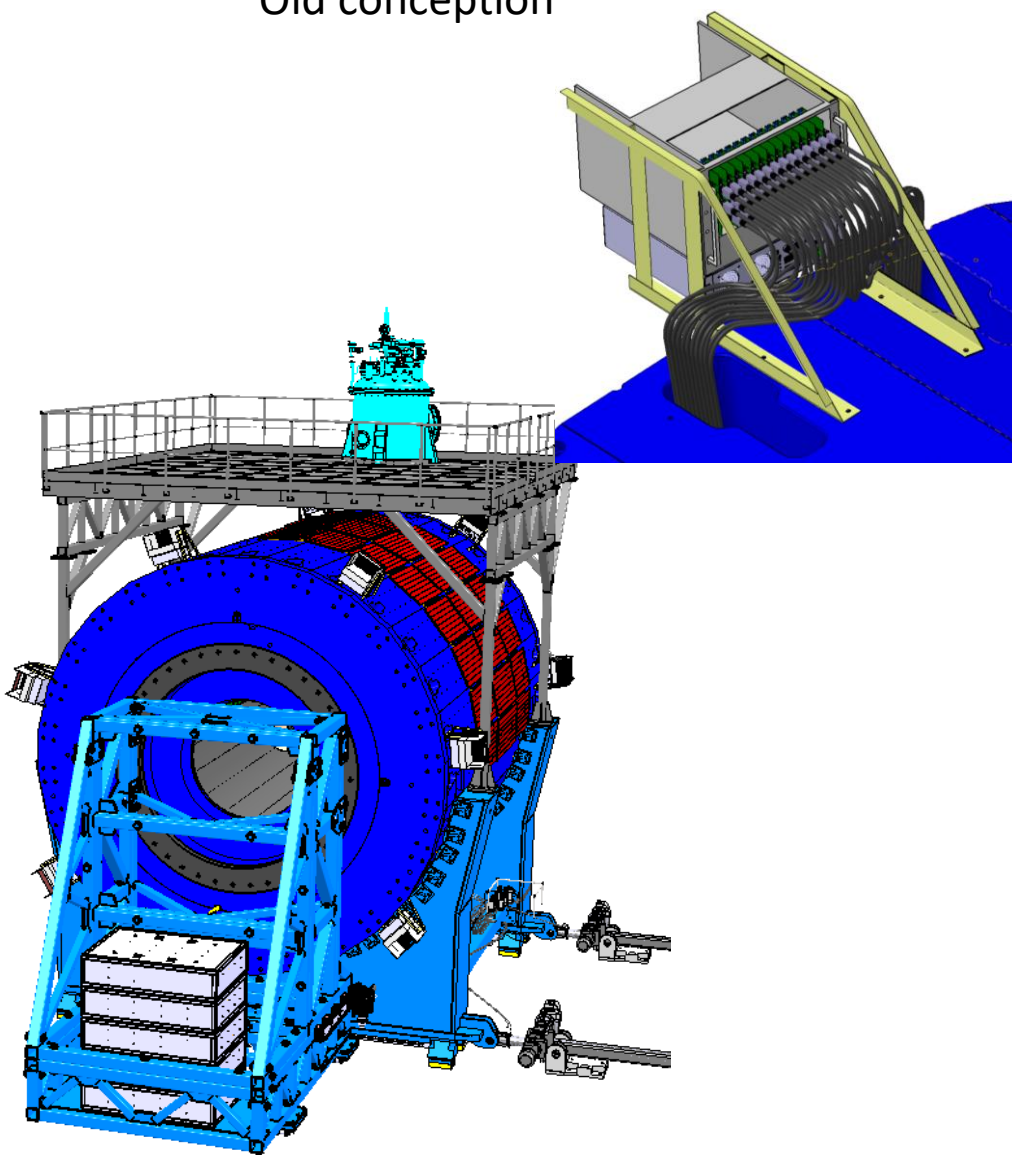
Installation bench elements in "PELCOM-Dubna"



