

AST443 - Lab 0

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ABSTRACT

This is my abstract about Lab0.

1. BACKGROUND

CCD Cameras: Meaning of the various frames Spectrography

2. PROCEDURE

Separated into sections perhaps similar to the lab manual.

3. DATA COLLECTION AND REDUCTION

Many figures with descriptions, titles, legends, axis labels, units, etc. Equations as well

3.1. *Analysis of Bias Frames*

Beginning with the bias frames taken at -10° , Figure 2 shows the value of each CCD pixel for a single bias frame. Figure 2 is a histogram showing the distribution of counts in all of the CCD pixels during this bias frame. This data does not look gaussian due to the outliers in the data, so 0.029% of outlying pixels in the data set are rejected so that the distribution appears gaussian. The distribution of counts for this trimmed data set is shown in Figure 3.

```
MacBook-Pro-3:Lab0 abigailbishop python3 DataAnalysis4p1-m10.py Gain = 2.06 Unclipped  
Read Noise: 18.884857898803837 Clipped Read Noise: 15.618166364038043 Percent Rejected =  
0.02956390380859375 Master mean = 994.6683856964112 Master Standard Deviation = 6.003172702060524  
STD Decreased by: 0.3451613015828955 1/sqrt(N_images) = 0.31622776601683794
```

```
MacBook-Pro-3:Lab0 abigailbishop python DataAnalysis4p1-p10.py Gain = 2.06 Unclipped  
Read Noise: 23.186913206437666 Clipped Read Noise: 16.555773015334577 Percent Rejected =  
0.09555816650390625 Master mean = 1013.5294130325318 Master Standard Deviation =  
10.1260447421899 STD Decreased by: 0.10036959283050784 1/sqrtN_images = 0.31622776601683794
```

3.2. *Analysis of Dark Frames*

```
python DataAnalysis4p2-m10.py Percent Rejected = 1.7302694635048852 Percent Hot = 1.7951011657714844  
python DataAnalysis4p2-p10.py Percent Rejected = 1.8139990481250066 Percent Hot = 1.8419265747070312
```

