Electron-Muon Ranger (EMR)

EMR Operation

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On Behalf of the EMR Group

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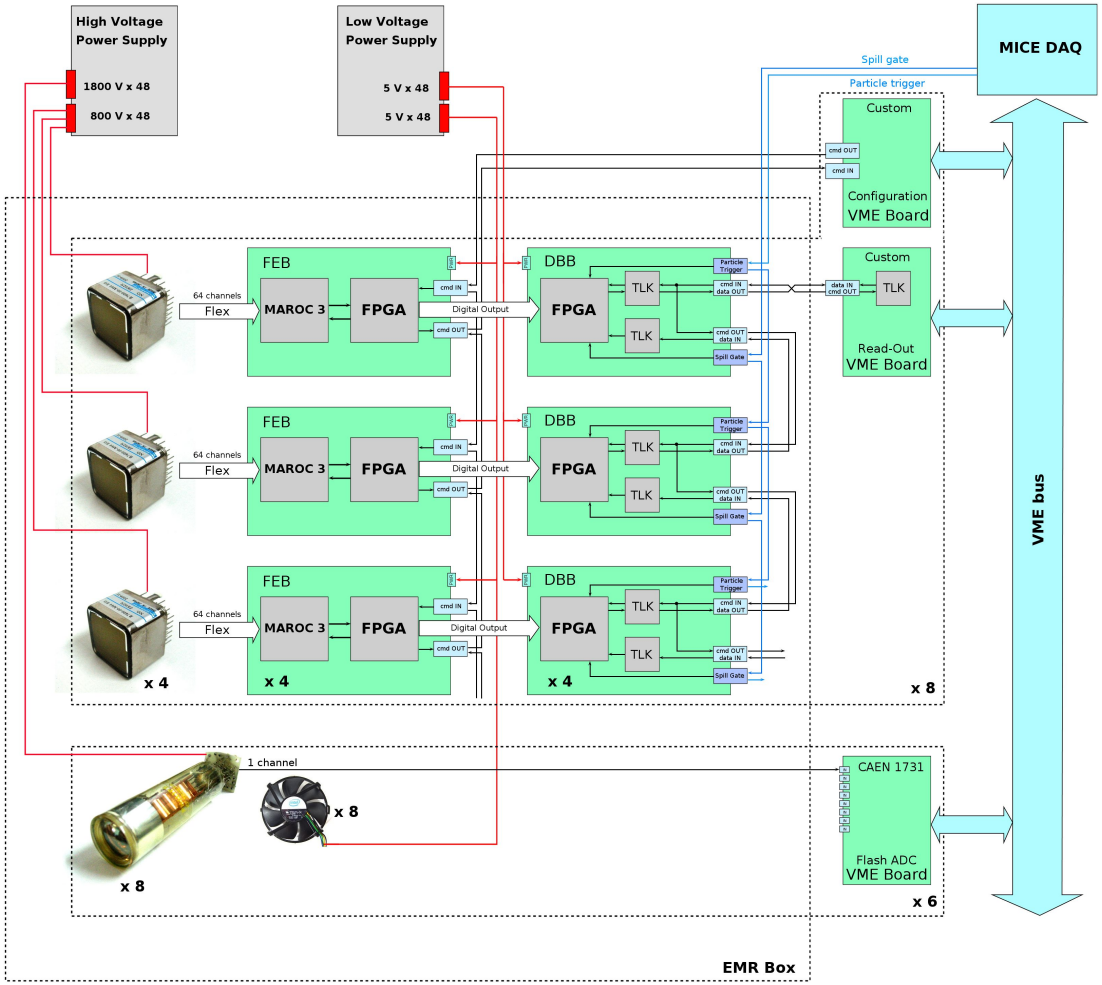
Electronics (Upgrades)



Inside the EMR box:

- 48 Front-End Boards
- 48 Buffer Boards **DONE**
- 48 1-ch. Philips PMTs (will be replaced)
- 48 64-ch. Hamamatsu PMTs

EMR electronics rack:

