



UNIVERSITÄT
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中国科学技术大学
University of Science and Technology of China

eTOF Module Production

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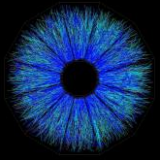


28 September 2018

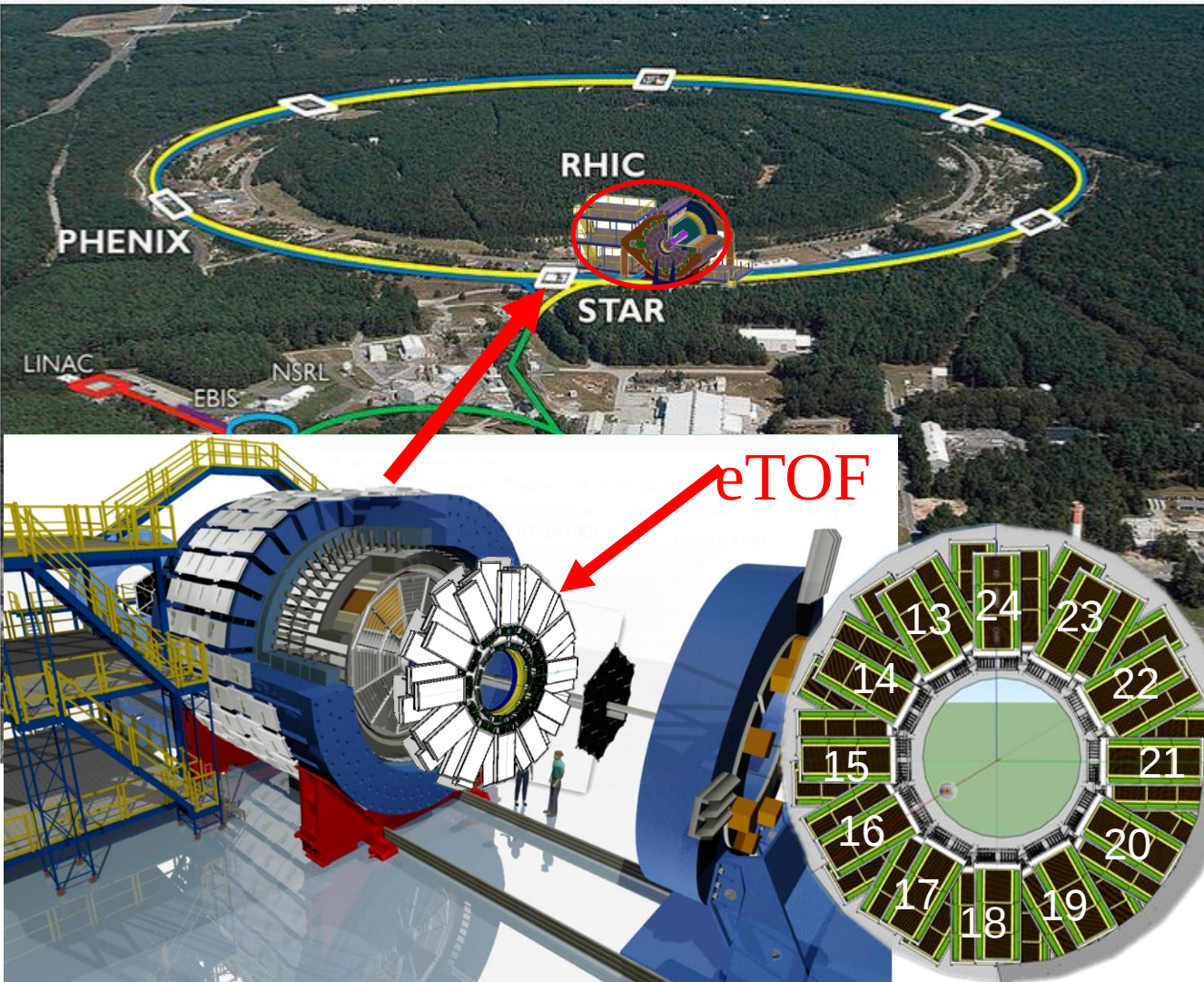
STAR-CBM joint workshop
DongdongHu USTC 09.2018

中国科学技术大学

- eToF Upgrade plan for STAR
- The status of MRPC3a/b
- Mass Production of the eToF Module
- Summary

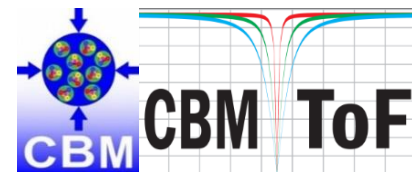


RHIC-STAR endcap TOF Upgrade



CBM - STAR: eTOF installation 2018-10

- 36 modules
(=108 MRPCs;
72 MRPCs from USTC;
36 MRPCs from Tsinghua;)
- 3 layers
- 12 sectors
- 6912 channels
- Sector counting matches the TPC sectors



