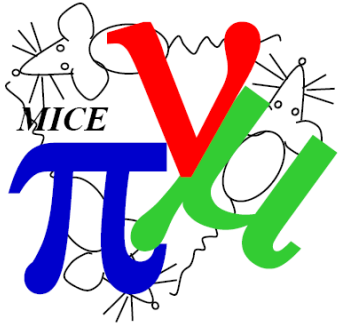


University of Glasgow

Instrumentation Status (but not tracker)

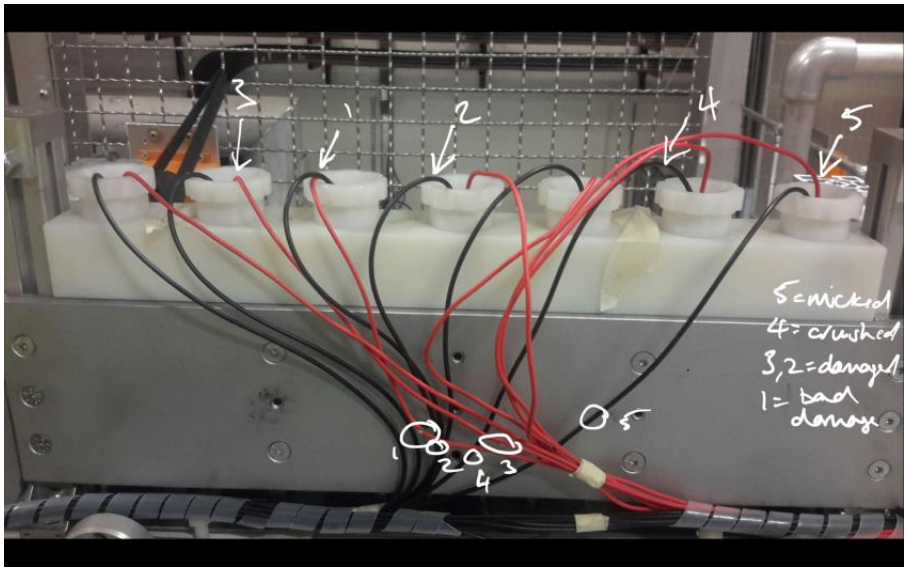
MICE CM43

RAL, 29 October 2014

Paul Soler

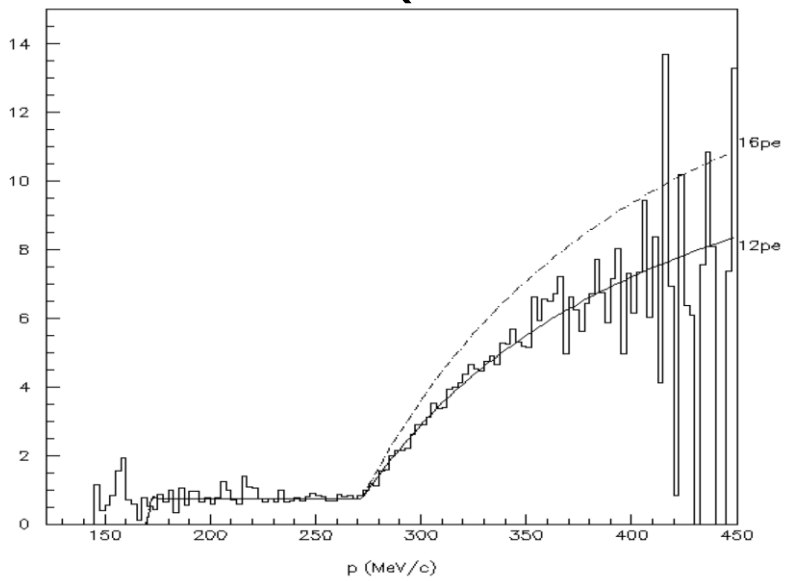
Readiness TOF

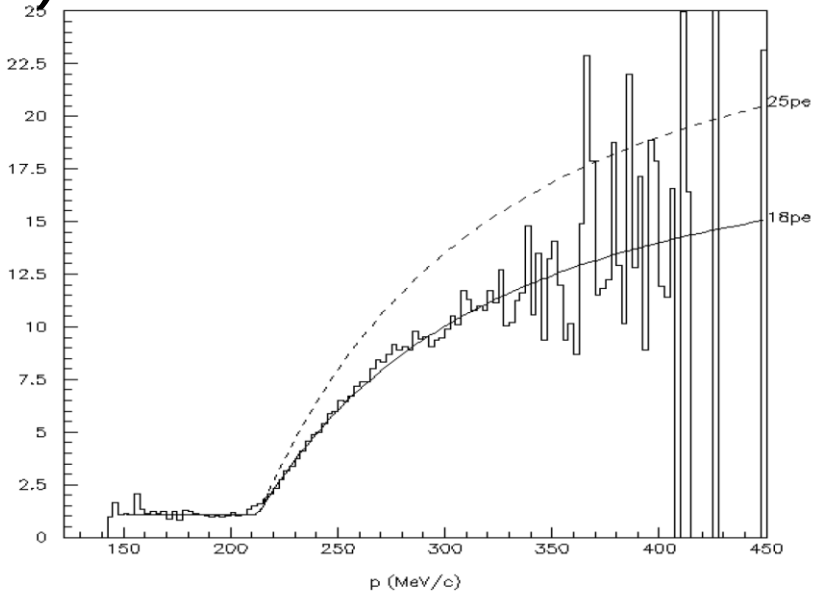
- TOF system (TOF0,TOF1,TOF2) working smoothly
- One PMT found broken after TOF1 shielding operation
- During installation of PRY and installation of tracker, some cables were damaged and had to be fixed
- Some mapping problems between software and hardware (flip of vertical/horizontal + 1 bar flipped)



CKOV

- HV channels moved to EMR high voltage crate
- Calibration muon/pion distributions as function momentum (MICE Note 473)

