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Project 0

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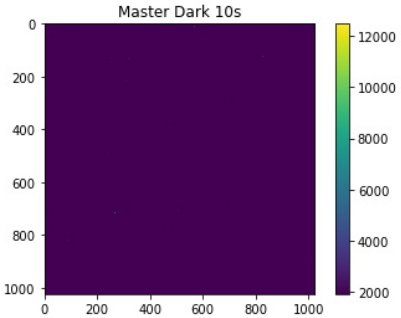
ABSTRACT

1. OBSERVATIONS

Our group decided to convene at the PMA rooftop telescope on 2-9-2020 from 4-5pm in order to take the appropriate flats, darks, and biases for the project. We had hoped to be able to take all of these but due to weather conditions we were only able to take darks and biases. For the flats we had to rely on the generosity of another group. We took 7 bias frames with 10 second exposure times. We then took 2 darks with an exposure time of 10 seconds and 1 dark each with an exposure time of 20s, 30s, and 40s. Upon realizing we needed more darks in order to do proper data analysis, a member of our group returned to the telescope on 2-16-2020 and took 5 darks each at each of the previously listed exposure times, as well as some new biases.

2. ANALYSIS

The fits files were read into a jupyter notebook for processing. Master images were created by combining all relevant exposures and taking the per-pixel median. This was done to create master images for the 10s dark exposure, the 20s dark exposure, the 30s dark exposure, the 40s dark exposure, the bias, the B band flats, the R band flats, and the V band flats. For each we also showed the distribution by creating a histogram that showed the count for each pixel value, and we calculated a mean and a standard deviation. To find the dark current, we took the mean of each of the master dark images vs exposure time and used the np.polyfit method to obtain a fit and a error on the fit. The np.polyfit method produced a dark current of about 4.11 counts/second, with an uncertainty of 0.739+/-.



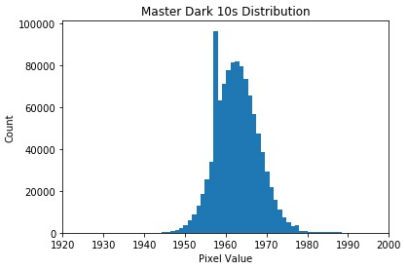
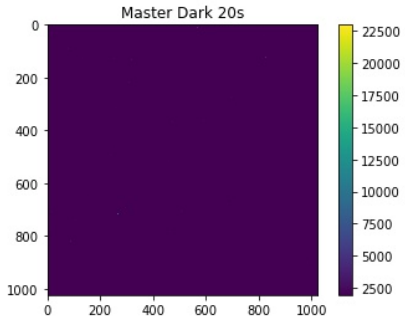


Figure 1. Mean: 1963.16 STD: 25.58



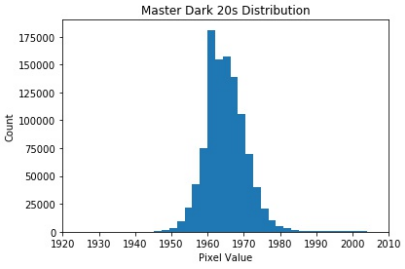
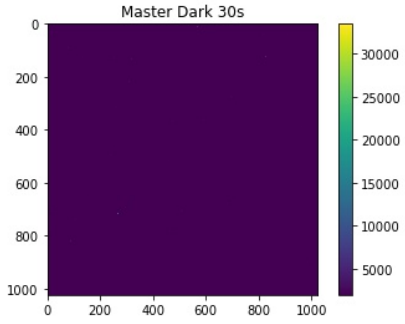