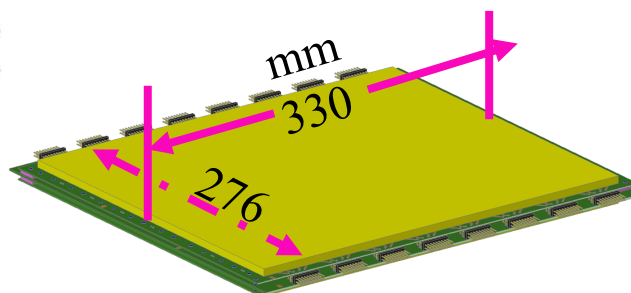
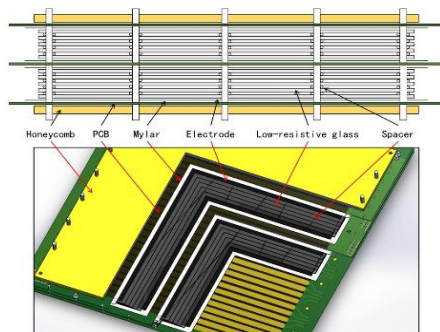
Parameter		MRPC3a	MRPC3b
		Double-stack	Double-stack
Glass	Type	Low resistance glass	ultra-thin float
	Size	330 x 276	330 x 276 x 0.28 mm
Gaps	Size	0.25mm	0.230 mm
	Number	4 x 2	5 x 2
Readout strips		(0.7 cm + 0.3 cm) x 32 ,double-end strip readout	(0.7 cm + 0.3 cm) x 32 ,double-end strip readout
Impedance		~50 Ω	50 Ω differential signal to PADI
Active area		32 cm x 27.6 cm	32 cm x 27.6 cm
Detector size		360 x 338 x 26 mm	354 x 324 x 22 mm

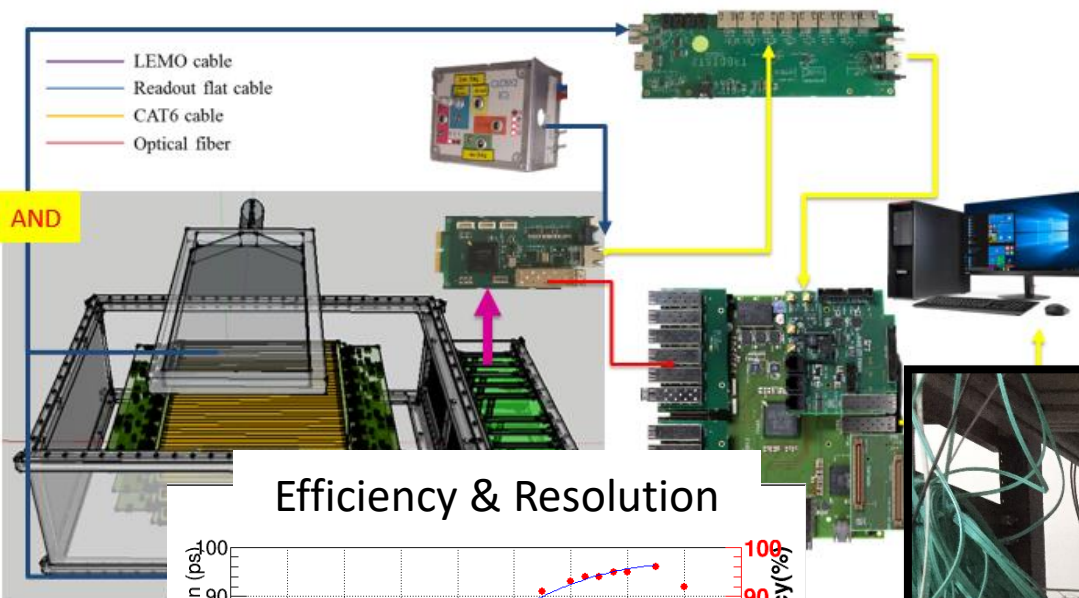
Difference:

Glass:
Material
(low resistance glass (mrpc3a)
ultra-thin float glass (mrpc3b));
Size;
Gaps number:

MRPC3a :
36 counters for eTOF.

MRPC3b:
72 counters for eTOF.