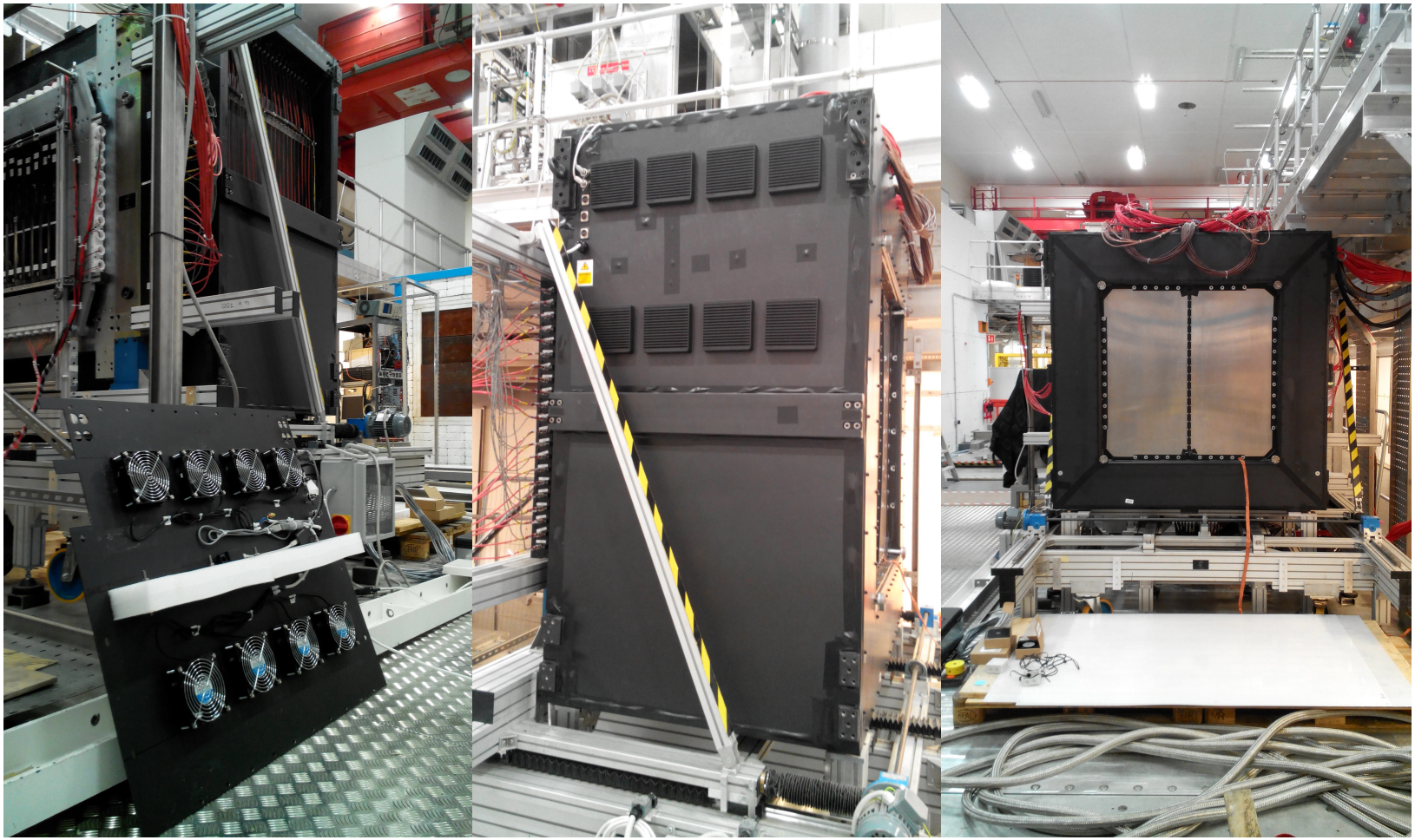
- High Voltage PSU (will be replaced)
- Low Voltage PSU (more channels)
- VME crate:
  - 6 fADC (V1731)
  - 8 VRB (DBB readout)
  - 3 VCB (FEB configuration)
  - I/O board
- NIM crate:
  - coincidence
  - discriminators
  - pulser
  - cosmic trigger logic

Support hardware:

- cooling fans **DONE**
- PMT calibration system (LED based)
- temperature and humidity sensors

