

HMPID

Stability in Run2 and perspective

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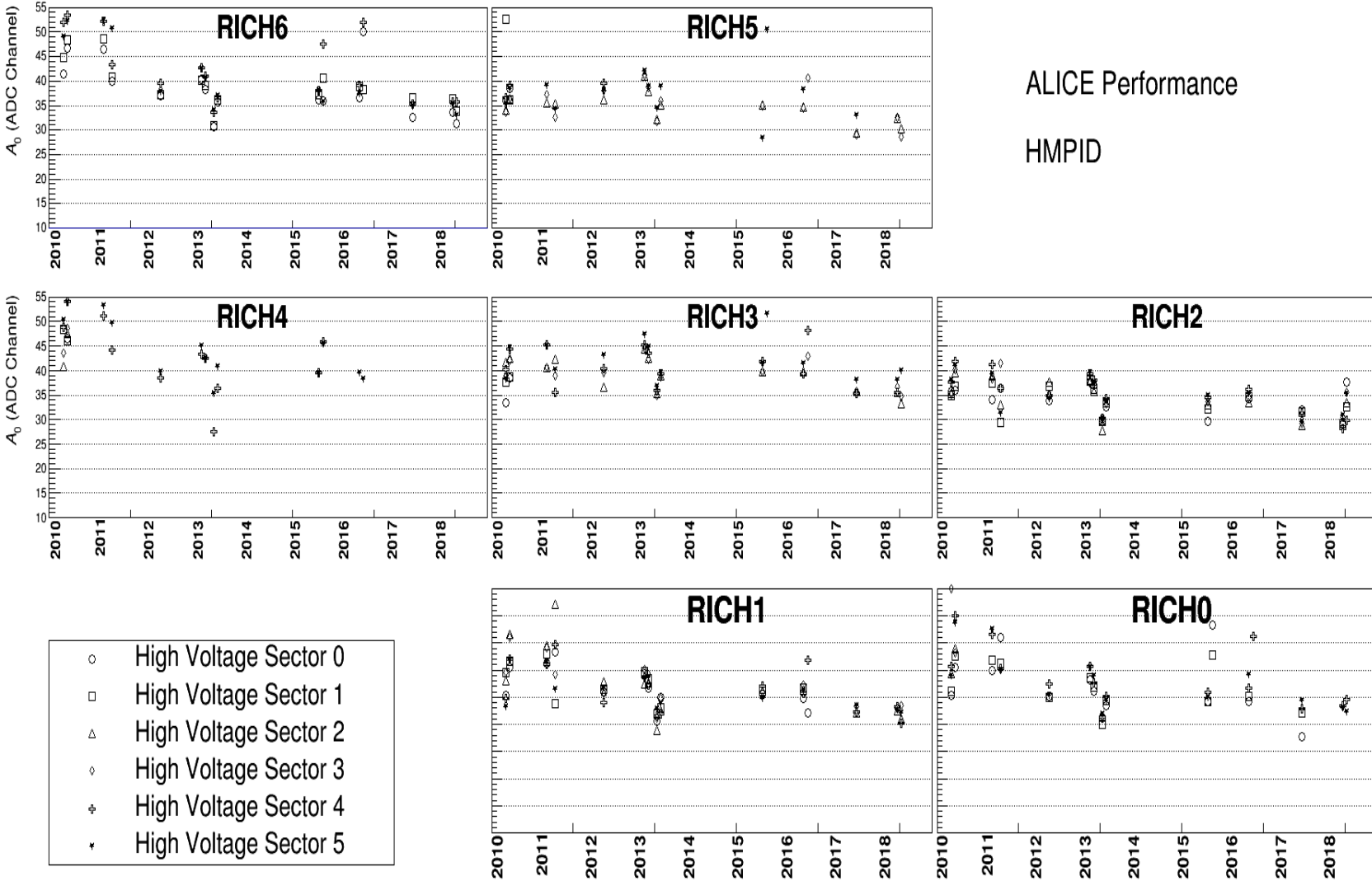


Detector Stability

The stability of the detector was studied by taking into consideration:

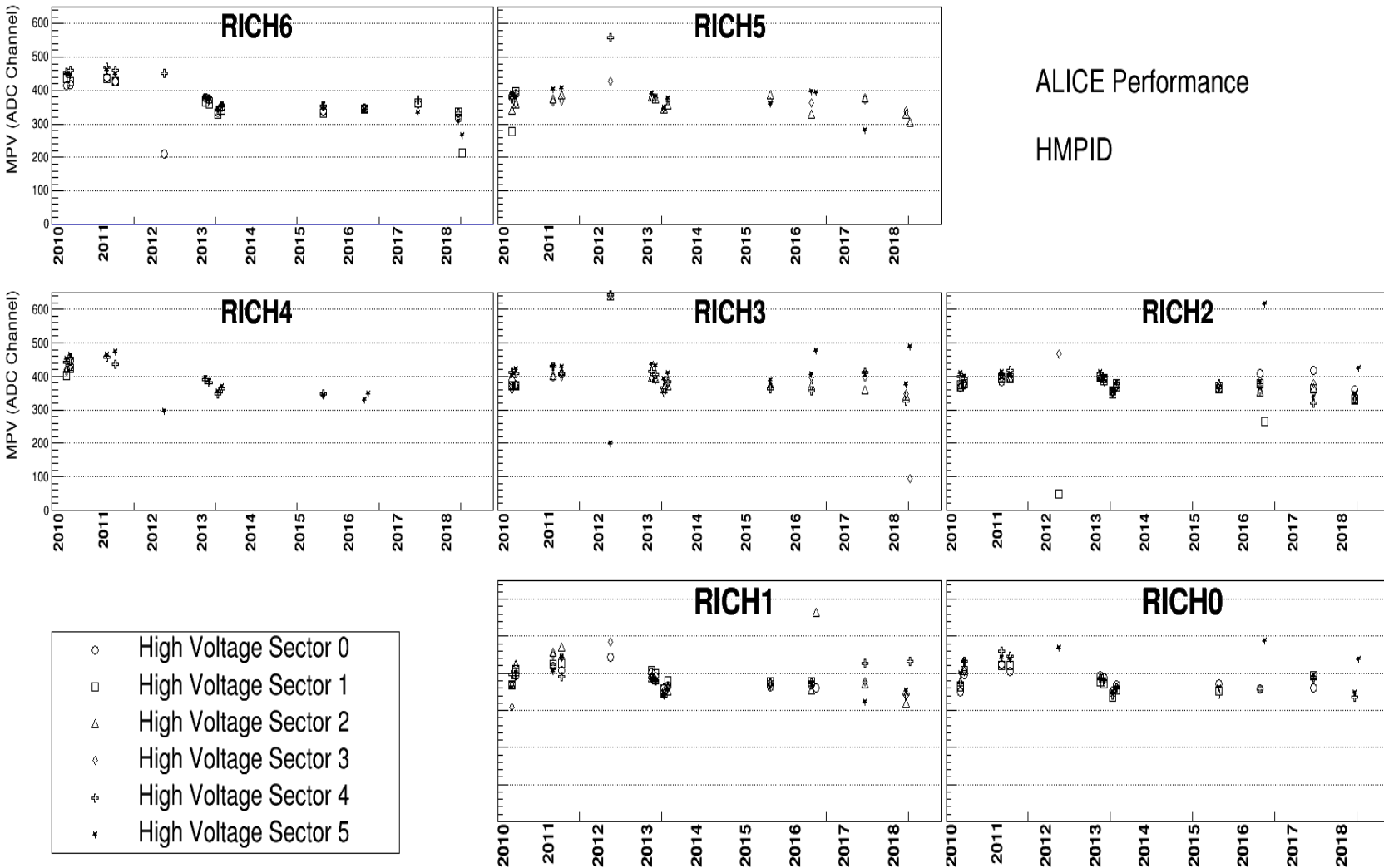
- The gas gain, A_0 per HV sectors.
- The MPV of the landau distribution of the MIP cluster charge distribution per HV sectors.
- The average number of reconstructed photons, N_{ph} , per photocathodes.