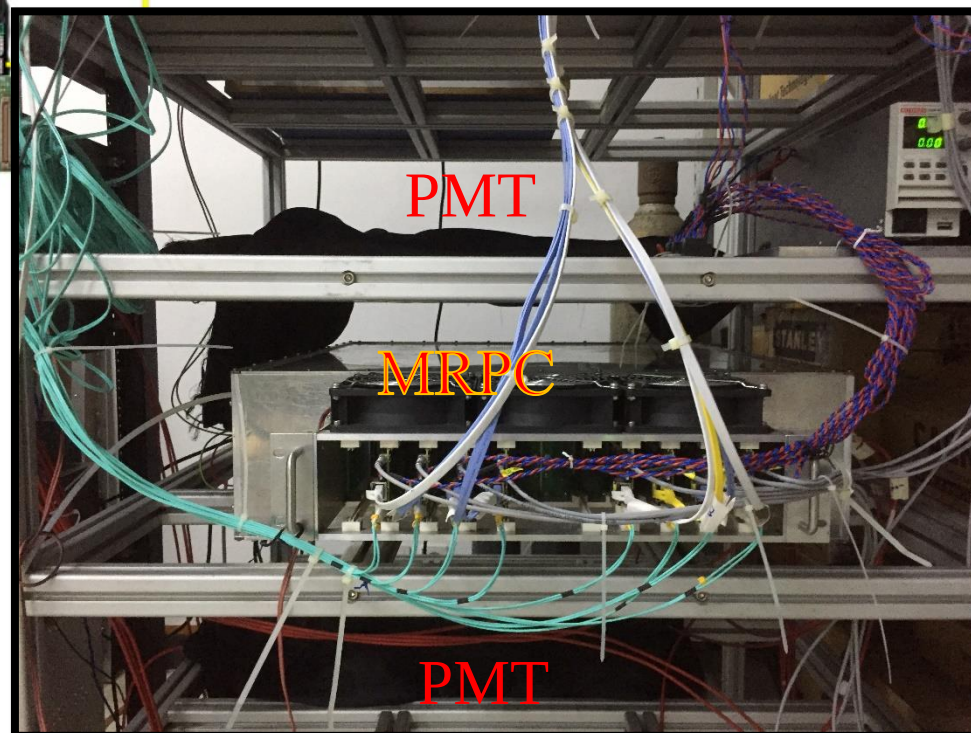
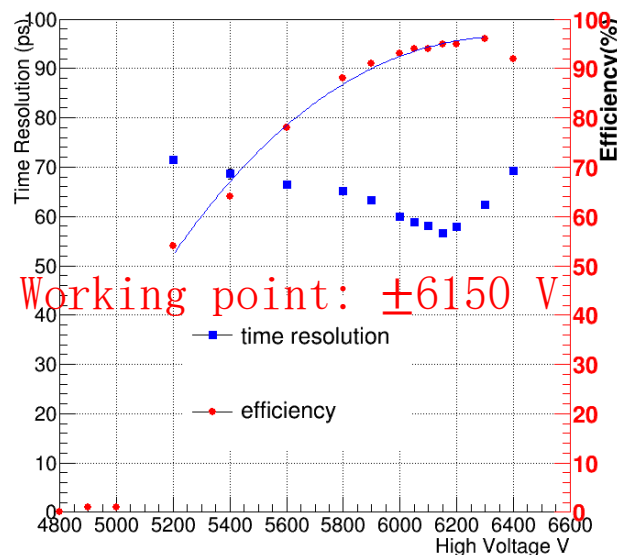




TRB system set up in the USTC for MRPC3b QA.

Threshold: -330 mV;
Gas: 95% Freon + 5% C₄H₁₀ + 0% SF₆.

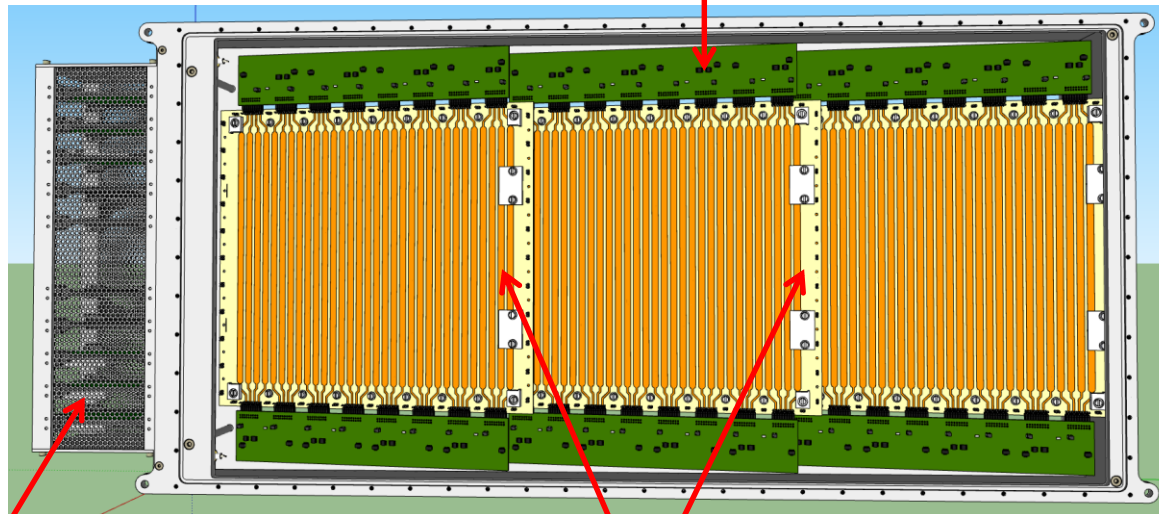
Efficiency & Resolution



- 3 MRPCs (MRPC3a/b) – tilted by $\approx 10^\circ$
- 32 strips/MRPC with a pitch of 1 cm
- 27 cm strip length
- Active area about 92 cm x 27 cm
- 192 read out channels