3.3. *Analysis of Flat Fields*

3.4. *Bad Pixel Map*

3.5. *Analysis of Spectroscopy*

4. RESULTS AND CONCLUSION

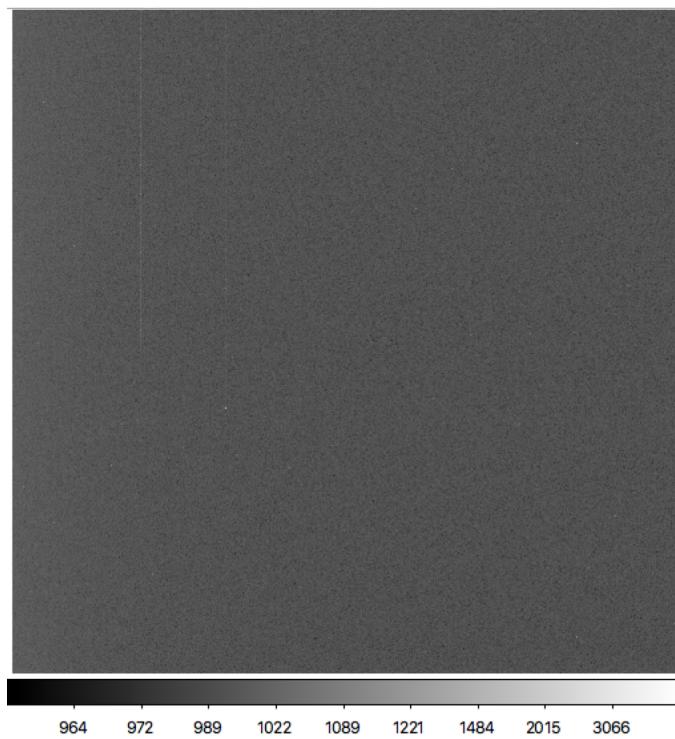


Figure 1. Bias frame

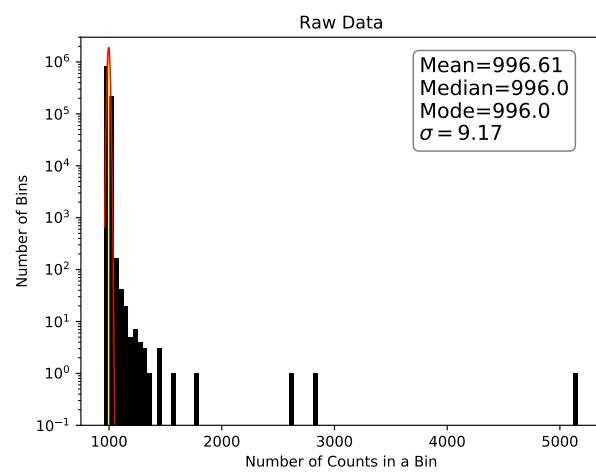


Figure 2.

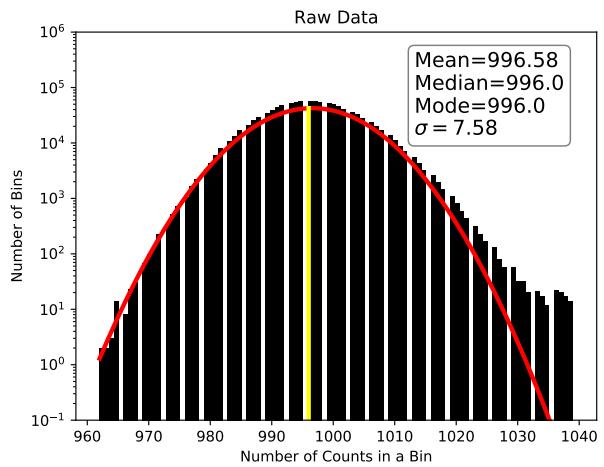


Figure 3.

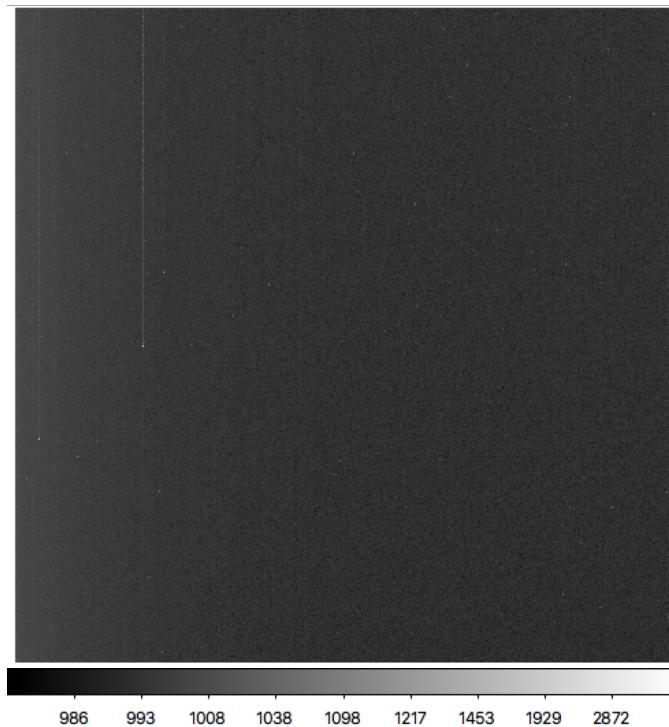


Figure 4.

