

Status of the first Si-plane based on STS modules

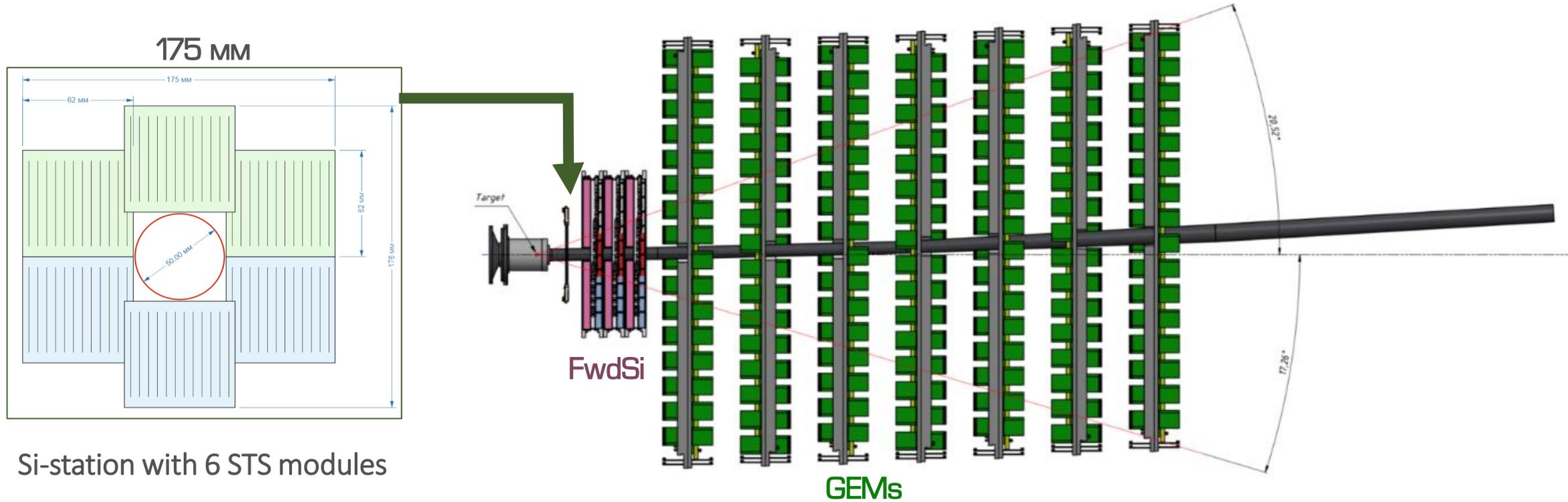
D.Dementev, D. Andreev, R. Arteche Diaz A., A. Kolozhvari,
V. Leontyev, A. Sheremetev, M. Shitekow, and Yu. Murin



Dubna, March 4-5 2025

Si-plane based on STS modules

Analysis and Detector Meeting of the BM@N Experiment at NICA, 2025

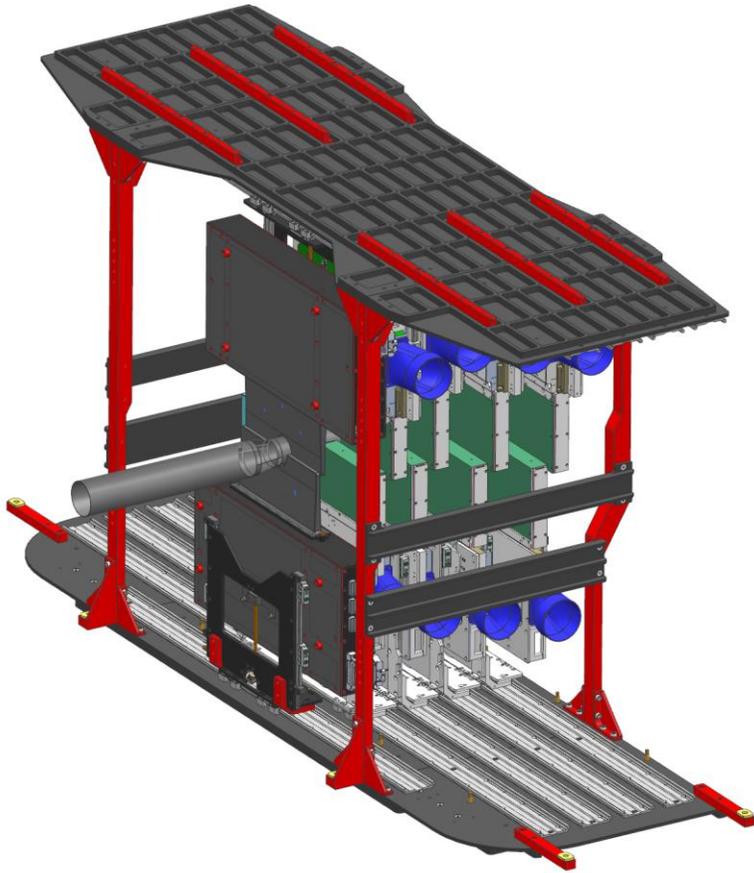


Si-station with 6 STS modules

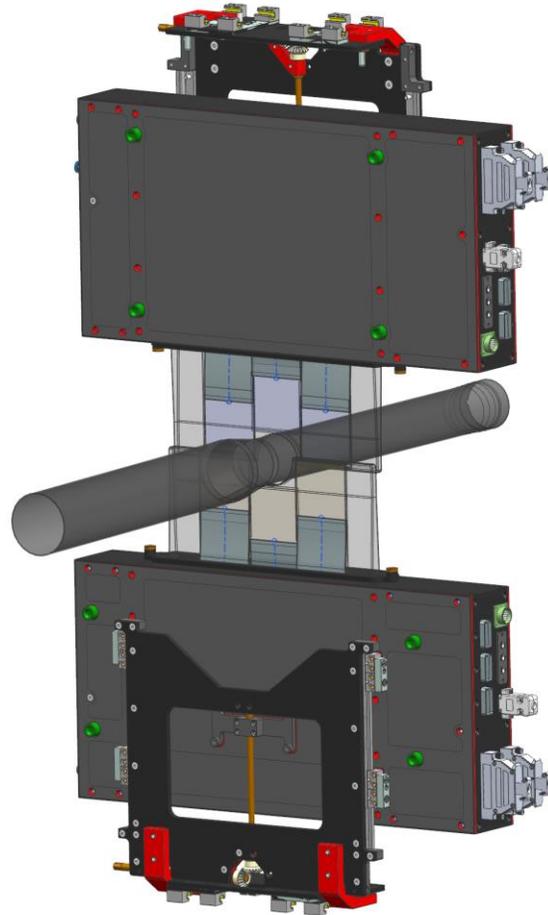
Size: 6×6 cm²;
Pitch: 58 μm;
Stereo angle: 7.5 deg;
Thickness: 320 μm.

