I. RESULTS AND ANALYSIS FOR ZEEMAN EFFECT

Table I displays the list of current (I) and the associated magnetic field (B-field) values which were used in Fig 1 that compare line separation ($\Delta\lambda$) as it changes with the B-field. The B-field values used in Fig 1 were derived from a 6th degree polynomial fit of more extensive I vs B-field values which are shown in Fig 2. One could potentially use a linear and square root fit in order to model the data in Fig 1 however this doesn't seem appropriate unless we have known theory which predicts such a model. As such, the polynomial fit seems more appropriate given that it can fit arbitrary data sets.

TABLE I. A table of B-field and line separation values as they depend on I

$I \pm 0.01$ (A)	$B \pm 0.1$ (mT)	$\lambda \pm 0.4 \times 10^{-6}$ (nm)
3.00	2069.3	9.5
4.00	2742.1	14.6
5.00	3303.6	17.3
6.00	3700.6	20.1
7.00	3951.0	23.8

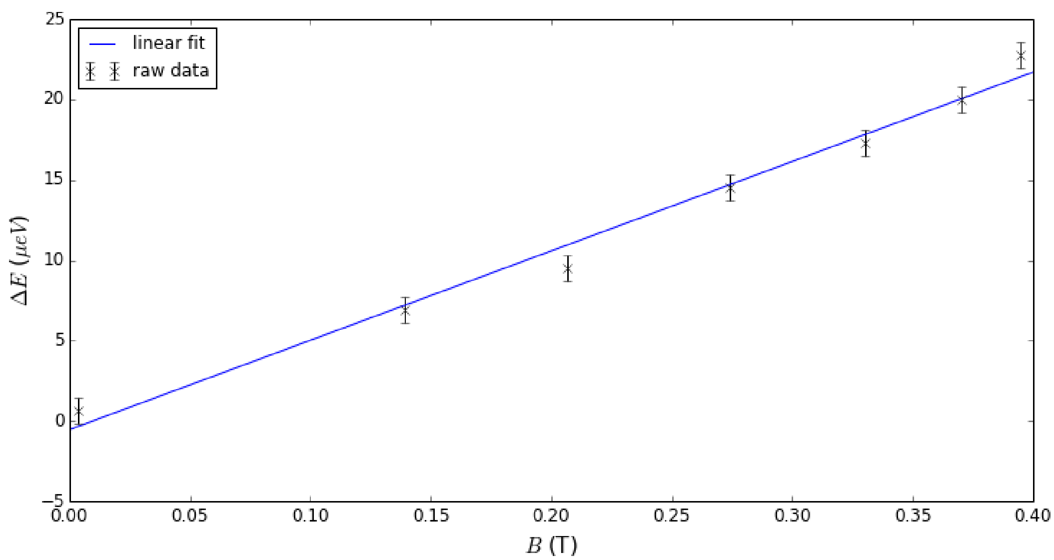

FIG. 1. The linear fit of raw ΔE measurements against extrapolated B field values.

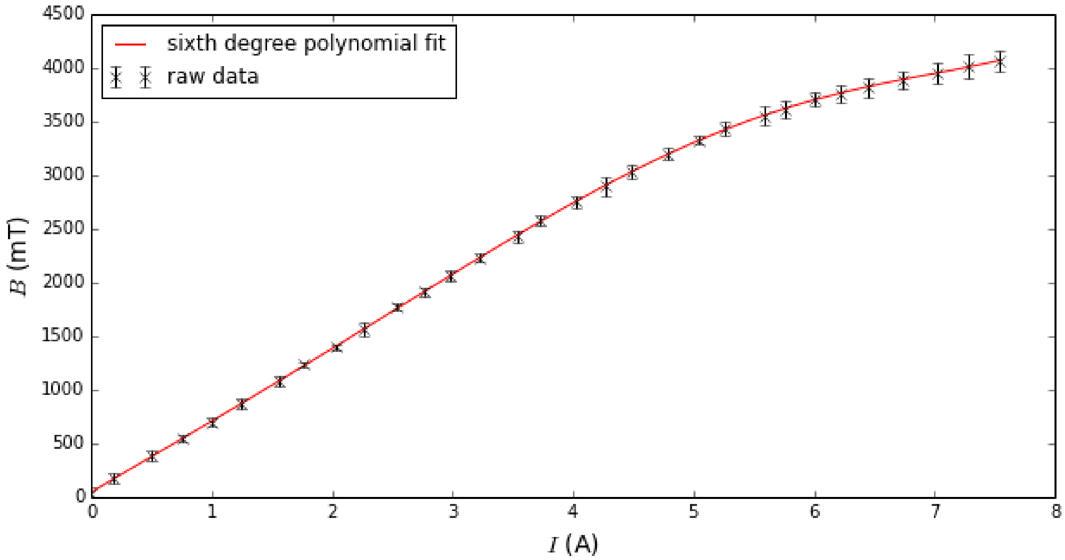

FIG. 2. The linear and sixth degree polynomial fits of direct B-field and I measurements.

Based on the slope of the graph in Fig 1, we find the Bohr magneton to have a value of 56 ± 3 $\frac{\mu\text{eV}}{T}$ which agrees with the accepted value of 57.9 $\frac{\mu\text{eV}}{T}$ to within one standard deviation. The y-intercept for the linear fit was -0.5$\pm$0.8 μeV which is also in agreement with the expected value of 0.0 μeV.

II. CONCLUSION

In this report we find the Bohr magneton to have a value of 56 ± 3 $\frac{\mu\text{eV}}{T}$ which is in agreement with the accepted value. Additionally having a near zero y-intercept helps to support this measurement by confirming the expected trend.