Preamplifier PADI boards



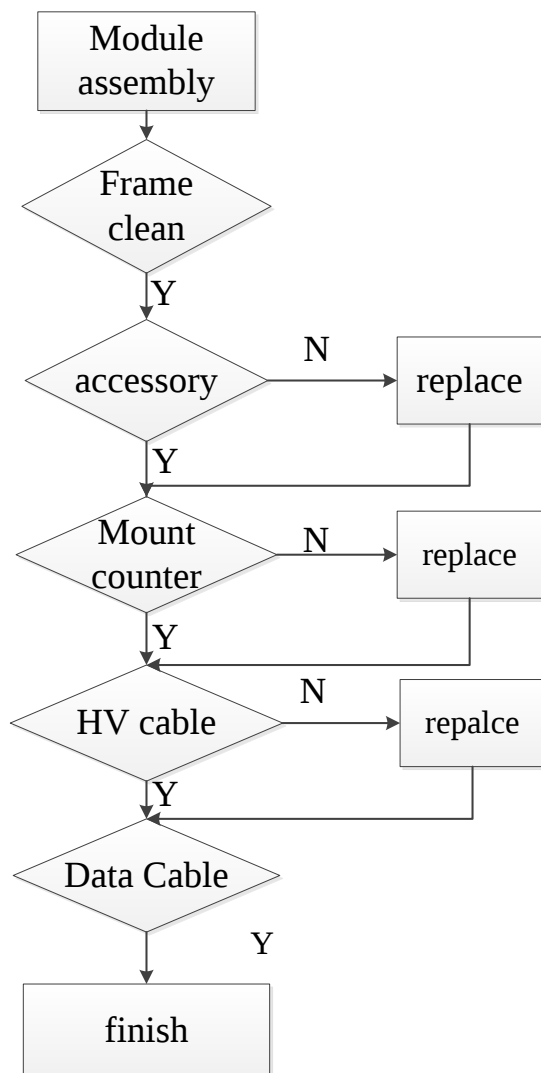
TDC GET4 boards

overlapping strips



- 36 Modules have been done
- 18 Modules have been closed
- Each Module have own ID
- 1~24 MRPC3b
25~36 MRPC3a
- Each counter has own ID
- Each PADI has own ID.