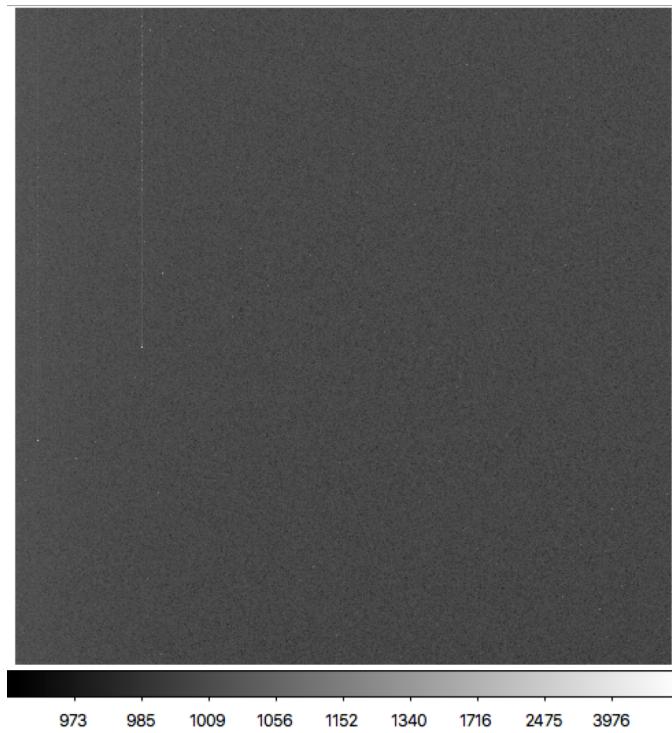


Figure 5.

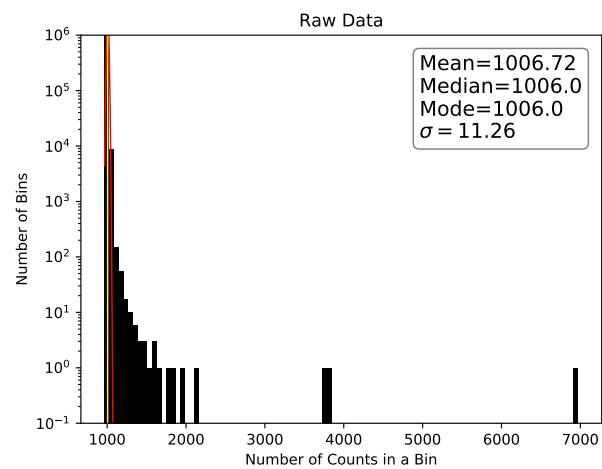


Figure 6.

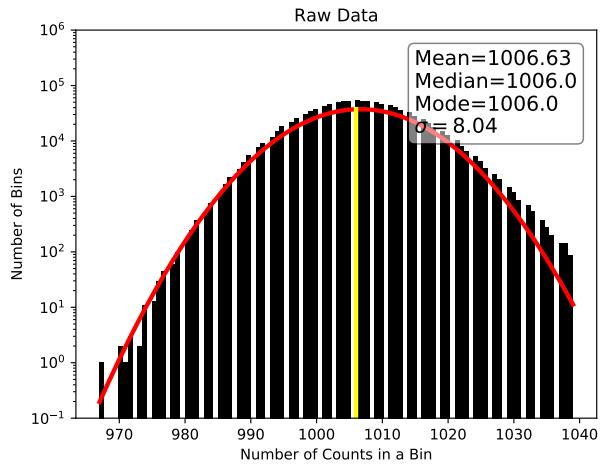


Figure 7.

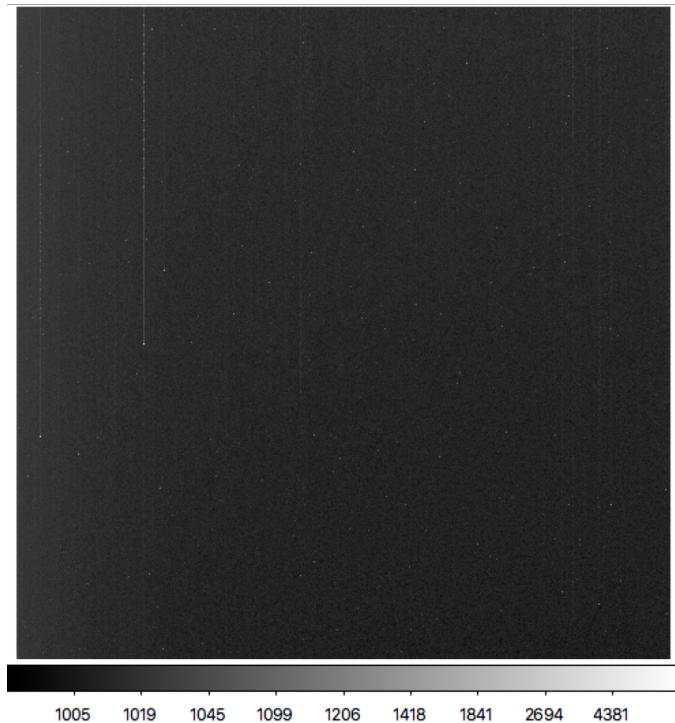


Figure 8.