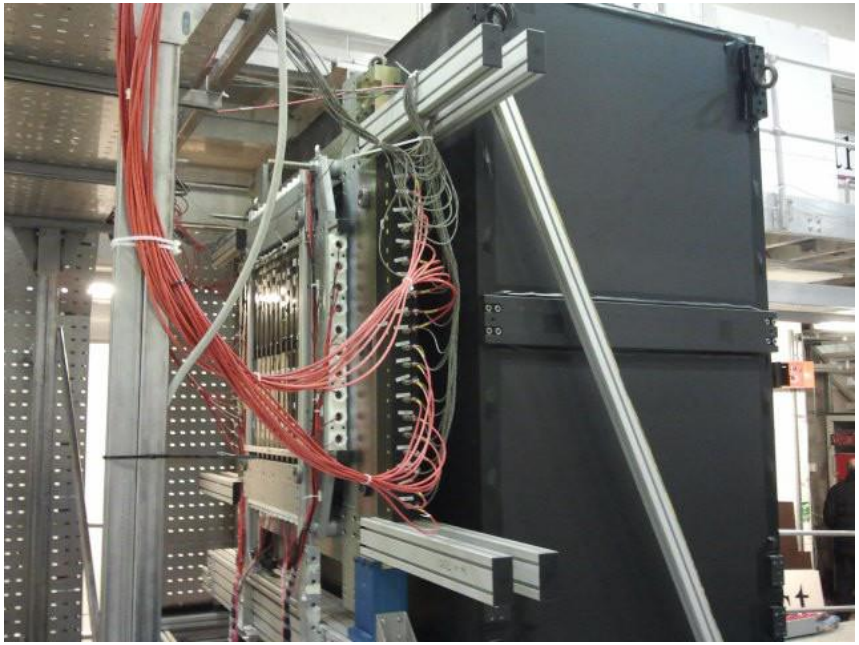


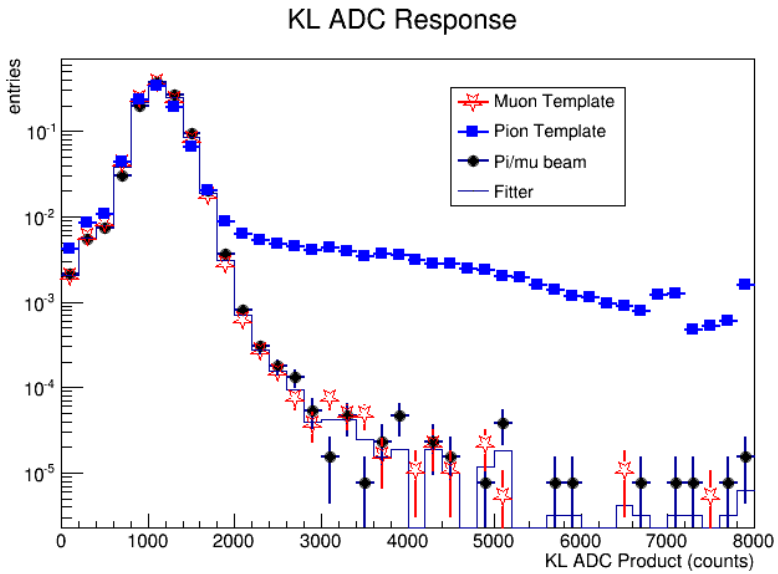


- Photoelectron modelling shows
  - CKOVA muon threshold: 272 MeV/c, n_A=1.073
  - CKOVB muon threshold: 213 MeV/c, n_B=1.116

KL

- Remaining hardware:
  - Final Step IV position after PRY installation during shutdown week in July
  - Detector has been working well and was used in pion contamination paper
  - New calibrations and surveys carried out