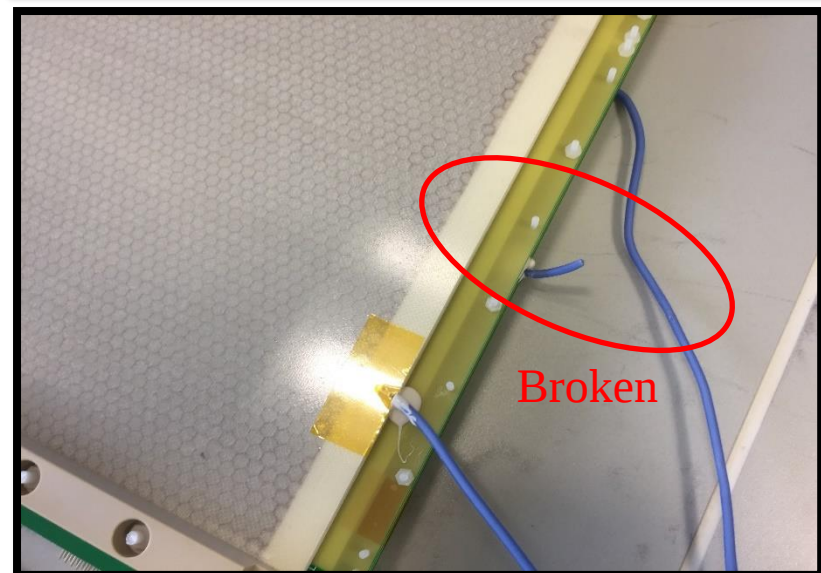




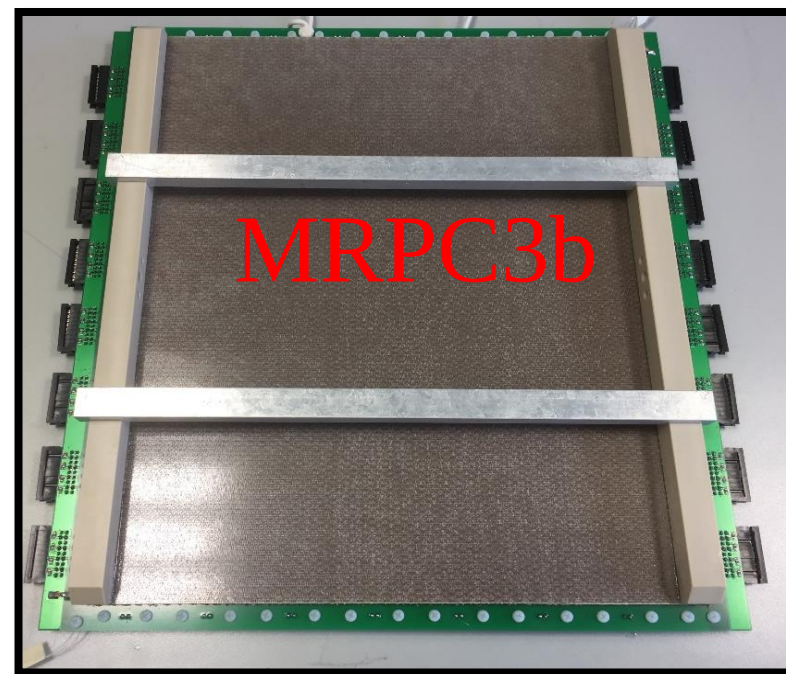
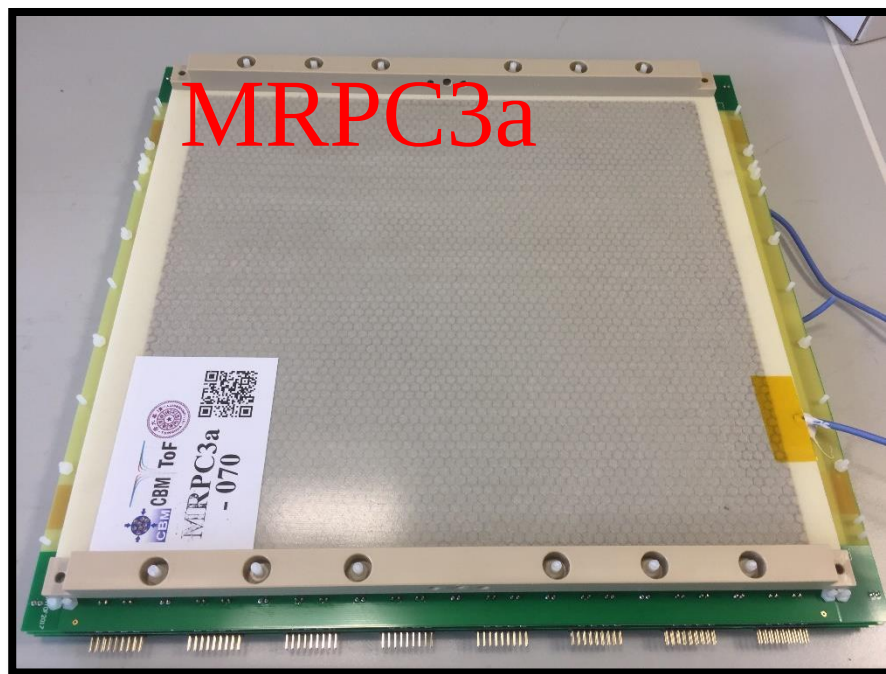
Front side



