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The first part of Monday involved re-testing all of the scintillators in the background to confirm the raw signal is what we expect. In the afternoon, we then tested the scintillators with the cobalt-60 source. Initially, the signal was incredibly weak, and no data was being picked up by the MCA. After looking around the RCNP wiki, we learned the source we were using was more than 40 years old, while cobalt has a half-life of  $\sim 5$  years. After this, two new sources were collected and we calculated the current activity of each and found the strongest source we could use. This new source was 16 times stronger than the original source and it sped up the process of the cobalt-60 calibration immensely. With the source all 4 scintillators worked very well and after being tested they were set up for collecting calibration data. Data was collected for each scintillator for 10 minutes, at 6.0cm, 10.0cm, and 14.0cm.

Tuesday we began analyzing the data we collected the night before. The MCA software we had used to collect the data had analysis features built in, but it was decided a manual analysis would be more accurate. To start, I wrote a jupyter-notebook script which read in the data file, and fit the characteristic peaks of cobalt-60 with a function. This fit gave us the information needed to start with the calibration. By the end of the day we had been slowly working on the coincidence circuit and were able to observe coincidence using a pulser to generate a signal.

Wednesday we continued working on the analysis script. The script calculated the efficiency associated with each configuration as well as the uncertainty in the calculation (error propagation from the fit). During this time, the coincidence circuit was still being troubleshooted, but we had confirmed that our signal's are looking good, we just need to acquire a few more modules for the NIM crate to successfully count the coincidence.

Thursday we finally finished analysis from the data received on Monday. This involved efficiency and energy calibrations. Efficiency calibrations involved comparing the number of counts in each peak to the number of expected counts due to the activity of the source. Energy calibration simply involved comparing the recorded channel data with the known energies of the cobalt-60 decay peaks. For the rest of the day, the coincidence circuit was tested further.

Lastly, on Friday, we re-measured the scintillator's background spectrums and used our calibrations to confirm expected peaks within the spectrum, such as from K-40 and Bi-214.