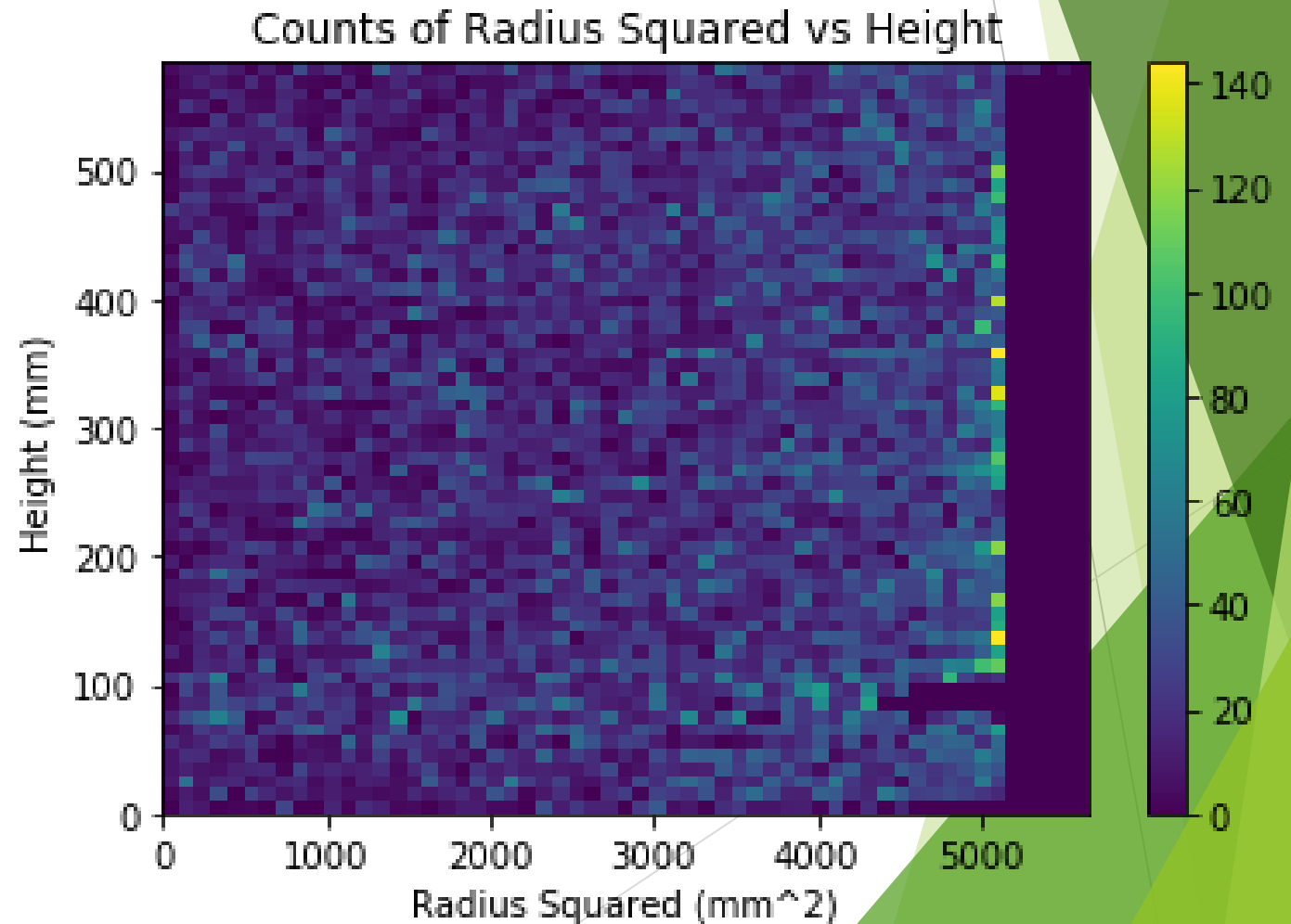# What I Am Doing

Simulating Co60 Decays in the Forward Field Region

Today's Slide is Here

Plots!