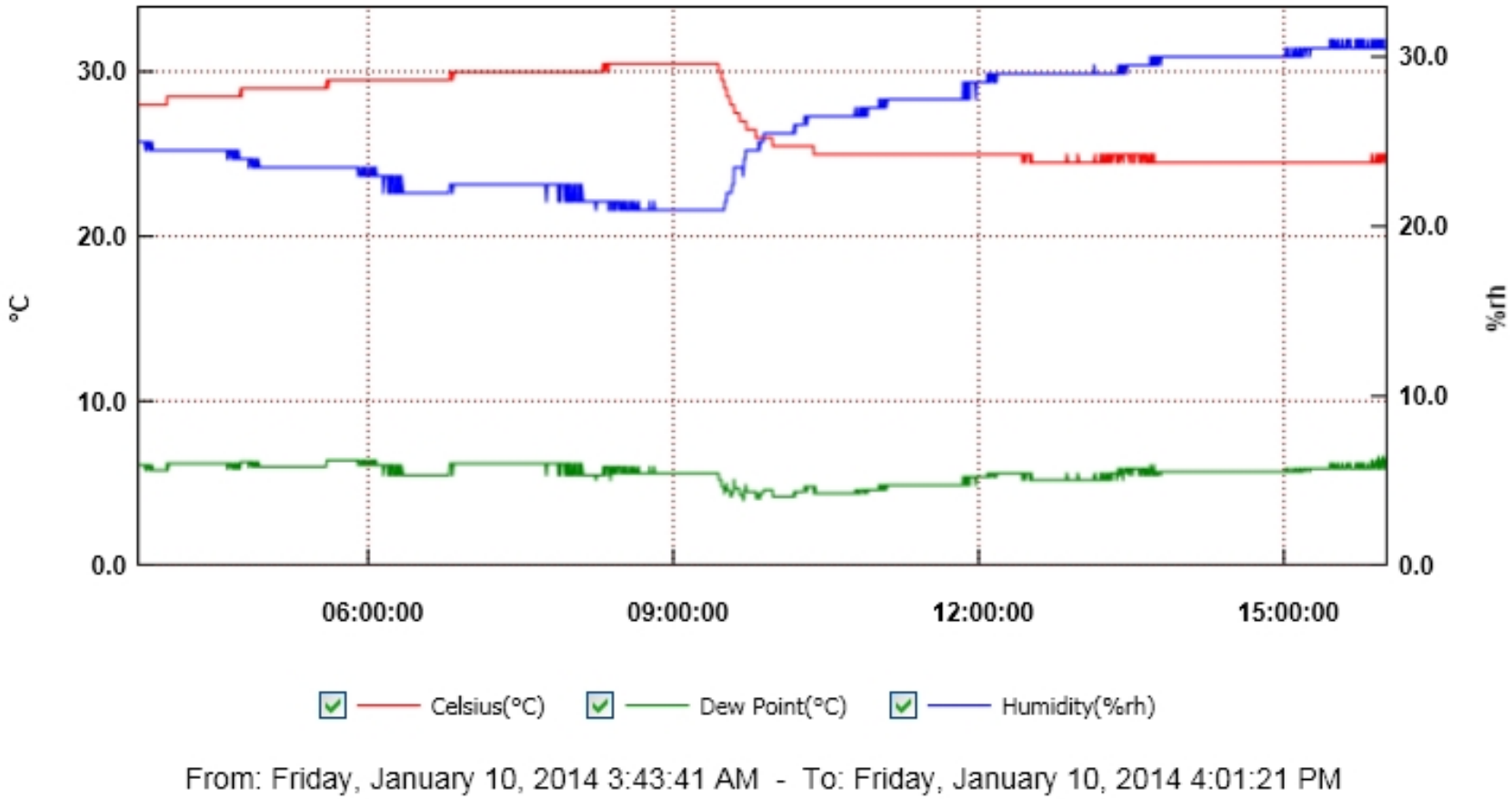
Upgrade: Cooling System

- temperature rises above 30° if there is no external air exchage
- cooling fans have been installed
- temperature and humidity sensors have been placed inside the detector



Upgrade: Cooling System

- temperature rises above 30° if there is no external air exchage
- once the fans are on the internal temperature drops to external one