Hybrid Si-tracker of the BM@N

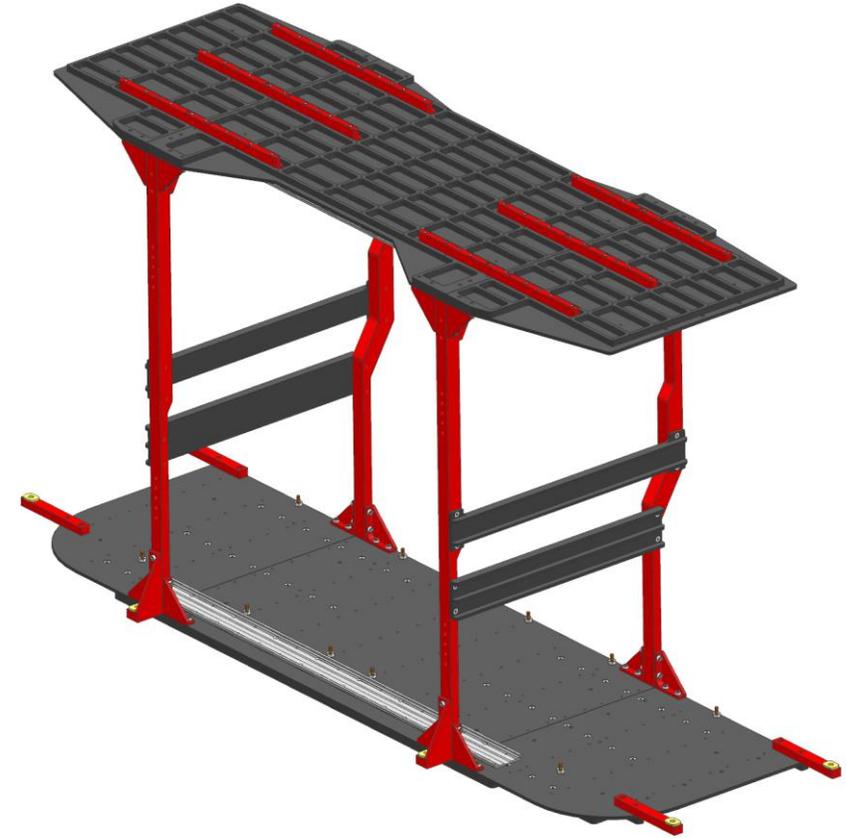
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FSD + STS plane



