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This week has been a very busy week, concluding with data acquisition and beam-time on Friday. The beginning of the week, we had finally decided that we cannot use the detector we had initially wanted to use. The original plan was to use a 1 channel germanium detector, but it obviously had a bad seal, meaning the crystal within the detector was getting cold, this was shown via water condensing on the top of the detector. So Monday we had decided to switch to a 2-crystal germanium detector. This detector on the other hand has 18 signals, 9 segments per crystal. So we had to determine how to take data from this detector.

On Tuesday we had to figure out how to mount this new detector, and we had decided to place it on the table that previously housed the NaI detectors, and move the NaI detectors elsewhere. Due to the lack of modules, we were only able to use 1 NaI detector during beam time rather than the originally planned 3.

Wednesday we had begun setting up the experiment for Friday, including filling the detector with liquid nitrogen. To get data from the 18 channels of the germanium detector, we had to use a sum-amp module that adds the signals from one side and can be output as a single signal to then send to a shaping amplifier. These signals need to be gain-matched so the signals intensity matches, this is to avoid multiple peaks for the same energy levels in the spectrum. Gain-matching the 18 signals took some of Wednesday and most of Thursday. The gain matching improves efficiency, but decreases our resolution. A single segment of the detector has a resolution of ~4 keV and the gain matched resolution is more like 8.5 keV. At the end of thursday, the rest of the experiment was prepared. The gadolinium target was placed in the beamline, a camera was set up, the beamline was calibrated and the MCA was set in place. Once everything had been fixed, we ensured we could connect to the MCA via remote connection to collect data while the beam was running.

Friday was beam time, we had from 9am to 9pm to collect our data. At 8:30 we arrived to fill the detector with liquid nitrogen and make any final decisions. By 10, the beam was up and running and we were able to collect our data. Starting with a beam current of 0.5 nA, we decided to increase to 1 nA and were collecting our data with this setting most of the day. Our data provided us with peaks, and analyzing the peaks showed that we were in fact generating the Dysprosium 158. We saw many peaks associated with the +10 levels of the Dysprosium 158 rotational band, as well as a peak at 511 keV for electron annihilation. We collected data the entire day and worked on our plans to analyze it.