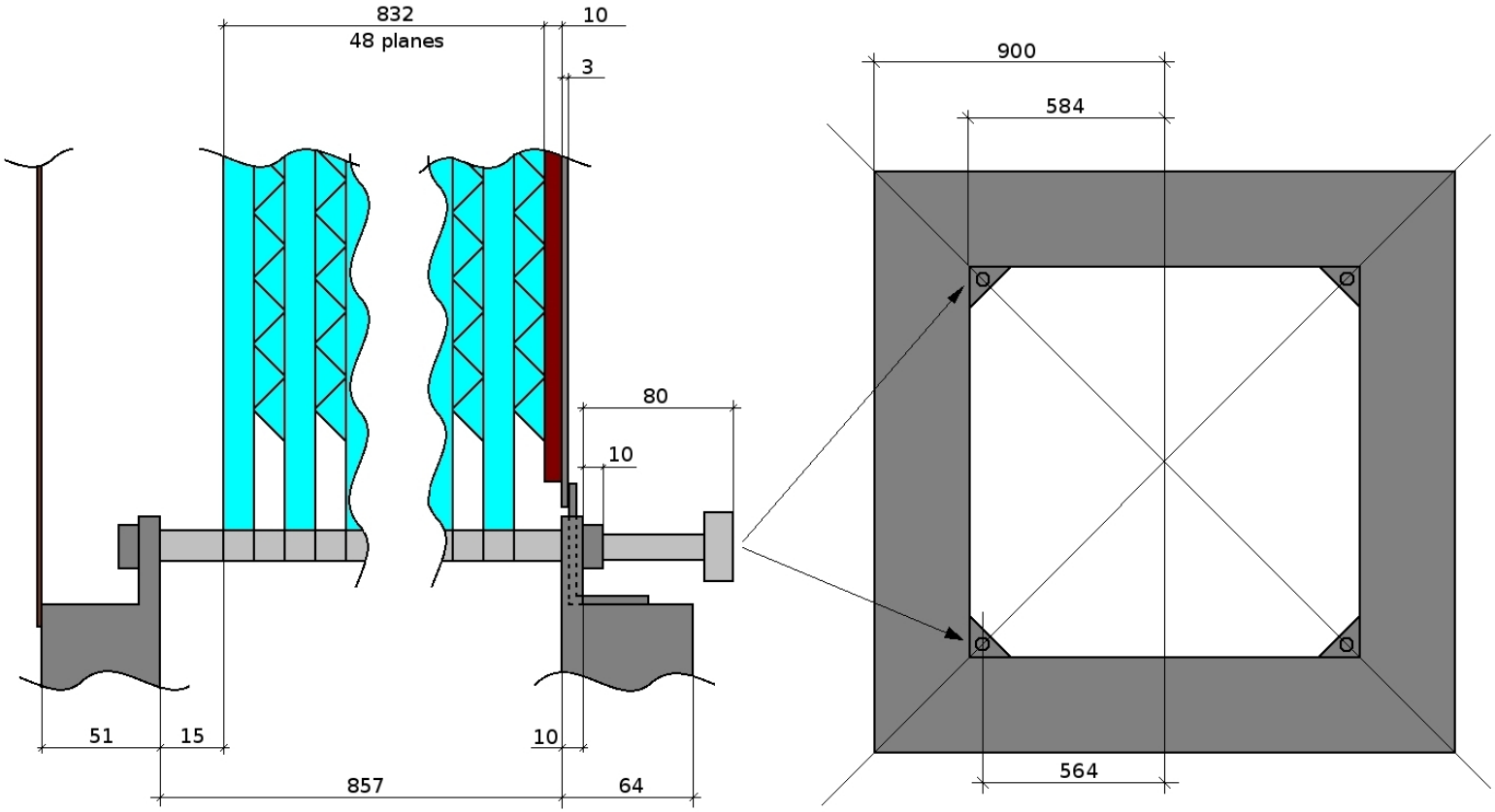


Upgrade: PMTs, Power Supplies etc.

- new Hamamatsu single channel PMTs have been delivered (will replace 20 years old PHILIPS PMTs)
- spare fADC delivered (was a problem during last beam tests, had to disable one of the MICE detectors)
- waiting for new power supplies with remote control
- the temporary electronics control rack will be replaced by a proper one (with efficient cooling and dust protection)
- once installed, the whole detector can be controlled and monitored via network

