Vadim Murakhovskiy
Week 4 June/24-28/2024

Day 1: June/24/2024

After working on the sim on Friday it would appear that some of the edits made caused bash to not work properly so I spent the first half working on solving the issue. Thankfully I was able to get it sorted and continue the progress from last week. There appears to be more issues with the code than first thought as one error snowballs to another. The graphical aspect seems to be the issue as it's giving an error for the provided angles. I believe I am getting closer to figuring out what line is giving the sim the problem but another error from root is making it not possible to recompile the code. I also attended a meeting for plans about the J-PARC trip. I mostly just listened but also gave some output about how certain aspects of the plan were for me and the other interns.

Day 2: June/25/2024

On Tuesday, I did more of the same work I have been doing. I implemented some more files to add to the sim, that should allow the user to input custom position and angle of the beam. Currently it is not working but I will be checking my current progress with Suzuki-san and hopefully get it sorted.

Day 3: June/26/2024

The sim now works visually, I will be sure to put the results for the weekly presentation. This is a big step towards having it fully operational. The image is based on the physical tests I did in previous weeks. During the running simulation the large circle shows the large side of the cone and a smaller circle showing the end of the cone. Together they build the cone shape of the reflector. There are also small blue dots to show the beam exiting the reflector. By changing parameters in the PrimaryGeneratorAction.cc file you are able to adjust the angle at which the beam enters the cone and where it would exit.

Day 4: June/27/2024

Having finished the entire cone and the angle, today I work at refining/debugging the code with Suzuki-san. Fixed errors relating to root not working in certain files and directory paths as well as errors preventing the user from seeing all the data during “beam on” time. The bigger issue as of now is getting into the formula heavy physics attributes for the project as even though you can see and interact with the sim. The reflections are not generated correctly making the data useless as of now. There is also talk about going back to doing some more physical testing with more finite angles for the laser that will go into the concentrator.

Day 5: June/28/2024

After finishing the friday meeting me and Suzuki-san went to work on finite angle measurements for the light concentrator. We first made a reproducible environment working

around the tendency for the laser platform to move while the angle of the laser was changed. This was done by lining a ruler up to two points of the platform and marking the position on the graph paper below using the markings as the default point to correct to. These corrections would be taken anytime the angle is changed to insure the accuracy of the test. I then began to record my findings like I had done in week two, through paper screen tests and entering peak values on excel. I will continue these tests next week.