Concerns
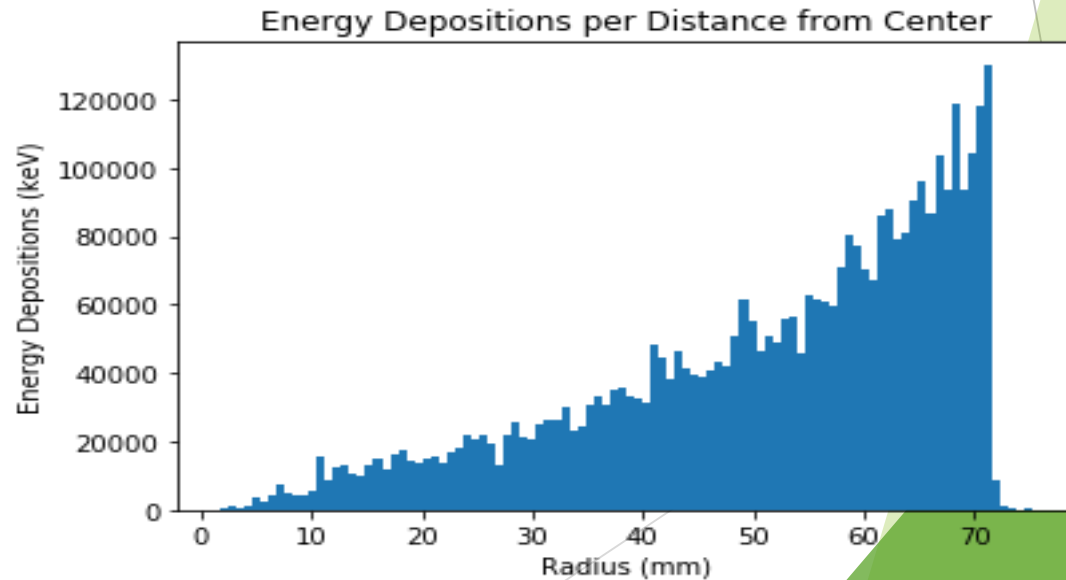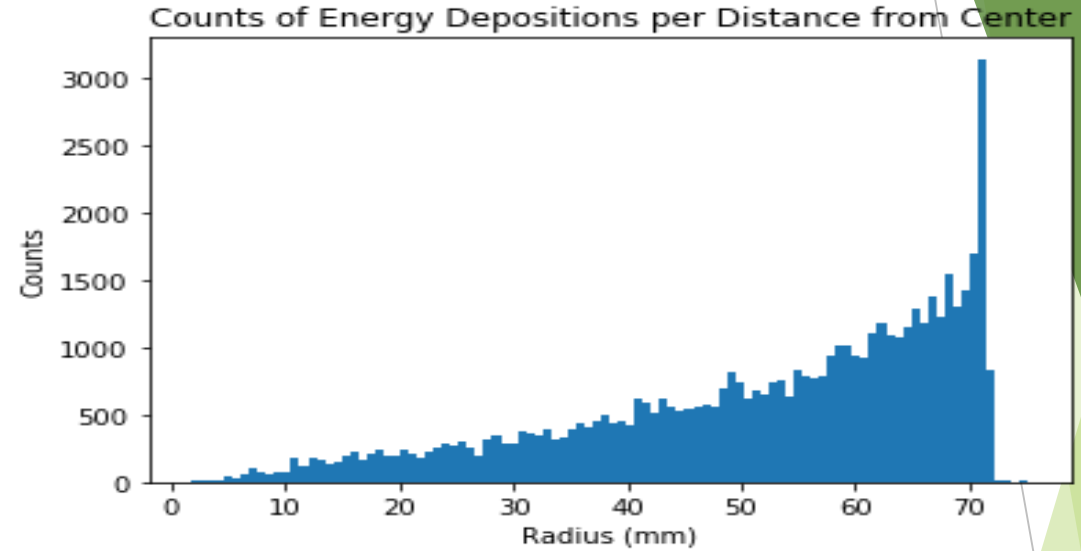
- Time threshold?
- Does not line up exactly with parameters (especially height)
- Gap at 100mm height

Counts of Radius Squared vs Height

Still To Do

- Fix Current Issues
- Use Energy Values Instead of Counts
- Try Simulating Decays from Bottom
- Possibly other Materials?

