LMG Progress Report

Merrick Lavinsky

Florida Institute of Technology

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LMG updates

- Completed GEM QC4 test in LMG
  - HV scan for IV curve to ensure Ohmic response
  - Spurious noise rate
- Spurious rate as function of Threshold on discriminator
  - Reduced the rate to 200 Hz at operating voltage from 4kHz
- Reperformed QC4 on LMG with new threshold

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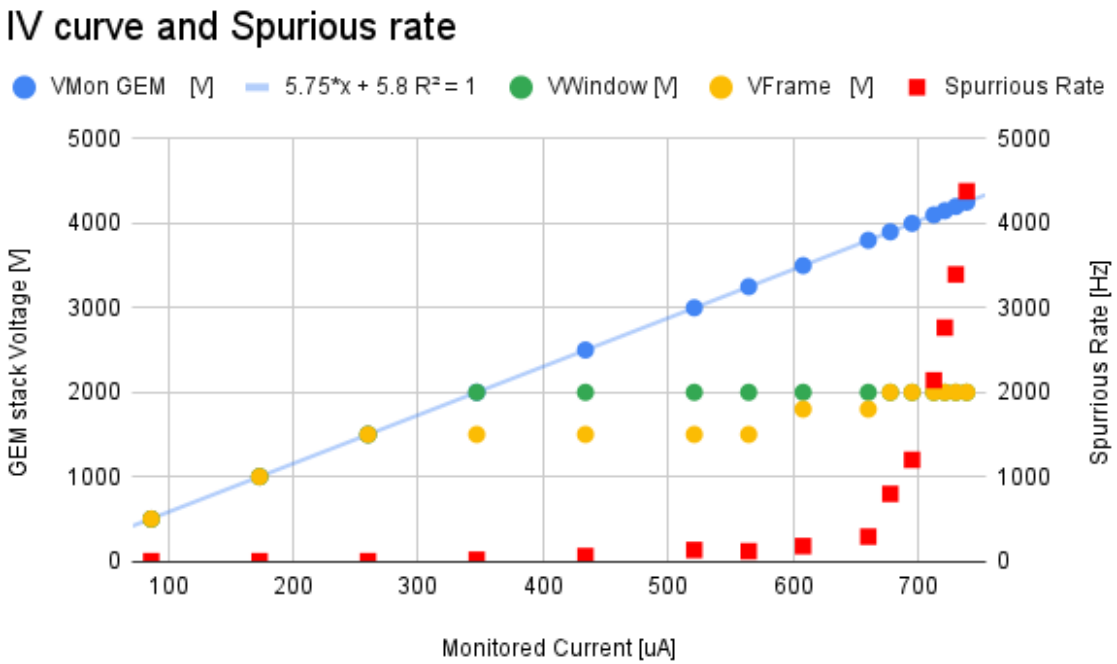
Inital QC4 results



Gas: CO_2 at 130 ml/min

Disc Threshold: 220 mV

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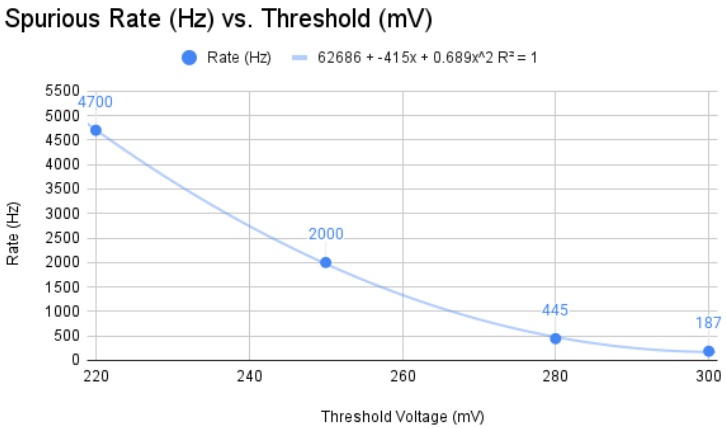
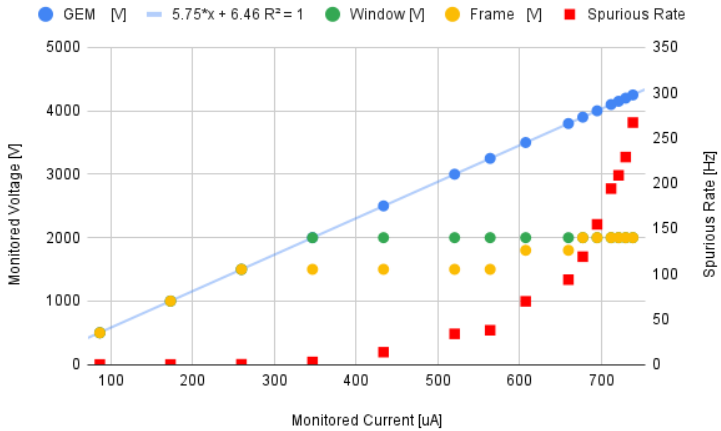
Threshold study and final QC4 results