Figure 2. Mean: 1965.83 STD: 49.78



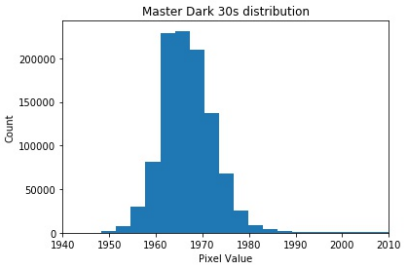


Figure 3. Mean: 1968.19 STD: 73.32

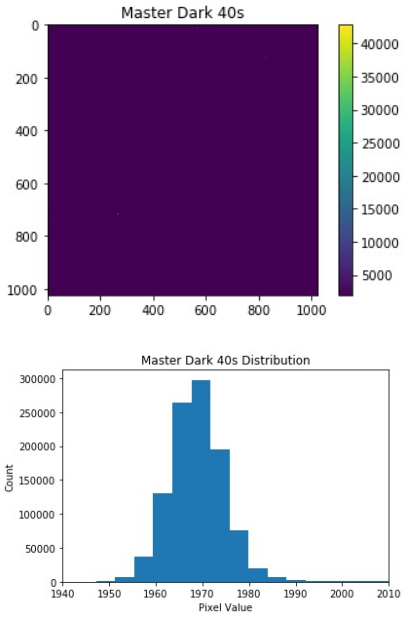


Figure 4. Mean: 1970.46 STD: 94.09

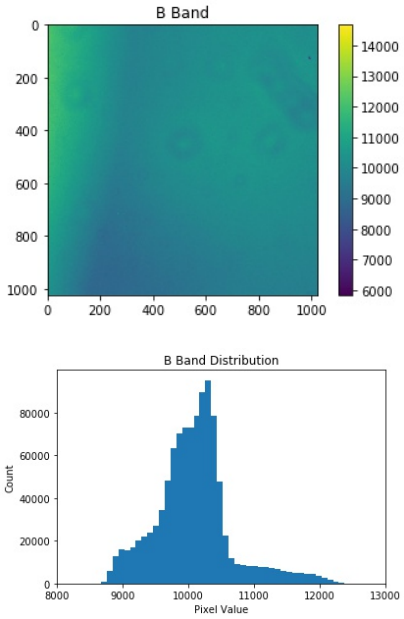


Figure 5. Mean: 10086.81 STD: 583.83

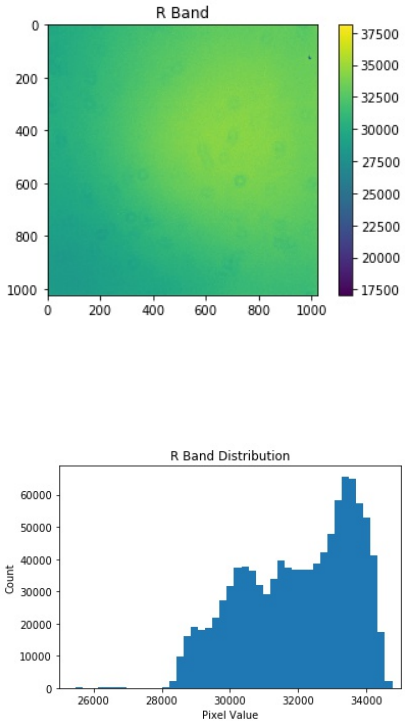


Figure 6. Mean: 31995.31 STD: 1617.11

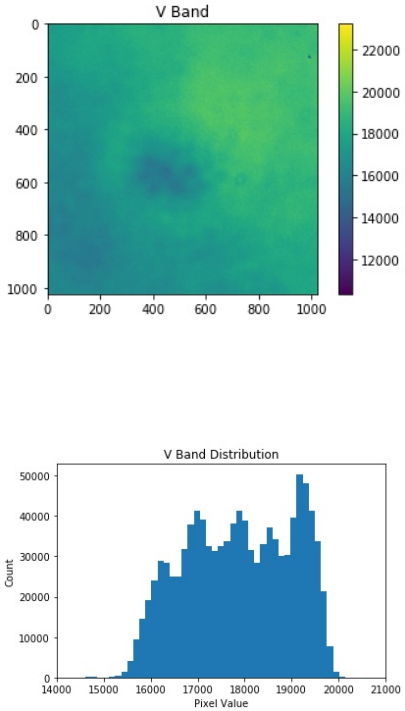
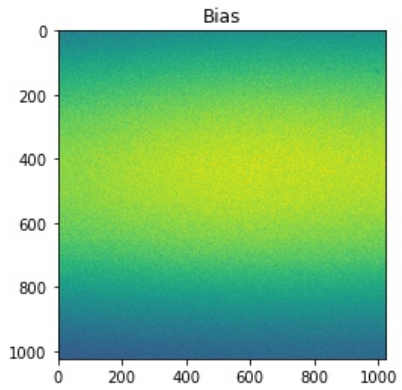


Figure 7. Mean: 17876.14 STD: 1135.67



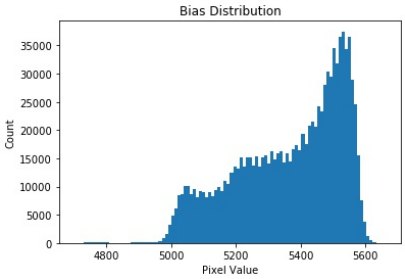


Figure 8. Mean: 5365.39 STD: 164.60

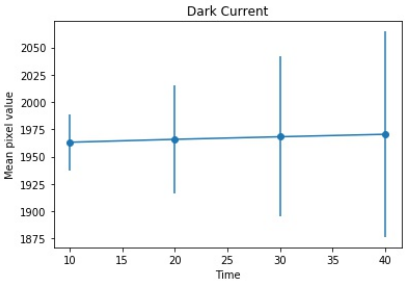


Figure 9. Slope:4.11 Uncertainty: 0.739+/-