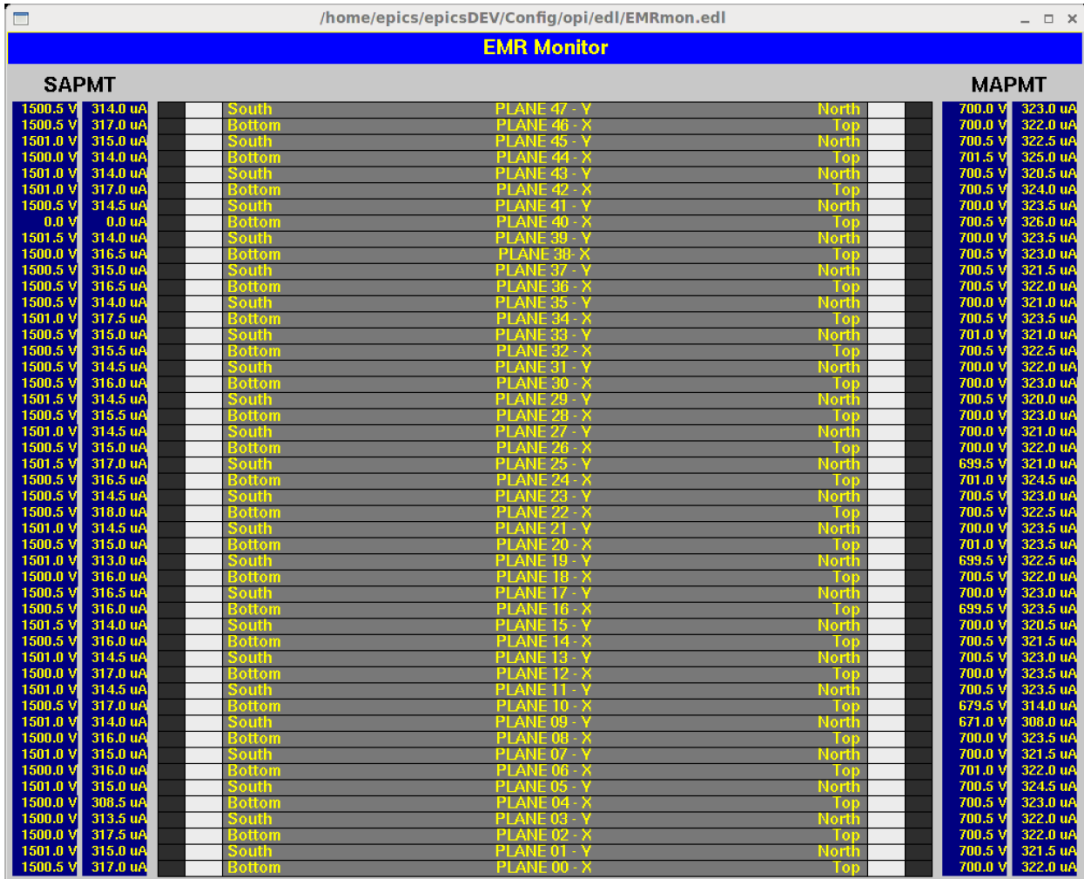


EMR

- October 2014:
  - EMR hardware extensively upgraded: new Hamamatsu R6427 PMTs, new rack, AC fan system, remote controlled AC power supply, HV PSU (PMTs), LV PSU, new VME and NIM crates
- Other issues fixed since October 2014:
  - 1 VHDC fails to configure FEBs, HV PSU did not start, LED not working (LV PSU changed), cosmic DAQ code bugs, two noisy FE boards, one single-anode PMT faulty and fixed

