Vadim Murakhovskiy
Week 3 June/17-21/2024

Day 1: June/17/2024

Today was the first day of starting work on a simulation of the project. I was tasked to mostly just work on understanding Geant4 and working within Bash/Linux. I went over mainly the basics like what are the different methods and how they function and how to run the program. There is much to cover so I will most likely have the week to work on figuring the systems out. The goal is to create a program that simulates the physical tests I did last week, but as of now it is out of my reach.

Day 2: June/18/2024

I did more of the same today, now using my own account I installed geant4 and was still getting my bearings on what I could do. Currently I think the main idea on how I will be able to create a simulation is by using presets offered by geant4 and start editing from there. However, this is not a simple task. As far as I was able to research about the presets the best option is G4EMLOW or G4NDL. G4EMLOW simulates how particles slow and change direction depending on the material, while G4NDL focuses on scattering and absorption. The issue is that in theory, I need features provided by both, but it won't be as easy as cherry picking the files I need. Currently I have learned about geant4 and running basic tests provided in the install. I hope that tomorrow me and Suzuki-san will look at it and come to a consensus of what to do next.

Day 3: June/19/2024

With a bit more experience under my belt I used today to make test examples of a simple particle reflector simulation. Using a real simulation that Suzuki-san helped me download to guide me as well as AI. So far there is no visual aspect to the program, but this is a big leap for me as this is my first from scratch sim that was able to run. I also worked on my slides for this week as the weekly meet has been moved to Thursday.

Day 4: June/20/2024

After the weekly meeting I did more solo work today. I got a simulation done that resembles what we need. A particle shot into a detector cone. I have some bugs getting the visual results, but as soon as I'm able to figure out the last part of the simulation we can run and observe the results. Perhaps in tandem with physical tests that I worked on last week.

Day 5: June/21/2024

With some help from Suzuki-san, I finished a simulation. This should work for the specification as it measures the particle going through through a light concentrator, or for the sake of the program a cone, that's about 120 mm in diameter and has a reflectivity of about 99%. The program produces a simple image as well as an output.root file to be analyzed. The simulation data output however is not perfect so this will be the next thing I will focus on next week.