Figure 9.

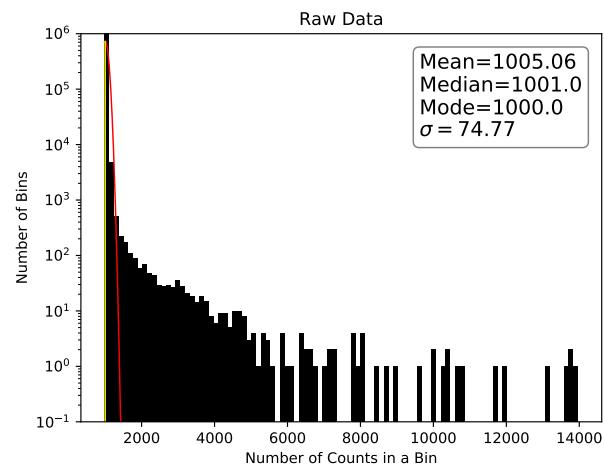


Figure 10.

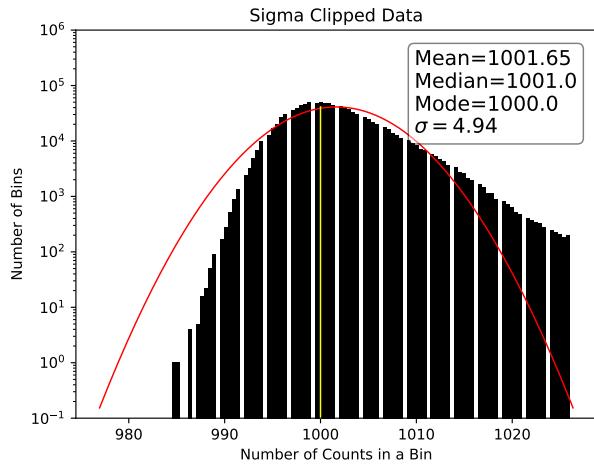


Figure 11.

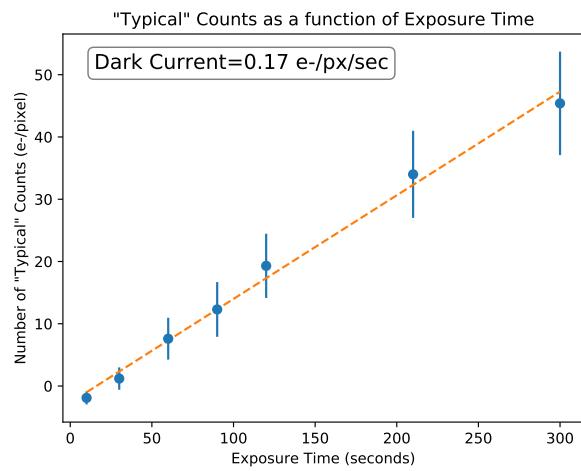


Figure 12.

