Phys 512 - PS1

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P2

Constant 10μA current, read out voltage.
Chart temperature vs. voltage.
Write an interpolation routine that takes an arbitrary voltage and returns a temperature.
Give a quantitative estimate of the error in the interpolation.

Importing the data from txt.file:

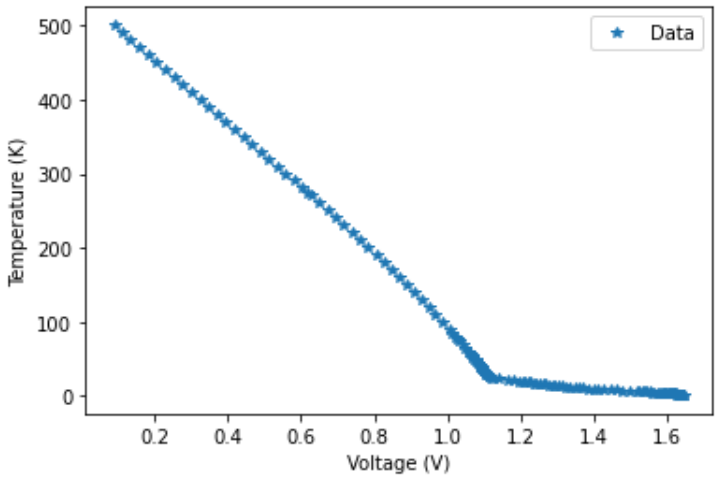

Figure 1: Imported data.

I am making two lists by spliting the data into even and odd indices, and using the "even list" to interpolate and the "odd list" as my true value to calculate the error.

Using a cubic spline from scipy "interpolate":

Applying the cubic spline from *scipy*, I get a function T(v) that gives temperature as a function of voltage.

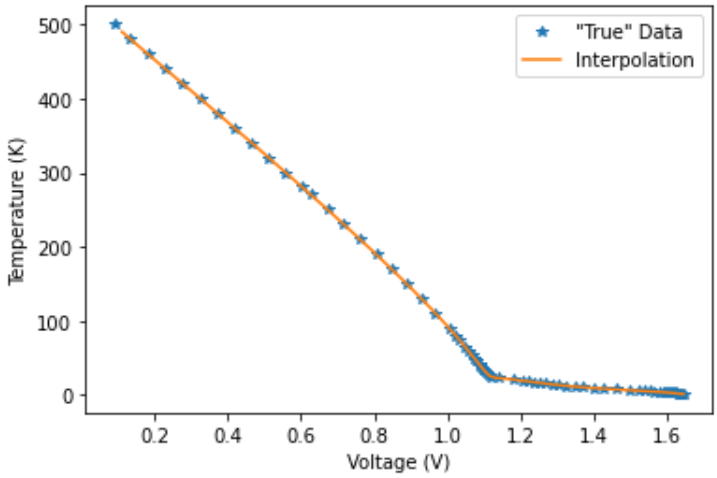

Figure 2: Interpolation of "even list" and comparison to the true value ("odd list").

The error estimate is taken to be the standard deviation of the difference between interpolation and true data ("odd list"), and is equal to 0.03397412046318192.