Information for the Survey

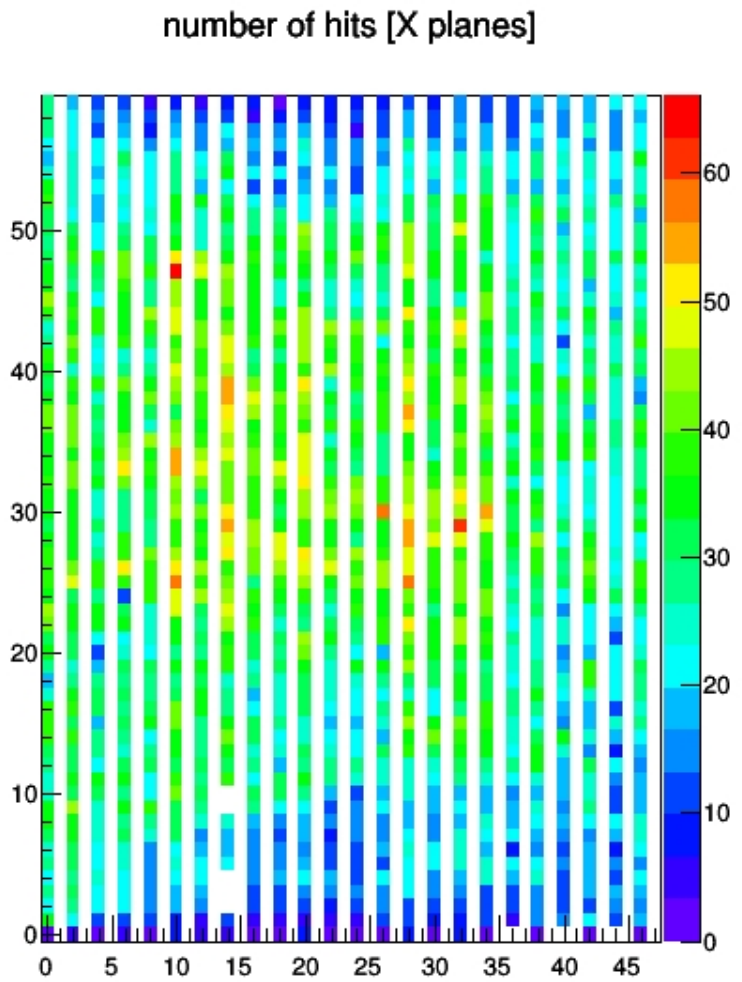
- position of the sensitive volume with respect to the survey points is not known precisely due to rubber dumper between back wall and the last plane
- some planes are know to have displacement and little curvature in Z direction
- precision is within a few millimeters

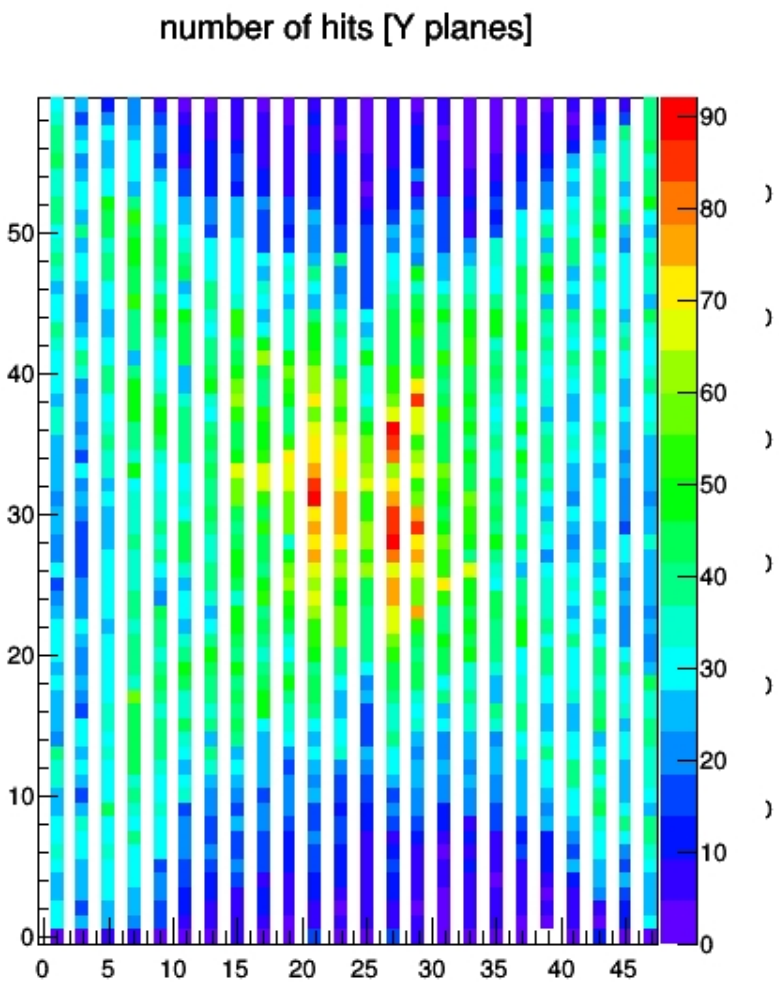


Coscmics for Calibration

- during three weeks in January the EMR was taking cosmics
- this data is used to calibrate PMTs and fibers

