Lab Notebook for

PHY 445

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Lab notebook for PHY 445 Spring 2026

Contents

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Link to the lab website: https://you.stonybrook.edu/phy445/experiment-overview/

Note: We are allowed to have 1–2 extra days for this experiment as there was no lab manual given.

1.1 Experiment: Nuclear Magnetic Resonance

Experiments that we will run:

- We will test T_1, T_2, T_2^*, and T_2' for three samples: distilled water, tap water, and water with metal in it (or honey if we do not have that);

Sub-experiment one: distilled water

We got the distilled water from the HEP-ex water room; poured it into the little pipe without a pipette because the only one we found was super dirty and probably full of AIDS.

Distilled water: T_1 Experimental set-up and tuning for measuring T_1 for distilled water:

- RF frequency matching: Tuned it until there was a minimal sine curve. Measured frequency is 21.01291 MHz.
- $\pi/2$ pulse: $1.12 \pm 0.005\,\mu$s
- π pulse: $7.32 \pm 0.005\,\mu$s

Now we tried to measure T_1 for distilled water, but this was very hard:

- We didn't know how to export the osc. data to fit it.
- We didn't know if the pulse was just one peak of the sine curve or if it was the entire curve.
- Corliss came over and helped us kind of. We didn't know how to do anything. He pointed out that we were syncing on A when we probably should have been syncing on B.
- TA came over and helped us more; (**finish**)

Sub-experiment Two: Tap Water

Sub-experiment Three: Water with Metal in It