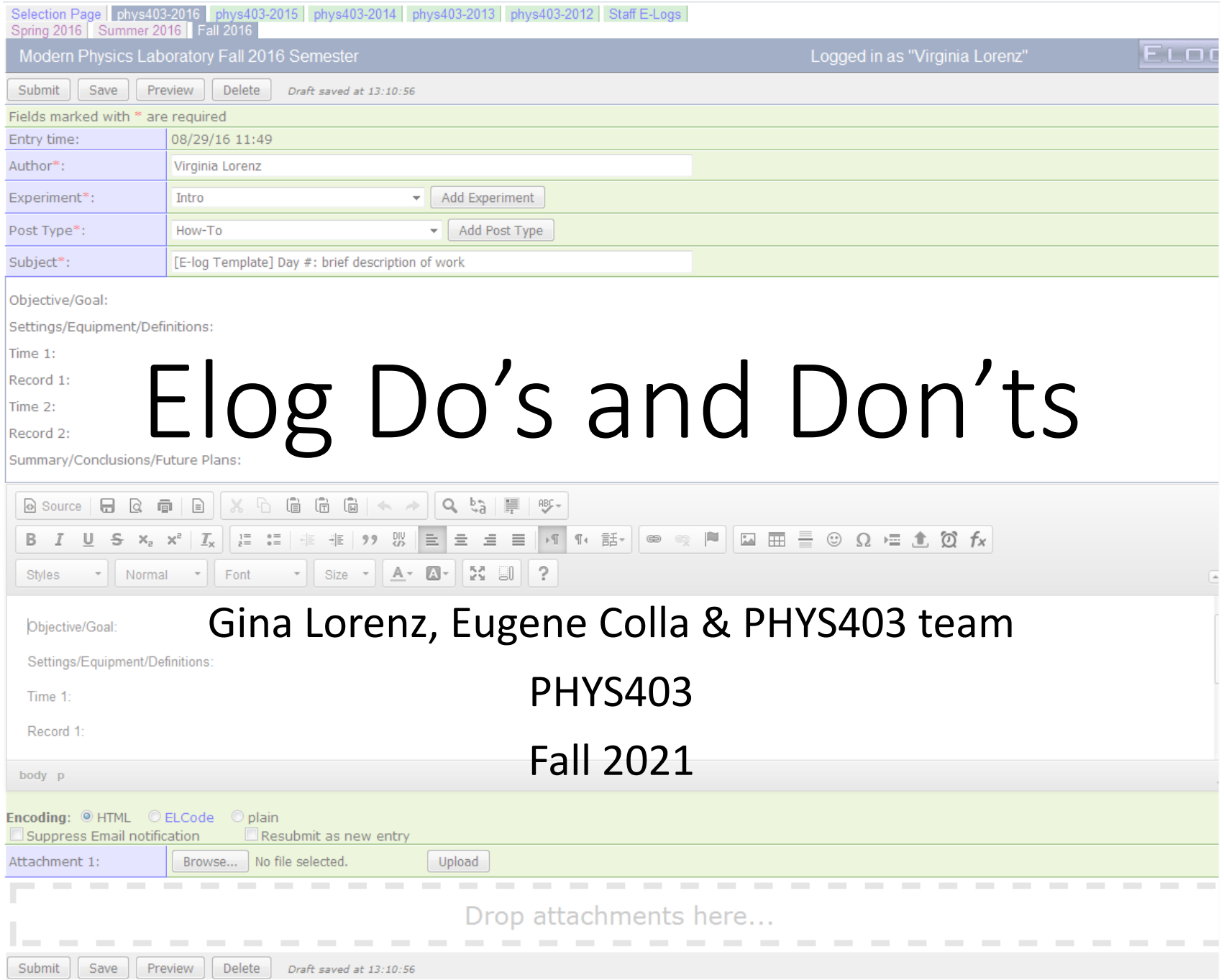


Elog Do's and Don'ts

Gina Lorenz, Eugene Colla & PHYS403 team

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 elog.
- 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.

Experiment:	Fluorescence
Post Type:	Setup
Subject:	Day 1: Ruby 2 Decay Rate -- Cryostat

A short description is useful

Goal: Familiarization with cryostat equipment, measurement/determination of fluorescence decay of Ruby #2 samples

Need both an overall goal and the day's goal

Data Path:

- \\engr-file-03\PHYINST\APL Courses\PHYCS403\Students\Simpkins_Steven\Fluorescence

A data path is very useful!

Equipment List:

- Stanford Research Systems Model SR830 DSP Lock-in Amplifier
- Aligent 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

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

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 net phase (sample phase - rhodamine phase) and frequency to determine decay constant(s).

Bullet points would make this easier to read

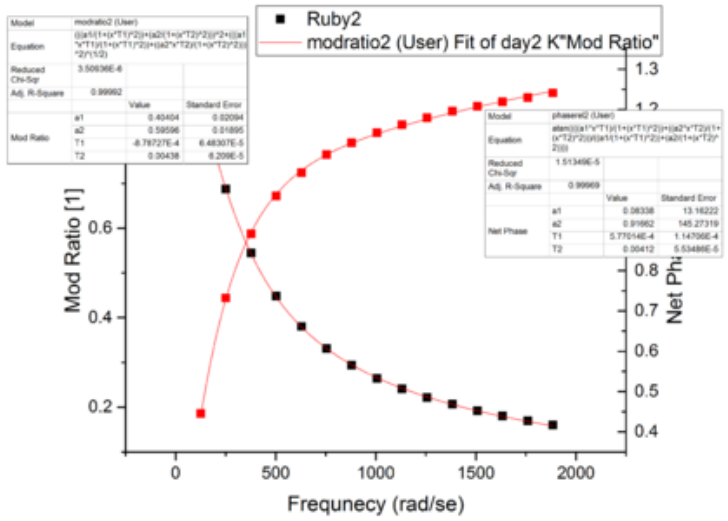
15:00-15:45: Tea Time

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.

Future directions?

Attachment 1:	Ruby2_cryo_300K.png 106 kB | Hide | Hide all



Include plots, photos, scope images when applicable

Example of A “Good” E-Log

Experiment:	Alpha Range
Post Type:	Measurement
Subject:	Day 4

Objective: 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

1:00-3:00

- We plan on finding the range of alpha particles in Ar
- 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.

Trial 2

- 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

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

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.

Objective/Goal

Settings

Organize in sections

Label times

Records, comments

Note parameters

Summary/Conclusions/Future Plans

Example of a “Bad” E-Log

Experiment*:	Gamma Gamma [Add Experiment]
Post Type*:	Setup [Add Post Type]
Subject*:	Experiment

Not organized in sections

Today we learned about the experiment. We took a long time looking through cables to get the right one. The computer program is very slow. Once we plugged the detectors in we figured out the voltages to optimize them. Detector A uses a different voltage than the other two. We got some data from the sodium sample but we need to retake it. We realized that A was switched with B, actually, so that may be reason. Either that or the second coincidence counter is broken.

No parameters, definitions

After tea: No times No objectives

We switched A with B and now everything works. Took data from sodium:

0.5	20
0.6	21
0.7	20

Unlabeled, unplotted data

Got a good result. So moving on now to set up three detectors. Got part-way through, will finish next time.

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

Entry time:	01/23/20 16:02
Author*:	Your name and your partner's name
Experiment*:	Intro Add Experiment
Post Type*:	How-To Add Post Type
Subject*:	Day [#]: [brief description of work]

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)?