Gas gain



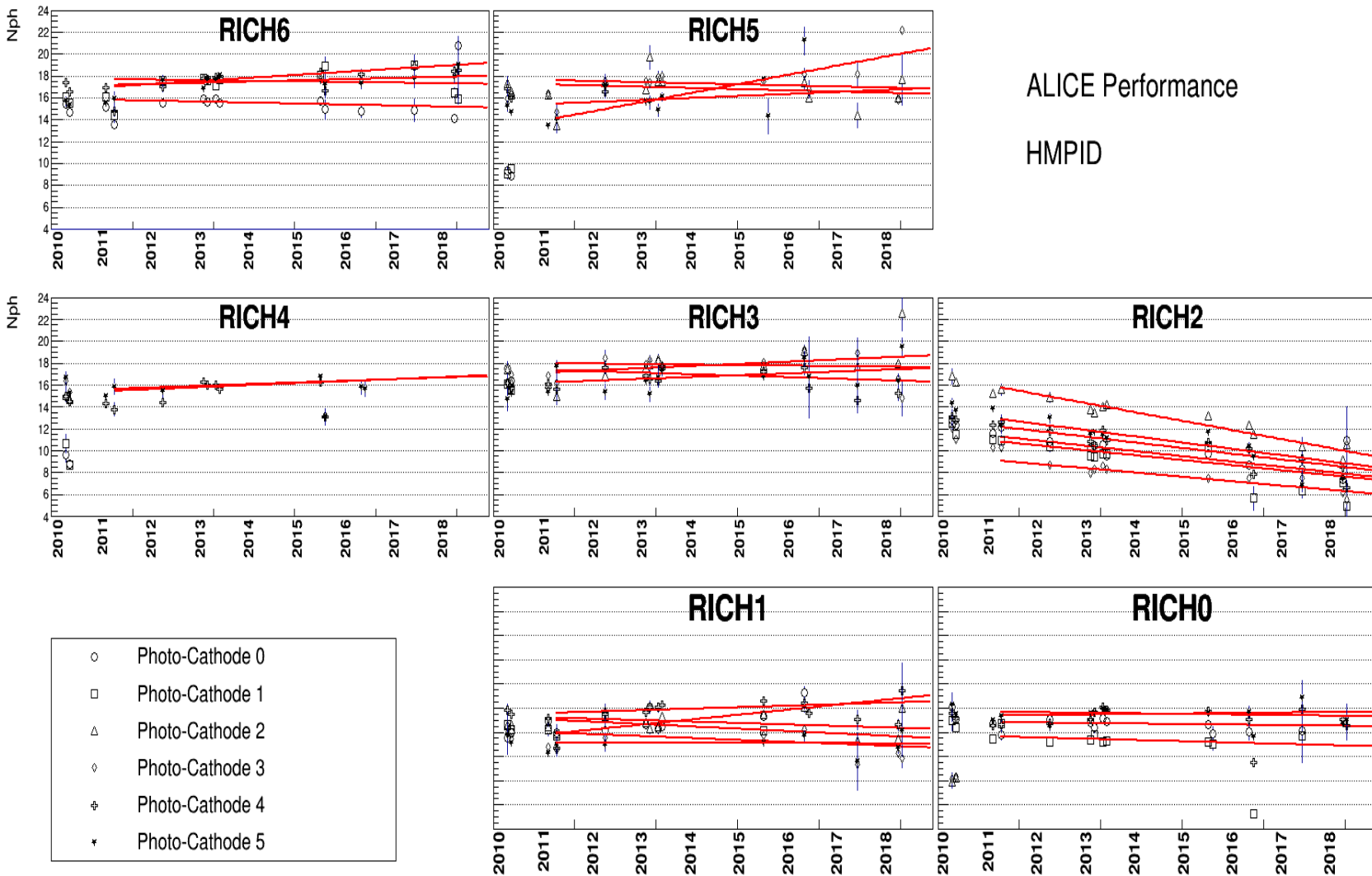
- The gas gain remained constant throughout the years with a $\pm 10\%$ variation during the 8 years of operation.