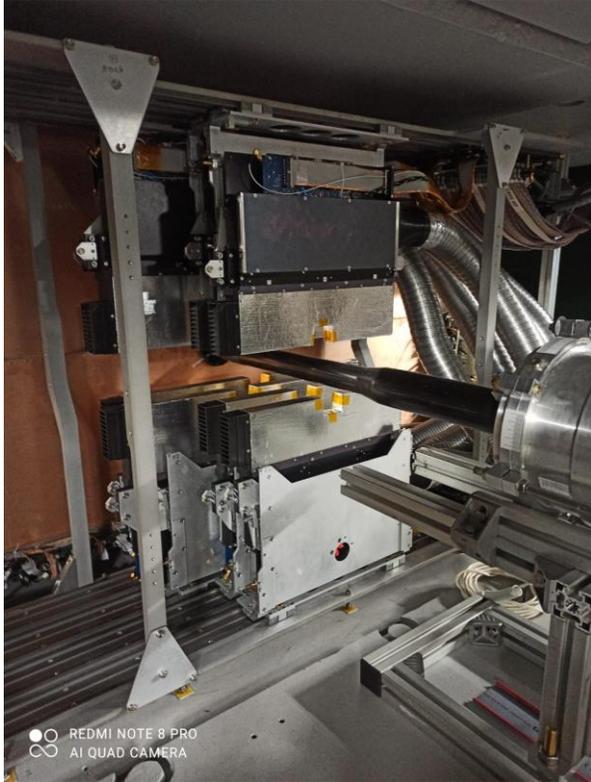
Two half-planes of STS



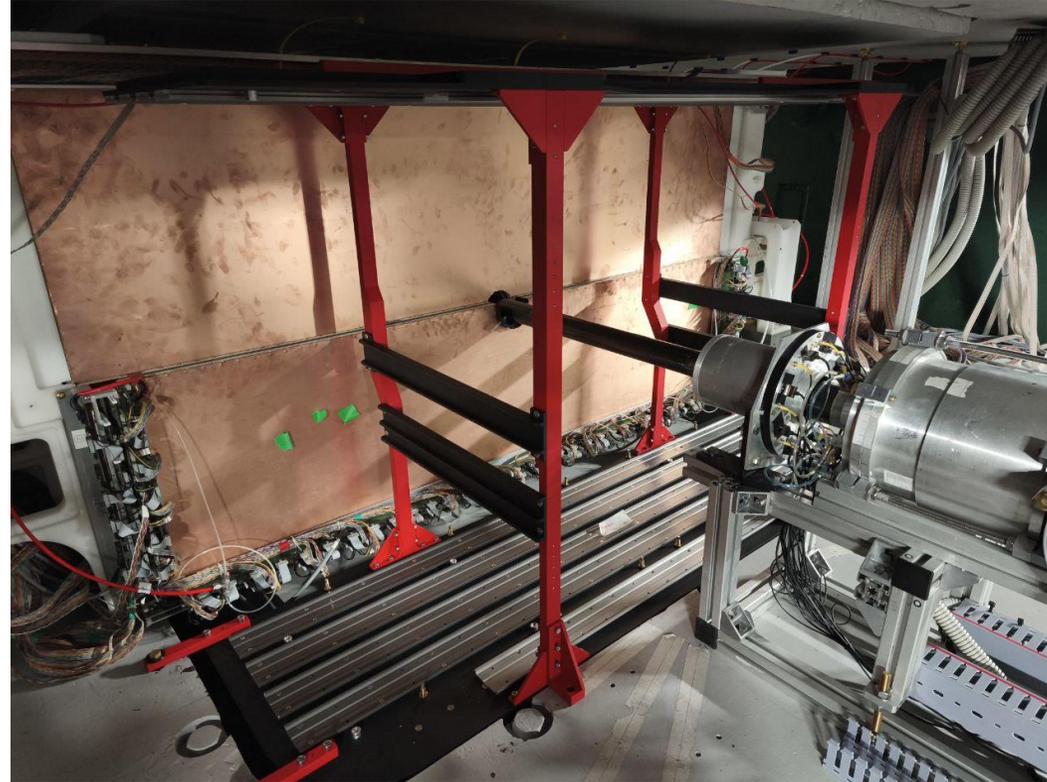
Mainframe

Installation of the Mainframe for the Si-Tracker

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Old Mainframe with FSD



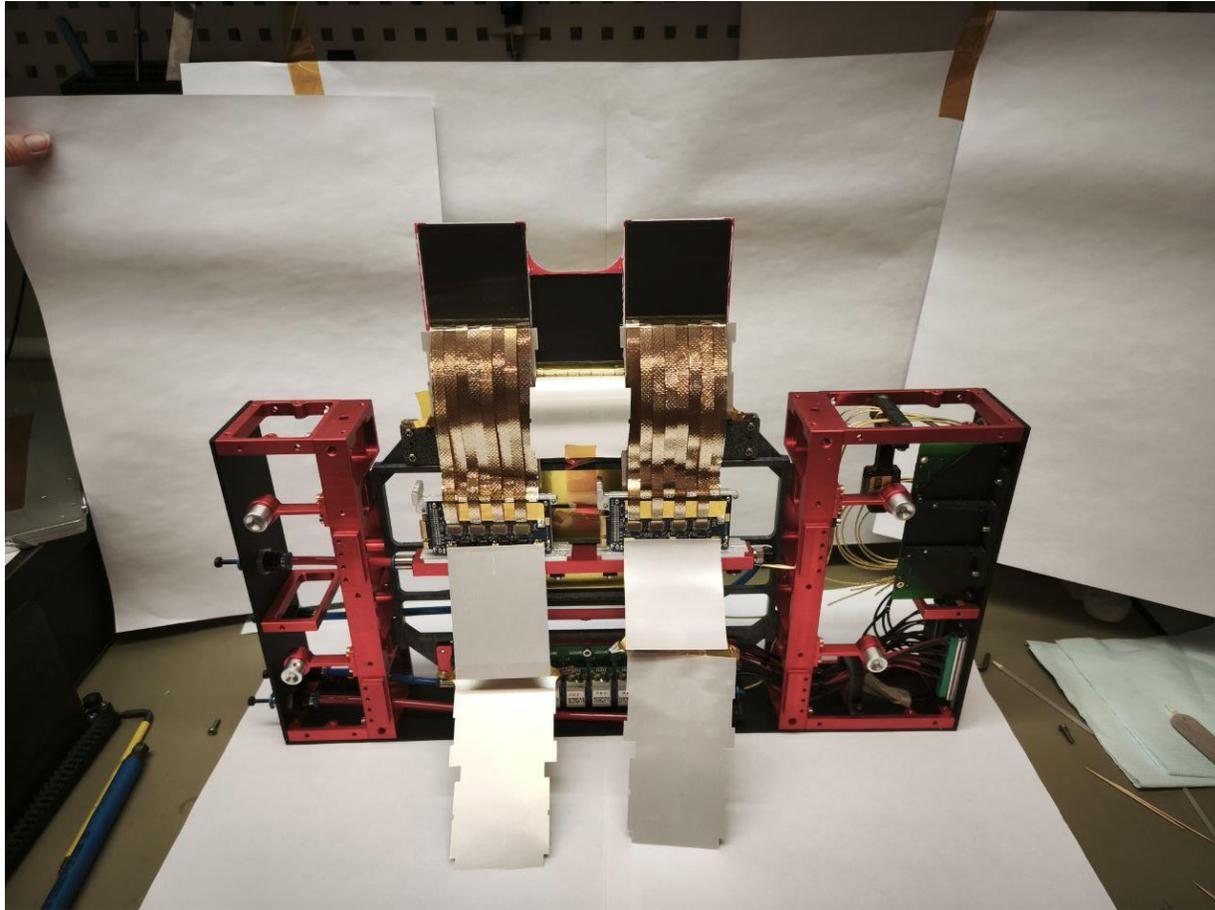
New Mainframe



Fixation inside the magnet

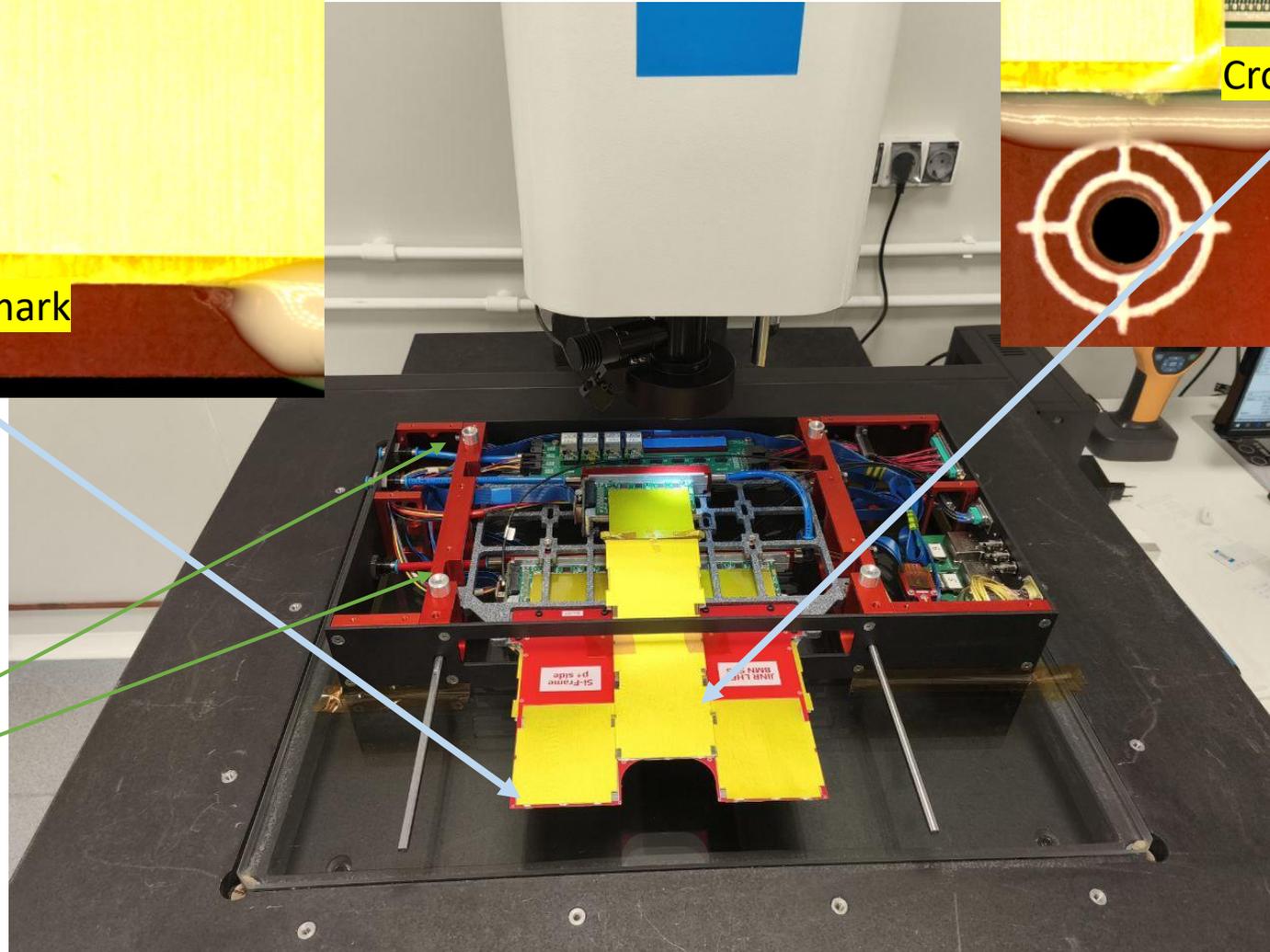
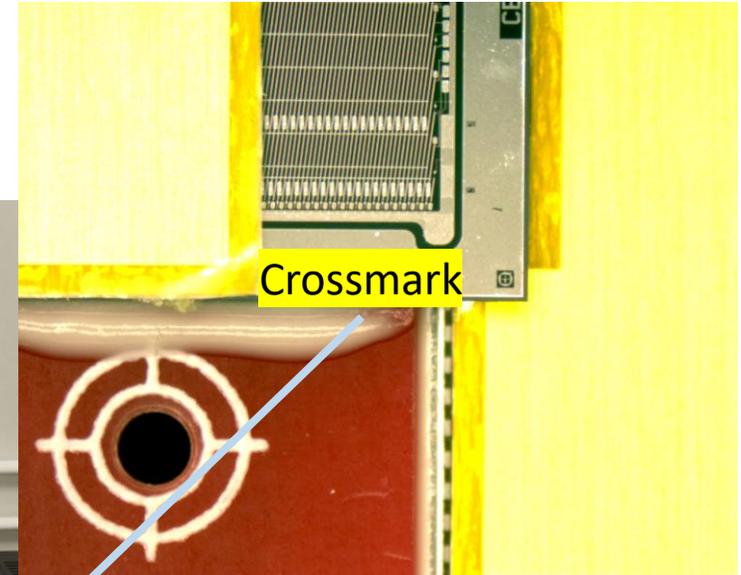
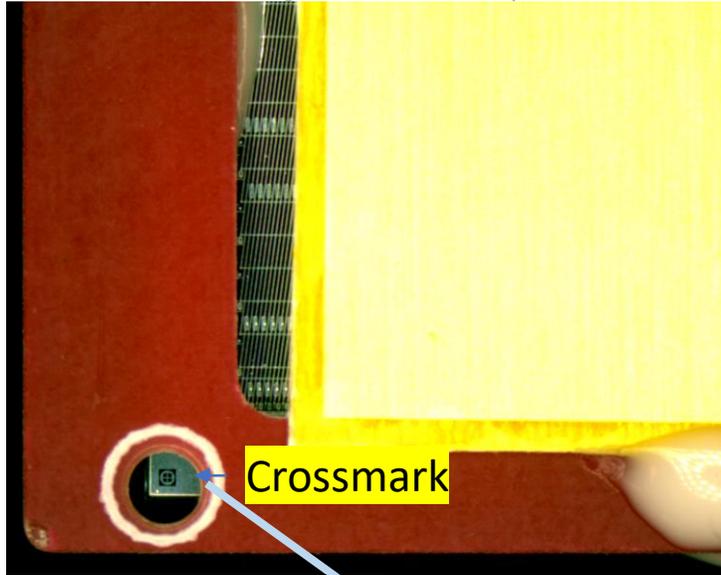
Assembling of the STS half-stations