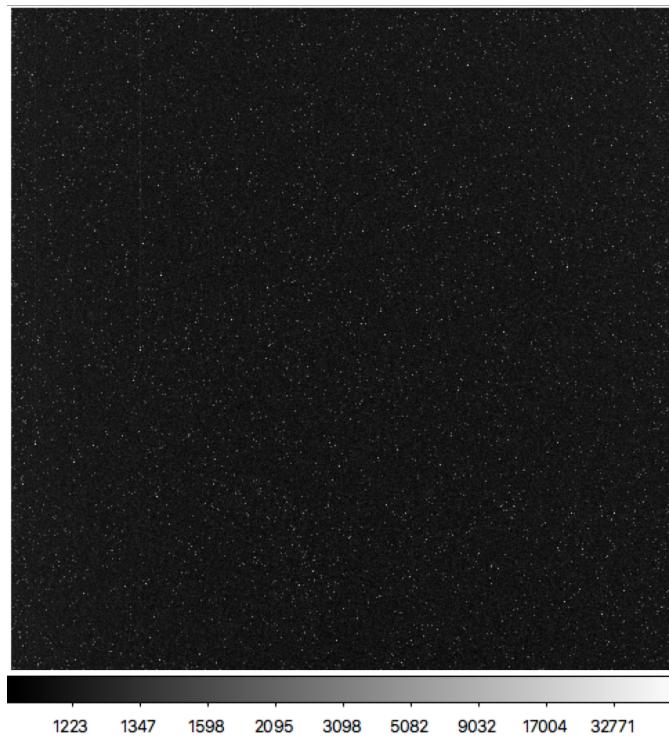


Figure 13.

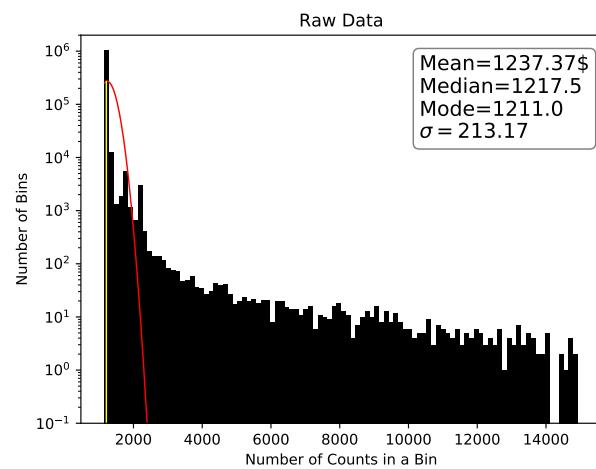


Figure 14.

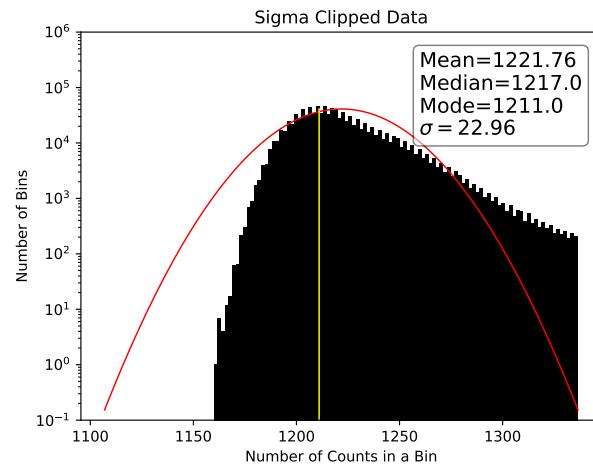


Figure 15.

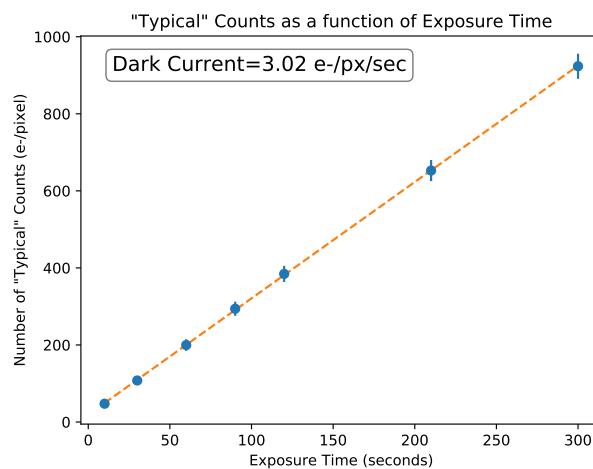


Figure 16.

