GCRF – RHUL CMOS Update

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OV7670 Camera Module with Arduino

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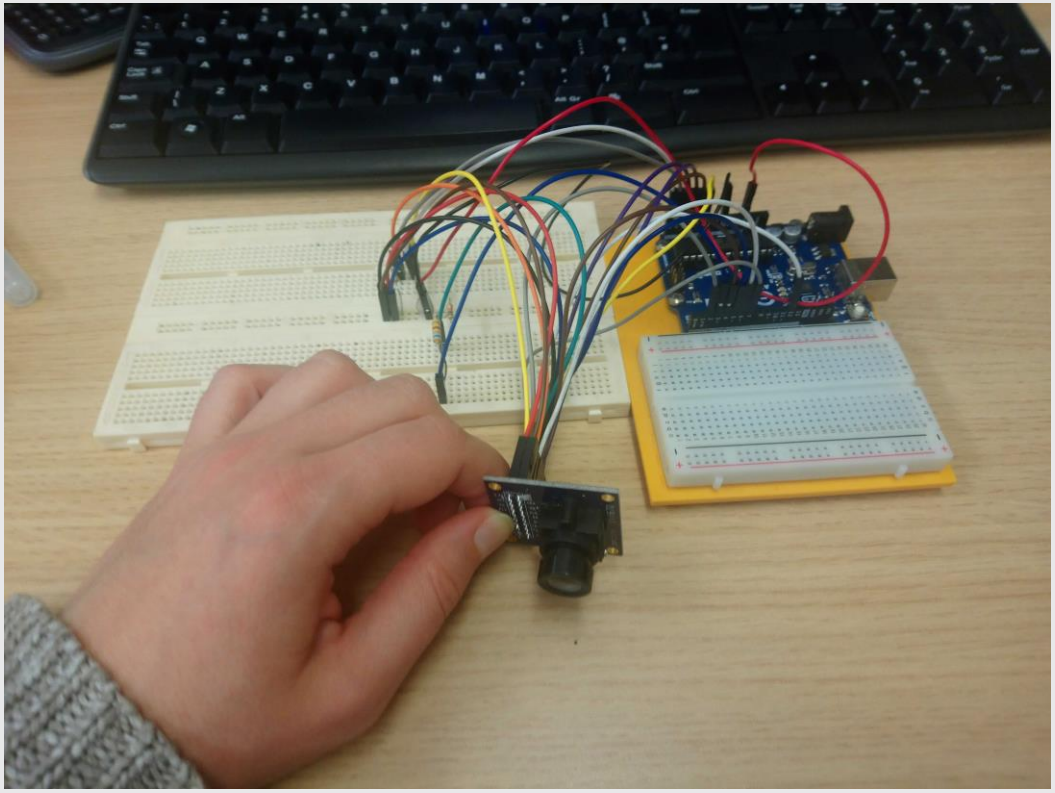
- Followed a tutorial to attempt to capture images with a small image sensor
- This is the Arduino and camera module connected:



OV7670 Camera Module with Arduino

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- And these are the first images obtained with it:

Expectation

Reality

OV7670 Camera Module with Arduino

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- According to the tutorial, the Arduino Uno cannot handle the 1 Mb/s baud rate.
- I tried using different image resolutions (320x240 and 160x120), but obtained similar results
- Interestingly, this problem does not exist with Chinese Arduino clones, so this may be something to consider purchasing
- I also had to reconnect the camera to the Arduino several times, so these glitches on the images could also be due to damaged cables

