Daniel Opdahl

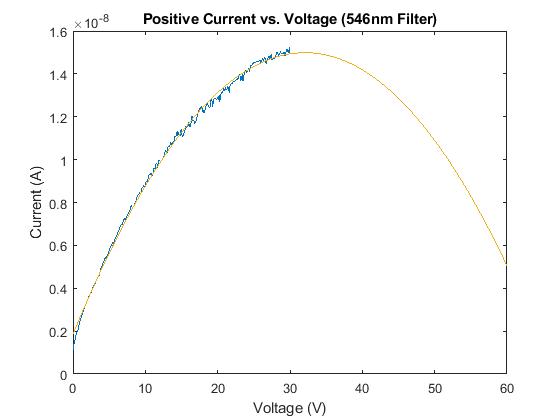
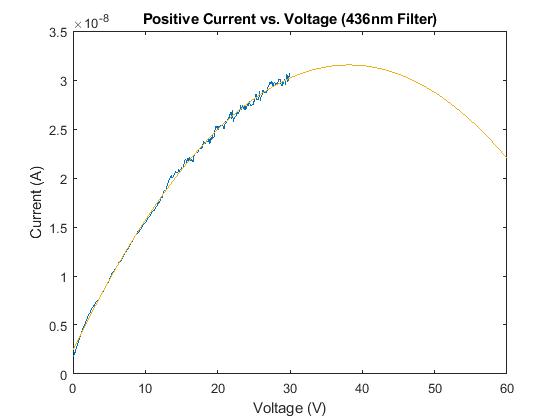
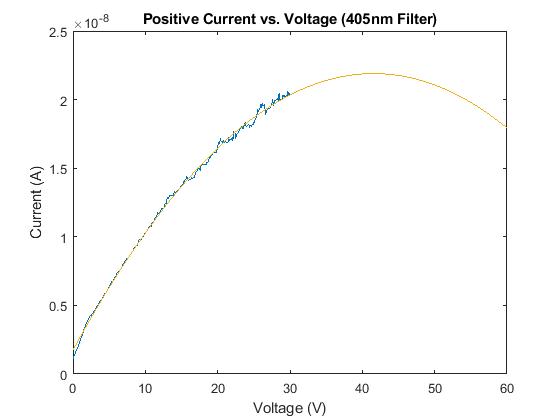
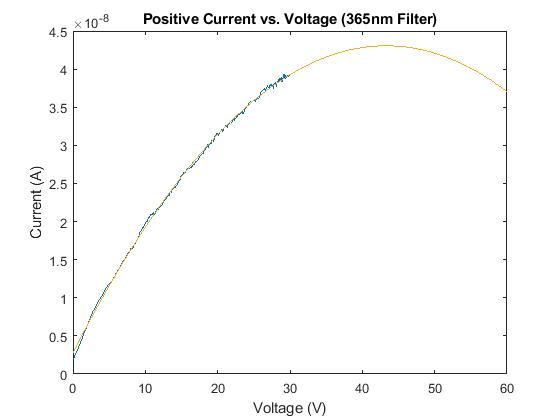
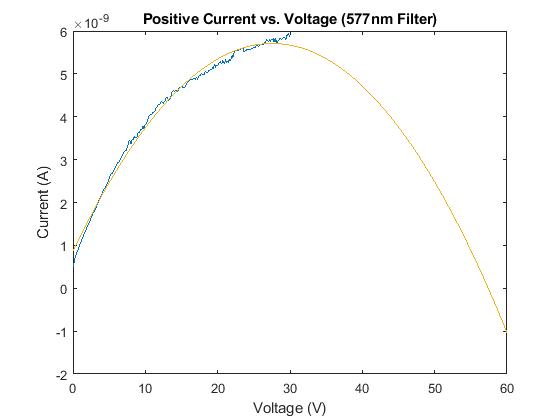
Photoelectric effect experiment

Introduction

Setup

Methods

Results and Interpretation



A plot of current versus positive voltage was created for each of the filters used.

In order to quantitatively determine the maximum current for each filter, ideally we would have continuously increased the voltage until a plateau in our data occurred. Unfortunately, we were limited by our apparatus in our range of voltages we could use. Even gathering data from 0 to 30 volts was not enough for a plateau to obviously occur in our data, as can be seen in Figures 1-5. In order to remedy this, we attempted to fit a logarithmic curve to our data, as we were looking for the value at which the curve would plateau. However, attempts at fitting a logarithmic curve to our data yielded nothing. For all of the filters, there simply isn’t enough data for an asymptoting logarithmic curve to be fit. In lieu of this, we settled on fitting polynomial curves to our data, specifically quadratic curves as we discovered no obviously significant improvements in curve fit with higher degree polynomial fits. Using our quadratic fits, we were able to find where the quadratic’s slope was zero by taking the derivative of each curve and finding the voltage at which the derivative is zero.

The results are shown in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Filter | 577 | 546 | 436 | 405 | 365 |
| Maximum Current (A) | 27.5339 | 32.0834 | 38.1583 | 41.5650 | 43.2780 |

In order to determine the