EMR

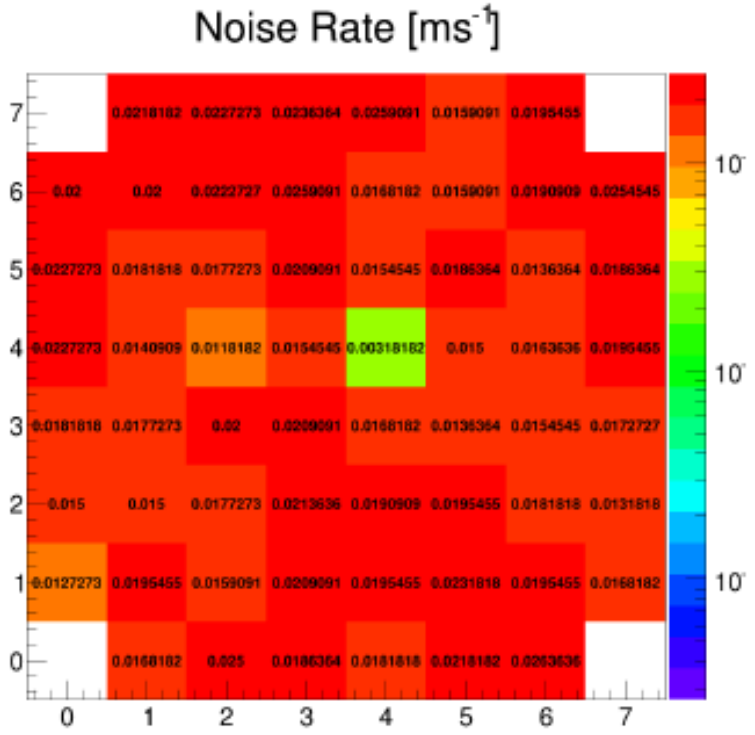
- Other issues fixed since October 2014:
  - HV PSU: 48 channels for SAPMTs (1500 V) and 48 channels for MAPMTs (700 V) remotely controlled