# Energy Depositions and Correct Dimensions
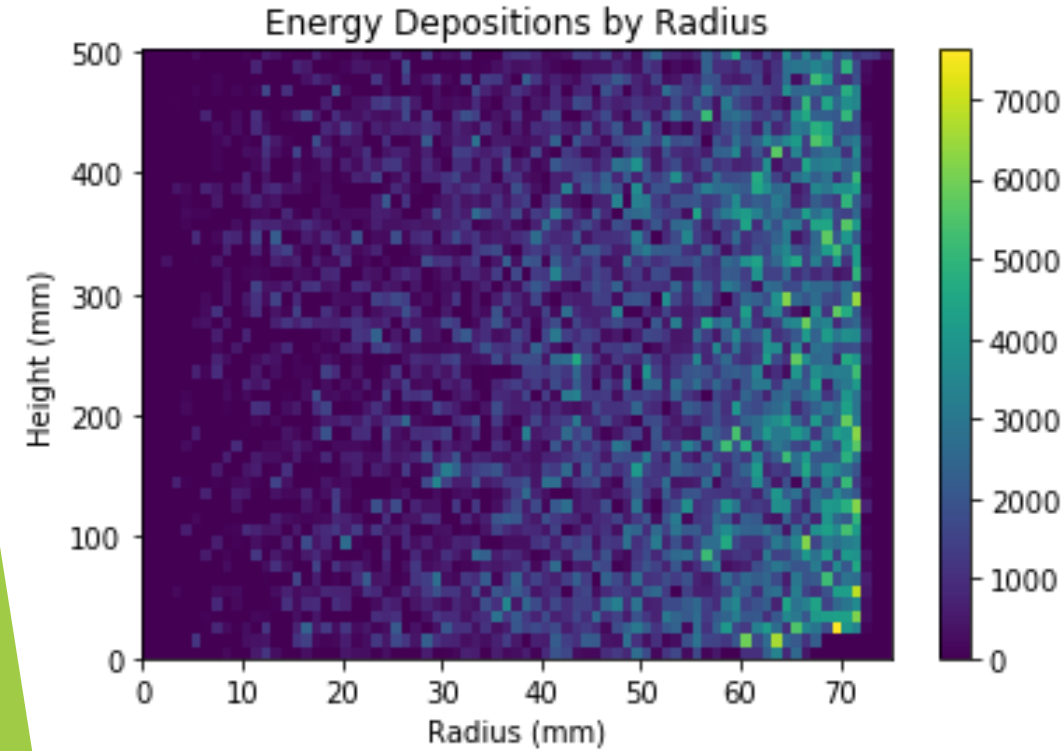
Still To Do

- Find decay rates in area
- Fix geometry problems
- Other materials?

Thermal Neutron Scattering

- https://indico.cern.ch/event/245281/contributions/1564676/attachments/420136/583408/thermal_physics_validation_argarcia.pdf