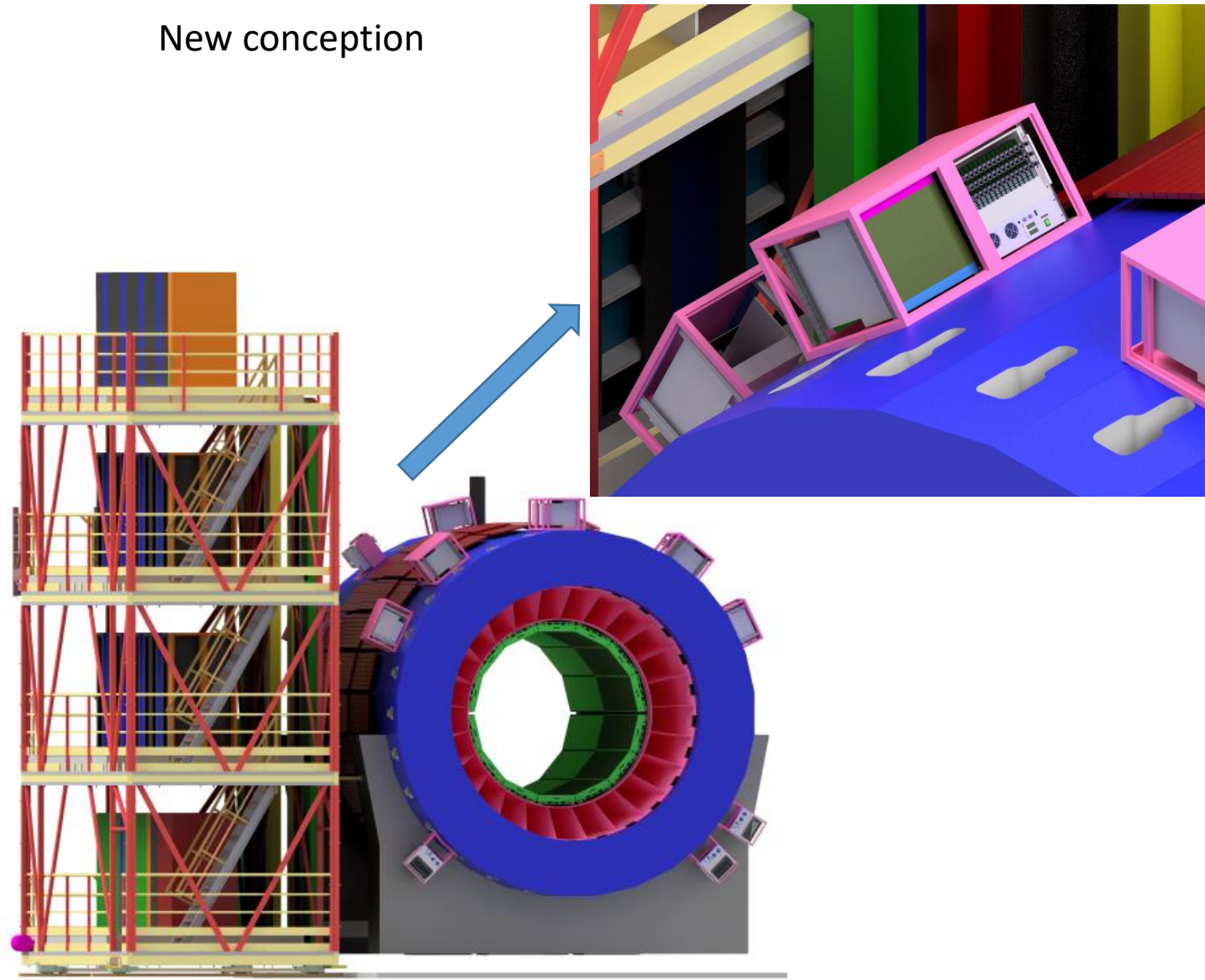
The lifting platform is under development