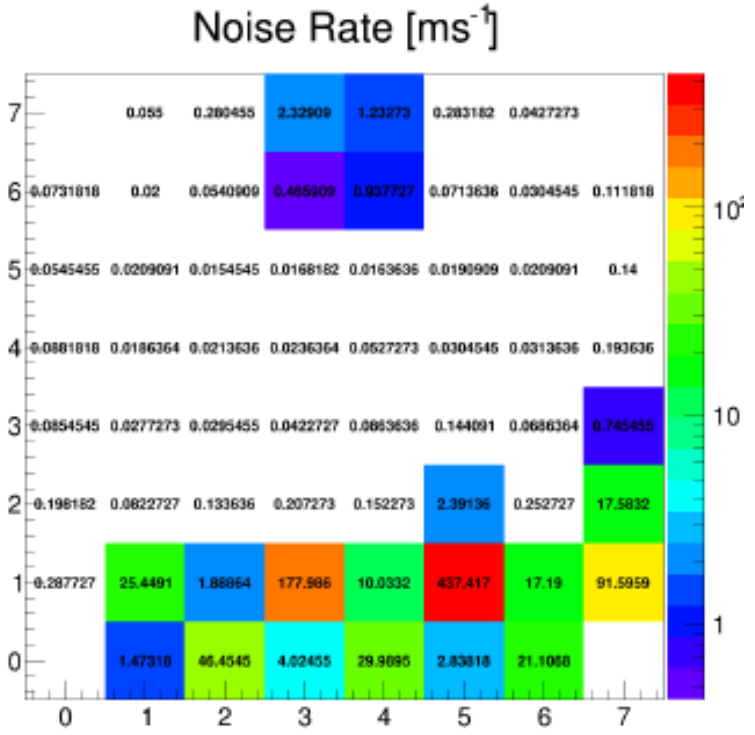


SAPMT					MAPMT	
1500.5 V	314.0 uA	South	PLANE 47 - Y	North	700.0 V	323.0 uA
1500.5 V	317.0 uA	Bottom	PLANE 46 - X	Top	700.0 V	322.0 uA
1501.0 V	315.0 uA	South	PLANE 45 - Y	North	700.5 V	322.5 uA
1500.0 V	314.0 uA	Bottom	PLANE 44 - X	Top	701.5 V	325.0 uA
1501.0 V	314.0 uA	South	PLANE 43 - Y	North	700.5 V	320.5 uA
1501.0 V	317.0 uA	Bottom	PLANE 42 - X	Top	700.5 V	324.0 uA
1500.5 V	314.5 uA	South	PLANE 41 - Y	North	700.0 V	323.5 uA
0.0 V	0.0 uA	Bottom	PLANE 40 - X	Top	700.5 V	326.0 uA
1501.5 V	314.0 uA	South	PLANE 39 - Y	North	700.0 V	323.5 uA
1500.0 V	316.5 uA	Bottom	PLANE 38 - X	Top	700.5 V	323.0 uA
1500.5 V	315.0 uA	South	PLANE 37 - Y	North	700.5 V	321.5 uA
1500.5 V	316.5 uA	Bottom	PLANE 36 - X	Top	700.5 V	322.0 uA
1500.5 V	314.0 uA	South	PLANE 35 - Y	North	700.0 V	321.0 uA
1501.0 V	317.5 uA	Bottom	PLANE 34 - X	Top	700.5 V	323.5 uA
1500.5 V	315.0 uA	South	PLANE 33 - Y	North	701.0 V	321.0 uA
1500.5 V	315.5 uA	Bottom	PLANE 32 - X	Top	700.5 V	322.5 uA
1500.5 V	314.5 uA	South	PLANE 31 - Y	North	700.0 V	322.0 uA
1500.5 V	316.0 uA	Bottom	PLANE 30 - X	Top	700.0 V	323.0 uA
1501.5 V	314.5 uA	South	PLANE 29 - Y	North	700.5 V	320.0 uA
1500.5 V	315.5 uA	Bottom	PLANE 28 - X	Top	700.0 V	323.0 uA
1501.0 V	314.5 uA	South	PLANE 27 - Y	North	700.0 V	321.0 uA
1500.5 V	315.0 uA	Bottom	PLANE 26 - X	Top	700.0 V	322.0 uA
1501.5 V	317.0 uA	South	PLANE 25 - Y	North	699.5 V	321.0 uA
1500.5 V	316.5 uA	Bottom	PLANE 24 - X	Top	701.0 V	324.5 uA
1500.5 V	314.5 uA	South	PLANE 23 - Y	North	700.5 V	323.0 uA
1500.5 V	318.0 uA	Bottom	PLANE 22 - X	Top	700.5 V	322.5 uA
1501.0 V	314.5 uA	South	PLANE 21 - Y	North	700.0 V	323.5 uA
1500.5 V	315.0 uA	Bottom	PLANE 20 - X	Top	701.0 V	323.5 uA
1501.0 V	313.0 uA	South	PLANE 19 - Y	North	699.5 V	322.5 uA
1500.0 V	316.0 uA	Bottom	PLANE 18 - X	Top	700.5 V	322.0 uA
1500.5 V	316.5 uA	South	PLANE 17 - Y	North	700.0 V	323.0 uA
1500.5 V	316.0 uA	Bottom	PLANE 16 - X	Top	699.5 V	323.5 uA
1501.5 V	314.0 uA	South	PLANE 15 - Y	North	700.0 V	320.5 uA
1500.5 V	316.0 uA	Bottom	PLANE 14 - X	Top	700.5 V	321.5 uA
1501.0 V	314.5 uA	South	PLANE 13 - Y	North	700.5 V	323.0 uA
1500.0 V	317.0 uA	Bottom	PLANE 12 - X	Top	700.0 V	323.5 uA
1501.0 V	314.5 uA	South	PLANE 11 - Y	North	700.5 V	323.5 uA
1500.5 V	317.0 uA	Bottom	PLANE 10 - X	Top	679.5 V	314.0 uA
1501.0 V	314.0 uA	South	PLANE 09 - Y	North	671.0 V	308.0 uA
1500.0 V	316.0 uA	Bottom	PLANE 08 - X	Top	700.0 V	323.5 uA
1501.0 V	315.0 uA	South	PLANE 07 - Y	North	700.0 V	321.5 uA
1500.0 V	316.0 uA	Bottom	PLANE 06 - X	Top	701.0 V	322.0 uA
1501.0 V	315.0 uA	South	PLANE 05 - Y	North	700.5 V	324.5 uA
1500.0 V	308.5 uA	Bottom	PLANE 04 - X	Top	700.5 V	323.0 uA
1500.0 V	313.5 uA	South	PLANE 03 - Y	North	700.5 V	322.0 uA
1500.0 V	317.5 uA	Bottom	PLANE 02 - X	Top	700.5 V	322.0 uA
1501.0 V	315.0 uA	South	PLANE 01 - Y	North	700.5 V	321.5 uA
1500.5 V	317.0 uA	Bottom	PLANE 00 - X	Top	700.0 V	322.0 uA