- http://pubs.cnl.ca/doi/pdf/10.12943/CNR.2017.00002

Average Energy Deposition

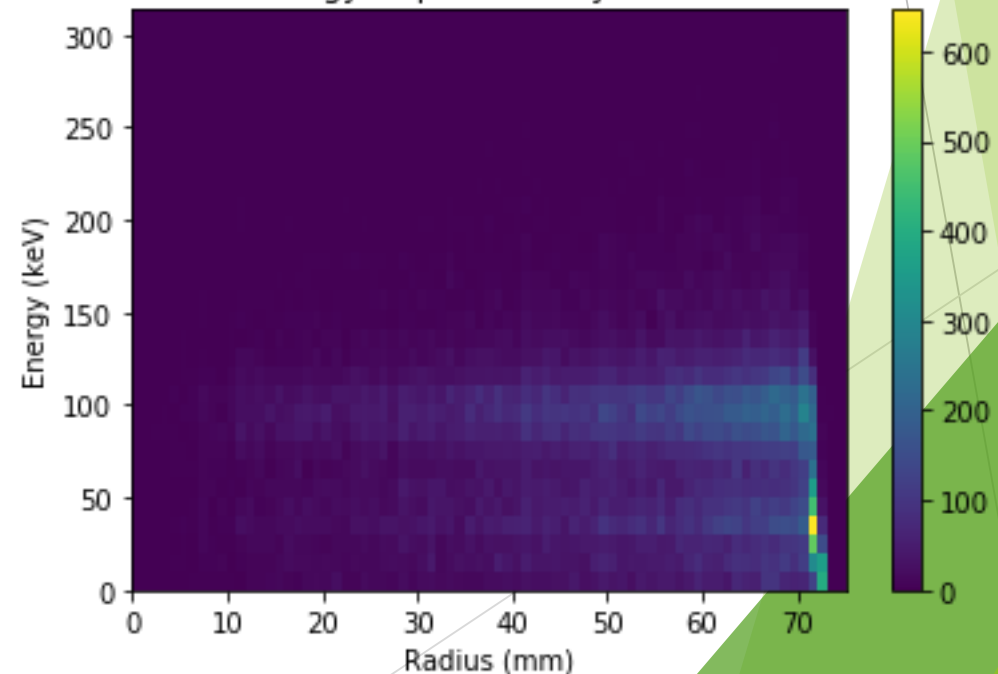Average Energy Deposition per Event by Radius (Pre-Clustering)
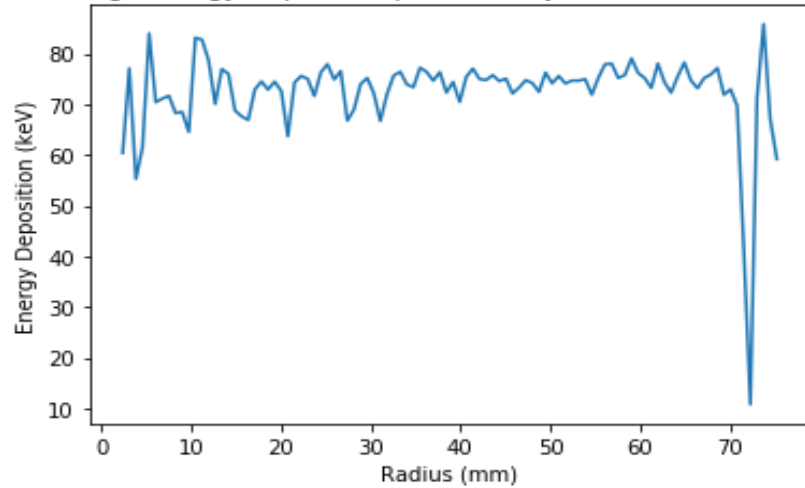
Average ED (Blue) and Total ED(Red) by Radius (Pre-Clustering)