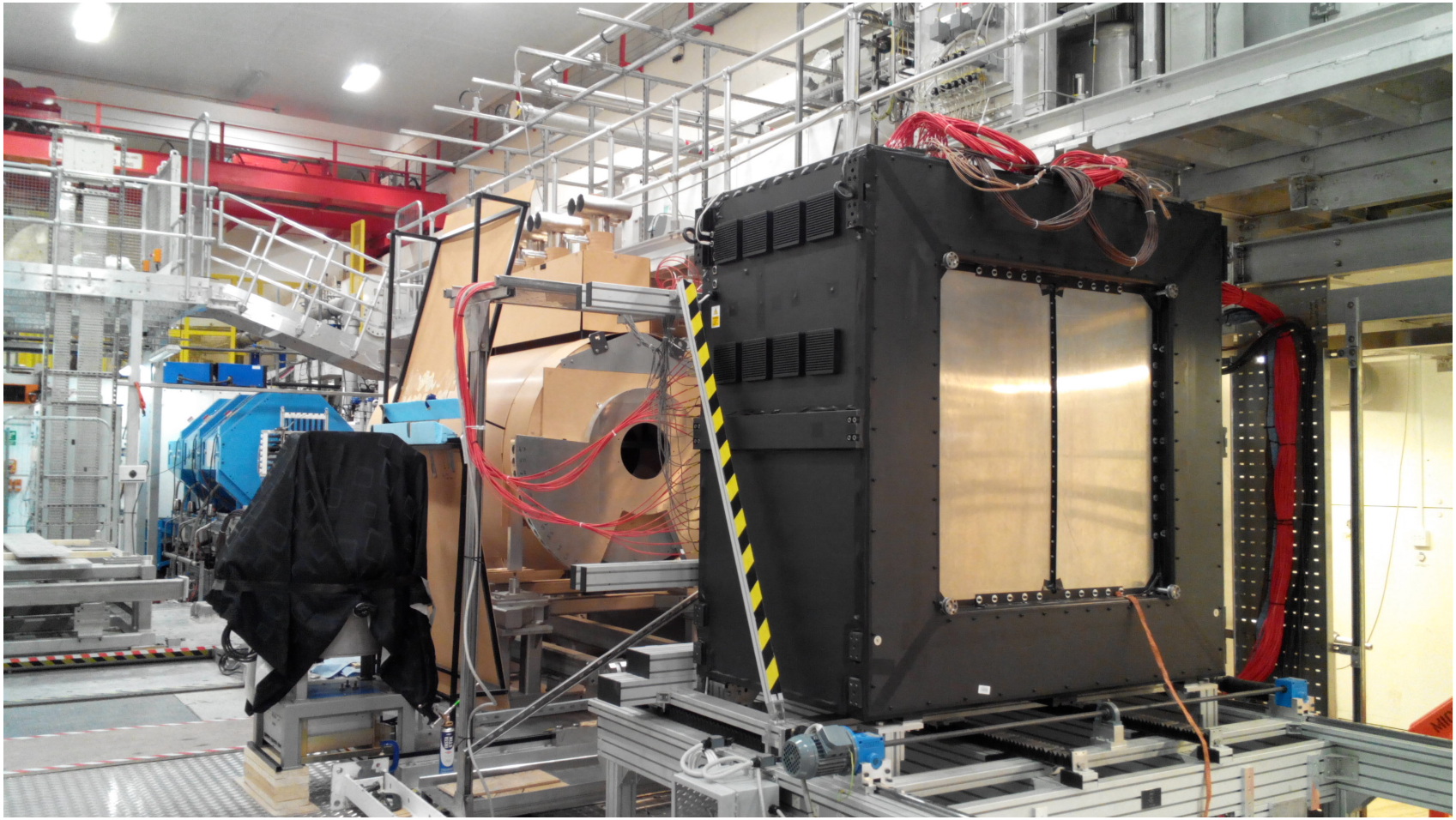
below: integrated event display (first and last planes are used to create a trigger)





Summary

- cooling fans were installed
- cosmic data was taken to calibrate the detector
- many hardware upgrades are planed
- the temporary control rack will be replaced



- **the detector performance is exceptional**