EMR

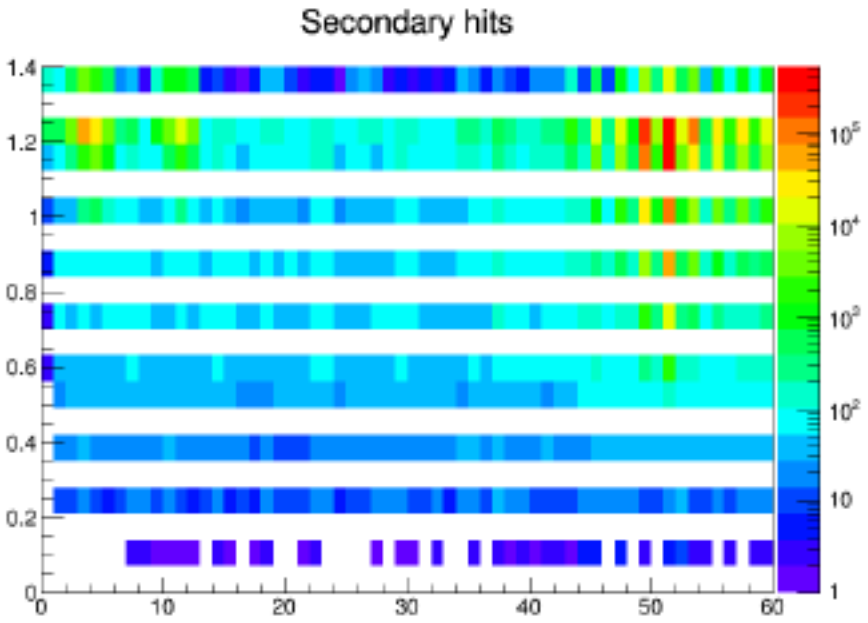
- Noise in SAPMTs:
  - 39 planes with vey little noise (< 1 ms^{-1})
  - 7 somewhat noisy planes (< 100 ms^{-1})
  - 2 very noisy planes (> 100 ms^{-1})



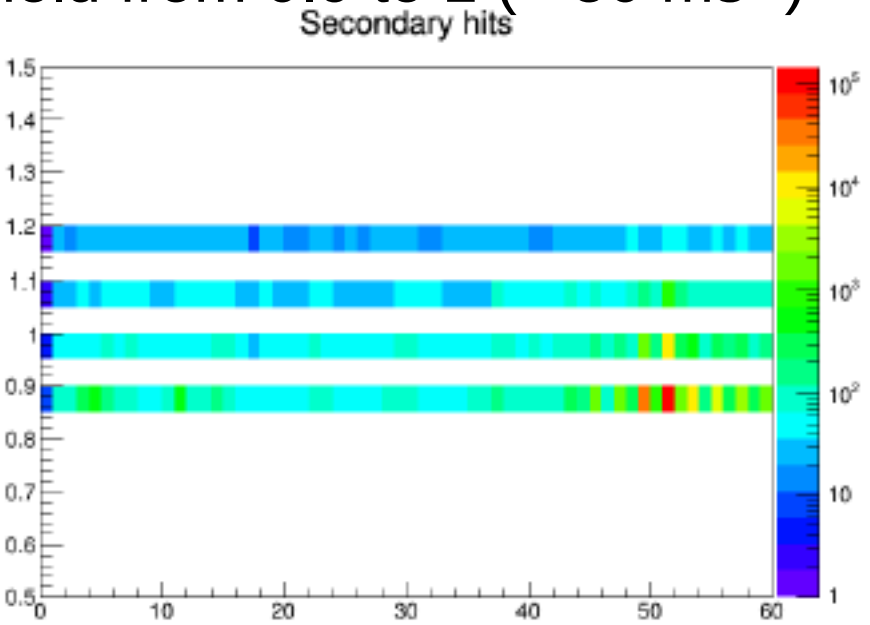


EMR

- Noise in SAPMTs:
  - Reduce gain of noisy MAROC channels ~0.75 (< 50 ms^{-1})
  - Increase discriminator threshold from 0.9 to 1 (< 50 ms^{-1})