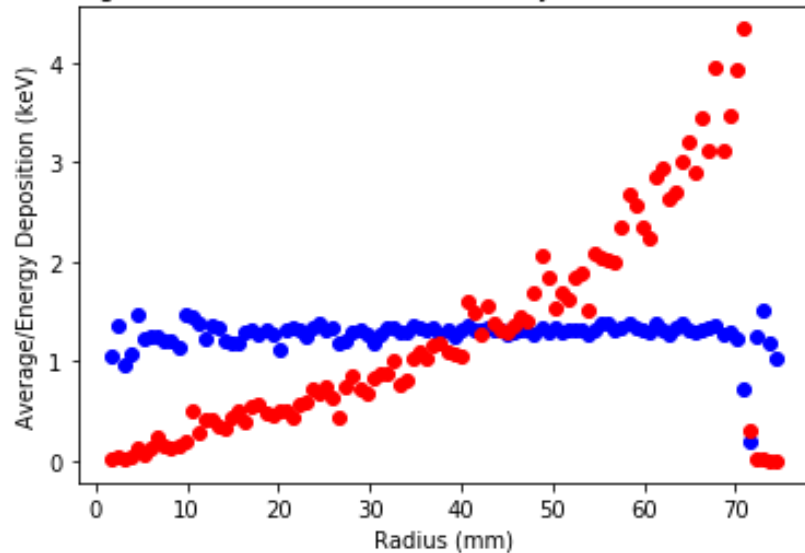
➢ Why is there so little energy degradation until it is close to the center?
➢ Why is there a sudden drop at the edge, but regular events past it?
➢ Why are there so many small-energy events at the edge, but fewer later on?
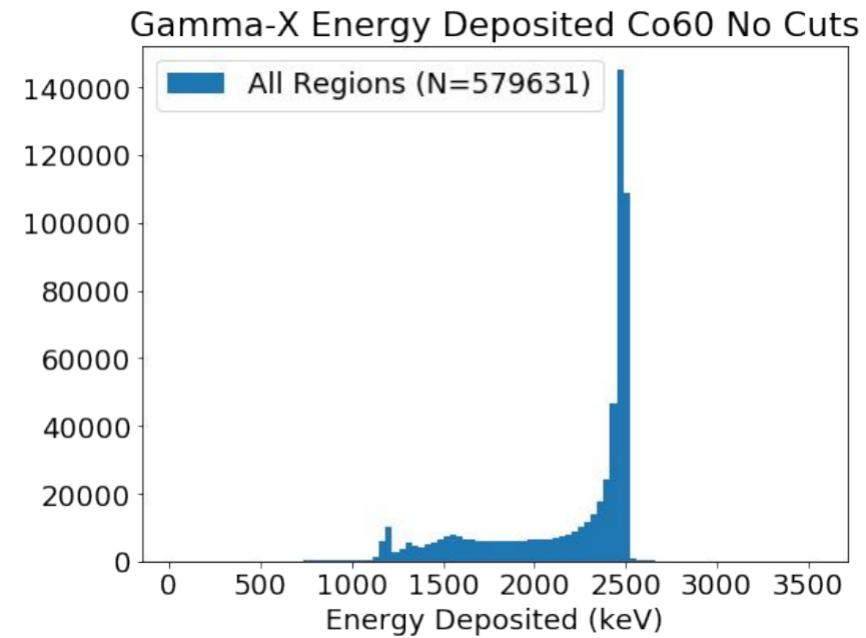

