Linearizing the Clio Detector

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Abstract:

For this project, I had to calibrate the Clio infrared detector using Python code. Due to the detector’s light saturation, there was a non-linear data trend. Therefore, I had to write code to figure out how the data should be calibrated. I first obtained data where the exposure time was gradually increased. I had to read in every picture’s exposure and brightness count, and devised a way to linearize the pictures to correct them through an equation. I took the coefficients generated and calibrated another set by applying the generated coefficients. My biggest accomplishments revolved around learning Python and seeing how coding was applied in a scientific setting. I also learned about the process of data collecting and how that relates to work beyond my undergraduate career. Since the data set is now calibrated, we can fix more data sets from Clio, and use those to accurately measure the brightness of other stars and exoplanets found with this instrument.