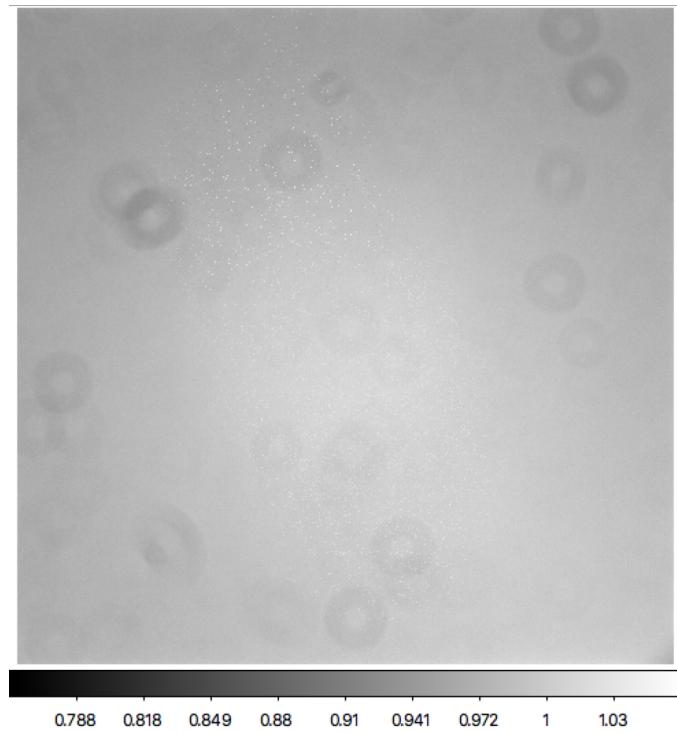


Figure 17.

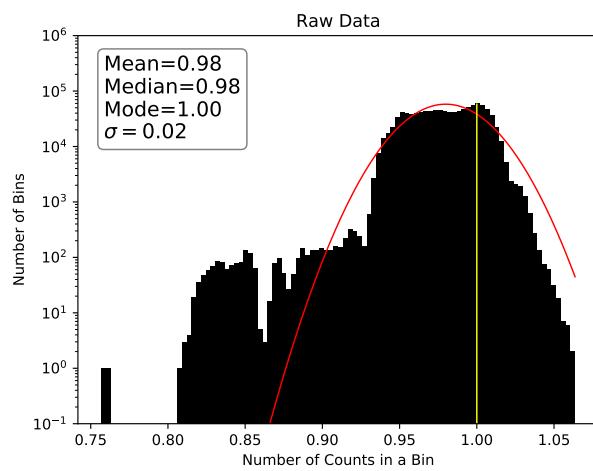


Figure 18.

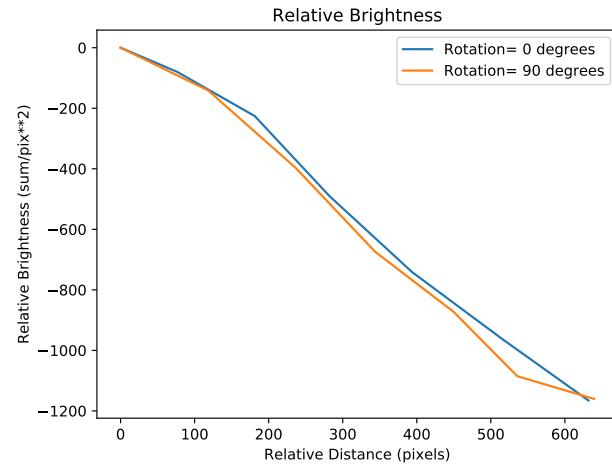


Figure 19.

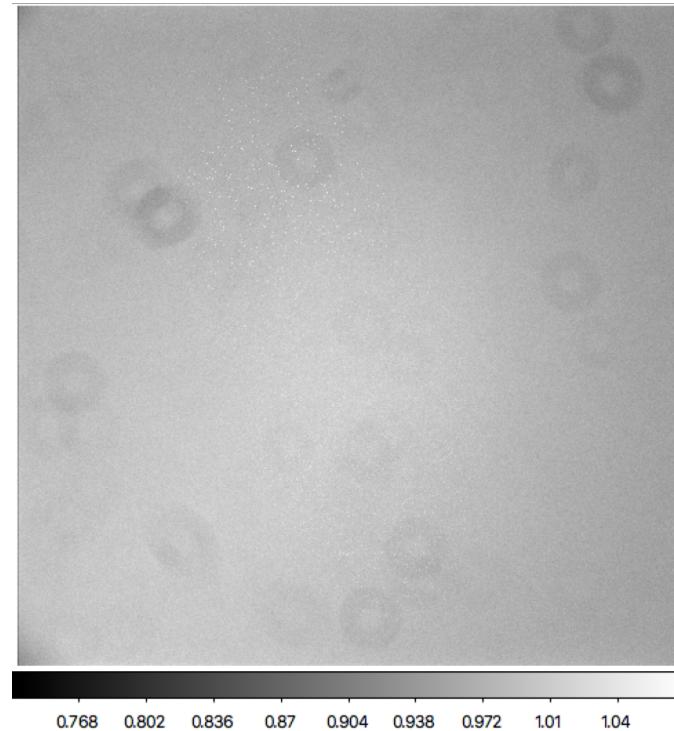


Figure 20.