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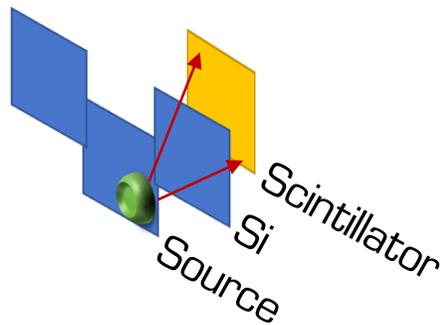
Metrology measurements

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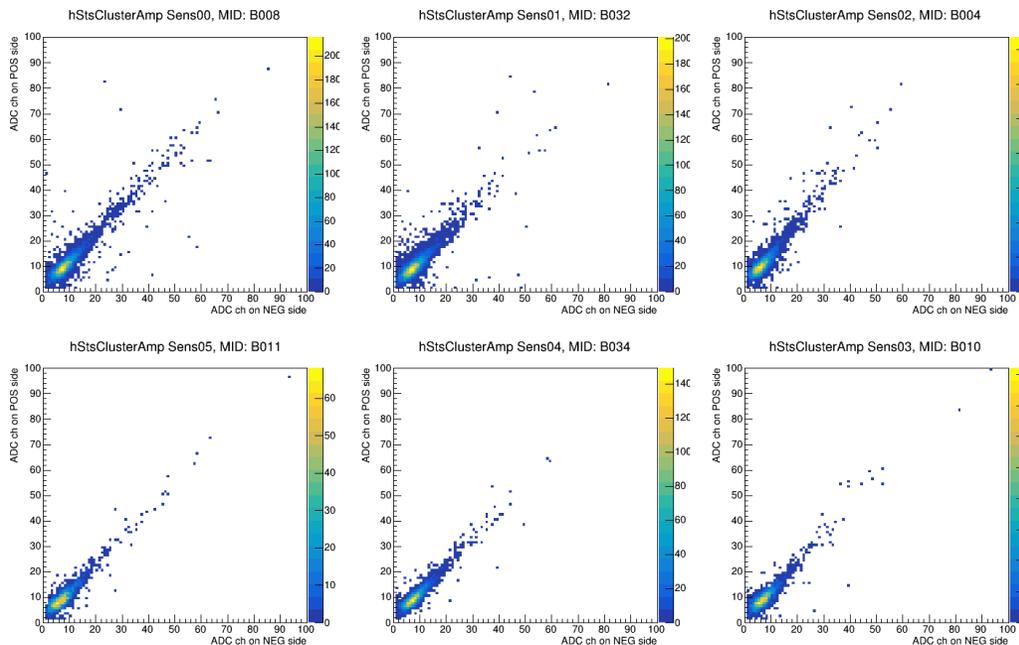
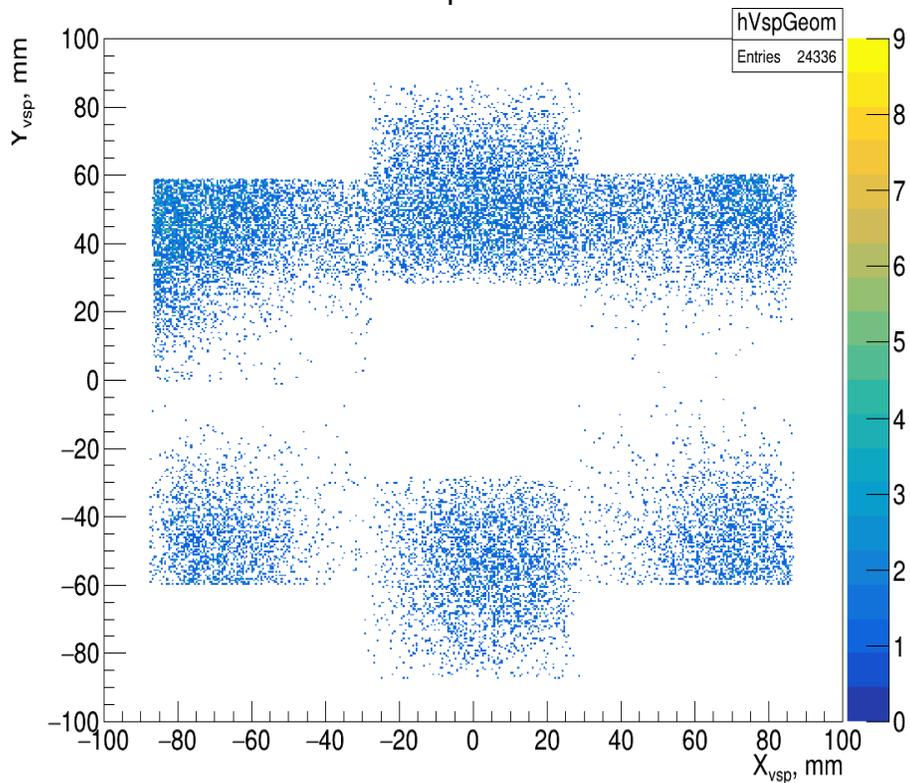


Tests with Ru-106

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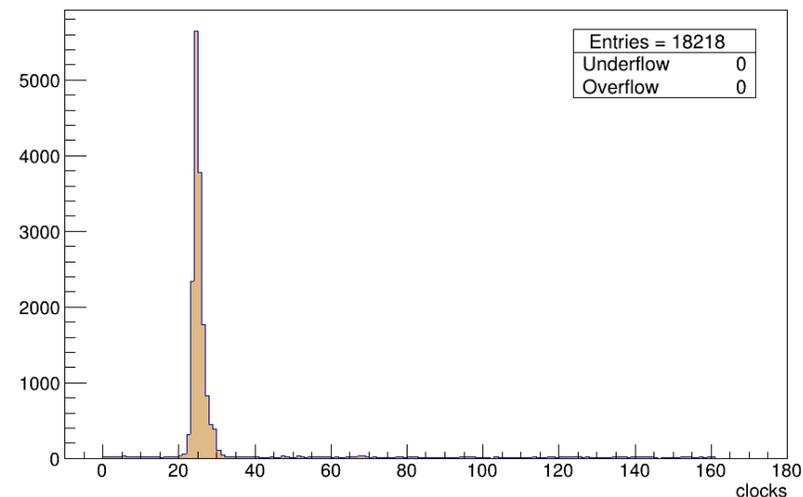


hVspGeom



Hit Amplitude (p- and n- sides)

