

FCAL photon energy range

Igal Jaegle

Thomas Jefferson National Accelerator Facility

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Introduction

Is the FADC voltage settings optimized for energetic photons (above 3 GeV)?

<https://logbooks.jlab.org/entry/3909028>

<https://logbooks.jlab.org/entry/3990094>

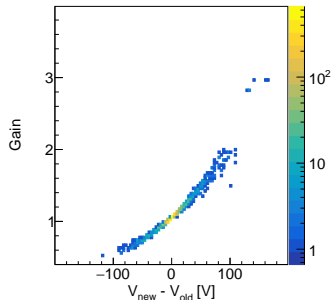
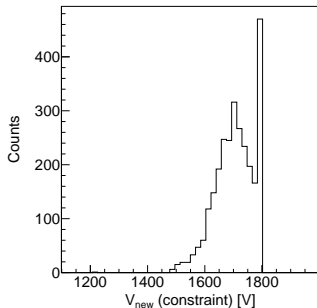
https://halldweb.jlab.org/primexd/be-phase2/period_8/be_phase2_method0_period_8.pdf

<https://logbooks.jlab.org/entry/3910786>

Acceptance holes, not due to a calibration issue, are showing up for energetic photons

HV distributions

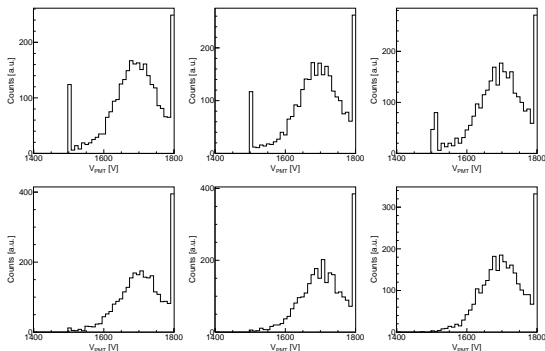
Large number of blocks set at the maximum HV, 1.8kV



~ 15% of FCAL HV blocks cannot be tuned properly

HV distributions

Again this is not a calibration issue and overtime number of FCAL blocks set to the maximum operation HV is increasing



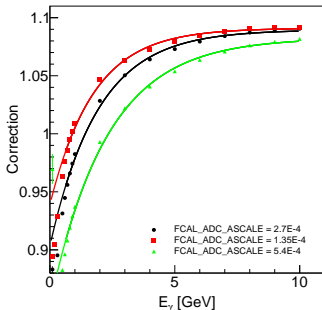
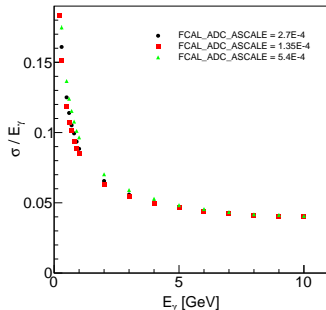
- Closewise from top left 2017-01, 2018-01, 2018-09, PrimEx, 2019, 2020
- Number of HV maximising out at 1.8kV increases dramatically between early 2017 and today

Solutions

Replace PMTs (underway)

An additional possibility change the FADC voltage settings from 2V to 1V

- Threshold will be increased by a factor 2
- Minimal impact on the energy resolution



Not applicable for the coming CCP and PrimEx runs but decreasing the setting to 1V will allow to decrease all HV by 100V