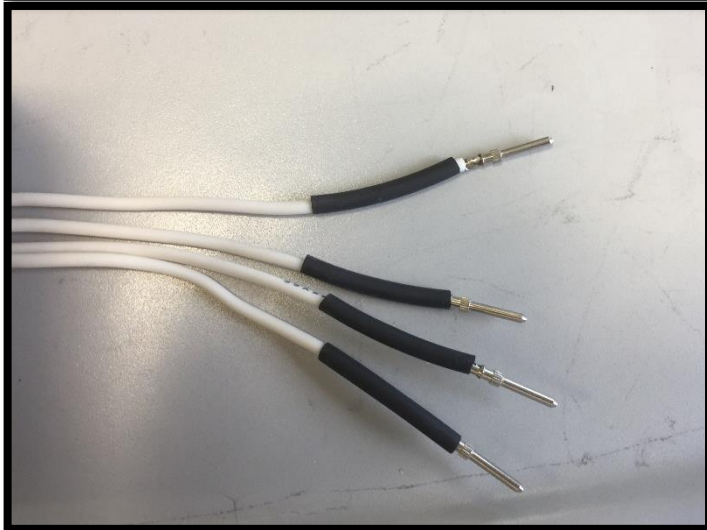
Back side



- Cover: Ultrasonic Cleaner
- Counter: Shield cable



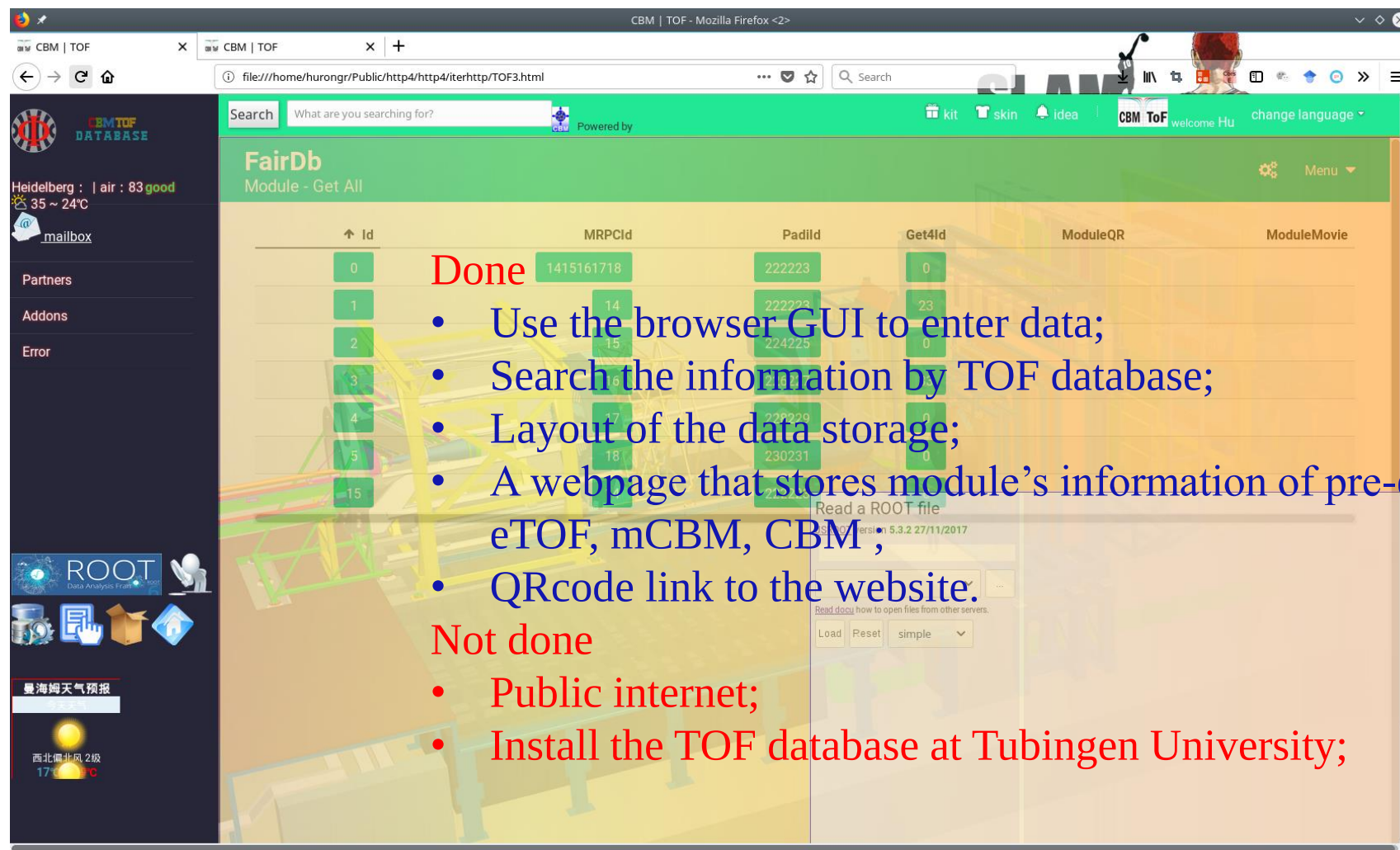
Two kinds of MRPC use different way to fix the plastic bar
 MRPC3a: screw fix the bar
 MRPC3b : glue



The HV cable is soldered to the HV head and protected with the shrink cable to prevent leak current, afterwards it is plug into the HV box.



- 18 modules are flushed with gas
- All(36) eTOF modules have been finished
- 12 modules be test with cosmic ray.
- Each module stick its own ID which record the information. ie. Counters number, PADI board number.