Reduction gain

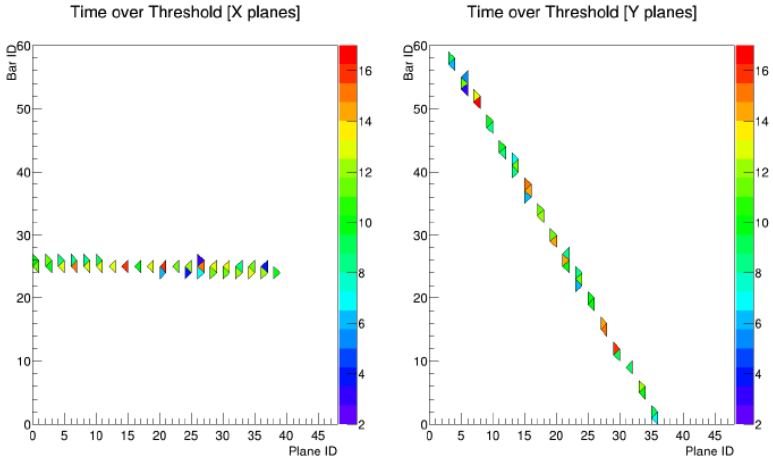


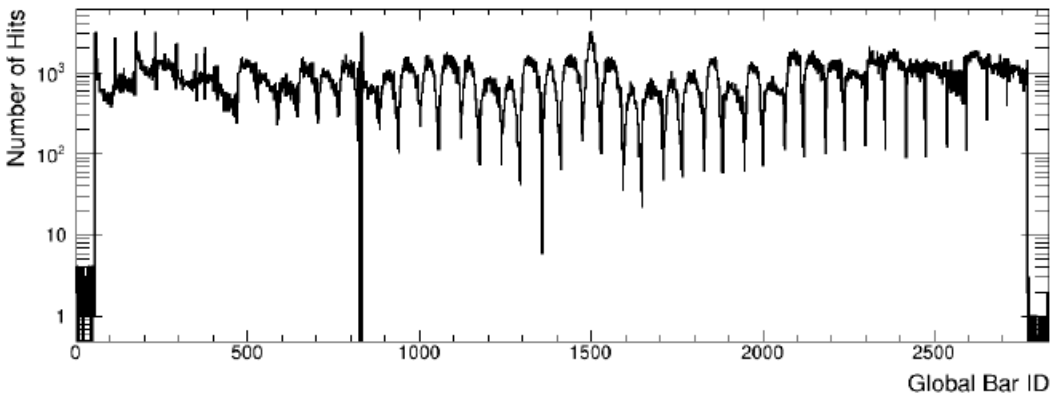
Increase threshold

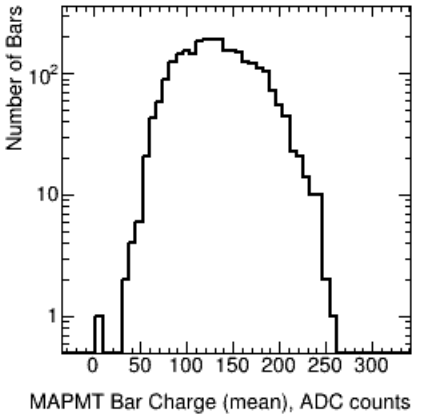
  - Origin noise unclear (FEB, MAPMT?): noise does not overflow DBB buffer at the moment by reducing gain

EMR

- EMR charge calibration:
  - Require ~300k cosmics (~2-3 days)
  - Measure mean charge $\overline{Q}_{ij}$ and correction factor: $e_{ij} = \frac{\overline{Q}_{ij}}{\overline{Q}}$
  - Will require new calibrations after EMR movement in July







EMR

- Final status:
  - Over the reporting period the remote-controlled switch, the low-voltage power supplies and the high-voltage power supplies have been stable in operation.
  - A short manual has been written describing the remote operation of the different pieces of hardware in the EMR rack.
  - The NIM crate PSU failed and was replaced by a spare Wiener crate. A study of the noise in the 48 frontend boards was performed. Some boards were identified as “noisy” and will be replaced with spare front-end boards.