Most probable value



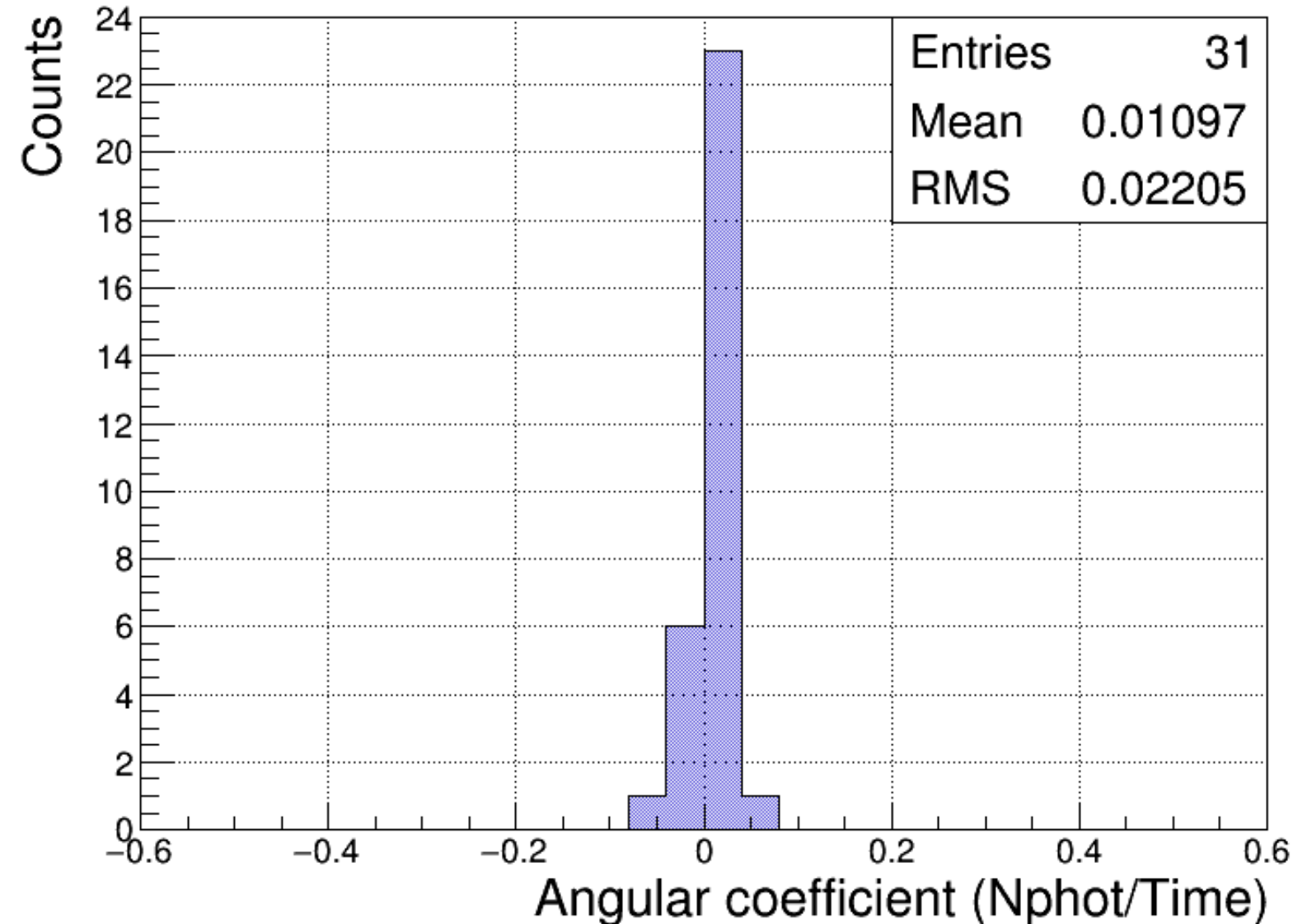
- The MPV of the landau distribution of the MIP charge clusters have also remained constant throughout the years.
- The slight decrease is believed to be accounted for by increasing the MWPC voltage.

Number of Photons



- The negative slope in RICH2, indicates a 30% drop in photocathodes 2 and 3.
- The drop is due to a re-evaporisation of the two photocathodes back in 2005.
- QE is deemed to stay constant throughout the years.

Angular coefficient



- A mean slope of zero is implied by the distribution of the angular coefficients of the fitted straight line of the N_{ph} graphs.
- Provides further evidence of the non-ageing process of the photocathodes.