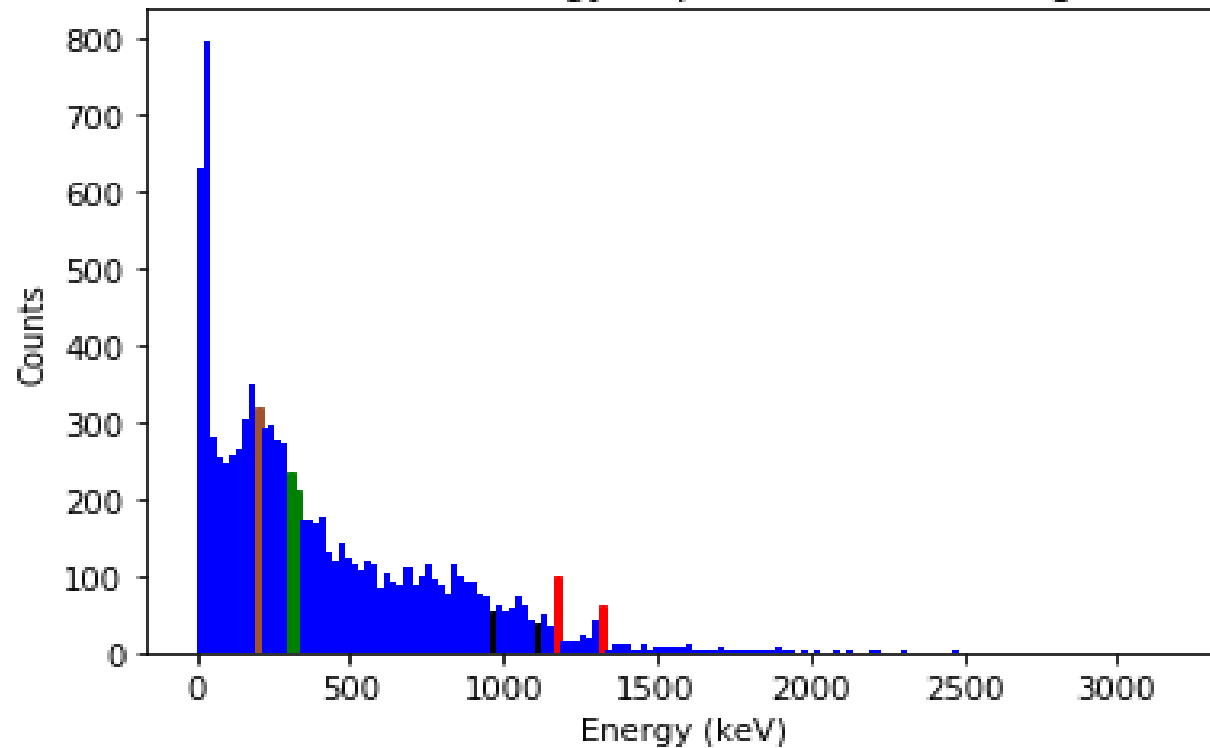Energy Depositions by Radius

Energy Histogram Very Far Off

Mine

Jonathan's

Counts of Energy Depositions (Pre-Clustering)
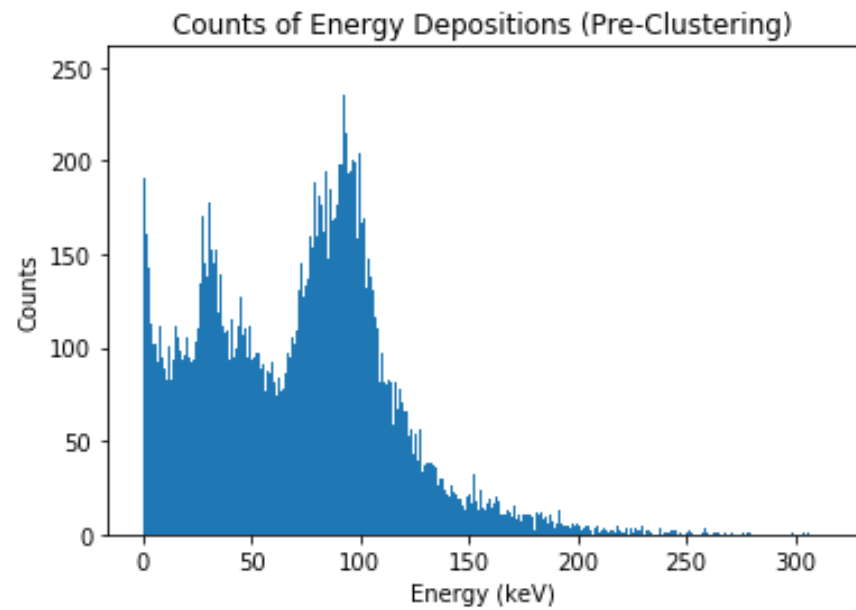
Gamma-X Energy Deposited Co60 No Cuts

Now With Clustering

Post-Clustering

Counts of Energy Depositions (Clustering)

Expected Values (keV)

▶ Brown=E' (204, 208)

▶ Green=$\beta^{-\,max}$ (316)

▶ Black=E_e (966,1112)

▶ Red=Photopeak (1173,1333)

$^{60}_{27}Co$	5.271 y	β^-	0.316	100%	1.173	100%
					1.333	100%

Still to Do/Answer

Read

- Why I am getting so many events well above 1333 keV?
- What types of events are causing the very small, but numerous energy deposits?
- Why are there relatively few events at photopeak (compared to other measurements)?
- What other energy values do I want to look at?
- Understand equations that I am using

Do

- Find values of other energy factors (escape peaks, detector efficiency, etc.)
- Create rough model of what I should be seeing (ideally)
- Keep reading