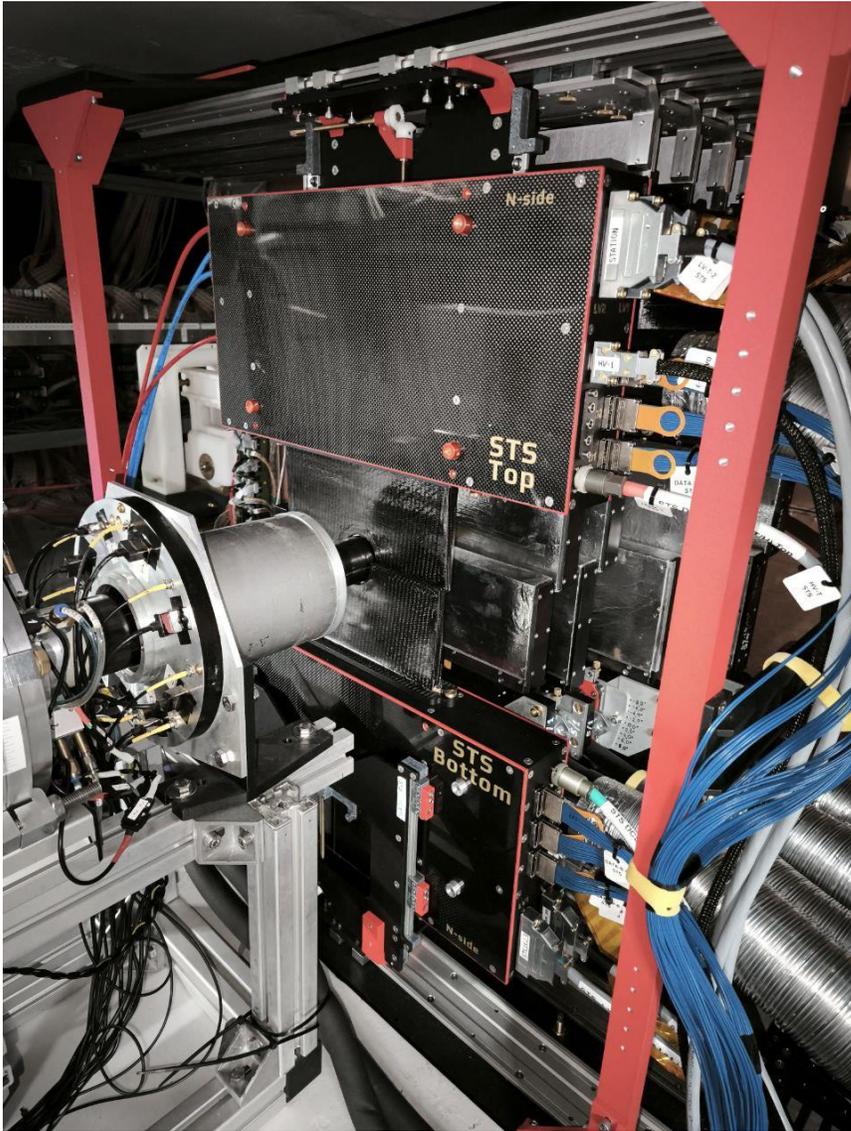
hStsSideTStamp InEvent FromTrigger Sens00 POS, MID: B008



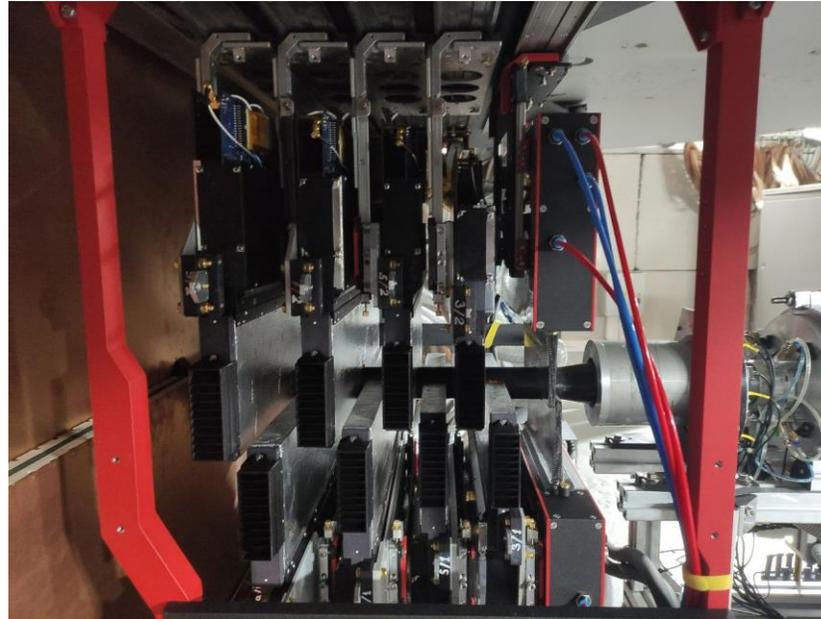
Time diff between trigger and hit

Installation inside the magnet

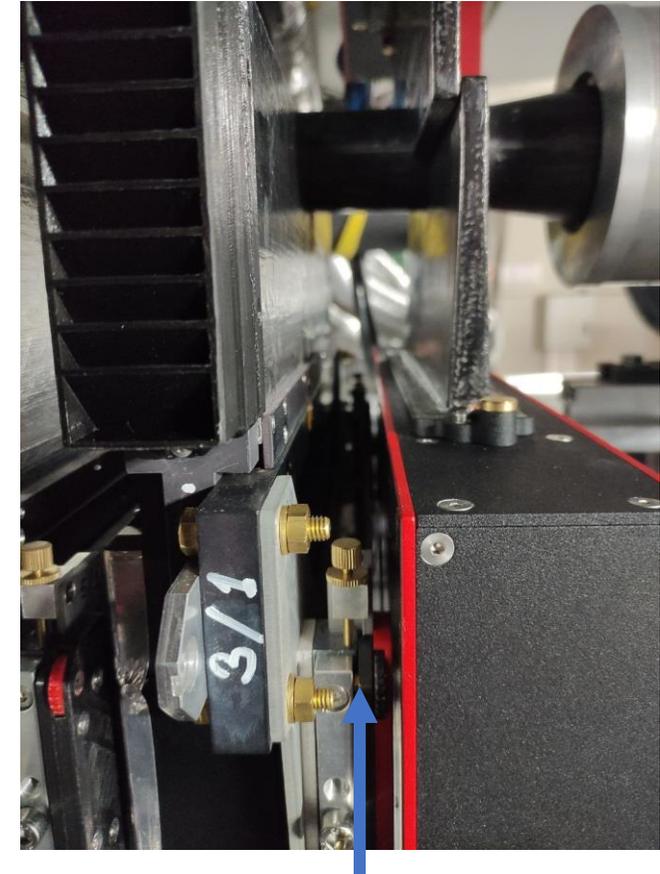
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STS