Gas: CO_2 at 130 ml/min

new disc Threshold: 300 mV

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LMG plans

- Planned to complete QC5 on saturday

  - QC5 is measure signal rate and current from LMG from XRay gun to calculate gain

  - planned to do this on Tuesday, but the computer wasnt connecting to XRay gun nor CAEN unit, so im working on connection troubleshooting

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LMG Updates 2/12

- Performed QC5 "effective gain" on the LMG
  - Varied current in LMG from 700 - 770
  - Measured background and signal rate in SS region with AmpTek XRay gun
  - Measured current from SS region with picoammeter
- Results show that I need to measure higher voltages
  - 4400 is only the plateu

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QC5 results compared to expectation

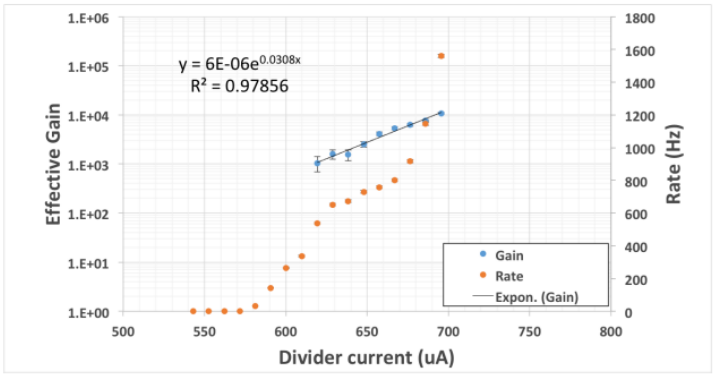
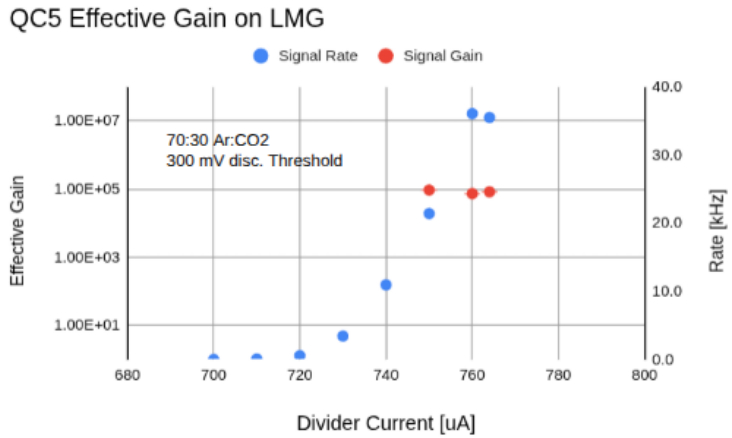
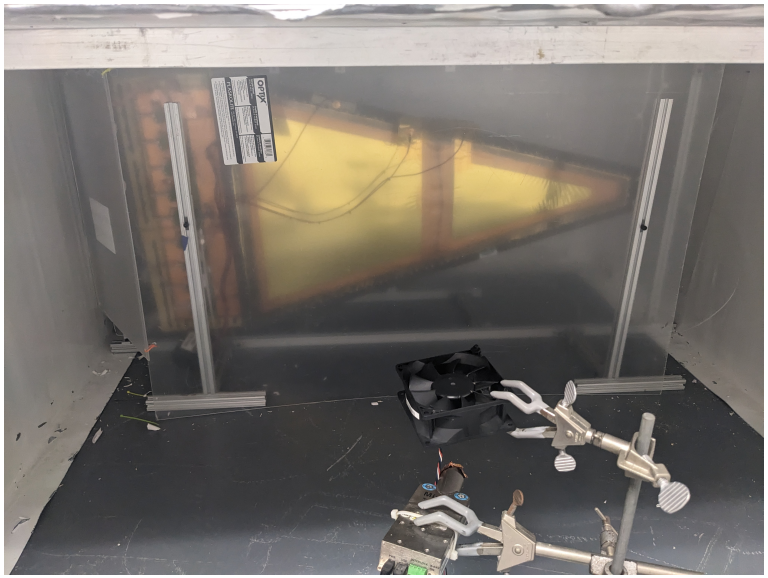
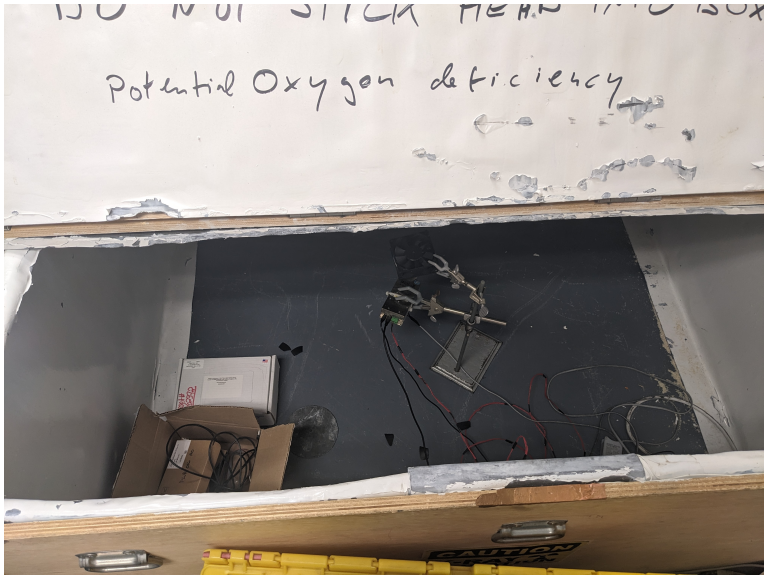


