Vadim Murakhovskiy
Week 2 June/10-14/2024

Day 1: June/10/2024

Met up with Ken Suzuki as he just returned from J-PARC. Gave me a run down of what to expect for this week. Helped reset the RICH light concentrator laser test. This included grabbing new parts from the store room and some minor adjustments. These adjustments are required as the past test had a system that would change the angle of the lazer in tandem with moving the x-axis. Suzuki-san and his group found that this was obsolete and we spent a good portion of the day removing that system for one that would make the angle and x-axis of the lazer independent. Next we needed to set up a reproducible environment for the test and began to experiment with how the lazer would pass the reflector funnel when in differing positions of the x and y axis. We temporarily removed the pmt and placed graph paper instead to record the results.

Day 2: June/11/2024.

Continuing from Monday, we reinstalled the PMT and began gathering results with the oscilloscope. Recorded the data on google sheets and plotted scatter graphs. I ran three tests today, first being the control with only the x-axis moving. Another was with the y-axis being shifted 4mm above and the x-axis moving, and the last being performed without the scintillator. All of these experiments are recorded and we plan to go over the data tomorrow.

Day 3: June/12/2024

Unfortunately Suzuki-san had to call in sick and we postponed the deeper analysis. However a quick look at the data showed that this new modified test was showing different results then expected. I was tasked with doing a couple other tests to see what could be the reason. The way I did this is by first removing the pmt and re-recording the physical locations of where the lazer would show up using a graph paper screen. I will provide the doc I used to record my findings. I then ran a normal light concentrator test, now using the images gathered by the last test to understand the results better. With what I understand so far, as the light is shifted to another location the peak of the pulse temporally increases and every “jump” is larger than the last. It also seems that perhaps the last team used increased voltage on the PMT causing them to have slightly higher peaks, this so far is just my hypothesis.

Day 4: June/13/2024

I continued to work on the tests solo for the day. With sufficient data pointing to everything being calibrated, I began doing scans with a finer step measurement. Before the data was recorded in intervals of 2mm or even 5mm, today I did 1mm. This proved useful (if not a bit time consuming) as it confirmed some suspicions on how the y-position should affect the pulse

height and drop off point. I also made another slide for week 2 for the meeting that I will attach in the same place as the report. I will present again on Friday my current data and findings.

Day 5: June/14/2024

I attended the Friday meeting and presented once again, but now with tangible results to show for it. During the meeting, it was decided that next week we will run a simulation of the light concentrator test. Today I finished my tests and added a new variable, that being angle. This was done the same way as I did yesterday and I was able to get most of it done by the end of the day.