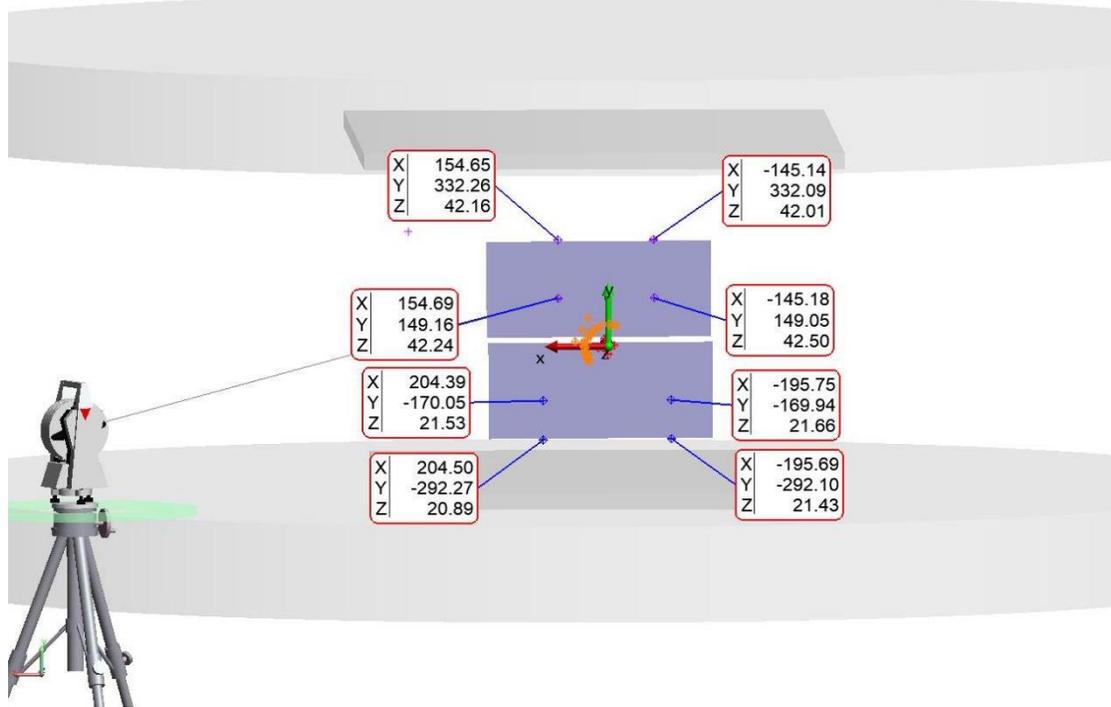
FSD+STS



3mm clearance between STS and 1st FSD

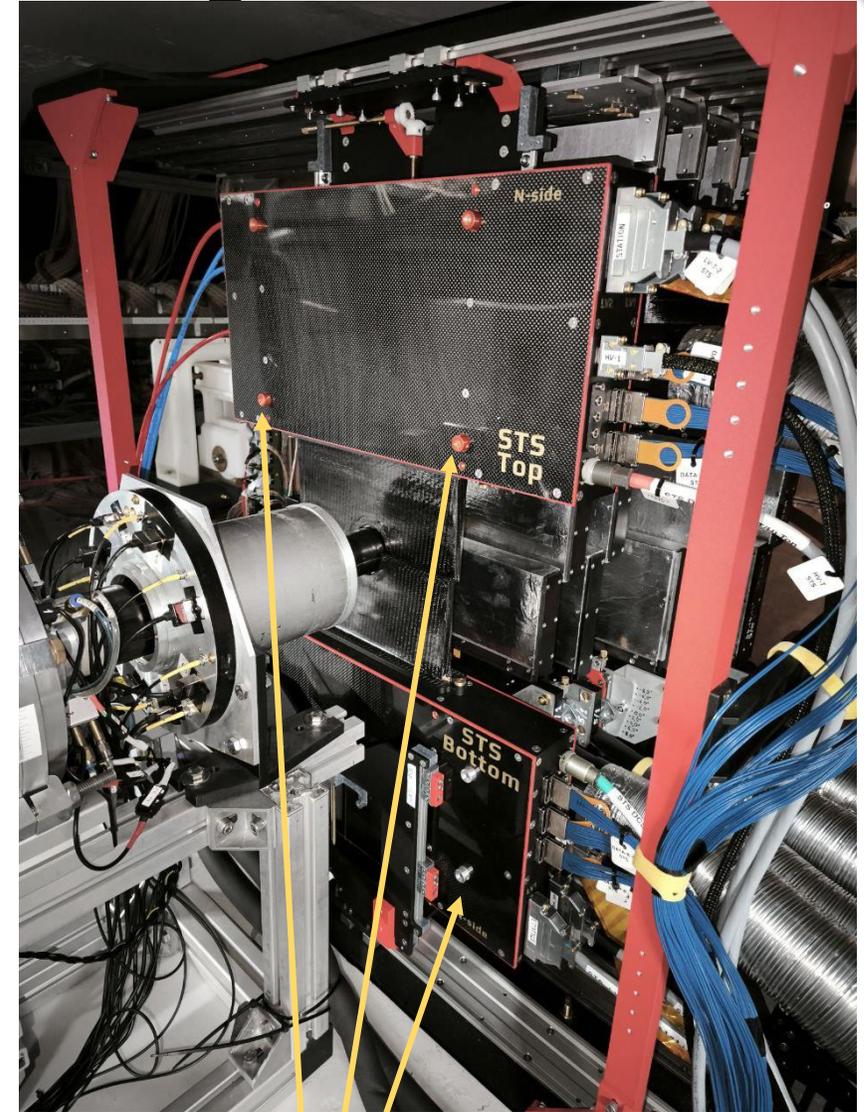
Alignment and metrology inside the magnet

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Rotation angles for half-stations after installation and alignment procedures