Search What are you searching for? Powered by

FairDb Module - Get All

Id	MRPCId	PadId	Get4Id	ModuleQR	ModuleMovie
0	1415161718	222223	0		
1	14	222223	23		
2	15	224225	0		
3	16	224225	0		
4	17	224225	0		
5	18	230231	0		
15	21	21	0		

Read a ROOT file
 Version 5.3.2 27/11/2017
 Read docu how to open files from other servers.
 Load Reset simple

Done

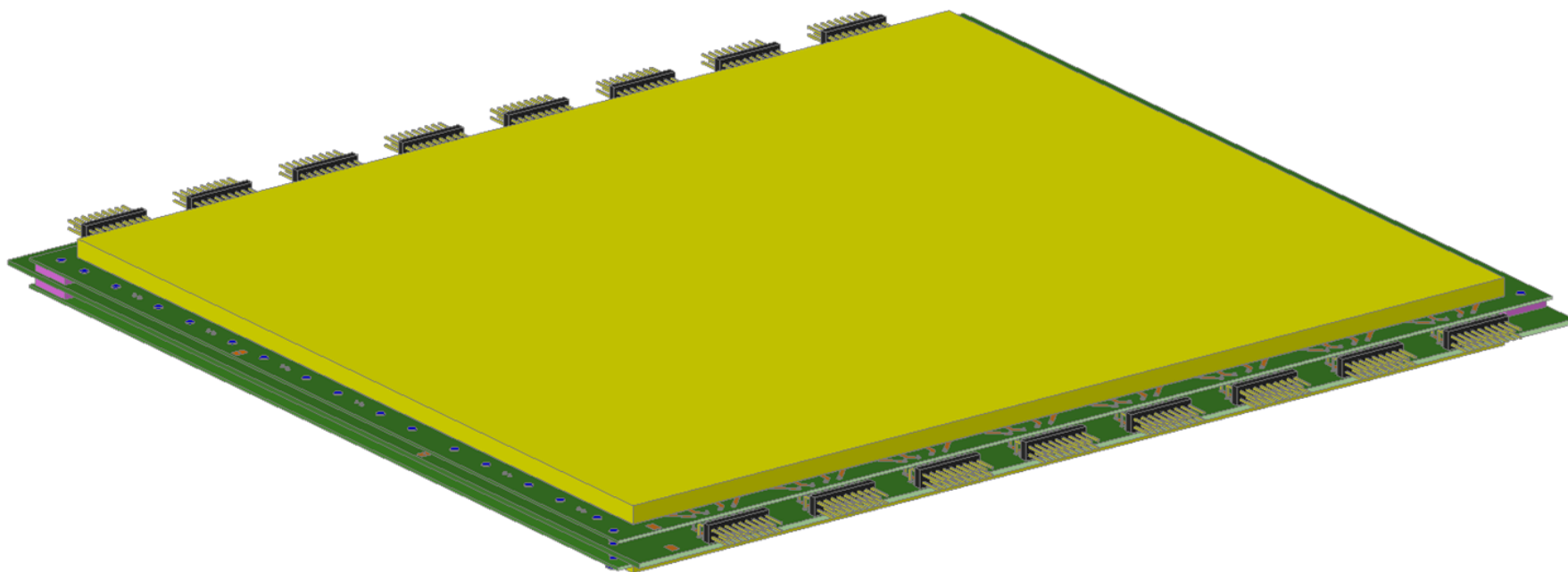
- Use the browser GUI to enter data;
- Search the information by TOF database;
- Layout of the data storage;
- A webpage that stores module's information of pre-eTOF, eTOF, mCBM, CBM ;
- Qrcode link to the website.