Figure 30: A successful QC5—Effective Gain plot.



Experimental setup





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Changes for next time

- I'll probably need to redo this test, but at least detector works still
- XRay gun seems too close
  - Rate is too high
  - Or put more copper tape on the tip
- Go to higher voltages

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Research updates 2/26

- Computer died for XRay box
  - Midway through test, computer died
  - Reinstalled software onto other laptop
- Previous results for a 3/2/2/2 GEM gain curve

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Previous 3/2/2/2 results and mine

published results

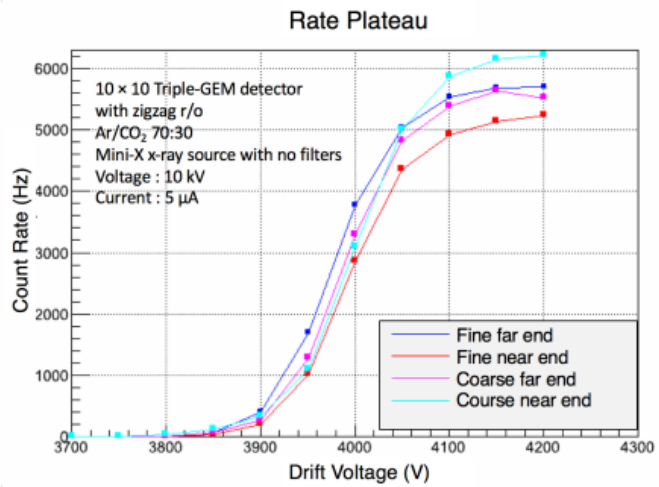

Figure 3.8: The rate plateau for the four reference points starts at 4100 V.