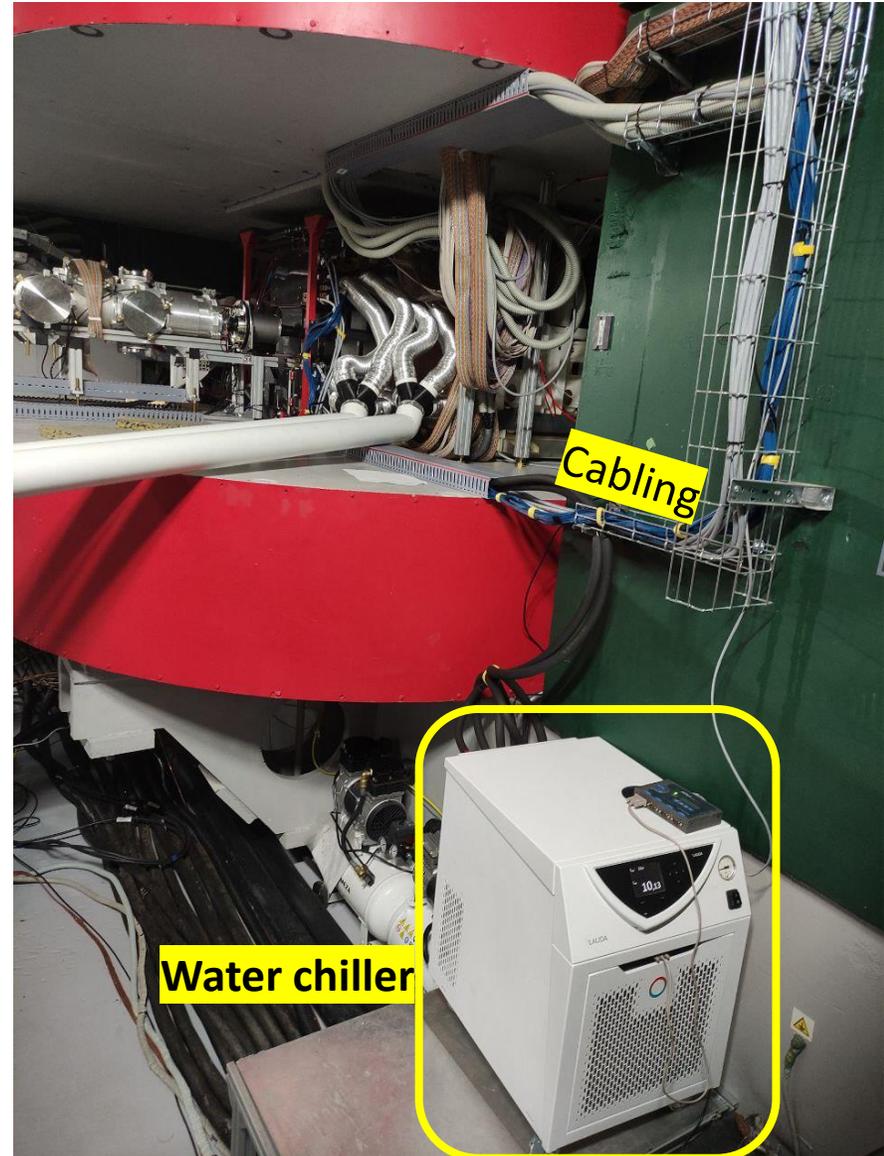
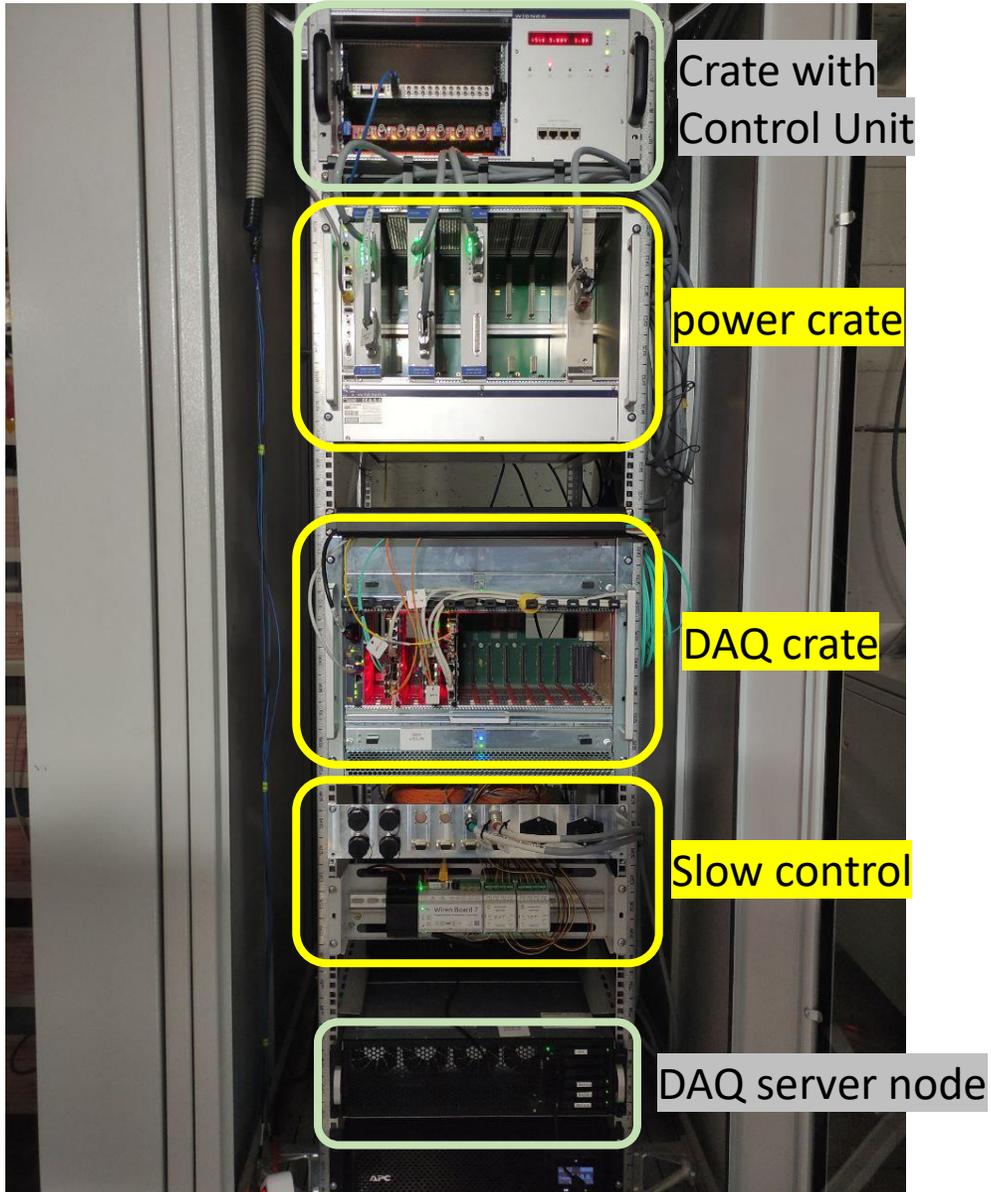
	α_z	α_x	α_y
TOP	0.5 mrad	0.2 mrad	0.1 mrad
Bottom	0.4 mrad	0.2 mrad	0.2 mrad



