Xuan Yi

Bachelor of Science
in Physics
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Summary

A bachelor of science in Physics graduated in Dec 2022. Acquire the knowledge from different fields in physics and exam some theories through experiments. During the experiment, apply the Python to analyze the data and fit into the existed model. Write the experiment report by comparing the expected values.

Education

Bachelor of Science in Physics
University of California Santa Barbara
Graduate data: Dec, 2022
GPA: 3.66

Experiments

- **Mossbauer Effect**
  in collaboration with Chang Yin
  - I used resonant gamma ray fluorescence and the Mossbauer effect to observe the energy spectrum of ^{57}Fe.
  - Combined with the dopper shift and hyper fine splitting, I determined the magnetic moment of the first excited state of ^{57}Fe and measured the internal magnetic field in natural iron.

- **Johnson-Nyquist Noise**
  in collaboration with Max Gao
  - I built the filtering and amplifying circuit and used the frequency analyzer to find the gain of the circuit.
  - By applying the Nyquist's theorem, I deduced the measured value of the Boltzmann constant and the enviromental temperature in absolute scale.

- **Interferometry**
  in collaboration with Pinrui Pan
  - I used the beam spliter and two mirrors to create the interference pattern of the laser.
  - I calculated the wavelength of the laser and the refractive index of different medium by changing the path of the laser which lead to the fringe transition.

- **Millikens Oil Drop**
  conducted independently
  - I atomized the oil into the viewing chamber and put the radioactive source near the oil drop to manipulate the electric charge of it.
  - I calculated the charge of the drop and examed the quantum feature of electron by applying the electric field and observing the motion.

Technical Skills

- **Programming Languages**: Python, C++
- **Tools and Frameworks**: Jupyter, Vscode, Git, MySQL
- **Operating Systems**: Windows, Linux

Key courses taken

- **Physics**: Classic Mechanism, Electromagnetism, Quantum mechanism, Particle physics, Condense Matter Physics, Experimental Physics and Relativity.
- **Math**: Linear Algebra, Differential Equations, Vector Calculus, Complex Variables