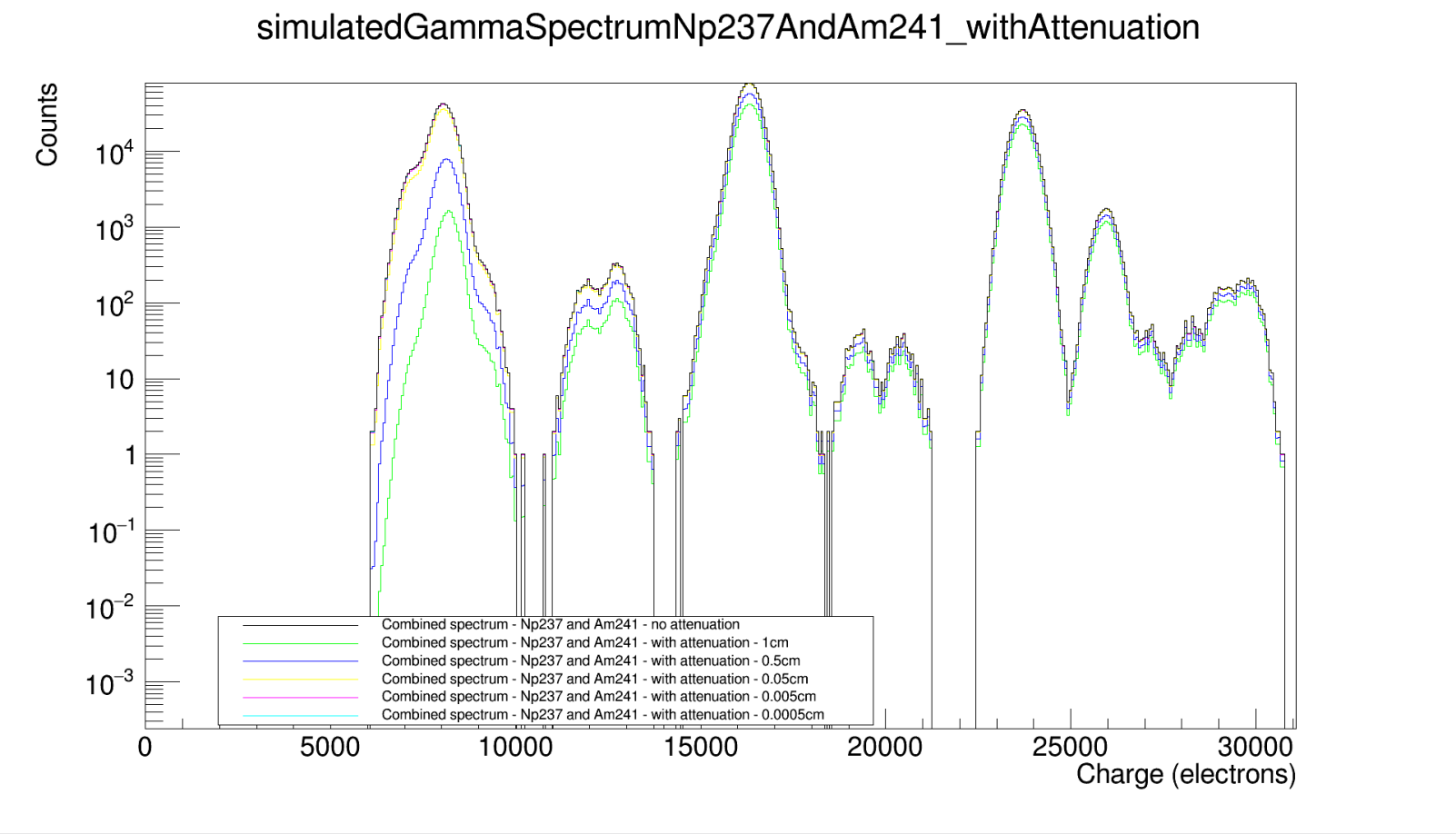
Am241 attenuation with CMOS

- Want to find thickness of silicon in CMOS
- Can do so by using attenuation coefficient of the material and simulate what am241 energy spectrum looks like at different distances
- Beer-Lambert law: $I = I_0 e^{-\left(\frac{\mu}{\rho_m}\right)\rho_m l}$ ($\left(\frac{\mu}{\rho_m}\right)$ is attenuation coefficient, ρ_m is the density of the material and l is thickness of material

For our experiment:

- $\left(\frac{\mu}{\rho_m}\right)$ - total attenuation without coherent scattering
- ρ_m - $2.33 g/cm^3$
- l – varying lengths, from 1cm to 0.0005cm

Am241 – simulated attenuation spectrum



Energy Spectrum for Am241+Np237 after attenuation from sensor

Am241 – simulated attenuation spectrum

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- Currently subtracting no attenuation from attenuated plots to understand what gets stopped by the silicon
- Will then compare this with real am241 data