4x alignment marks per half-station

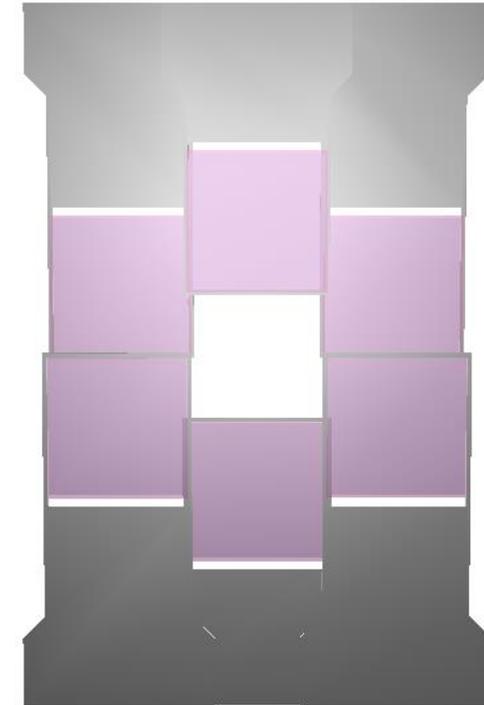
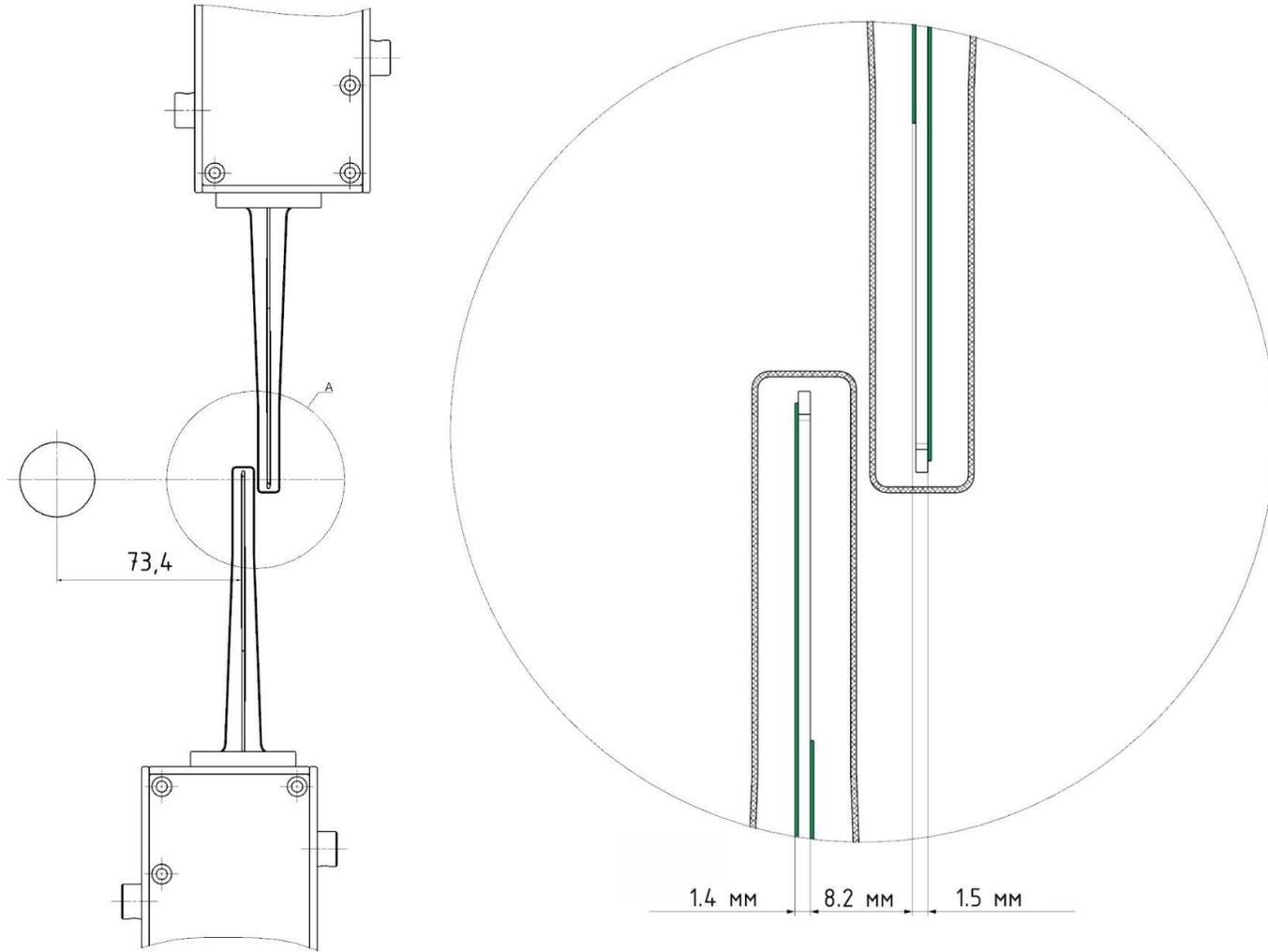
Services

Analysis and Detector Meeting of the BM@N Experiment at NICA, 2025



Distance from the target

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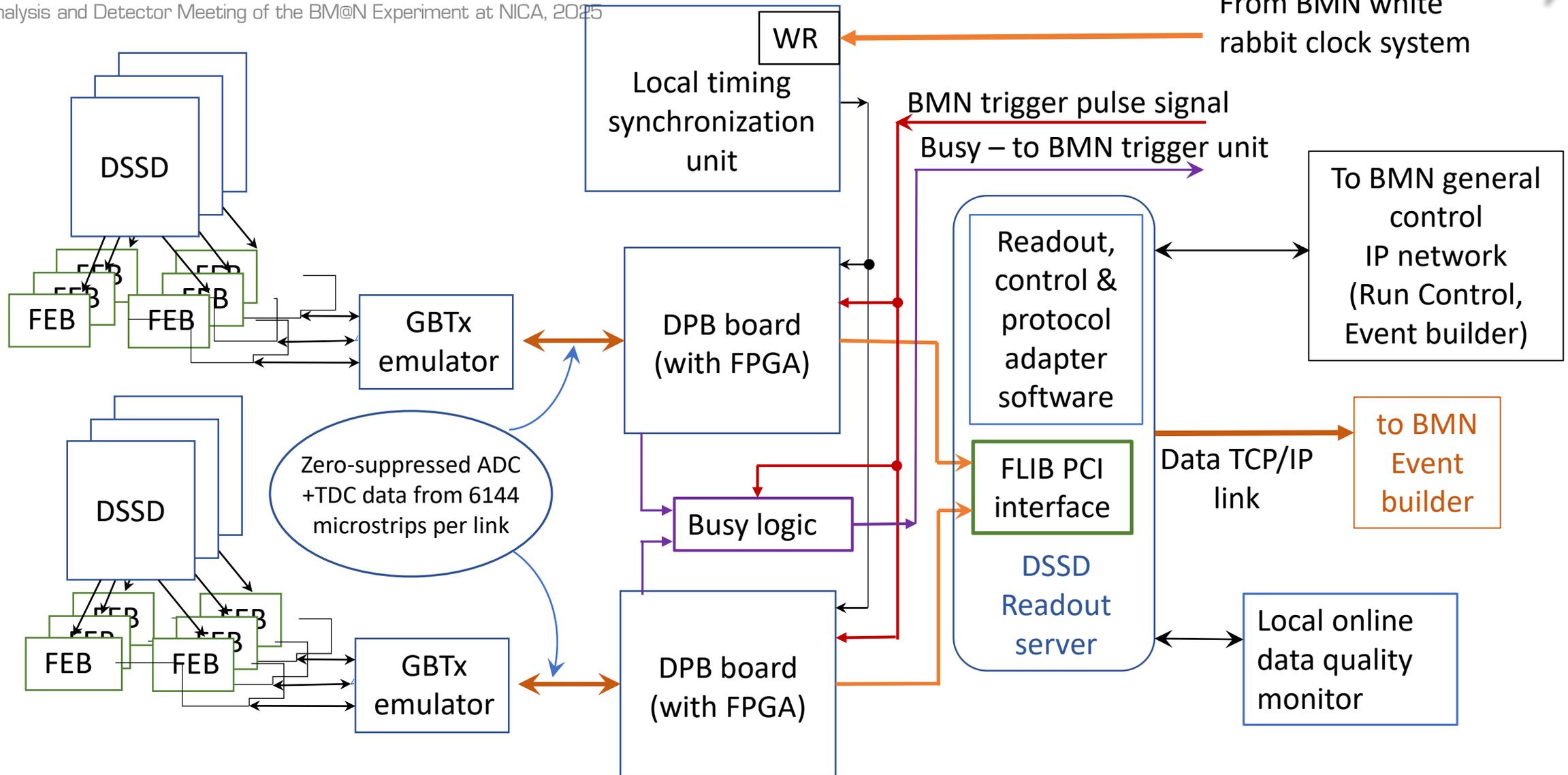


Root geometry: VSP_Run9.root needs to be updated

Angular acceptance: ~ from 20 to 50 Deg.

DAQ scheme

Analysis and Detector Meeting of the BM@N Experiment at NICA, 2025



Summary

Analysis and Detector Meeting of the BM@N Experiment at NICA, 2025



- Mainframe: designed, produced, installed and aligned inside the magnet.
- STS detector was assembled and installed inside the magnet;
- Alignment and metrology were done (will be repeated due to the reinstallation of the FSD detectors);
- Cooling and cabling done and tested;
- Noise cross-check of the system was done

TBD:

- Measurements with a source in a “stand-alone mode”
- Integration in the BM@N DAQ