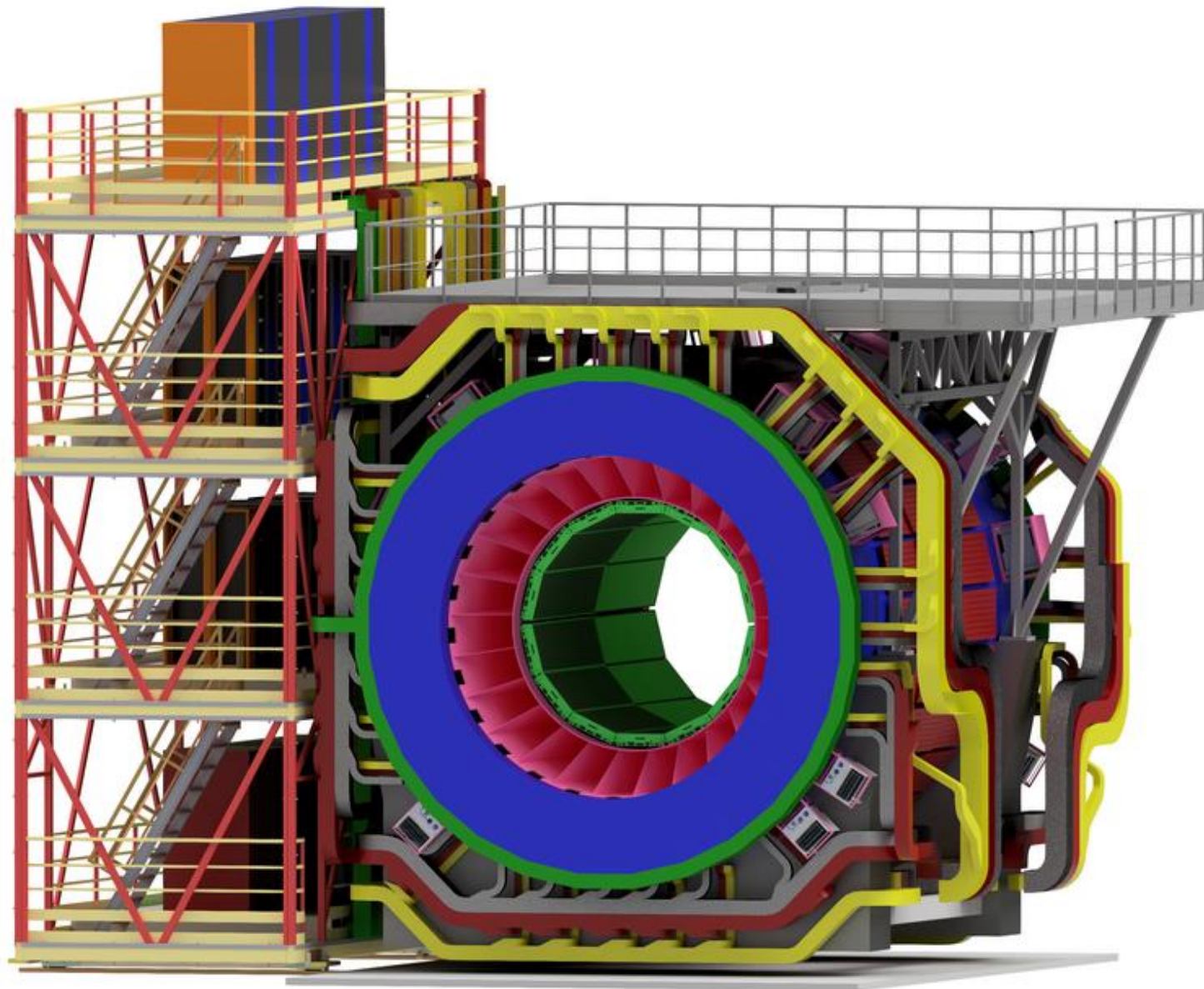
# VME crates, HV distributors and signal cables on the yoke

Old conception



New conception





Details are in the talk of *Krystian Roslon* “Status of the NICA-MPD-Platform” (Wed 13/10/2021 12:00)

## Current status of production and equipment purchasing

Task	Current status	Readiness
<b>TOF modules</b>		
Materials for detectors	Purchased all the materials and components.	<b>100%</b>
TOF module box	In stock – 23 pcs of 28. The last 5 housings will be delivered from Minsk by the end of October 2021.	<b>82%</b>
<b>TOF cosmic test stand</b>	In operation.	<b>100%</b>
<b>TOF front-end electronics</b>	In stock – ~600 (560 needed).	<b>100%</b>
<b>DAQ sysytem</b>		
Signal cables	In stock – 680 pcs (560 needed).	<b>100%</b>
VME64x VXS crates	In stock – 16 pcs (14 needed).	<b>100%</b>
TDC72VHL modules	In stock – 210 pcs (v4) (196 needed).	<b>100%</b>
<b>Gas system</b>	Gas system for building 17 in production.	<b>80%</b>
<b>TOF integration</b>	The installation bench in assembling. Lifting platform in development.	<b>90%</b>
<b>HV &amp; LV systems</b>		
Mpod LV+HV power crate	In stock – 8 pcs (6 needed).	<b>100%</b>
LV modules	In stock – 16 pcs (14 needed).	<b>100%</b>
HV modules	In stock – 32 pcs (28 needed).	<b>100%</b>
HV&LV cables	All new HV and LV cables are in stock.	<b>100%</b>
HV distribution modules	In stock – 20 pcs (28 needed). 10 – in production.	<b>70%</b>

## Conclusions

- 1) Mass production of MRPCs – **ahead of the plan** (167 of 280 are ready (~60%))
- 2) Mass production of TOF modules – **behind schedule** (10 of 28 are ready (~35%))
- 3) Integration equipment – **completion of production**
- 4) VME crates, switches, and HV distributors on the MPD yoke – **in development**
- 5) Gas supply and storage for the gas system in building 17 – **in development**

Thank you for the attention!