Not done

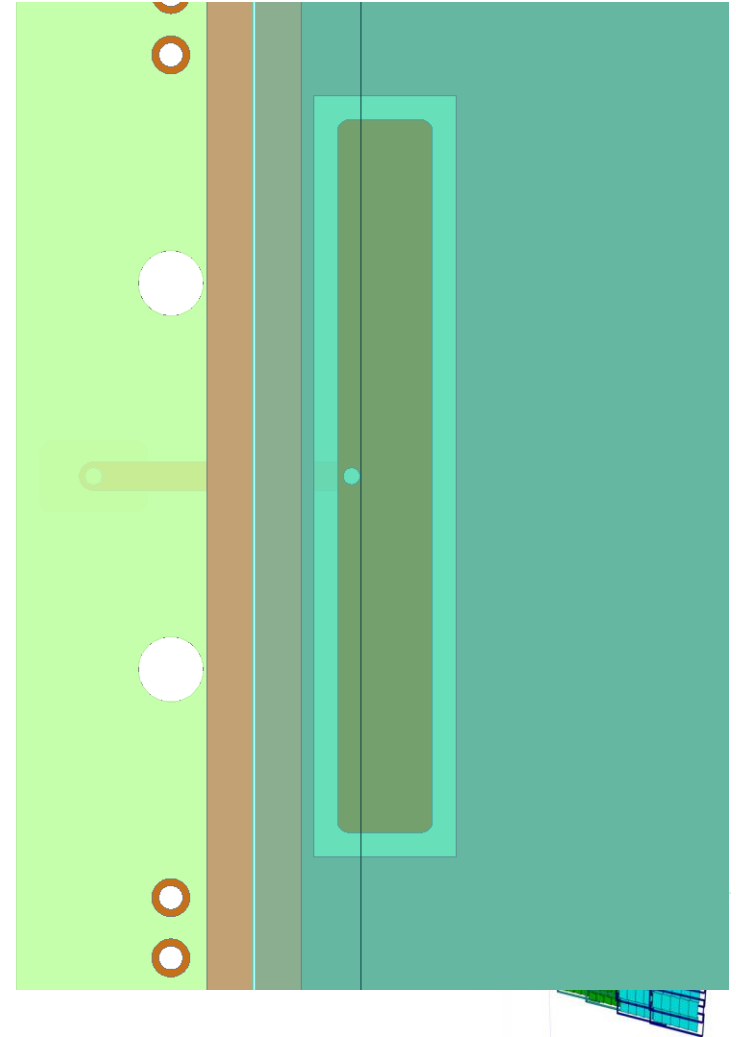
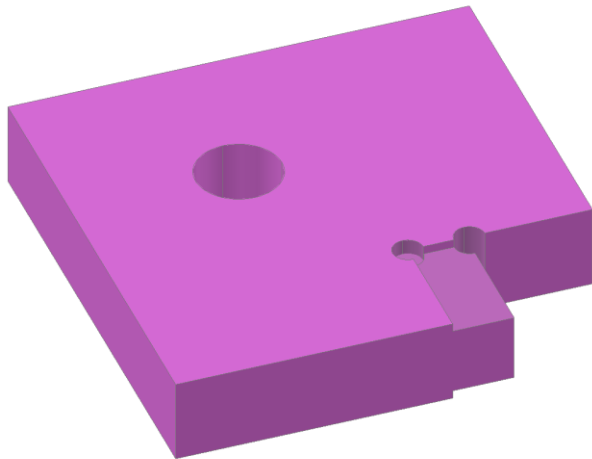
- Public internet;
- Install the TOF database at Tübingen University;

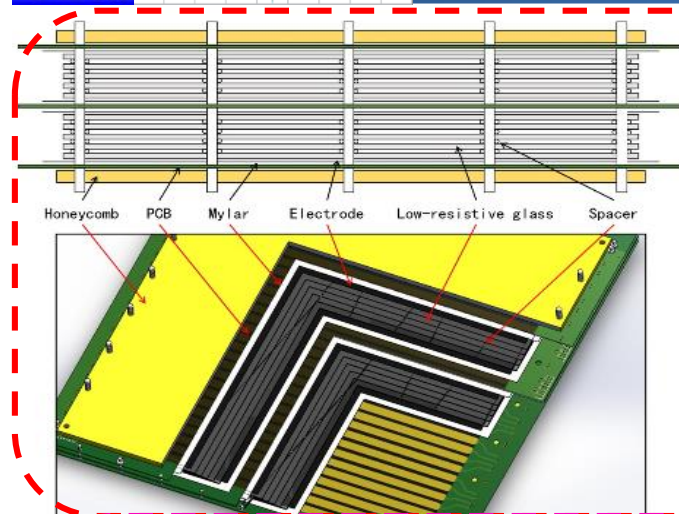
1. 36 eToF modules have been done.
2. TOF Database went into a state of adjustment.
3. Next step, after the collaboration meeting, we enter the data into database and analyze the cosmic ray test data.

Thank you!



- The distance from the graphite paint to glass edge is **2.5 mm**.
- Around the HV connection point, the copper edge to the glass edge is **1.5 mm**. This makes the **weakest point**.





Parameter	Value
Dimension	360 × 338 mm ²
Height	26 mm
Weight	3.3 kg
Glass dimension	330 × 276 mm ²
Gas gap number	2 × 4
Gas gap width	0.25 mm
Strip pitch	7 + 3 mm
Strip length	270 mm
Strip number	32

MRPC3a : 36 counters for eTOF.

Difference:

Glass:
Material(low resistance glass(mrpc3a)
ultra-thin float glass (mrpc3b));

Size;

Gaps number:

Impedance:

MRPC3b:
72 counters
For eTOF.

Double-stack		
Glass	Type	Double-stack ultra-thin float
Type	Size	330 × 276 × 0.28 mm ultra-thin float
Size	Size	330 × 276 × 0.230 mm
Gaps	Size	0.230 mm
Size	Number	5 × 2
Readout strips	Number	(0.7 cm + 0.3 cm) × 32, double-end strip readout
Impedance	Number	(0.7 cm + 0.3 cm) × 32, double-end strip readout
Active area	Impedance	50 Ω differential signal to PADI
Detector size	Active area	32 cm × 27.6 cm
Detector size	Detector size	354 × 324 × 22 mm

