

UNIVERSITY OF OKLAHOMA

PHYSICS 3302/3312 LAB

COMMON MISTAKES in LAB WRITE-UPS

- 1) Lack of error analysis. This includes several steps. a) You must estimate the error on any measured quantity. Do this in two ways. First, by a simple estimate, that is, think about what you are doing in the measurement and estimate the precision you can obtain. (By thinking about the measurement, itself, often you can come up with techniques to minimize this error.) Second, by repeating the measurement several times. This allows you to gather enough statistics to actually experimentally estimate the error. b) Propagate this error to obtain the error in any value you determine. c) Compare this experimental error to the percentage difference between your measured value and the accepted value. Are the differences due to systematic error? Explain.
- 2) Explicitly answer all questions in brought up in class and in the handouts.
- 3) Label the axes of all graphs.
- 4) Suggest and document improvements to the procedure. (Make sure they really are improvements.)
- 5) Discuss more complicated models in sufficient detail.
- 6) Use the correct number of significant figures throughout the lab. Typically, for estimated and propagated error, this is one or two. In your data, your precision should not exceed your error. And, of course, this should also be true for your final measured values.

ABSTRACT:

We measured the “universal constant” to be 3.14 ± 0.04 units (3.14 units $\pm 1.3\%$). Comparing this to the accepted value of 3.12 units, we find our measurement high by 0.02 units or 0.63% . This disagreement is well within our expected error. Improvements in our measurement, would be obtained by