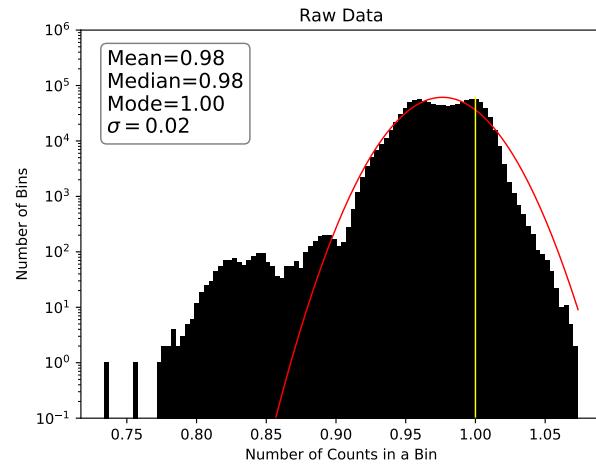


Figure 21.

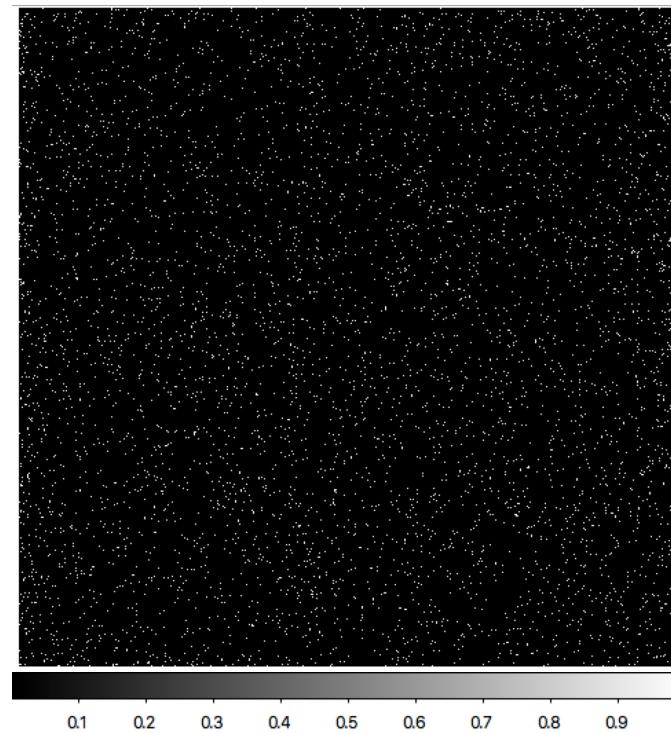


Figure 22.

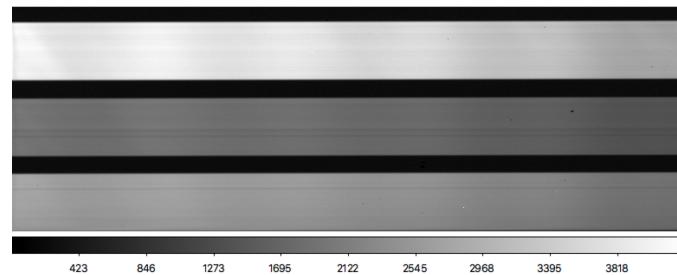


Figure 23.