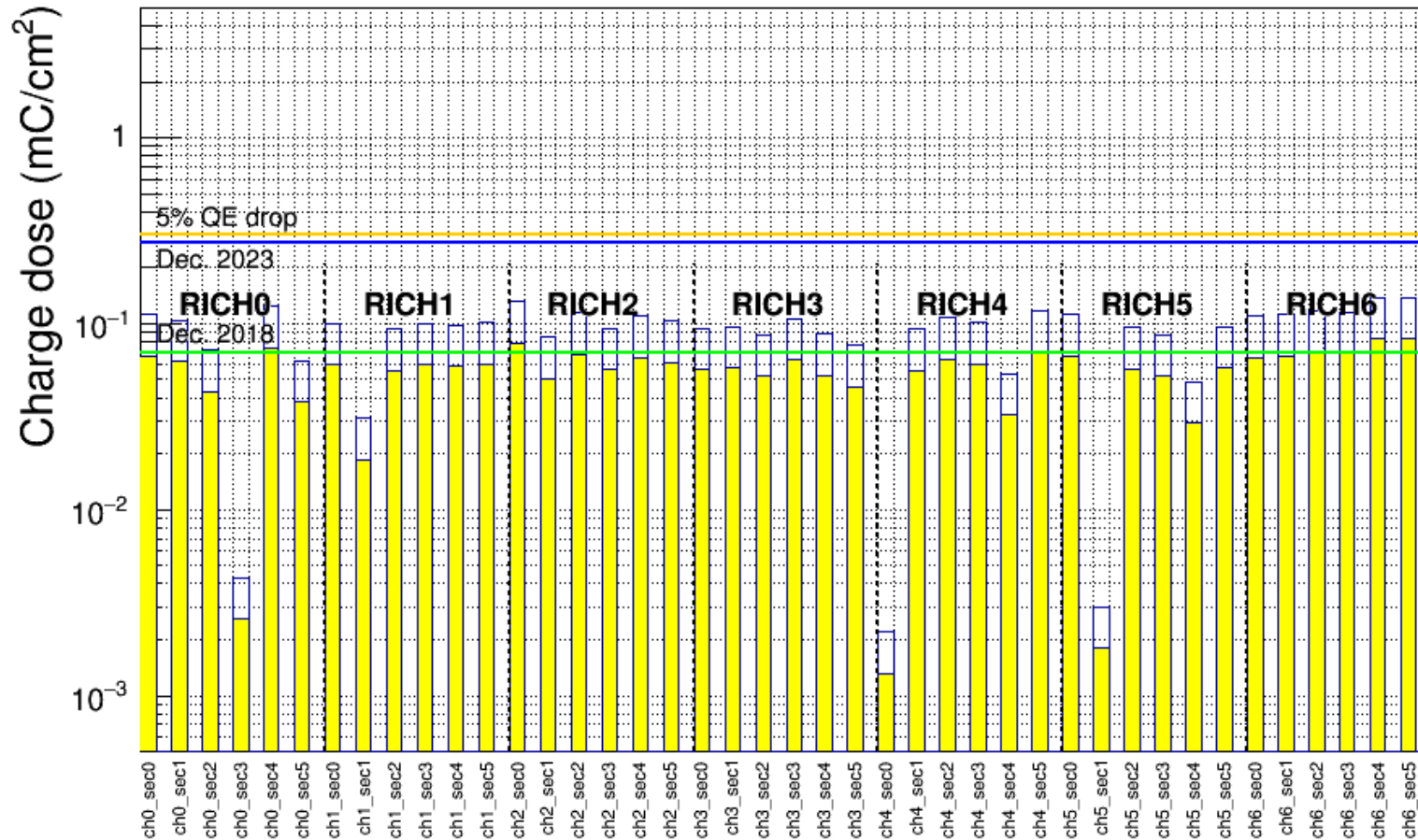


HMPID in Run3

- HMPID has shown an excellent stability and PID performance in Run2 and it is believed to show such excellence even in Run3.
- Such evidence is given by the Charge dose on the CsI cathodes per HV sector graph.
- The graph predicts that the HMPID detector will be able to operate until 2023 without any serious drop in the QE.

Charge dose per HV sector

hChargeSummary



- As denoted by the green line, the predictions done in 2015 for 2018 were correct.
- A plenty of margin is left for the detector to take readings till 2023.
- A maximum 5% drop is predicted, which could not influence the PID performance of the detector, which should be recovered by increase the voltage in the MWPC.



Summary

- HMPID has shown an excellent stability in Run2 as demonstrated by the A_0 , MPV and N_{ph} graphs, clearly indicating a non-ageing process.
- The HV of RICH2 has been increased by 10V in the MWPC to overcome the decreasing problem encountered, which data will soon be analysed to check the outcome of the increase.
- The charge dose predictions show that only a 5% drop is expected by 2023, thus not affecting the performance of the detector.
- The HMPID is expected to show the same excellence in Run3.

Run3

On Nov. the 1st The Physics Board has approved the HMPID scientific program for Run-3;

And on Nov. the 14th the Management Board has given the green light for the HMPID in Run-3;

HMPID