Elog Do’s and Don’ts

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PHYS403

Fall 2021
What’s the point of the e-log?

• Provide
  • ability to reconstruct sequence of work
  • results of calibrations, physics
  • relevant boundary conditions, such as temperatures, pressures, magnetic fields, distances, voltages, currents, ...

• Document lab work within and outside regular class time

If you came back to these notes in a few months, would they give you enough information to understand what you did that day?
How to use e-logs

• At the beginning of the lab discuss with your lab partner the plan for the lab session and summarize it briefly in the e-log: what needs to be done next? For day 1, write down the overall goal as well as the day’s goal.

• During the lab, pause and summarize your work at natural stopping points in the action, for example, record PMT HV settings after you have determined the best settings.

• Use your folder on the server to save data, plots, scope shots. Include screen shots of plots and scope shots in your e-log.

• At the end of the lab session, make a summary and ensure the e-log provides a rather complete overview of the highlights of your work. Indicate future directions.
**Include plots, photos, scope images when applicable**

**A short description is useful**

Need both an overall goal and the day's goal.

**A data path is very useful!**

If it helps, great, but listing all equipment is not necessary.

**Bullet points would make this easier to read**

**Future directions?**

- Stanford Research Systems Model SR830 DSP Lock-in Amplifier
- Agilent 33220A 20 MHz function/arbitrary waveform generator
- Tektronix TDS 3201B Oscilloscope
- Fluke 77 multimeter
- Fluorescence Spectroscopy chamber in cryostat (polarizer, detector, light source filter)
- Ruby #2 sample and rhodamine

13:00-15:00: Collected VDC (multimeter), VAC (lock-in amplifier), and phase (lock-in amplifier) at 15 frequencies in the range 20-300 Hz at 20 Hz intervals for Ruby #2 and rhodamine sample. Calculated modulation (VAC/VDC) and modulation ratio (sample modulation/rhodamine modulation). Fit relationship between modulation ratio and frequency and phase (sample phase - rhodamine phase) and frequency to determine decay constant(s).

15:00-15:45: Tea Time

15:45-17:00: Data fitting for new data collected as well as three parameter fit for previous data. The three parameter fit includes three different lifetimes for the decay of ruby #2. Corrected background subtraction in old data. Removed the subtraction of the offset from the AC voltage. Hooked up new digital multimeter for automated collection of DC voltage.

**Summary:** Setup the experiment in the cryostat and verified the validity of the cryostat setup by comparing it to the table-top setup.
Example of A “Good” E-Log

**Objective/Goal:**
Today’s goal is to collect data again for the alpha range in Ar to compare with our results for before and investigate a peak above atmospheric pressure.

Today’s Pressure: 756.1 mm Hg
Pressure gauge: 737 mm Hg
Offset: 19.1 mm Hg

**Record Settings, comments:**
- Source to Detector Separation Ar: 2.82 cm
- Filled and pumped the chamber with Ar 3 times to ensure purity.
- Recorded spectrum data for the range of pressures from 50 mm Hg to 771 mm Hg with a step size ~90 mm Hg. Filled in extra data points around areas of interest.
- This time we used separate MCA plots for each pressure to get the exact time.
- Recorded the Peak Energy, the integrated number of counts, and the duration so we could plot $E^{-2}$ vs p and the Count Rate vs p
- We messed up, sample was too close to the detector so we only saw the linear portion of the count plot.

**Label times:**
1:00-3:00
- We plan on finding the range of alpha particles in Ar
- Source to Detector Separation Ar: 4.07 cm
- Repeat same procedure.
- Count data was the best we recorded so far, however the $E^{-2}$ was not scaling correctly.
- Did not up the Bias voltage, so the data will have to be scaled if we want to use it
- Will redo after tea time

**Trial 2:**
3:00-3:40 Tea Time
3:40-4:50

**Trial 3:**
- Source to Detector Separation Ar: 4.07 cm
- Repeat same procedure.
- Turned on Bias Voltage to 40 V
- $E^{-2}$ scaling and count rates were both right this time

**Summary/Conclusions/Future Plans:**
Conclusions: On the work day we will fit our data to the formulas in the literature to calculate the actual alpha range in different gases. Change the scale on Trial 2 to match the $E^{-2}$ scaling.
Example of a “Bad” E-Log

Not organized in sections

No times

No objectives

No parameters, definitions

Unlabeled, unplotted data

Weak summary/future plans
**Do**

- Organize in sections:
  - Goal (don’t forget overall goal on Day 1)
  - Settings/Notes
  - Times & Records
  - Conclusions & Future Plans
- Be specific
- Label by time of each event
- Include exemplary plots
- Use the e-log as a tool to help you throughout the lab

**Don’t**

- Write one big paragraph
- Be general (“We learned about the experiment”)
- Indicate “when” with “after tea”
- Include long data tables (better to plot them)
- Leave e-log writing as an after-thought
**E-log Template**

<table>
<thead>
<tr>
<th>Entry time:</th>
<th>01/23/20 16:02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author*:</td>
<td>Your name and your partner’s name</td>
</tr>
<tr>
<td>Experiment*:</td>
<td>Intro</td>
</tr>
<tr>
<td>Post Type*:</td>
<td>How-To</td>
</tr>
<tr>
<td>Subject*:</td>
<td>Day [#]: [brief description of work]</td>
</tr>
</tbody>
</table>

**Overall goal of experiment (for Day 1 eLog):** Be specific. Example: “We will measure second-sound in helium using a resonant cavity.”

**Goal for today:** Be specific. Not, “Learn about experiment,” but, for example, “prepare samples and perform temperature calibration...”

**Settings / Equipment Notes:** Note important environmental and experimental parameters such as atmospheric pressure, settings on equipment, etc.

**1:00 – 1:30PM (use time ranges, not “before tea”):** Note important steps and results. Include plots, photos, or scope shots. Organize using bullet points and tables.

... 

**Summary and Future Plans:** What did you find and what is the next step (be specific)?