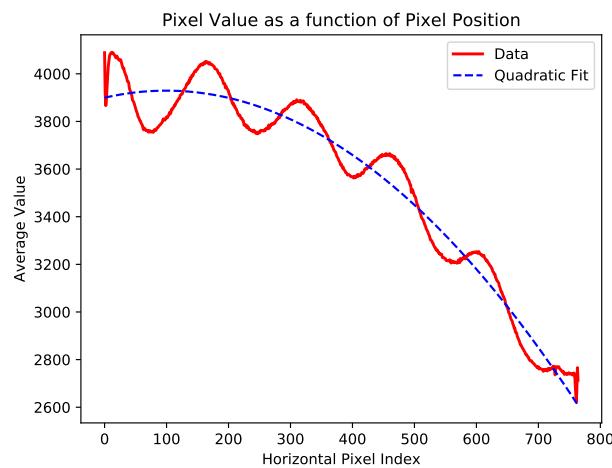


Figure 24.

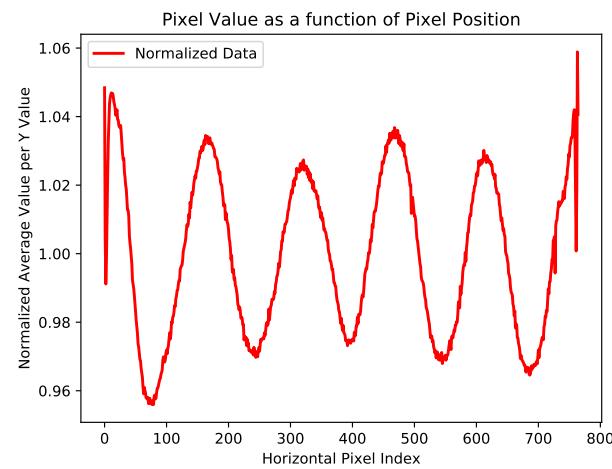
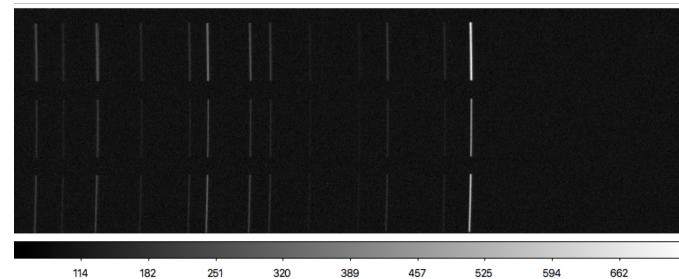
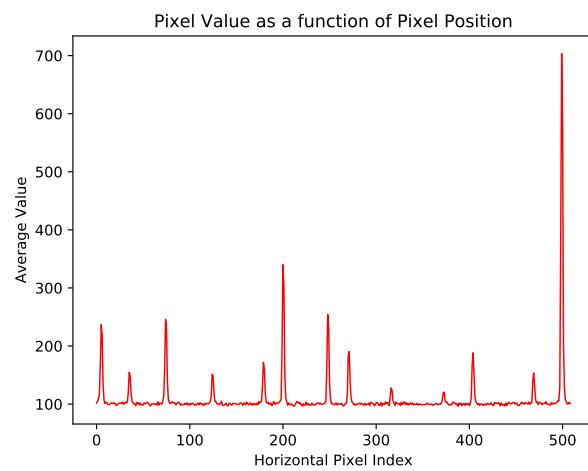
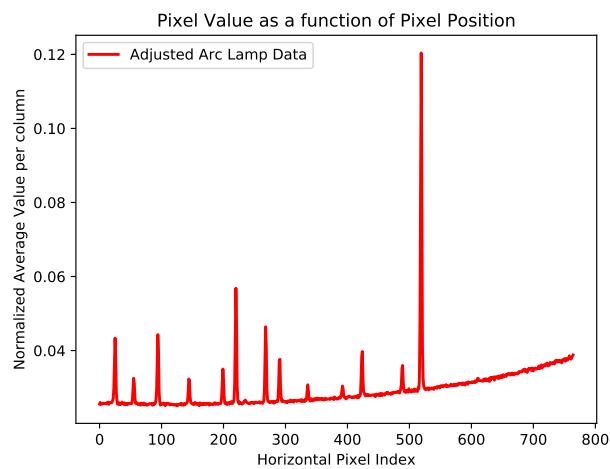


Figure 25.

**Figure 26.****Figure 27.****Figure 28.**